GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

Naoko Ishii
CEO and Chairperson

April 14, 2015

Dear Council Member:

UNDP as the Implementing Agency for the project entitled: ***Malaysia: Green Technology Application for the Development of Low Carbon Cities (GTALCC)***, has submitted the attached proposed project document for CEO endorsement prior to final approval of the project document in accordance with UNDP procedures.

The Secretariat has reviewed the project document. It is consistent with the proposal approved by Council in June 2013 and the proposed project remains consistent with the Instrument and GEF policies and procedures. The attached explanation prepared by UNDP satisfactorily details how Council's comments and those of the STAP have been addressed. I am, therefore, endorsing the project document.

We have today posted the proposed project document on the GEF website at www.TheGEF.org. If you do not have access to the Web, you may request the local field office of UNDP or the World Bank to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,

Elwyn Grainger-Jones
for Naoko Ishii

Attachment: GEFSEC Project Review Document
Copy to: Country Operational Focal Point, GEF Agencies, STAP, Trustee

1818 H Street, NW • Washington, DC 20433 • USA
Tel: +1 (202) 473 3202 - Fax: +1 (202) 522 3240
E-mail: gefceo@thegef.org
www.thegef.org

REQUEST FOR CEO APPROVAL

PROJECT TYPE: Full-sized Project
TYPE OF TRUST FUND:GEF Trust Fund

For more information about GEF, visit TheGEF.org

PART I: PROJECT INFORMATION

Project Title: Green Technology Application for the Development of Low Carbon Cities (GTALCC)			
Country(ies):	Malaysia	GEF Project ID:[1]	5329
GEF Agency(ies):	UNDP	GEF Agency Project ID:	4283
Other Executing Partner(s):	Ministry of Energy, Green Technology and Water; Iskandar Malaysia, Melaka (Hang Tua Jaya), and cities of Putrajaya, Cyberjaya (Sepang), and Petaling Jaya.	Submission Date:	19 February 2015
GEF Focal Area (s):	Climate Change	Project Duration (Months)	60
Name of Parent Program (if applicable): ➢ For SFM/REDD+ ☐ ➢ For SGP ☐ ➢ For PPP ☐	n/a	Project Agency Fee ($):	413,705

A. FOCAL AREA STRATEGY FRAMEWORK[2]

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Grant Amount, $	Co-financing, $
CCM-4	4.1: Sustainable transport and urban policy and regulatory frameworks adopted and implemented	4.1: Cities adopting in low-carbon programs	GEFTF	2,192,595	2,794,250
CCM-4	4.2: Increased investment in less-GHG intensive transport and urban systems	4.2: Investment mobilized	GEFTF	1,052,133	26,161,455
CCM-4	4.2: Increased investment in less-GHG intensive transport and urban systems	4.3 Energy savings achieved	GEFTF	1,110,066	26,656,561
		Total project costs		4,354,794	55,612,266

B. PROJECT FRAMEWORK

Project Objective: 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						
Project Component	**Grant Type**	**Expected Outcomes**	**Expected Outputs**	**Trust Fund**	**Grant Amount ($)**	**Confirmed Co-financing ($)**
1. Policy support for the	TA	1.1 Major cities implemented	1.1.1 Approved city policies, legislations and	GEF TF	988,351	1,050,124

[1] Project ID number will be assigned by GEFSEC.
[2] Refer to the Focal Area Results Framework and LDCF/SCCF Framework when completing Table A.

promotion of integrated low carbon urban development		and adopted integrated low carbon urban development plans and /or programs	regulations; and strengthened enforcement systems for integrated low carbon urban development. 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 programs for cities and precincts.			
2. Awareness and institutional capacity development	TA	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	GEF TF	418,751	368,041
	TA	2.2 Major cities are aware of, and are planning and implementing low carbon technology applications for integrated urban development.	2.2.1 Completed 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.	GEF TF	578,451	562,083
3. Low carbon technology investments in cities	TA	3.1 Increased investment in low carbon technology applications in cities	3.1.1 Applied design considerations into BRT systems 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	GEF TF	1,052,133	26,161,455

			based on low carbon development plans; 3.1.5 Approved pilot NAMA proposal for low carbon urban development.			
	INV	3.2 More low carbon projects implemented in Malaysian cities	3.2.1 Operationalized electric vehicles and charging station infrastructure; 3.2.2 A BRT system operating in Iskandar Development Region (no GEF support requested); 3.2.3 An operating city cycleway in Putrajaya; 3.2.4 Operationalized onsite waste processing projects in Petaling Jaya.	GEF TF	1,110,066	26,656,561
			Subtotal		4,147,752	54,798,264
			Project management Cost (PMC)[3]	GEF TF	207,042	814,002
			Total project costs		4,354,794	55,612,266

C. SOURCES OF CONFIRMED CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME ($)
Please include letters confirming co-financing for the project with this form

Sources of Co-financing	Name of Co-financier (source)	Type of Co-financing	Co-financing Amount ($)
GEF Agency	UNDP	Cash	240,000
GEF Agency	UNDP	In-kind	114,000
National Government	MEGTW	Cash	22,476,341
National Government	MEGTW	In-kind	252,486
Local Government	Iskandar Malaysia	Cash	28,771,703
Local Government	Iskandar Malaysia	In-kind	250,120
Local Government	Petaling Jaya	Cash	1,516,959
Local Government	Petaling Jaya	In-kind	509,161
Local Government	Putrajaya	Cash	1,261,830
Local Government	Putrajaya	In-kind	149,666
Local Government	Cyberjaya/ Sepang	Cash	20,000
Local Government	Cyberjaya/ Sepang	In-kind	50,000
Total Co-financing			**55,612,266**

D. TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY[1] N/A

E. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

Component	Grant Amount ($)	Co-financing ($)	Project Total ($)
International Consultants	558,000	2,031,900	2,589,900
National/Local Consultants	1,913,658	4,063,801	5,977,459

F. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT? No

[3] PMC should be charged proportionately to focal areas based on focal area project grant amount in Table D below.

PART II: PROJECT JUSTIFICATION

A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN OF THE ORIGINAL PIF[4]

A.1 National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, Biennial Update Reports, etc.: NA.

A.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities: NA

A.3 The GEF Agency's comparative advantage: NA. There are no changes in UNDP's comparative advantage from when the PIF was approved.

A.4. The baseline project and the problem that it seeks to address:

There have been minor omissions and additions to the project baseline presented in the PIF although these have not resulted in changes to the proposed project outcomes. The following changes in project context resulted in omissions from the baseline as presented in the PIF:

- Green Township Malaysia (GTM) – has transitioned into subsequent LCCF programme which is still a part of the baseline as intended in the PIF.
- EV Master Plan – Policy shift of the Government has led to a delay in the EV Master Plan proposal and recently the focus is more on enhancing the EV manufacturing and supply chain. Consequently the EV Master Plan is no longer a central part of the baseline projects. However the Project will address the promotion of EVs by focusing on the market-side by removing barriers for investment in low carbon vehicles by transport operators, and; mainstreaming of EV charging station deployment and EV adoption in local municipal planning. GEF support will be used to enhance the effectiveness of the Green Mobility Fund, being a baseline project not envisaged at the time of approval of the PIF.

During PPG several additional baseline projects were identified both at the federal level and the city level and incorporated into the Project. These include:

- Green Mobility Fund (GMF) - The MEGTW is establishing a GMF that will provide financing to enable public transport operators to adopt low emission vehicles. Whilst the initial scoping for this fund has been completed the detailed design and implementation of the facility is ongoing. There is also a need to strengthen the demand for this fund by assisting public transport operators to assess the business case for low carbon buses (including electric) and to prepare their systems and procedures. An initial grant allocation of $22.08 million (being RMY70 million) is planned by the Government which will provide the seed funds for the provision of finance and risk mitigation measures to enable at least 50 electric buses.
- Green technology incentive scheme – are ongoing baseline activities identified in Petaling Jaya (also known as the Green Rebate Scheme) and Cyberjaya/Sepang and provide rebate on land tax as reward for residents and SMEs investing in green technologies.
- Private sector Initiatives on EV Promotion and Sharing Scheme – In a first of its kind initiative private sectors such as CMS Consortium Sdn. and Eclimo Sdn are developing service platform for complete e-mobility solutions by integrating various parts of the EV ecosystem and value chain. They are planning to roll out electric cars and scooters sharing schemes and deploy public charging infrastructure.

[4] For questions A.1 –A.7 in Part II, if there are no changes since PIF and if not specifically requested in the review sheet at PIF stage, then no need to respond, please enter "NA" after the respective question.

- Mobility Plan and Electric Bus Project in Heritage Sites in Melaka- Melaka is planning to develop a mobility plan for the state as public transportation is a priority in the Green City Action Plan. It has trialled the electric bus operations around the heritage areas since 2012 and plans to scale up the promotion of electric vehicles, to enhance interconnectivity in the tourist areas.
- Putrajaya "Bikeable & Walkable City" – involves the development of a cycleway scheme in Putrajaya. The baseline activities entail an assessment of best practices, and the piloting of a cycle sharing scheme.
- Central Markets Onsite Waste Management Scheme – the project is planning to scale-up pilot project on-site processing of compostable waste in Petaling Jaya. The baseline project includes the installation of more than 90 small-scale systems in key locations (markets, food courts, multi-residential buildings).

These baseline activities are described in detail in the Project Document, section 1.5

A. 5. Incremental /Additional cost reasoning: describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:

There are no changes to the Objective, Component and Outcome levels. Taking into account the changes to the baseline, some changes to outputs were identified during the PPG. These changes are reflected in the Project Result Framework presented from page 46 of the Project Document.
During preparation of the Project Document, it was evident that some aspects of the baseline project(s) require updating and that this involved some changes to the project design. In particular, the PIF identifies 5 target cities, however upon further review and discussions with the cities and MEGTW this list was modified. The participating cities are now: Putrajaya (Federal Territory), Petaling Jaya, Iskandar (Johor), Cyberjaya/Sepang, and Melaka (Hang Tuah Jaya).
The changes from the PIF outputs are as follows:

PIF Output Affected	Changes
1.1.1. Approved and enforced policies, legislations and regulations on integrated low carbon urban development.	Substantively retained as Output 1.1.1 with minor rewording to focus on strengthening of existing systems and enforcement activities, and align with the local level planning process. The PPG identified the need to build on existing experience with low carbon planning in such a way as to ensure mainstreaming within local planning rather than the development of stand-alone low carbon plans. The modifications clarify and strengthen the focus on the city-level with the role of Federal agencies being more clearly directed at supporting cities in their local level planning rather than top-down driven initiatives.
1.1.2 Completed design and planning of integrated urban systems (such as those related to sustainable urban transport, energy supply, waste management, spatial planning).	Incorporated at activity level into Prodoc Output 3.1.4. This enables support to be focussed on projects identified through local level planning process.
1.1.3 Completed sectoral priority assessment for cities; approved action plan comprising comprehensive low carbon climate resilient options as well as financing and implementation plan.	Incorporated at activity level as part of Output 1.1.3. Ensures prioritization is undertaken as part of local planning cycles and is integrated with broader priority setting. The intention results in mainstreaming of prioritized sectors into nominal local development plans and budgets.
1.1.4. Established GHG inventory framework and baseline GHG emissions for project cities; completed monitoring, verfying and reporting (MRV) system for carbon emissions.	Incorporated into Output 1.1.2. This output has been strengthened and builds on the existing experience of national and city-level GHG inventories. The output now establishes a framework for GHG accounting that provides vertical and horizontal (sectoral) data frameworks and also provides tools to

	support decision-making. The framework will link the national and sub-national GHG data mechanisms. Output 1.1.2 will lay the foundation for an MRV system and Output 3.1.1 will design, pilot and institutionalize the MRV framework within the context of the BRT Project. Output 3.1.5 will develop a robust MRV framework as a part of the pilot urban NAMA.
1.1.5. Operational one-stop center in the Ministry of Energy, Green Technology and Water (MEGTW) that facilitates the development and implementation of low carbon sustainable cities and create synergies with similar initiatives to promote coherent actions.	The PPG identified that in order for One-stop centre to provide effective support to local development a decentralised approach building on the existing One-stop centres in cities is warranted. Consequently this output was incorporated at activity level into Output 2.1.1.
2.1.1. Established and operational institutional framework for the effective implementation of low carbon cities policies including defined roles, responsibilities and reporting structures of related agencies.	Reworded to reflect focus on strengthening existing structures and included as Output 2.1.1
2.2.1. Completed training programs for policy decision makers, local governments, green practioniers and financing institutions on strategic urban planning processes for low carbon and climate resilient development, decision making and financing opportunities.	Slightly reworded as 'Completed 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. Disseminated knowledge products for specific target groups in designing, implementing, financing low carbon technology applications.	Included at activity level under Output 2.2.2. The PPG identified the need to strengthen knowledge systems and networks.
2.2.3. Established National Low Carbon Cities Network with linkage to a global network for experience sharing.	Included at activity level under Output 2.2.2. The PPG identified the need to strengthen knowledge systems and networks.
3.1.1. Approved Electric Vehicle (EV) Master plan; and feasibility study and business plan for EV charging stations.	This output was removed as EV Master plan was no longer a baseline activity. The preparation of feasibility study and business plan for EV charging stations was incorporated into Outputs 3.2.1 for electric cars and scooters, and Output 3.1.2 for electric busses. The use of renewable energy for charging infrastructure is also incorporated in these outputs.
3.1.2 Completed feasibility study on the expansion of new corridors of the Bus Rapid Transit (BRT) line in Iskandar Development Region.	This output was removed. The PPG identified that this study had been undertaken by IRDA. The project refocusses on applied design considerations ito BRT for enhnced GHG emission reduction performance of BRT phase 1 and 2 in Prodoc Output 3.1.1.
3.1.3 Developed a regular monitoring system for customer feedback for BRT system to increase ridership.	This output was modified to ensure integration with the BRT Operations Management Systems (BOMS) which was not envisaged at the time of the PIF. This output is now incorporated into Output 3.1.1 with additional focus on increasing rider awareness on GHG emissions and the linkages with personal travel choices.
3.1.4 Operational mobility management system for the Iskandar Regional Development Authority.	This output has been incoporated in Prodoc Output 3.1.1 where the "Operational mobility management system" is being now refered to as the BOMS by the project proponent IRDA.
3.1.5 Formulated city-level Nationally Appropriate Mitigation Actions (NAMA) proposals	This output has been retained as Prodoc Output 3.1.5
3.1.6 Established and operational financing mechanism to support the sustainable	This output has been refocused. Instead, the PPG idenified several targetted financing mechanisms to be strengthenned.

scaling up of low carbon urban development.	These include the Green Mobility Fund (Output 3.1.2) and the Green Technology Incentive Scheme (Output 3.1.3).
3.1.7 Developed and operationalized framework for integrating climate resilient strategies and climate proofing into urban transport planning.	The PPG emphasizes to mainstreaming of an integrated low carbon climate resilient approach at key entry points enabled through the project. In particular, the PIF output 3.1.7 has been integrated into Output 3.1.1 where climate resilient strategies and climate proofing of urban transport will be mainstreamed and tested in a real ogoing BRT project.
3.2.1. Operationalized EVs and installed charging stations, for e.g. in at least five cities.	This output is now incorporated into Output 3.2.1.
3.2.2. Leveraged investments in low carbon urban systems (e.g. community solar PV power generation system, municipal waste incineration and power generation project, etc.) based on the outcome and output of 1.1.2.	This output is now Output 3.1.4. Additionally, the PPG identified a number of specific low carbon urban system projects which have been included as investment projects.
3.2.3. Commissioned a BRT system in Iskandar Development Region (no GEF support requested)	This output is now Output 3.2.2.

A.6. Risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and measures that address these risks:

There were no changes in the risks identified in the PIF. The PPG anticipated other operational risks and proposes countermeasures and management responses as detailed in the Project Document: Annex 3. The overall risk rating is unchanged and is low.

A.7. Coordination with other relevant GEF financed initiatives

There was no change required to the coordination requirements identified in the PIF. However the PPG identified additional opportunities to build synergies and complementarities with ongoing GEF activities in the country, in particular the following:

- The Building Sector Energy Efficiency Project (BSEEP) is a GEF-UNDP initiative with the goal to reduce GHG emission growth rate in the Malaysian building sector and it will do this by improving building energy utilisation efficiency. In particular, the Project will extend the BSEEP activities with regards energy efficiency in buildings by focusing on capacity development of council officers in regards to applying and enforcing revised building codes.
- The Malaysia Clean Technology Innovation Competition and Entrepreneurship Acceleration Programme (MCTICEA) is a medium sized UNIDO-GEF project which commenced in 2013. The Project recognises the opportunities for innovative clean tech service providers to partner with cities. In particular, the Project will focus on linking with BRT, EV and waste management initiatives identified.
- The Energy Efficient Low-carbon Transport in Malaysia project is a UNIDO-GEF project that is currently at PPG stage. The project focuses on manufacturing sector for low carbon vehicles and the promotion of the EV industry. The Project has been liaising with UNIDO country team during PPG to ensure coordination in design.

To ensure effective coordination of activities the Project staff will maintain linkages with these GEF projects. This will include participation of GEF project staff in the Project Technical Advisory Committee.

B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE:

B.1. Describe how the stakeholders will be engaged in project implementation.

The overall governing body for the project will be the National Steering Committee (NSC) which will be a multi-stakeholder body co-chaired by MEGTW and the Ministry of Urban Wellbeing, Housing and Local Government (MUWHLG). This arrangement recognises the comparative strengths and mandates of the two ministries, as MEGTW is the policy lead on green technology and low carbon development whilst the MUWHLG is mandated with the support for local Government and local planning. The NSC will also include representation from sectoral ministries, and beneficiaries, being the participating city authorities, and private sector from the participating cities; and sponsor, being UNDP. The NSC will provide strategic oversight and ensure coordination and mobilisation of pledged resources.
A multi-stakeholder technical advisory group (TAG) will also be established to ensure technical quality and to provide a decision support resource for the NSC. Other stakeholders engaged in the project implementation are identified in the Project Document pp. 13.

B.2. Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCF/SCCF):

There are socio-economic benefits 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 include:

- Reduced dependence on fossil fuels. Malaysia's economy is sensitive to global energy prices. Whilst these financial risks are largely bourne by the broader economy a significant portion is passed through to end-users. The regulated price of fuel includes a significant component which is dependent on global energy prices and as such business are also directly exposed to these financial risks. The subsidies on fossil fuels presents a major burden on public budgets and represents 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 emisisons will be reduced. However in reducing GHG emissions a concommitant reduction in Common Air Pollutants and other Volatile Organic Compounds is expected.
- 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 and in the promotion of local and foreign direct investment.
- Gender benefits are expected primarily through an increased awareness of the need for, and participation of community and marginal groups in local level planning and development processes.

B.3. Explain how cost-effectiveness is reflected in the project design:

The proposed project is extremely cost-effective as it will utilised $4,354,794 of GEF funds to leverage approximately $55,612,266 million of co-financing. In the absence of the Project the LCCF and other baseline projects will lead to reduced emissions, however this is likely to be a slower pace and with diffuse and uncoordinated rollout. In particular, the investment projects will either not maximise emission reductions or will not be implemented.

The cumulative direct GHG emission reductions anticipated from the Project will be 346,442 tonnes CO_{2eq} by End of Project and 2,152,032 tonnes CO_{2eq} over the lifetime of project investment. The GEF contribution for the Project is US$4,354,794. This gives a direct CO_2 unit abatement cost (UAC) of US$2.02 per tonne of CO_2eq.

The Project will also strengthen national planning systems broadly and this is expected to present economic benefits. The Project will boost investor confidence and generate lessons and knowledge on the promotion and application of green technologies, and integrated urban systems. In particular, cities where the main economic drivers are especially closely linked to low carbon development agenda, such as tourism (e.g. Melaka) and attracting foreign direct investment (Iskandar), will further leverage the low carbon gains towards broader economic benefits. This will catalyse further green technology investments and generate replication and indirect GHG emission reductions.

C. DESCRIBE THE BUDGETED M &E PLAN:

Project monitoring and evaluation will be in accordance with the standard approach of UNDP and GEF and is detailed in Monitoring Framework and Evaluation Section of the Project Document on pp. 57.

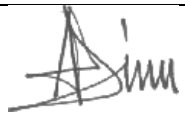
PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

1. **R**ecord of Endorsement of GEF Operational Focal Point(s) on behalf of the Government(s):

NAME	POSITION	MINISTRY	DATE
Dr. Lian Kok Fei	Undersecretary	Climate Change and Environmental Division, Ministry of Natural Resources and Environment	18 Dec 2012

2. GEF Agency(ies) Certification

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for CEO endorsement/approval of project.

Agency Coordinator, Agency Name	Signature	Date	Project Contact Person	Telephone	Email Address
Adriana Dinu Executive Coordinator, GEF		19 Feb 2015	Rakshya Thapa Regional Technical Advisor	+66 2 3049100	Rakshya.thapa@undp.org

ANNEX A: PROJECT RESULTS FRAMEWORK.

Complete project result framework can be found in PROJECT RESULT FRAMEWORK Section of the Project Document on page 46.

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

(i) GEF Secretariat – April 11, 2013

Q#	Comment	Response
6	d) Please develop a detailed schedule to implement the project in harmonization with the baseline projects by the CEO Endorsement stage.	The start and end dates for baseline projects have been included in section 1.5 Baseline Analysis of the Project Document.
7	a) Explanation has been provided. Comment cleared. Please include detailed analysis of integrated urban systems that maximize GHG emission reductions at a city level by the CEO Endorsement stage. Regarding energy supply, please note that GEF-5 focuses on end-use energy efficiency measures and co-generation. Supply-side measures related to electric power generation, transmission, and distributions are not supported.	The Project proposes to mainstream an integrated approach. PPG also identified opportunities to demonstrate the GHG potential for integrated urban systems. These include renewable energy-based recharging of electric vehicles (Outputs 3.1.2, 3.2.1); low carbon/electric vehicles use in BRT (Output 3.1.2); decentralized waste management integrated with urban services and landscaping (Output 3.2.4); multi-modal urban mobility systems (Output 3.2.1); BRT and integrated land use planning (Output 3.1.1). Energy efficiency measures promoted under the project are all focused on end-use efficiency and no Supply-side measures are included.
8	Please provide detailed estimation of GHG emission reductions, including the effects of integrated urban systems, at the CEO Endorsement stage.	A detailed GHG emission reduction analysis is included in the Annex 1 of the Project Document.
13	To ensure replication of the project outcomes and outputs in other cities, please elaborate financial mechanisms to support the sustainable scaling up of low-carbon urban development (Output 3.1.7) by the CEO Endorsement stage.	PIF Output 3.1.6 has been superseded in the final project design by several specific financing mechanisms such as the Green Mobility Fund (Output 3.1.2) Green technology investment incentive scheme (Output 3.1.3), and pilot NAMA proposal for urban development which is anticipated to serve as a vehicle to leverage additional sources of financing (Output 3.1.5). Together these mechanisms will ensure sustainable scaling up of the low carbon urban development. With regards PIF Output 3.1.7 it has been incorporated within other outputs in order to reflect the mainstreaming of low emission climate resilient approach. This includes Output 2.2.1 (training) and Output 3.1.1 where the climate resilience strategy for urban transport will be mainstreamed and demonstrated for BRT project.
25	Please address the following items by the CEO Endorsement stage: a) detailed schedule to implement the project in harmonization with the baseline projects;	See responses above.

	b) detailed analysis of integrated urban systems which connect individual activities (e.g., BRT, EV etc.) to maximize GHG emission reductions at a city level; c) detailed estimation of GHG emission reductions, including the effects of integrated urban systems; d) Elaboration of financial mechanisms to support the sustainable scaling up of low-carbon urban development.	

(ii) Comments submitted by GEF Council Members on the work program approved by the Council in June 2012

Country	Comment	Response
Japan	The Japanese government will start a feasibility study for large-scale formation of greenhouse gas emission reduction projects in Iskandar, Malaysia shortly and will start an investment project next year. This project is to support realize a low carbon society blue print, developed jointly by Japan and Malaysia, by utilizing Japanese environmental technology and products applicable to smart cities. We request close cooperation by the GEF agency and its executing partners with the Ministry of the Environment of Japan to complement each other's activities and maximize synergy effects.	The Project will be supporting Iskandar Malaysia towards its low carbon development agenda. This agenda is driven by the Low Carbon Society (LCS) blueprint that was developed under collaboration with the Japanese Government and Universiti Teknologi Malaysia. The Project formulation team have met with these collaborators including JICA during formulation to ensure that the Project activities are aligned with the relevant initiatives of the Japanese Government including the LCS blueprints and strengthen Iskandar Malaysia ongoing efforts.
Germany	Germany supports the conclusions by the STAP. The development of an extensive BRT network to foster public transportation is welcomed. However, 1. The concept has some shortcomings especially with regard to the envisaged multi-sectoral and holistic approach for urban development planning, as most activities are limited to the transport sector and have a narrow, technology-oriented focus.	1.The Project has been shifted to emphasize a mainstreaming approach whereby low emission climate resilient development will be strengthened within existing national planning and financing systems down to the city-level. This approach subtly moves away from the technology-focused structure of the PIF. The Project supports cities and local authorities through their normative planning processes to identify low carbon projects. These are likely to include energy, water and waste projects. Moreover, the Project includes demonstration of waste processing projects in addition to transport

		interventions and will examine potential for renewable energy for EV recharging. The emphasis on low carbon urban transport is a reflection of the priority placed by cities, government and the private sector.
	2. From a transport perspective, there is a shortage of information on how large the mitigation potential of the EVs will be. Although electric mobility can play role in future sustainable urban mobility concepts, there should be more information on its expected climate benefits.	2. A detailed GHG analysis is included in the Project Document Annex 1 that clearly presents the mitigation potential of low carbon urban mobility including electric vehicles. The project will also examine the potential for renewable energy as an option for EV recharging.
	3.There seems to be a weak embedment of the 2 isolated measures EV and BRT into an Overarching concept for sustainable (urban) mobility. We recommend a thorough review of the proposal a) to fulfill the requirements of a multi-sectorial approach and b) avoid the current technology-focused approach based on only two technologies (EVs and BRT).	3. The project targets multiple sector as it emphasizes its focus on the mainstreaming of low carbon options into local level planning mechanisms. The demonstration projects include an element of integration across several sectors. For example, the EV intervention will demonstrate solar charging or other renewable energy charging options; cycle way and BRT planning will consider integration with land use and urban planning measures; the waste project will provide compost for urban landscaping.
	4. There is potential for cooperation with projects of the bilateral German development cooperation: i.e. TRANSfer (www.transferproject.org) (energy efficiency NAMAs) and mitigation in the Land Transport Sector in the ASEAN Region (http://www.citiesforcleanair.org/EEandCCM.html) with regard to climate-friendly transport in general.	4. The project supports the linkages with local, regional and international programs and networks. According to GIZ country office, Malaysia is not a participating country in the TRANSfer project but as and when it does, the Project will ensure potential cooperation. Output 2.2.2 supports the establishment of a National Low Carbon Cities Network in Malaysia that will be a focal point for fostering engagement with broader networks including TRANSfer. In particular, this network will ensure linkages with the cities for clean air initiative in Malaysia which has completed inputs to the Melaka Green City Action Plan[5].
USA	The United States is supportive of this project and believes that low carbon urban development is an important means to mitigate greenhouse gas emissions.	
	1.We suggest that the proposal include a clearer explanation of the types of EVs that are planned for use (plug in hybrids or battery	1. The types of EVs included in interventions such as EV sharing schemes in Output 3.2.1 are battery operated electric cars and scooters. The choice of vehicle reflects the business prospect considered by

[5] http://www.melakagreentech.gov.my/index.php/2-uncategorised/165-green-city-action-plan-gcap-negeri-melaka

	electric vehicles), as well as examination of the challenges that EV adoption faces, especially in terms of consumers' willingness to pay higher prices.	the private sector and the proponents of the related baseline projects such as COMOS and ECLIMO and are a key aspect of their respective business models. These private sector proponents have examined the business case (including willingness to pay). This is an ongoing effort that will be strengthened by the Project. Under Output 3.1.2 an assessment of options (hybrid or electric) buses will be undertaken in the context of specific business cases for individual bus operators.
	2. The project could also be strengthened by including evidence that BRT and EVs are types of low carbon transport that would be welcomed and adopted by the people in these cities.	2. The BRT and EV projects included in Project are all locally driven and supported initiatives. For the electric cars and scooters, piloting and demonstration has already been undertaken and the project will focus on scaling up. For the electric buses, initial piloting has indicated a high level of interest and the Project will ensure support operators in their assessment of the investment towards scaling up.
	3. Lastly, a more comprehensive results framework would be helpful in defining what constitutes success in the various components of this project	3. A more comprehensive result framework and explanation is included in the Project Document.

(iii) Scientific and Technical Advisory Panel (STAP) comments – May 8, 2013

Based on this PIF screening, STAP's advisory response to the GEF Secretariat and GEF Agency(ies): Minor revision required.

Q#	Comment	Response

Sec. III, 2nd para.	[…] If not already the case, STAP recommends that the five selected "pilot" cities in this proposal are chosen to represent older, modern and still being planned urban developments. It is appreciated that the MEGTW has already undertaken a selection process but the proposal does not provide clarity on the rationale for selecting the 5 urban areas. It would be most useful in the longer term to consider cities that are typical for the country including their differing sizes of populations.	The five selected "cities" have been reviewed during PPG and a revised list identified. The Project targets 5 urban areas including Putrajaya (Federal Territory), Petaling Jaya, Iskandar Malaysia (Johor), Cyberjaya (Sepang) and Melaka (with emphasis on Hang Tuah Jaya). These target areas were selected during project preparation and in consultation with MEGTW and the local authorities. These focal areas represent some of the different legal entities of Malaysian urban setting being 2 municipalities (Petaling Jaya and Cyberjaya/Sepang), a federal territory (Putrajaya), a regional authority (Iskandar Malaysia), and a state (Melaka). They also represent areas at different stages of development including older established (Petaling Jaya, Melaka), new (Cyberjaya, Putrajaya) and under development (Iskandar Malaysia). These areas represent a range of population sizes. For convenience and in line with the colloquial use, the Project Document refers to all participating focal areas as "cities"[6]. Other factors were also considered in selection of the "cities" including: • Involvement in low carbon approaches –participating cities are active and in most cases have tested the LCCF (or other low carbon framework such as the Low Carbon Society) and are therefore likely to deliver replicable lessons in the course of the project; and • Contribute to a representative set of boundaries of planning activities to be demonstrated – they present opportunities for low carbon planning at different scales, being state, region, city and precinct (also called section or district). The lessons arising from these cities will inform replication throughout the country.

[6] The term "city" has a specific legal definition in Malaysia and refers to only 5 historical locations. However, in colloquial usage the term "city" is broadly applied to mean an urban area as represented by the focal areas participating in this project.

Sec. III, 3rd para.	EVs are mentioned throughout but not defined and there are several types already on the market. The proposal reads as though "EV" implies an existing design of automobile but with its standard internal combustion engine replaced by electric motor. Plug-in hybrids are not mentioned, but of more relevance here, neither are 2 wheel electric bikes and scooters. In many urban areas, these will have a more major role to play in future than EV automobiles. The government is planning to introduce an electric bus fleet as part of its BRT system which is commendable. It is not clear whether the intention is to import vehicles (for example from South Korea or China where they are already used) or to manufacture them under the EV Master Plan. It could be that due to technical complexities, local EV manufacture in Malaysia as suggested (page 5), should concentrate on small commuter type cars and 2 and 3 wheel electric bikes. (Why are 400 recharging points needed for a fleet of 400 vehicles as on page 12?)	The types of EVs included in interventions such as EV sharing schemes are battery operated electric cars and scooters. The EV's to be promoted are defined by baseline projects and the baseline project proponents have already selected their preferred technologies on the basis of the business plans and requirements of each baseline project. Consequently, the Green Mobility Fund is considering the adoption of electric buses (both full electric and hybrid configurations); and the private sector participants COMOS and ECLIMO are scaling up their fully electric car and scooter programs. In these cases the vehicles used will be imported from establish vehicle suppliers. Pilot EV charging stations for municipalities will be funded under the project. These will be deployed in accordance with city plans and will target both the fleets of the Municipalities themselves and public use at strategic locations in the cities. EV charging station deployment for EV busses will be integrated with the systems and support mechanism of the bus operators and funded through bus operator investment. The cars and scooter charging stations to be deployed by the private baseline project proponents as part of their scaling up actions in accordance with their business plans. Consequently, the ration of EVs to charging stations will vary depending on the needs of the project. As a guide the EV operators currently anticipate a ratio of 3.6 EVs per recharge station and about 1000 charging stations are to be installed depending on requirements of each city.

Sec. III, 4th & 5th para.	The proposal does not mention the GHG factor for the current electricity supply that was used for GHG emission calculations. Since it is around 60% gas and 20% coal it is probably around 700kg CO2 /MWh, so there may be little GHG benefit in EVs compared with using standard gasoline or diesel engines. This should be carefully considered if EVs are to be encouraged and the grid is used for recharging. The proposal is weak on proving the assumptions and formula for calculating ex ante CO2 emissions reductions (e.g. 1,081,990 t CO2). This should be clarified during the project preparation and needs to be monitored and verified.	The most up-to-date emission factors for electricity are used in determination of GHG emission reductions using the GEF approved GHG methodology and these are included in the Project document. An Emission Factor of 0.741 tCO2/MWh is used, being the most recent EF estimate for Peninsula Malaysia. The project also recognizes that the relatively high grid emission factor is a problem and includes specific activities to examine various low emission vehicle options (Output 4.2) and the potential for renewable-energy based recharging (Output 4.2 & 5.1) either through on-site renewable generation (e.g. solar powered recharging stations) or by green grid electricity options. A detailed analysis of GHG emission reduction for the project using STAP and CDM methodologies (as appropriate) is included in Annex 1 of the Project Document.
Sec. III, 6th para.	An integrated approach to city planning as mentioned in several places is commendable. Measuring the carbon footprints of the pilot cities is essential. Ideally, using a standard method, as done by other cities, represents a useful approach.	The project, under Component 1, will support the development of GHG inventories as well as a framework and system for collection and maintenance of GHG data. Output 1.1.2 includes identification of standard tools and methods that are compliant with IPCC guidelines and which are appropriate for use by cities (e.g. ICLEI's "Harmonized Emission Analysis Tool plus").

Sec, III, 7th para.	A major part of the proposal concerns sustainable transport systems, based on the comprehensive design, implementation and demonstration of BRT systems and EVs. The proposal for a supportive institutional framework to give a low carbon outcome involves waste management, land use planning, and energy supply systems together with transport. Integration of a set of environmental indicators relating to water, waste, energy and transport will make the proposal truly "integrative" and multi-sectoral. Component 2 aims at ensuring the participation of key sectoral agencies/departments under city management. These will have an important role in identifying relevant policy themes and interventions.	The project, under Output 2.1.1, now includes the strengthening of existing monitoring systems (the MURNInets system) and the incorporation of benchmarks and indicators into the national planning systems to drive an integrated approach.

ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS[7]

A. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES FINANCING STATUS IN THE TABLE BELOW:

PPG Grant Approved at PIF:			
Project Preparation Activities Implemented	***GEF/LDCF/SCCF/NPIF Amount ($)***		
	Budgeted Amount	***Amount Spent To date***	***Amount Committed***
Updating and analysis of background context including baseline investments and GHG emission profile	20,000	20,000	0
Conduct of the Project Logical Framework Analysis	10,000	10,000	0
Scoping and assessment of potential city wide NAMA concepts	15,000	9,252	5,748
Review and assessment of financing mechanism to support the sustainable scaling up of low carbon cities	10,000	10,000	0
Detailed design of project activities with participation of relevant stakeholders	35,000	25,000	10,000
Discussions and agreement on the project management and implementation arrangements	5,000	5,000	0
Negotiation and confirmation of co-financing	5,000	4,000	1,000
Preparation of Project document, CEO Endorsement Request and tracking tool	0	0	0
Total	100,000	83,252	16,748

ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used**)**

Provide a calendar of expected reflows to the GEF/LDCF/SCCF/NPIF Trust Fund or to your Agency (and/or revolving fund that will be set up): N/A

[7] If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities.

United Nations Development Programme
Country: MALAYSIA
PROJECT DOCUMENT

Project Title: Green Technology Application for the Development of Low Carbon Cities (GTALCC)

UNDAF Outcome(s): Malaysia does not have a United Nations Development Assistance Framework, UNDP's framework is based on activities that directly supports the achievement of national priorities as laid out in the 10th Malaysia Plan and in line with the *national transformation policy, government transformation programme*, *economic transformation programme*, *rural transformation programme*, and *political transformation programme*.

UNDP Strategic Plan 2014-2017 Primary Outcome: Outcome 1 - Growth and development are inclusive and sustainable, incorporating productive capacities that create employment and livelihoods for the poor and excluded

UNDP Strategic Plan 2014-2017 Secondary Outcome: Outcome 3: Countries have strengthened institutions to progressively deliver universal access to basic services

Expected CP Outcome(s):
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 and an enhanced national framework for biodiversity management of the central forest spine in Peninsular Malaysia and the heart of Borneo.

Expected CPAP Output (s)
Framework on sustainable financing options for both wide-spread green technology applications in the low carbon cities initiatives and effective management of biodiversity endowments

Executing Entity/Implementing Partner:
Ministry of Energy, Green Technology and Water (MEGTW)

Implementing Entity/Responsible Partners:
Ministry of Energy, Green Technology and Water (MEGTW)

Brief Description

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 and 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 will be 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.

Programme Period:	2015 - 2019
Atlas Award ID:	00085917
Project ID:	00093379
PIMS #	4283
Start date:	Mar 2015
End Date	Dec 2019
Management Arrangements	NEX
PAC Meeting Date	_____

Total resources required:	$59,967,060
Total allocated resources:	$59,967,060
• GEF:	$4,354,794
Other (in-kind & in-cash):	
• Federal & Local Govt	$ 55,258,266
• UNDP	$354,000
Leveraged Co-finance	
o Private Sector	US$ 164,136,278

Agreed by (Government):

Date/Month/Year

Agreed by (UNDP):

Date/Month/Year

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Acronyms

10 MP	10th Malaysian Plan
BCIS	Building Consumption Input System
BRT	Bus Rapid Transit
CETDEM	Centre for Environment, Technology and Development Malaysia
CFZ	Cyberjaya Flagship Zone
DTS	Dedicated Transport System
EC	Energy Commission (English for Suruhanjaya Tenaga)
EE	Energy Efficiency
EPP	Entry Point Projects
EPU	Economic Planning Unit
EV	Electric Vehicles
FiT	Feed-in-Tariff
FT	Federal Territory
GBI	Green Building Index
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GTCCC	Green Technology and Climate Change Council
GTFS	Green Technology Financing Scheme
GTP	Government Transformation Programme
IPP	Independent Power Producer
KTMB	Keretapi Tanah Melayu Berhad
LCCF	Low Carbon Cities Framework
LCS	Low Carbon Society
LECB	Low Emission Capacity Building Project
LRT	Light Rail Transit
LULUCF	Land Use, Land Use Change and Forestry
MBPJ	Majlis Bandaraya Petaling Jaya (Petaling Jaya City Council)
MDeC	Multimedia Development Corporation
MEGTW	Ministry of Energy, Green Technology and Water (English for Kementerian Tenaga, Teknologi Hijau dan Air
MESITA	Malaysia Electricity Supply Industries Trust Account
MGTC	Malaysia Green Technology Corporation
MHA	Malaysian Highway Authority (English for Lembaga Lebuhraya Malaysia)
MUWHLG	Ministry of Urban Wellbeing, Housing and Local Government (English for Kementerian Kesejahteraan Bandar, Perumahan dan Kerajaan Tempatan)
MIEEIP	Malaysian Industrial Energy Efficiency Improvement Project
MIGHT	Malaysian Industry-Government Group for High Technology
MITI	Ministry of International Trade and Industry
MOSTI	Ministry of Science, Technology and Innovation
MP	Malaysia Plan
MRT	Mass Rail Transit
MRV	Measurement Reporting and Verification
MSC	Multimedia Super Corridor
NGTCCC	National Green Technology and Climate Change Council (English for Majlis Teknologi Hijau dan Perubahan Iklim)
MURNInets	Malaysian Urban-Rural-National Indicators Network on Sustainable Development
MYR	Malaysian Ringgit
NKEA	National Key Economic Areas
NMT	Non-Motorised Transport
PEMANDU	Performance Management and Delivery Unit
3PU	Public Private Partnership Unit, of the Prime Minister's Department
PMD	Prime Minister's Department

SEDA	Sustainable Energy Development Authority
SME	Small and Medium Industries
SPAD	Suruhanjaya Perkhidmatan Awam Darat (Bahasa for Land Public Transportation Commission Malaysia)
TNB	Tenaga Nasional Berhad
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention for Climate Change
UNIDO	United Nations Industrial Development Organization
USD	US Dollars

Currency Equivalents[1]

Currency Unit = Malaysian Ringgit, MYR

1 USD = MYR 3.52

Other unit equivalents

All tons = metric tonnes (t).

1 kiloton (1kt) = 1000 tons

[1] www.oanda.com (exchange rate effective January 2015)

1 SITUATION ANALYSIS

1.1 Country Context and Global Significance

1. Malaysia is one of the most rapidly urbanising countries in Asia with more than 72% (as of 2010 Census) of the population living in urban areas. The multi-ethnic population of 27.9 million is growing at an annual rate of more than 1.8% where urban growth is around 3.3% whereas rural populations are declining at around 1.3%[2]. It is predicted that urbanisation will further outpace growth so that by 2030 about 82% of the population will live in urban areas. This will lead to a population density shift of 71 persons/km^2 in 2000 to more than 107 persons/km^2 by 2030. This burgeoning urban shift has been strongly linked to nearly continuous economic growth since independence.

2. Malaysia's Greenhouse Gas (GHG) emission levels are relatively high compared to other countries in the region at similar stages of development. Subsequently, Malaysia's per capita GHG emissions in 2007 were estimated to be 10.8 tCO_2e with a national total of 292.9 million tCO_2e. Of these emission sources more than half are directly related to urban settings – specifically electricity (up to 26% of GHG emissions), transportation (16%) and solid waste (12%). Since 2009, the transport sector has become Malaysia's largest GHG emitter sector, and the second-biggest driver of energy demand in the economy.

3. Malaysia has made low carbon development a key feature of its development agenda**.** In 2009, at the UNFCCC's COP 15 in Copenhagen, the Prime Minister announced that Malaysia would voluntarily reduce its emissions intensity of gross domestic product (GDP) by the year 2020 by up to 40% compared to 2005 levels. This voluntary commitment is underpinned by the expectation of significant technology transfer and financial support from developed countries. This gives targeted carbon intensity for 2020 of 1.059 tCO_2e per thousand USD of GDP[3]. However, GHG emissions are still expected to grow at 3.7% per annum from 2000 to 2020.

4. The Tenth Malaysia Plan (10MP) is the country's comprehensive blueprint for development from 2011 to 2015 and sets forth the country's overarching strategy for low carbon development. The National Policy on Climate Change (NPCC) and National Green Technology Policy (NGTP) subsequently set the foundation for the formulation of the Low Carbon Cities Framework (LCCF) administered by the Ministry of Energy, Green Technology and Water (MEGTW). The objective is to achieve sustainable development, reduce carbon emissions of the cities and contribute towards the national GHG reduction ambitions.

5. The NPCC and NGTP set the policy framework for low carbon development in the country. The main objectives of the NPCC include mainstreaming climate change through the wise management of resources and enhanced environmental conservation. The policy also aims to strengthen institutional and implementation capacity to better harmonise opportunities to reduce negative impacts on climate change. The policy is based on the principles of sustainable development, coordinated

[2] UN Habitat, Global Report on Human Settlements, 2011

[3] for 1USD:3.52MYR for July 2014

implementation, effective participation and common but differentiated responsibilities. The NGTP, launched in 2009, seeks to complement the NPCC through the promotion of low carbon technology, sustainable development and conservation of the natural environment and resources. The NGTP focuses on four broad sectors (building, energy, waste and transportation) with five strategic thrusts driven by MEGTW.

6. Local land-use planning and development has a key role in reducing GHG emission from cities and in Malaysia this is a top down process through three tiers of government – the Federal Government, State Government and Local Authorities. The National Physical Plan (NPP) and the National Urbanisation Policy (NUP) 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. The Federal Department of Town & Country Planning (FDTCP) of the Ministry of Urban Well Being, Housing and Local Government (MUWBHLG) guides planning, including for low carbon development, through the provision of planning policies, standards and guidelines. Together with the NPCC and NGTP, the NPP and NUP form the key policy framework for low carbon cities.

7. Despite the overall policy efforts, increasing urban sprawl and growth in incomes continue to put additional pressure on city authorities and emissions are set to increase. 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. Underlying this sprawl is the continuing development of new areas of mostly rural land for new, low density housing and industrial estates although in some cases cities have resorted to in-filling of urban cores with higher density, mixed-use developments. Consequently, city land area is increasing at a greater rate than population so that average population density in cities is decreasing - in KL by 1.34% per year, Penang by 1.6%, and Iskandar Malaysia by 2.46%.[4]

8. Local planning and development drives 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. For example, Johor Bahru in Iskandar Malaysia region has significant industrial activity and consequently these energy intensive sectors account for a large part of GHG emissions. In Putrajaya, which is a centre for administration, or Melaka that is tourism oriented, the issues are related to buildings and transportation. Consequently, there is a significant variation in per capita annual GHG emissions across cities with one review[5] in 2011, estimated Kuala Lumpur (federal territory only) to be 7.2[6], Putrajaya 8.7[7] and Iskandar Malaysia Region 9.3tCO_2e[8]. The national annual average in 2010 was 7.7 tCO_2e, which was above the East Asia and Pacific region, and the upper-middle income country average of 4.9 and 5.4 tCO_2e respectively.[9]

9. Recognizing that sustainable economic development is closely tied to the ability of the country to move to a low carbon climate resilient development pathway, and that cities

[4] World Bank, 2013 based on data from Department of Statistics, Malaysia
[5] Malaysia Economic Monitor, Nov 2011
[6] Economist Intelligence Unit, 2011
[7] University of Technology Malaysia and others, 2011
[8] Ho, et.al, 2011
[9] Malaysia Economic Monitor, Nov 2011

are natural partners to chart a low carbon growth path, the Government of Malaysia has formulated the Green Technology Applications for Development of Low Carbon Cities (GTALCC) project (hereby "the Project"). The Project aspires 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.

1.2 Threats and Root Causes

10. Malaysia and its cities must decouple economic growth and GHG emissions or risk being locked into unsustainable development pathways. Consequently, the federal Government has set ambitious GHG emission reduction targets and put in place a supportive national policy framework. Several low carbon city initiatives that explicitly target low carbon development are at various stages of development at the national and sub-national levels. However, the initiatives are developing in a fragmented manner without a common shared vision, underpinning "integrated approach", or accepted methodologies and standards.

11. The national GHG emission reduction target is not translating to local low carbon development plans partly because national planning systems are not uniformly implemented. Green technology and climate change issues may not be as readily assessed during prioritisation compared to other more immediate and familiar development challenges normally faced by local authorities. Delays in funding for planning and inconsistent adoption of planning standards and guidelines means that many national goals are not being translate to the local level in a timely manner. Those cities that have undertaken low carbon development plans have by and large done so as a consequence of external support from federal agencies or donors. Consequently, many of these plans remain unfunded and set apart from the nominal development plans and budgets of the government.

12. Further delay in adopting a low carbon approach poses a number of threats to sustainable urban development and cities continue to face development problems that are directly linked to environmental degradation and increased GHG emission. These include:

    - Unintegrated and existence of adhoc urban development plans and a "lock-in" of unsustainable economic activities which threatens growth. This is especially the case with regards urban mobility, which is the priority development challenge for cities participating in this project. Congestion undermines growth, and fuel and energy subsidies continue to be a burden on public budgets, yet alternative low carbon approaches and green technologies for urban development are not widely applied.
    - Inconsistent development across the country leading to inefficient use of resources and inequity. Vague jurisdiction on policy and regulatory control over low carbon development leads to poor technical and implementation performance.
    - Missed development opportunities through ineffective decision-making. Data and tools for decision-making on low emission development are not available and cities are unable to do effective planning.
    - Reduced opportunities to access finance or create enabling partnerships for investment. Lack of preparedness due to limited capacity to access new carbon financing or to liberate private sector investment through enabling finance and partnerships.

13. The root causes of slow and inconsistent transition to low carbon development include: a weak and inconsistent planning and development mechanism, especially at the sub-national level; entrenched sectoral hegemonies which oppose a more integrated approach; lack of data and limited understanding of the costs and benefits of low carbon development; mixed perceptions of green technologies as risky and unprofitable, an entrenched suspicion of innovation and preference for status quo; pervasive subsidies on fossil fuels and a reluctance to pass environmental costs to the polluter, which contributes to undermine the business case for some green technologies. These root causes including the barriers discussed in section 1.3 will be addressed, if not eliminated, by the Project.

14. External assistance is required otherwise MUWHLG and MEGTW are unlikely to be able to support cities to mainstream low carbon development within national planning and development mechanisms and cities will not contribute meaningfully to meeting the Government's 40% emission intensity reduction target by 2020.

1.3 Barrier Analysis

15. Barriers to the widespread adoption of low carbon integrated approaches to development in cities in Malaysia include:

An incomplete policy and regulatory framework to promote low carbon planning and development, especially at the sub-national levels

16. Cities and States have struggled to translate the national GHG emission reduction agenda into local action. The weak and inconsistent planning and development mechanisms in cities are due in part to the lack of institutional and human capacity, weak coordination between levels, and lack of effective policy tools for decision-making, inconsistent standards and guidelines, and limited low carbon finance options. This has meant that low carbon development has not featured widely in local development. The exception is where there is a clear linkage with local economic priorities (e.g. green tourism, carbon conscious foreign investment) or other incentives has boosted political will. This has been the case in Melaka or Penang where tourism is a major economic driver; or where cities have received additional support either from MEGTW or other external partners, such as in Iskandar Malaysia or Putrajaya where the Japanese Government provided support for development of low carbon plans.

17. Adoption of national frameworks such as LCCF has been piecemeal and in some cases cities have identified other frameworks more suited to their local needs (i.e. Low Carbon Society, LCS, in Iskandar Malaysia and the use of UN Urban Environmental Accords (UN-UEA) in Melaka). In part, this has been driven by donor funded technical support and local capacity and linkages with international low carbon development programmes. This may not be a problem in itself provided there is coordination and sharing of lessons and data. A more open and flexible learning-oriented approach is justified at this time with a view to promoting a city-led framework for low carbon development.

18. In early 2010 the National Green Technology and Climate Change Council (NGTCCC or also known as Green Technology Committee) was established to oversee the implementation of NGTP and NPCC and to improve linkages with national planning and development mechanisms. However, weak vertical and horizontal institutional linkages have hampered the effectiveness of the Green Technology Committee to support sub-national entities. Consequently, in 2013, the establishment of state level Green Technology Committees with city representation was commenced and this rollout is underway. A key challenge in engaging cities is the unclear linkage between

NGTCCC and the urban planning and development structures (where the decisions are made) as this means that cities see the NGTCCC as a policy body distant from the planning and development system.

19. In the case of green technology and climate change, neither the NPP nor the NUP provide clear guidance to local authorities on low carbon cities and how they can support the national agenda. The NPP acknowledges the NGTP and the use of green technology to address climate change impacts; however it does not address how NGTP and NPCC will be implemented. The NPP and NUP are also very broad and generic policy statements with regards low carbon development and as such they do not provide concrete guidance for relevant agencies at the local level. Subsequently, the local plans do not provide clear entry points for national ministries. Except for those agencies dealing directly with planning and development, there is a general lack of understanding of plans at all levels by agencies and stakeholders and consequently they do not refer to plans when designing projects at the local level. A review of the NUP is currently underway and the NPP is to commence in 2015 and will be reformulated for the period until 2025.

20. Planning mechanisms are incomplete and inconsistent. Currently, all states in Peninsular Malaysia have their own State Spatial Plans that are gazetted in accordance with the Act 172 (Town and Country Planning Act 1976). However, many District and Municipal council plans are out-dated and yet to be reviewed in terms of the current NPP due to lack of technical assistance and funding. There have been instances where some municipalities have set out to review their plans using their own funds or using funds obtained from the State Government. Planning is framed by the FDTCP standards and guidelines, however, the federal structure means that states and local authorities have a lot of autonomy in terms of policy and planning and they are free to adopt, modify, or reject as they see fit. Whilst this can be an enabler of innovation, it also leads to local variations of guidelines or standards or failure to incorporate into local policy. Inconsistency between state and local level approval and appeals processes further disrupts and undermines local low carbon initiatives. These issues are often exacerbated for green technology and climate change areas, as they are relatively new policy areas with implications for investment. Reviewed plans are therefore not necessarily consistent with the NPP and there is a lack of capacity to effectively integrate low carbon considerations.

21. Policy complementarities are missing and there is a lack of cooperation across sectors and jurisdictions. 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. This is a general problem due in part to unclear roles and responsibilities and weak coordination between sectors. In particular the potential to link with private sector in the delivery of services is over constrained and under-utilised.

22. The Green Technology Committees established (and as discussed above) have provided a framework for improved coordination on low carbon policies such as the NGTP and NPCC. However, there has been limited participation from cities largely due to unclear linkages between the committees and the planning and development mechanisms. Cross-sectoral linkages are also weak and in many cases sectoral activities do not take into account the local development plans. Consequently, efforts at the local level do not necessarily align with local priorities and staff capacity is diffused.

Lack of awareness and institutional capacity for evidence-based low carbon planning at the sub-national levels

23. 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. There is a broad recognition of the conflicting subsidy policies for fossil fuels and GHG emission reduction and government has been committed to subsidy rationalization scheme, with gradual increase of fuel and electricity prices since 2012 and with the recent announcement where subsidy for gasoline for transportation has been totally removed, effective December 2014. Electricity industry, however, is still being subsidized. A lack of analysis and awareness of the costs and benefits of many green technology options including energy efficiency benefits hamper the justification for removal of subsidies for electricity industry. 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 best practices. There is no effective system to monitor, gather, analyse and disseminate information on low carbon development activities and progress. Consequently, lessons are often not well communicated and there is yet to emerge a consensus on best practices.

24. Experience in developing stand-alone special plans or blueprints for low carbon development is not translating into the normal planning or project development cycles. Consequently, low carbon development is seen as being something outside normal planning and funding and often being organized in a one-off affair. Iskandar Malaysia for instance, has adopted this approach with assistance from several partners including the Government of Japan. The perception extends from citizens to decision makers and investors and as such weakens end-user demand (for low carbon services) and undermines the ability of service providers to respond. It is then crucial for the stand-alone special plans to be eventually integrated with the available Spatial Plan.

25. Lack of data and tools for analysis means that cities are unable to base low carbon plans and policy on empirical evidence. Some cities have received support from foreign donors, MGTC or MEGTW to undertake GHG inventories or other analysis. MNRE has established national level inventories but these are yet to be downscaled for city level use. 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 especially when this has potential to impact on short-term council revenue. For example, Malaysian cities generate most of their revenue from land developments and land taxes and any shift in practices that impacts on these revenue streams requires solid supporting evidence if it is to get council support.

26. Engagement of general public especially in local planning is limited. An effective integrated approach to urban development, especially for low carbon development, requires broad and effective community participation. Whilst public participation is mandatory under the Town & Country Planning Act (1976) for all State Structure Plans and District Local Plans (section 9 of the TCPA 1976) involvement in other plans has been limited, especially at the community level. In the case of Petaling Jaya, the local authority has introduced innovative by-laws and processes to improve community engagement in planning and development processes. However, these lessons are yet to be adopted in other cities.

27. The limited technical capacity on low carbon projects in many council departments means that the efficiency and rigour with regards low carbon development applications appraisal and enforcement of the guidelines and standards is not uniformly applied. In

some cases unclear roles and responsibilities, political issues and inefficient administration have also contributed to delays and errors in processing low carbon development applications or created opportunities for corruption. These problems are exacerbated when policy and guidelines are poorly defined or do not align with the planning processes. The recent development of new MS1525 voluntary standards for energy efficiency and renewable energy in non-residential buildings, and their incorporation into the UBBL[10] building codes has put in place effective guidance, however capacity at the local level to incorporate in existing development processes and planning considerations is limited. The voluntary notion of the standards necessitates additional effort from council officers as developers adjust their expectations around the new practices and technologies involved. Consequently, there are many local authorities that have not adopted the new standards or have made their own modified versions.

Lack of capacity of cities to mobilise finance and incentives to promote low carbon investments

28. Cities and their service providers are unable to access finance or overcome the high cost of entry for some green technologies. There is a lack of both public and private sector finance available for low carbon technologies and infrastructure, and incentive mechanisms are not accessible or poorly targeted. While the facility has been limited, service providers are unable to access finance for many green technologies, as they are perceived as high risk. 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. There is a lack of financial incentives such as grants, tax incentives and concessional finance, especially at the local level. Cities are responsible for local economic development and urban services yet the public financing mechanisms have no provision for prioritising low carbon options or in reflecting lifecycle costs.

29. Lack of data or inaccurate data on low carbon technologies and practices limits the capacity of urban system providers to assess investment risks associated with low carbon technologies. For example, data unavailability on the costs and benefits of local incentive schemes for improving energy efficiency and waste management means that planners are unable to commit significant funding. Similarly, households and industry are not able to make informed decisions about the technologies they may purchase.

1.4 Key Stakeholders

30. Stakeholders involved in the promotion of low carbon urban planning and development includes

    - The **Ministry of Energy, Green Technology and Water (MEGTW),** is responsible in promoting and implementing sustainable energy and green technology policies. It is the implementing agency for the promotion and adoption of the Low Carbon Cities Framework (LCCF) to the cities and local authorities. MEGTW is also the guardian of the RE Act and a key partner in the development of NAMAs and MRV in the energy sector. In close collaboration with MUWHLG, MEGTW will serve as the UNDP's Implementing Partner for the Project in partnership with the 5 participating cities. MEGTW will lead the project implementation, oversee the accomplishment of project objectives, outcomes and activities, lead co-funding

[10] Uniform Building By-Laws (UBBL).

requirements, initiate policy actions on its own (and through other departments), and facilitate coordination with other key stakeholders including MUWHLG, MNRE, EPU, all related ministries, agencies, and local authorities. MEGTW will be responsible for managing the day to day operations of the project implementation as per the approved work plans and as such will host the Project Management Unit including the National Project Manager, Chief Technical Advisor and other necessary project team members and consultants. It will chair the TAG and organize the TAG meetings. The Secretary General of the MEGTW will co-chair the Project NSC.

- **Ministry of Urban Wellbeing, Housing and Local Government (MUWHLG)** is committed towards building a dynamic society through planning, coordinating and implementing comprehensive housing programs, uniformed development with integral infrastructure facilities, social and recreational services. MUWHLG provides guidance to local government and planning units. In the Project, they will ensure buy in and effective engagement from cities as well as the mainstreaming of low carbon development within national planning and development systems. The MUWHLG will be the member of the TAG and the Secretary General co-chair of the Project NSC.
- **Federal Town and Country Planning, MUWHLG** is responsible in the formulation of city and spatial planning and guidelines to be used by the sub-national and local authorities. FTDCP is the guardian to the Green Neighbourhood Guidelines, National Physical Plan2 and the National Urban Policy. Together with the Local Government Department (LGD) of MUWHLG, they will facilitate coordination from cities and integration with existing sub-national planning processes. They will be an important source for national housing, cities and waste data, and access to MURInets.
- **Ministry of Natural Resources and Environment (MNRE)** is responsible for environmental conservation including implementation of climate change and biodiversity policies. MNRE is the national focal point to the UNFCCC and GEF and will provide overall coordination of the project with respect to GEF guidelines. MNRE is also the implementing agency for the National Communications process and is the custodian of the National GHG Inventory. It is the implementing agency for UNDP LECB Project and the National Corporate Greenhouse Gases Reporting Programme (or MY Carbon). MNRE will be responsible for ensuring linkages between cities and the national GHG inventory systems and the broader climate change policy agenda. It will be an important partner in the GHG accounting frameworks, provide data for GHG analysis and related capacity development trainings. It will provide advice and assistance in the design and formulation of the pilot urban NAMA. It will be the member of the NSC and TAG.
- **Economic Planning Unit**, Prime Minister's Department is responsible for the formulation of the 5-year Malaysia plan and provides overall policy direction on national development including issues related to sustainable development and climate change. It is the co-signatory to the Project Document and as such will oversee project governance as part of the NSC. It will assist in overall policy guidance and facilitate the uptake of policies related to low carbon urban development. EPU is a key cross-sectors policy convenor and will ensure engagement of sectoral agencies towards an integrated approach (at the national policy level). It is expected that key sections in EPU mainly Environment, Natural Resources and Economics section, Energy section, Regional Development section and International Division section will be participating as members of the TAG and in the NSC meeting.
- **Sustainable Energy Development Authority (SEDA)** is administers and manages the implementation of the feed-in tariff mechanism which is mandated under the Renewable Energy Act 2011. SEDA is also responsible in the management and issuance of RE quotas under FiT.

- **Malaysian Green Technology Corporation (MGTC)** provides coordination support, capacity development training and policy studies on green technology. MGTC, upon consultation from MEGTW, will be involved in the delivery of key technical support to the cities.
- **Ministry of Transport** is responsible for the formulation and implementation of national transportation policies/schemes. In the Project, it will provide advice and assist the MEGTW in enforcing various policies on sustainable urban transport and green mobility initiatives.
- **Land Public Transport Commission (SPAD)** is responsible for policies, planning and regulating all aspects of train, bus and taxi services as well as road- and rail-based freight transport. In the Project it will assist the Ministry of Transport in drafting and enforcement of policies related to integrated low emission transportation. SPAD is responsible for the issuance of the Bus Rapid Transit licensing and permits and will be a member of the NSC and TAG.
- **Public Works Department** is responsible in the implementation of the national infrastructure projects, asset management, roads and maintenance as well as providing expertise and advisory on national physical development. PWD is currently executing the UNDP-GEF Buildings Sector Energy Efficiency Project in promoting wide-spread energy efficiency practices in the public and private building sectors.
- Public sector stakeholders and local and regional authorities such as **Putrajaya, Melaka, Sepang, IRDA, Petaling Jaya** are the main beneficiaries, change agents, and co-implementation partners with guidance from MEGTW and MUWHLG.. They will be responsible for coordination of all local planning activities and will ensure that technical assistance provided by the Project is linked to local planning needs and aligned with local priorities. They will be important stakeholders in scaling up of low carbon urban interventions in collaboration with the private sectors.

31. Other stakeholders include:

- Private Sector Entities will be supporting the project through co-financing. A nominee on the NSC and TAG will represent them**.** In particular these include:
  - **CMS Consortium Sdn. Bhd** is developing a service platform for complete e-mobility solutions by integrating various parts of the EV ecosystem and value chain comprising of the EV users, charging infrastructure providers, fleet operators, parking management operators and telecommunication network operators in a concept known as Cohesive Mobility Solutions (COMOS). They will participate in the deployment and operation of EV sharing scheme across several of the participating cities.
  - **CH Green Sdn Bhd.** will install and operate on-site waste processing plants such as decentralized compositing and biogas plants. They could be one of the technology providers and are planning additional investments during the project period.
  - **Eclimo Sdn Bhd.** produces and supplies electric scooters for the Malaysian market. It is planning to introduce electric scooter sharing scheme which also forms a part of the Project.
- Academic Institutions such as **Universiti Teknologi Malaysia** have been engaged in the formulation of the Low Carbon Society Projects 2025 for cities such as Putrajaya, Cyberjaya, and Iskandar Malaysia. In the Project they will provide technical and training support in the assessment and development of low carbon scenarios. Similarly, **University Malaya** provides policy research assistance on the baseline scenarios and capacity development support to the LCCF. Academic institutions will be a key partner in the provision of technical assistance to cities in the preparation and implementation of GHG accounting framework and

development and dissemination of knowledge products. They will be the members of TAG.

- Professional organisations such as the **Malaysian Institute of Planners** have participated in the baseline activities, especially the application of LCCF in Petaling Jaya, Cyberjaya and Putrajaya. In the project they will provide policy support and training and in the development of capacity of local level planners. Professional organisations will be a key partner in operationalizing and maintaining low carbon planning capabilities at the local level.
- **Civil social service organizations** such as the Center for Environment, Technology and Development Malaysia (CETDEM) that can raise the profile of green technology applications and low carbon planning, and its local and national environmental and social benefits through advocacy, awareness raising and training programmes.

1.5 Baseline Analysis

32. Development of low carbon cities is being supported by a number of on-going and upcoming programme and policy tools at the national and local levels. The on-going national initiatives include the Green Neighbourhood Guidelines (GNG) of FDTCP[11], the Low Carbon Cities Framework (LCCF)[12], the Green Mobility Fund, from MEGTW. In most cases national ministries have driven these initiatives, although their impact has been fully dependent on the interest and capabilities of the local authorities. Private sector is also expanding delivery of low carbon services, in particular COMOS Sdn. Bhd., which is providing electric vehicle fleet services; Eclimo Sdn. Bhd., which provides electric scooters; and CH Green Sdn. Bhd., which is developing on-site waste processing plants.

1.5.1 Low Carbon Cities Framework (LCCF)

33. The MEGTW 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 evaluation of low carbon development options can be based. It focuses on four key areas: urban environment, urban transport, urban infrastructure and buildings. The LCCF is structured around the Low Carbon City Criteria, which is categorized into 13 performance criteria and 35 sub-criteria, each of which provides specific action plans toward carbon reduction targets for cities to adopt.

34. The MEGTW has established a programme of activities to roll out the LCCF that has been implemented by Malaysia Green Technology Corporation (MGTC). The support includes on-going technical assistance on quantifying GHG emissions of a city and identifying mitigation strategies and action plan for implementation. The assistance includes measuring the participating city's carbon footprint and establishing the baseline scenarios. This entails defining the boundaries of the city units; identifying and setting criteria for baseline data collection and developing the baseline scenarios. In collaboration with academic institutions, awareness and capacity development

[11] Planning standards and guidelines can be prepared by FDTCP, other government agencies and by the local authorities themselves. The FDTCP issues planning standards and guidelines to state and local authorities as well as the public, however state and local authorities have discretion as to which guidelines to adopt and/or adapt. In 2013 as a response to the NGTP the FDTCP produced the "Green Neighbourhoods" guideline for local authorities although it has not been uniformly adopted. The LCCF focuses only on planning elements that are directly related to GHG emissions, whereas the Green Neighbourhood Guide (GNG) covers all aspects including governance, equity, security and liveability.

[12] Other federal agencies and local authorities themselves can produce guidelines that are similarly tabled at state and local councils for adoption. In this context the MEGTW produced the LCCF however as yet it has not been tabled for adoption at the State Planning Committees or Local Council.

trainings to local councils, urban developers and stakeholders are being provided on the use and application of the LCCF. The programme identifies and promotes strategic showcase projects within the participating cities to demonstrate low carbon developments. Monitoring of these activities and assessing the effectiveness are being planned.

35. Whilst the LCCF has been applied the participation of the cities has been on a voluntary basis only. Few councils have used the framework as a way of responding to national policy gaps for low carbon development and climate change, such as in Petaling Jaya where local guidelines helped promote more efficient buildings and the integration of electric vehicles. However, at a broader level, demonstrating the relevance of the LCCF to local authorities has been a key challenge. This is especially the case in smaller cities where skilled staffing resources are not available. MGTC has been largely relied upon to provide the technical assistance but this has resulted in a capacity bottleneck in MGTC and scaling-up by this approach is not feasible. The lack of effective tools has limited the scope for self-implementation and without extensive support from national ministries or universities it is unlikely to be self-sustaining or scalable. Furthermore, the LCCF has not been able to supersede the more general appeal and familiar format of the Green Neighbourhood Guideline, launched in 2013 as planning guidelines by FDTCP. This contrast has further contributed to LCCF being seen as a top-down framework outside the planning process. While the FDTCP is preparing its "Sustainable Future Cities" programme that will build on the early experience of GNG, the Project will support a closer integration with LCCF.

1.5.2 Low Emission Capacity Building (LECB) Programme

36. It assists Malaysia in enhancing national greenhouse gas (GHG) inventory systems, promoting the uptake of nationally appropriate mitigation actions (NAMAs) as well as designing measurement, reporting, and verification (MRV) framework that ultimately serves national priorities for LEDS. Some of the on-going and planned activities that are considered as baseline activities to the Project include assistance in developing procedure and data collection system for national GHG data; strengthening the institutional framework on GHG inventory at the national level; developing sector-specific MRV guidelines in collaboration with the private sector; establishing implementation framework and mechanism for NAMAs; prioritization of pilots for NAMAs and sectoral MRVs with a focus on the industrial sectors; identifying and developing tools to intensify NAMA implementation; capacity development trainings to operationalize the inventory reporting cycle and related guidelines and tools.

37. The Project will benefit from the preparatory work undertaken by the LECB project especially the formulation of procedure and data collection system for national level GHG data, and NAMA frameworks and MRV systems which can provide early lessons to the cities. GEF assistance will support to enlarge the scope of the LECB by including the development of GHG inventories or accounting frameworks applicable at the sub-national level and in the identification of design options and implementation arrangements for the pilot urban NAMA. The project implementation is scheduled from 2013 to 2017.

1.5.3 Green Mobility Fund

38. The MEGTW is planning the establishment of a Green Mobility Fund that will provide financing to enable public transport operators to adopt low emission vehicles. This way the MEGTW aims to promote the use of EVs and support the establishment of EV eco-infrastructure that will catalyse wider adoption. Through successfully establishing and implementing the Fund, MEGTW aspires to contribute towards the national target of

10% market share of energy efficient vehicles in Malaysia's transportation sector. Whilst the initial scoping for this fund has been completed the detailed design assessment and implementation structures of the facility is being planned starting 2015. The design study will consider suitable financing structures and business models, as well as mechanisms for leveraging and scaling-up support to low carbon public bus transport. An initial grant allocation of USD 22.08 million (MYR 70 million) is planned which will provide the seed funds for the provision of finance and risk mitigation measures to enable, for instance, at least 50 electric buses. The fund is planned to be operational by 2017.

39. The three above mentioned baseline projects were developed in an independent manner and are being implemented in parallel. As such they are currently not directly related and coordinated but do have scope for clear synergies. GEF assistance will either supplement, enhance or modify these baseline projects to ensure they will be coordinated in a harmonious way and contribute synergistically towards a common overall objective.

1.5.4 Sub-national Context

40. The Project targets 5 urban areas: Putrajaya (Federal Territory), Petaling Jaya (Federal Territory), Iskandar Malaysia (Johor), Cyberjaya (Sepang) and Melaka (with emphasis on Hang Tuah Jaya). These target areas were selected during project development and in consultation with MEGTW, the local authorities and other key stakeholders. 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. These 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 10 local authorities being Johor Bahru, Johor Bahru Tengah, Kulai, Pontian and Pasir Gudang), and Melaka (Hang Tuah Jaya, Melaka Bandaraya Bersejarah and Alor Gajah). For convenience, the Project Document will refer to all participating urban areas as 'cities' to resonate the colloquial usage in the country.[13]
    A number of relevant subnational programmes, projects and activities in the participating cities that contribute to the project baselines are discussed below.

1.5.4.1 Putrajaya City

41. Putrajaya is a planned city that serves as the federal administrative centre of Malaysia. It also is a Federal Territory for Malaysia and houses almost all of Malaysian government ministries. A residential population of around 50,000 is matched daily by a similar number of commuters. Planned as a city that is environmentally, socially and economically sustainable[14], the Putrajaya Structure Plan 2025 was recently prepared and yet to be gazetted. Taking into account the National Green Technology Policy (NGTP), this plan 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) study which identified a priority set of action plans including: integrated city planning and management, low carbon transportation, cutting-edge sustainable buildings, renewable energy, and gas district cooling networks.

[13] The term "city" has a specific legal definition in Malaysia and refers to only 5 historical locations. However, in colloquial usage the term "city" is broadly applied to mean an urban area as represented by the focal areas participating in this project.
[14] Putrajaya Master Plan, 1994

42. Consequently, Putrajaya has been working with community leaders and the private sector on the 'Municipal Solid Waste Management Initiative' and with educational institutions on the 'Youth Led Awareness Programme on the PGC 2025' to encourage youth-led initiatives. These projects showcase precinct level planning and have subsequently led the council to escalate the initial pilots to a more substantial 'Integrated Precinct Level Special Area Planning' programme. The programme will in particular address urban mobility problems through promotion of non-motorised transport through the "Make Putrajaya a Bikeable & Walkable City" project starting 2014 till 2018 (hereby called the Bikeable City Project).

1.5.4.2 Iskandar Malaysia Region

43. Iskandar Malaysia was established in 2006 as a part of the Southern Economic Corridor under the 9th Malaysia plan. Iskandar Regional Development Authority (IRDA), being a Malaysian Federal Government statutory body, administers this project. The development region has a population of around 1.6 million (in 2010) people across 5 local planning authorities covering Johor Bahru, Johor Bahru Tengah, Kulai, Pasir Gudang and some parts of the district of Pontian.

44. IRDA has adopted and applied the Low Carbon Society framework (LCS)[15] on a regional scale for the low carbon development of the Iskandar Malaysia region. 'The LCS Blueprint for Iskandar Malaysia 2025' which was launched in 2013 promotes the low carbon development of a city and provides the policy framework and technical tools to support this. It outlines 12 actions to reduce carbon emission grouped in three themes, Green Environment, Green Economy and Green Community. IRDA does not have the authority of a local government, therefore, as of yet none of the local authorities within the Iskandar Malaysia region have adopted the Blueprint in the context of their local planning even though they are supportive of the LCS blueprint. As a consequence, regional and local plans do not align. Consequently, IRDA plans to review and update the Blueprint to focus on low carbon options that have broad appeal to local authorities. However, there is a need to support local authorities to integrate the Blueprint in their own planning if a common low carbon vision for the region is to be achieved.

45. Green transportation has been identified as a priority regional development challenge as well as a major source of emission growth. **T**he Bus Rapid Transit (BRT) has been identified as the main mass transit mode for the region. IRDA is preparing to implement the 'Phase 1 of BRT Master Plan'. 'The BRT corridor in Phase 1 Project' covers Johor Bahru CBD - Skudai (Skudai Corridor), Johor Bahru CBD - Nusajaya (Nusajaya Corridor) and Johor Bahru CBD - Terbau (Tebrau Corridor). The proposed BRT project has drawn interests to jointly develop several BRT stations on a Private Funding Initiatives (PFI) basis. The BRT Phase 1 construction is expected to start by end 2015 with commissioning in 2017. A comprehensive BRT Operations Management System (BOMS) is also planned to support efficient operation and planning and provide customer information and feedback. Phase 2 of the BRT preliminary feasibility and detailed engineering design is expected to commence after mid-2015. The Phase 2 BRT is planned to be commissioned by 2019.

46. Current bus services rely on diesel buses operating on mixed motorways and roads with aging bus fleets operated by struggling operators. Public buses represent only 10% of daily passenger movements. There are no dedicated bus lanes and so bus speed is compromised by any disruption in traffic flow. Due to diminishing ridership,

[15] **Initiative of research institutions** from Malaysia (Universiti Teknologi Malaysia (UTM)) and Japan (Kyoto University, National Institute for Environmental Studies (NIES), Okayama University).

driven in part by declining services, the Government has resorted to subsidy to keep bus routes viable. The aim of the BRT is to improve bus service quality and efficiency and increase ridership. 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 the BRT 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. A total of 754 buses are required to operate BRT Phase 1 and various private bus operators through a concession scheme facilitated by IRDA will provide these. IRDA is planning to include a requirement for a pilot of at least 20 electric buses and table for financing through the Green Mobility Fund. The up-front costs of electric buses are substantially higher than diesel buses being around $380,000 (MYR1.2 million) compared to about $190,000 for a standard diesel bus[16]. Bus operators expect a payback of around 5 years for their standard diesel buses but yet are unsure how electric buses will perform in operational conditions. The Project will provide assistance, among others, to facilitate the bus operators to evaluate electric bus investments and access finance through the Green Mobility Fund to overcome the high up-front costs of electric buses and manage the financial risks.

1.5.4.3 Petaling Jaya Municipality

47. Petaling Jaya is one of the fastest growing townships in the state of Selangor. The administrative area of Petaling Jaya (PJ) City Council is approximately 97 km^2 and total population of 620,000[17] in 2013. The following low carbon development activities are on-going and being planned:

    - *The Green Rebate Scheme* - Introduced in 2011, the local incentive scheme 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. By 2013, approx. 100 residents have received USD 34,700 (RM 110,000) in rebates. Lack of data and effective cost benefits analysis has limited the willingness of the council to publicise and scale the programme.

    - The *Low Carbon Transport Initiative* - In an effort towards a Low Emission 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.

    - *Central Markets On-site Waste Management Scheme*: The council has established in collaboration with University of Technology Malaysia an on-going pilot scheme (2014- 2019) for composting of food waste from the local market and plans to promote on-site waste processing systems in community areas (produce markets, food courts, and community centres) and in residential complexes. In partnership with a private firm, CHGreen Sdn. Bhd. it is aspiring to broaden the coverage of

[16] Although MGTC estimates that operating costs are estimated to be reduced by around 60%
[17] Petaling Jaya City Council portal, http://www.mbpj.gov.my/web/guest/ringkasan-eksekutif

the pilot and build supportive policy and regulatory frameworks to promote replication and scaling up.

48. Despite innovative pilots and positive early results, the lack of data for decision makers has limited the support and potential for scaling up these pilots. The council has yet to start on city-wide baseline GHG inventory due to budget constraints and poor access to data. Proponents of many of the above schemes indicate that stronger support for scaling up these pilot initiatives depends on the ability to identify costs and benefits of these actions and to link them with local development needs. In particular, the Green Rebate Scheme, whilst currently justified on corporate social responsibility grounds, has the potential to leverage other vested stakeholder support to drive low carbon investments and share the cost. Furthermore, the experiences from the on-going initiatives have as yet not resulted in the integration of low carbon approach in any formally defined local plans or policy. The Project will support Petaling Jaya to undertake low carbon development planning where they can scale up these on-going pilot initiatives within the context of local planning.

1.5.4.4 Melaka State and Hang Tuah Jaya Municipality

49. Melaka State is an historic centre with Hang Tuah Jaya at the focus of more than 14 million tourists per year and a population of around 900,000, which in 2011 identified green developments as a key economic strategy.[18] Melaka has put in place institutional arrangements to address its aim of “green” status by 2020.The state government has set up the Melaka Green Technology Council to oversee the planning and monitoring of green technology developments in the state.[19]

50. The Melaka 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. The policy whilst being a prominent driver for local investment has as yet not been incorporated into State or Local Development plans. This is in part due to the top down nature of implementation and neither the state nor municipalities (such as Hang Tuah Jaya) have engaged general public, professional organisations, or developers in formulation of low carbon (or “green”) plans. Whilst there is clear interest and commitment at the state level, there is limited local buy-in outside of Hang Tuah Jaya. As Melaka is planning the review of its local and special area plans, the Project will assist in low carbon planning by developing a precinct level low carbon plan for key areas of Hang Tuah Jaya and mainstreaming these issues into local and special area plans.

51. 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 the electric bus operations around the heritage areas. Commenced in 2012, this project has been operated under the state government subsidiary support through the Panorama Melaka Sdn. Bhd., being the state owned bus company. Scaling up of electric vehicles, charging stations and enhancing interconnectivity and the use of non-motorised transport, especially in the tourist areas is being planned.

[18] Five councils, being, administer the Melaka State: the Melaka City Council (covering Melaka Bandaraya and Melaka Bersejarah), Alor Gajah Town, Jasin Town and Hang Tuah Jaya.

[19] The Melaka Green Development Organisation (MGDO) was established by the Green Technology Council to support the establishment of local Green Councils within local municipalities. Through this network the MGDO oversees the focal areas of open spaces, industries, rivers, beaches, marketing, buildings, transportation, utilities as well as education and information down to the local level.

1.5.4.5 Cyberjaya

52. Cyberjaya is a new township under the jurisdiction of the Sepang council and created in 1996. It forms a key part of the Multimedia Super Corridor (MSC) in Malaysia and has a daytime population of around 55,000 of which 42% are students. The Sepang council is responsible for overall development planning and ensuring compliance to the local plan.

53. As a participating city in the LCCF Initiative and as a part of its Low Carbon City Action Plan, Cyberjaya in collaboration with MEGTW, is planning to undertake a rigorous city-wide GHG inventory to establish a more authoritative baseline scenario using the LCCF assessment tool. This assessment will build on preliminary GHG baselines studies, for instance, the Cyberjaya Digital Green City 2025 study prepared in 2012 based on the Low Carbon Society framework. This study has not yet been adopted by council or incorporated into local plans, therefore implementation of low carbon development is hampered by diffuse political will and coordination challenges where Cyberjaya as a government owned body reports to the Federal Government, but the jurisdictions fall under the Sepang local council. A coordination framework is being considered to enable strategic planning and foster greater coordination to mainstream low carbon action plans into local plans.

54. 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. However, the scheme has been slow to operationalize with limited uptake.

1.5.4.6 Private Sector Initiatives on EVs Promotion and Sharing Scheme

55. 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. 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. These initiatives are scheduled for implementation from 2013-2020.

1.5.5 Other complimentary projects / programme

56. In addition to those indicated above, the project will coordinate with and seek to build synergies and complementarities with other on-going activities in the country, in particular the following:

    - **Building Sector Energy Efficiency Project** (BSEEP) is a GEF-UNDP initiative with the goal to reduce GHG emission growth rate in the Malaysian building sector and it will do this by improving building energy utilisation efficiency. The Project will build on the outputs of the BSEEP as it includes activities to strengthen municipalities to adopt and enforce low carbon guidelines and standards, including for buildings. In particular, the Project will extend the BSEEP activities with regards energy efficiency in buildings by focusing on capacity development of council officers in applying and enforcing the MS1525 and the revised UBBL.

    - **Malaysia Clean Technology Innovation Competition and Entrepreneurship Acceleration Programme** (MCTICEA) is a medium sized UNIDO-GEF project that commenced in 2013. The project aims to assist Malaysia in creating enabling policy and regulatory environment and building up adequate institutional capacity to organize national competitions on clean technology innovations and implement acceleration programmes for clean technology SME start-ups. The Project recognises the opportunities for innovative clean tech service providers to partner with cities and will coordinate in potential linkages with BRT, EVs and waste management initiatives identified.

    - Global Accelerated Energy Efficiency (EE) Programme **Sustainable Energy for All** (SE4ALL) was launched in conjunction with the UN Summit20 to scale up of energy efficiency gains and to accelerate investment through technical assistance, support and collaboration. Iskandar Malaysia is participating in the programme. It is still an early phase where it is expected that assistance from the SE4ALL Secretariat will be made available by mid-2015. The Project will seek to provide entry points for SE4ALL into local level planning and leverage this support towards local low carbon development.

    - The **Third National Communication** (TNC) and the first Biennial Update Report (BUR) for its official national communications to UNFCCC. The Project will closely coordinate with TNC/BUR project to ensure integration of data systems and linkages with planning. It is expected that sub-national authorities will be participating in the GHG inventory process and preparation of the mitigation and adaptation measures. The TNC/BUR project represent a strategic tool to integrate climate change considerations into sector policies and programs, as well as building on the Project's outputs especially with regards data and GHG accounting under Component 1. As of December 2014, the project has completed streamlining the GHG institutional framework and the establishment of the GHG, Mitigation and Vulnerability & Adaptation working group. The preparation of the 1st BUR report is on-going for submission by December 2015.

    - The **MyCarbon** programme (previously called National Corporate GHG Reporting Programme) aims to advance GHG reporting and management by organisations in Malaysia, particularly those in the private sector. The objectives are to establish the framework to support GHG reporting by organisations in a standardised and internationally recognised manner as well as to mobilise and sustain participation of organisations in the long term. As at December 2014, 24 companies have participated in the pilot programme.

[20] 24 September 2014

1.6 Baseline Scenario

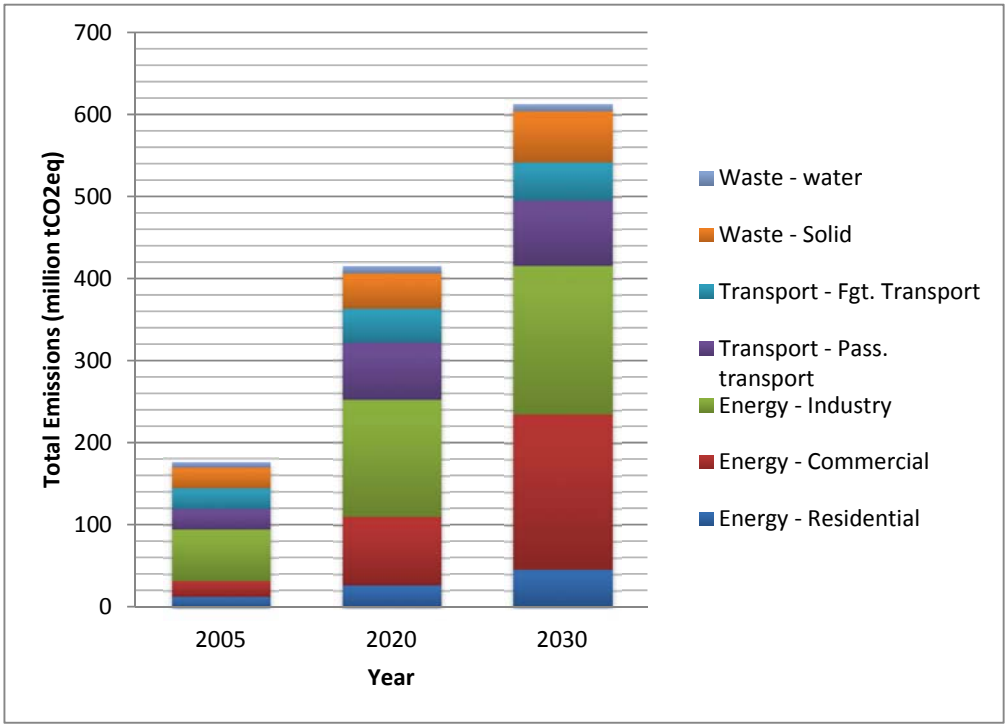
57. The baseline scenario is a continuation of the present business as usual (BAU) situation, which follows from existing government policy, activities, legislation and institutions. The BAU scenario will most likely be characterised as follows:

- Inconsistent translation of national policy goals for green technology and climate change into local policy and plans.
- Existing standards and guidelines do not reflect NGTP and NPPC or cities are unable to apply and enforce them due to limited technical and staff capacity. In particular council operators are unable to guide developers, appraise proposals and enforce the newly revised standards and guidelines.
- Community participation in local low carbon planning continues to be ineffective and in some cases regarded by city authorities as unhelpful.
- No or possibly weak incorporation of low emission development considerations into state and city development plans, and low carbon plans that are developed are treated as stand-alone and not incorporated into normative planning.
- Cities remain unable to pro-actively facilitate public private partnerships to advance low carbon actions through access to finance and technologies
- Lack of access to data continues to hinder effective evidence-based local low carbon planning and planners are unable to effectively priorities actions.
- Data gaps will persist, in some cases because it does not exist, but in other cases because it is not made visible by the data owners. Terms and requirements for access to data will remain unclear.
- If done at all, GHG inventory and analysis for planning will be on a project basis by external specialists and is unlikely to be institutionalized and become a useful tool for local planners, developers and decision makers.
- Weak and unclear links between the federal and state level Green Technology Committees and national planning processes and state and city authorities, undermine the potential for improved coordination.
- Federal ministries continue to provide limited support on green technology and climate change actions with limited regard for local level plans thereby forgoing opportunities for leverage and scaling up.
- Performance of councils towards national low carbon development goals will remain unclear and low carbon cities will not be recognised for their efforts. Cities will not take ownership of regional or state low carbon agendas and will continue to see low carbon development as an imposed top-down agenda.
- Inefficient and slow development application processing for green technology applications will continue to limit developer interest.
- Cities will remain dependent on limited public financing for green technology investments and will not be able to access private or international climate finance.
- Demonstration and showcasing of low carbon city initiatives and integrated urban systems will remain few and far between with ineffective dissemination of lessons and best practices. Whilst the LECB project will support Malaysia towards a NAMA framework, this is at a national sectoral level and specific opportunities for Urban NAMAs will be deferred.
- LCCF will continue to be regarded as an imposed top-down initiative of little value or relevance to city authorities
- BRT projects will fall short of maximising emission reduction potential and climate resilience considerations.
- Low emission buses, cars and scooters and non-motorised options will continue to be perceived as risky investments and an unknown alternative to fossil fuel vehicles for the daily commute

- Waste management will remain a centralised activity with high costs.

58. In the BAU scenario, it is unlikely that cities will contribute significant GHG emission reduction actions to meet the 40% national GHG emission reduction target (compared to 2005 levels) by 2020 without addressing the aforementioned barriers. According to the MNRE[21], under the national BAU scenario, total national GHG emissions have been projected to grow by 74% from 189 million CO2eq in 2005 to 328 million CO2eq in 2020. More than half of BAU emissions are related to energy industries (up to 26% of GHG emissions), transportation (16%) and waste (12%), all of which are by-and-large associated with urban systems. Consequently, the role of cities is anticipated to be pivotal in meeting the government's GHG emission intensity target .The BAU emissions are projected to increase for these "urban" sectors (see Figure 1) with emissions growing from 176 million tons of CO2eq in 2005, to 415 million tons in 2020, and subsequently 613 million tons in 2030.

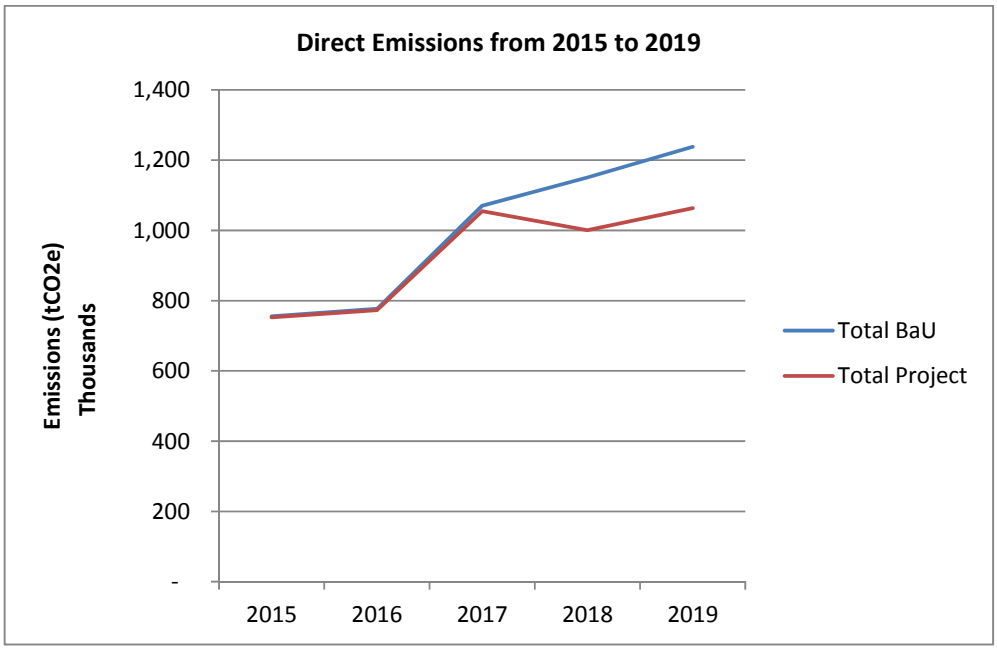
Figure 1: Business as Usual (BAU) "urban" emissions including energy, transport and waste for 2005, 2020 and 2030 (LCS 2013)



59. The Project will address the identified barriers and consequently improve the prospects for GHG emission reduction of cities by 2019. Figure 2, below present the BAU scenario without the Project and Alternate scenario with the Project. The BAU scenario without the Project will deliver cumulative GHG emission of approx. 5,000,000 tCO_2.

[21] SNC 2007

Figure 2: GHG emissions for the BAU (without the Project) and Alternative (with Project) scenarios from 2015 to 2019



2 STRATEGY

2.1 Project Rationale and Policy Conformity

60. The proposed project conforms to the GEF-5 Climate Change Strategic Objective 4 on the promotion of energy efficiency, low carbon transport and urban systems. Building on international experiences and best practices it will promote the capacity of Malaysian cities to facilitate low carbon initiatives and the application of green technologies. The project will contribute to the reduction of GHG emissions directly through, the transformation of public transport vehicles to more efficient low carbon alternatives; enhancement of the BRT project in Iskandar Malaysia to improve ridership and improve efficiency; promotion of green technologies in households and SMEs; and the implementation of new low carbon projects arising from local planning. The project will result in indirect GHG emission reductions through improved low carbon planning and data systems, strengthened enforcement of regulations and clarification of roles and responsibilities, enhanced awareness at all levels, and improved lessons sharing and access to information and finance. These measures will contribute to reducing emissions and promotion of low carbon development pathways for cities.

2.2 Country Ownership: Country Eligibility

61. Malaysia ratified the UN Framework Convention on Climate Change (UNFCCC) on July 13, 1994 and the Kyoto Protocol on 4 September 2002. Pursuant to that, Malaysia submitted its First National Communication in 2000 and the Second National Communication was submitted in January of 2011 with the help of the UNDP and GEF.

2.3 Country Drivenness

62. Malaysia's drivenness for the Project and resolve to promote low carbon urban development is reflected in its policies and relating to green technology, low carbon development and climate change. The Tenth Malaysia Plan (10MP) is the country's comprehensive blueprint and sets forth the country's overarching strategy for low carbon development and sustainable urban development. The National Policy on Climate Change (NPCC) and National Green Technology Policy (NGTP) subsequently establish the basis for the low carbon development. The Project directly addresses the main objectives of these key policies and seeks to strengthen the capacity for implementation through the planning and development systems. In the upcoming 11 Malaysia Plan, climate change mitigation and adaptation will be further addressed in the specific chapter pursuing Green Growth.[22]

63. Malaysia has set an ambitious emission reduction target of up to 40% of emission intensity of GDP from the 2005 level by 2020. The Project directly supports Malaysia, in line with national policy and frameworks in meeting this voluntary GHG emission reduction target. Importantly, the project is consistent with local development priorities and coordinates with sector initiatives.

2.4 Design Principles and Strategic Considerations

[22] http://rmke11.epu.gov.my/index.php/en/

64. In the national context of Malaysia, low carbon green growth is an inclusive, equitable, pro-environment, pro-job development agenda that is central to development. At the city level, this understanding has manifest in different ways and to differing extents. In order to capture the full potential for low carbon green growth there is a need to use policies and actions across a wide range of areas to correct existing market and policy failures and gaps, particularly those arising from environmental externalities and inadequate incentives for innovation. Cities struggle to draw concrete linkages between local development challenges and constraints, and the national policy priorities.

65. The strategy of this Project is to apply the precautionary principle[23] within the current context of cities where costs are relatively small and the likely benefits and risks avoided are significant. With a combination of investment finance and technical assistance, the Project will address the root causes and key barriers identified during project preparation (see sections1.2 and 1.3).

66. The Project will be in place for an implementation period of 5 years to ensure a greater likelihood of the Government meeting its targets for GHG emission reduction by supporting the cities as key partners in this mission. The Project will therefore strengthen the capacity of cities towards low carbon development whilst at the same time undertaking concrete actions that will deliver emission reductions during the life of the project. In some cases these will be funded by GEF support and identified co-financing, however the project aims to leverage additional resources where possible, especially from the private sector, towards the project objectives. For this reason a key component is focused on investment and the establishment of appropriate financing and incentive mechanisms.

67. The Project promotes an integrated approach to low carbon planning by addressing the following dimensions:

    - Horizontal cooperation between local authorities and territorial actors, especially private sector and community. This is achieved by demonstrating low carbon planning within specific subsumed territorial boundaries being region, city-level, precinct-level, with strong linkages to existing state, region broader low carbon plans.
    - Vertical cooperation between levels, to better enable federal support to the local level, and participation of local level in the national agenda. This is achieved by improving coordination and inputs for federal agencies during local level planning, and strengthening vertical coordination structures, such as the green technology committees.
    - Inter-sectorial cooperation, to ensure effective engagement across services and technology areas and efficient use of resources especially at the local level. In particular, planning of the main energy end-use sectors (transport, solid waste management, electricity) requires good inter-sectoral cooperation if resource efficiencies are to be improved.

2.5 Selection of Target Cities

68. Factors were considered in selection of the urban areas/cities including:

    - As explained in section 1.5.4 the Project targets 5 cities which were selected during the project formulation stage and in consultation with MEGTW and local authorities.

[23] Principle 15, Rio Declaration of Environment and Development, 1992

These cities represent areas at different stages of development including older established (Petaling Jaya, Melaka), new establishments (Cyberjaya, Putrajaya) and areas under development (Iskandar Malaysia).

- Involvement in low carbon approaches –participating cities are active and in most cases have tested the LCCF (or other low carbon framework such as the Low Carbon Society) and are therefore likely to deliver replicable lessons in the course of the project; and
- Contribute to a representative set of boundaries of planning activities to be demonstrated – they present opportunities for low carbon planning at different scales, being state, region, city and precinct (also called section or district).

2.6 Alternative Scenario

69. The alternative to the BAU scenario will be enabled through the activities designed in the Project. These will ensure that planning and development in major cities adopts a low carbon approach.

70. The alternative scenario will require the involvement of key stakeholders, namely MEGTW, MUWHLG (especially the FDTCP), MNRE, and EPU, at the federal level, and the state and city authorities in the implementation of the project. MEGTW's lead role as the custodian of green technology policy and as support for MUWHLG is crucial. The combination of MEGTW's national policy lead and MUWHLG's sub-national mainstreaming role is in itself a key enabler for the alternative scenario. Public and private sector such as SMEs, universities, Malaysian Institute of Planners and other professional bodies, Malaysian Sustainable Buildings Council, SME Bank and other financial intermediaries, green technology and climate change practitioners will support these key proponents.

71. In the alternative scenario the following will be realized:

- Strengthened standards and guidelines for states and cities that reflect national green technology and climate change and public private partnership policy and priorities and which can be applied and enforced by city authorities.
- Capacitated and available council staff and processes that can promote green technologies, appraise and guide development applications, and enforce standards and guidelines.
- Engaged communities that participate in local low carbon planning and green technology investments.
- Established systems for capturing and sharing knowledge on green technology and low carbon cities
- Useful systems and tools that make data available and more transparent and which help cities undertake GHG analysis and factor this into decision making
- Demonstration of evidence-based low carbon planning for integrated urban systems in at least 5 cities and for different scales in order to showcase low carbon local planning by cities. This will include support to ensure that low carbon planning is incorporated into normal local planning cycles.
- Strengthened and clarified roles and responsibilities with regard low carbon development. In particular within city administration, between cities and federal agencies, and with the Green Technology Committees.
- Established a low carbon city benchmarking system building on MURNInets.
- Demonstrated and scaled-up green technology financing schemes, public-private partnerships and incentives mechanisms to promote green technology investments.
- Demonstrated through a number of high profile projects the benefits of green technologies and integrated urban systems through a number of high profile

projects, including BRT, low emission vehicles, non-motorised transport, and urban waste management.

- Produced and disseminated information on lessons, best practices, and technologies, human and technical resources and establish a network for collaboration and sharing through workshops, forums, conferences and other professional meetings.

72. In this alternative scenario, city development planning will adopt a low carbon approach and promote investment in green technology through public and private means. With the Project interventions in the alternate scenario the direct GHG emissions reductions by the end of project in 2019 will be 346,442 tonnes of CO_2eq. Subsequent direct GHG emission reductions after the project through to the lifetime of the investments are expected to provide about 2,152,032 tonnes of CO_2eq. The detailed analysis is included in Annex 1 – Detailed CO2 Emission Calculations .

2.7 Project Goal, Objective, Outcomes and Outputs/Activities

73. The project has for its goal the reduction of the growth rate of GHG emissions from cities in Malaysia. The overall objective of the Project is to facilitate the implementation of low carbon initiatives in at least five Malaysian cities and to showcase a clear and integrated approach to low carbon urban development. This objective will be realised through the removal of the key barriers to the adoption by cities of green technologies and their use for low carbon green development. The Project is structured into three components comprising: 1) Policy Support, 2) Awareness and Institutional Capacity Development, and 3) Low Carbon Technology Investments in Cities.

2.7.1 Component 1: Policy support for the promotion of integrated low carbon urban development.

74. This component will address the strengthening of planning and development policies, standards and guidelines regarding low carbon integrated urban development and local capacity to implement central Government policies. The expected outcome of this component is (Outcome 1.1) that major cities implement and adopt integrated low carbon urban development plans and/or programmes. The component will eventually lead to clear direction and mandatory guidelines to local authorities, policy makers, project developers and others on low carbon integrated urban development. The following outputs will contribute to achieving the outcomes:

75. *Output 1.1.1: Approved city policies, legislations and regulations and strengthened enforcement systems for integrated low carbon urban development.* While the national policy context for green technology and climate change are well defined by the NGTP and NPCC, this output is designed to strengthen the ability of local authorities to induce transformative low carbon local development. The MEGTW is planning a review and update of green technology and climate change related policy, planning and development standards and guidelines, inter alia the LCCF, in the context of the revised NPP and NUP, and table for adoption by state and local authorities. The review will also recommend entry points in the existing policies to strengthen alignment with low carbon guidelines such as the LCCF and FDCTP's Green Neighbourhood Guidelines (GNG). Close engagement of city stakeholders is envisaged during the review process to ensure revised policy, standards and guidance will be adopted by states and local councils. This baseline activity will be augmented by the following GEF incremental activities to deliver Output 1.1:

    - Preparation of plans to guide MEGTW partner with FDTCP to build on the experience of the on-going pilots under the LCCF and GNG and support the

mainstreaming of low carbon urban development within national planning systems for the participating cities rather than as stand-alone initiatives. This includes factoring in of low carbon development considerations including land-use in the National Physical Plan and National Urbanisation Plan. Dialogue among FDTCP, MEGTW and MGTC will be facilitated to harmonise the LCCF and FDTCP's upcoming "Sustainable Future Cities".

- Preparations of guidelines to support cities identify and establish public private partnerships for low carbon infrastructure and services in cities. This is especially the case for housing and industry development, urban infrastructure, water, waste (including Waste-to-energy) and public transport services. These guidelines build on the existing legal frameworks and guidelines established by Public Private Partnership Unit (3PU) of the Prime Minister's Department (PMD). These guidelines will also define roles and responsibilities of the respective agencies in mobilising low carbon development through public private partnerships. These guidelines will strengthen cities capacity to use PPPs strategically in a proactive manner.
- Training of council officers in the promotion and appraisal of development proposals with regards green technology regulations. Local council officers will carry out activities for raising awareness amongst developers, and efficiently applying regulations during appraisal of development applications, including the provision of constructive feedback to applicants, and effective enforcement. These activities strengthen the capacity of council officers to deliver regulatory services more effectively in the broader context of local planning and development.
- Development of by-laws and local regulations to improve community engagement in local planning and development. This activity strengthens the ability of cities to engage community more effectively (and earlier) in the planning and development process. This activity builds on the local initiatives of municipalities such as Petaling Jaya and Putrajaya, which have demonstrated successful community engagement strategies through the establishment of town-hall meetings, public forums, and specific consultation initiatives.

76. *Output 1.1.2: Established GHG accounting framework and decision-making tools for national and sub-national levels.* This output comprises of a city-wide framework for accounting of GHG emission and suitable tools to enable cities to undertake evidence-based decision making for planning and policy. The output will ensure connections with national level so that a bottom-up national GHG account may be envisaged. As outlined in the baseline section 1.5.1, the activities associated with the LCCF (such as identifying and setting criteria for the collection of baseline data and development of baseline scenarios; establishing standardised data collection methodology for participating cities); as well as those related to LECB Programme (such as sector specific GHG inventory planning and capacity building, and national level GHG data collection procedure and system) are considered as related baseline activities. These will be supported by the following GEF incremental activities to produce Output 1.1.2:

    - 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. This activity extends the on-going GHG inventory work undertaken as a part of Third National Communications by MNRE and the LECB to incorporate citywide approaches. To ensure data visibility a national data model will be established which would detail all sources of data and data specifications for effective GHG accounting across key sectors starting at the local levels and aggregating to federal level. The data model will comply with existing international models such as the Global Protocol for Community-Scale Greenhouse Gas Emissions (GPC) prepared by ICLEI. Whilst it has been identified as a preferred candidate during project formulation, the plan is to enable extensive

assessment and determination of the most appropriate method which suites the local context and is accepted by national and sub-national stakeholders. A data framework agreement will be facilitated at the federal level with all key data owning agencies so as to ensure smooth access to data for cities.

- Development of a web-based portal for collection and analysis of disaggregated data for bottom-up GHG accounting, focussing on key sectors, and building synergies with existing data systems. This activity will augment and integrate with existing systems including the MNRE's GHG inventory data management systems (including MyCarbon) and with MUWHLG's MURNInets data systems. The web-based system management will be jointly supported and hosted by MNRE, METGW and MUWHLG and will ensure all data is high quality, timely and transparently documented.
- As a mechanism for mainstreaming and capacity building, MNRE and MEGTW will jointly support MUWHLG in the linking of the database with the MURNInets data systems and in supporting the local authorities.
- Development of a standardize approach to support participating cities to prepare GHG marginal abatement cost curves and emission scenarios analysis for key sectors. These tools will link with the web-based GHG portal to help local governments account for GHG emissions.

77. This output will allow cities a consistent standard to set emission reduction targets; forecast GHG emissions; track performance, responding to regulations and requirements of local GHG programs; build and report GHG inventory which is compatible to international standards; allow horizontal aggregation and vertical integration of city GHG data; enable priority setting; and, provide solid evidence for planning.

78. *Output 1.1.3: Completed and approved evidence-based low carbon development plans and investment programmes for cities and precincts.* The delivery of this output will draw on the guidelines of Output 1.1.1 and the data and tools available from Output 1.1.2 to provide a practical demonstration of evidence-based low carbon integrated urban development planning in the participating cities. The participating cities have adopted low carbon frameworks such as the LCCF to guide low carbon development. The on-going and planned activities under these initiatives comprise the baseline activities. In particular, those described under section 1.5.4 such as (a) the LCCF supported activities in estimating baseline emissions and identifying priority sectors, (b) review and update of local plans such as the 'Integrated Precinct Level Special Area Plan' in Putrajaya; Low Carbon Blueprint in Iskandar Malaysia; and, local and special area plans in Melaka. Through the review of local planning guidelines and capacity development of council staff to strengthen delivery of regulatory services, the planning effectiveness - including decision making with regards to land-use and zoning (e.g., in planned development areas of cities) will be improved.

79. During the course of the Project, participating cities such as Putrajaya, Petaling Jaya and Cyberjaya are considering to undertake at least one new low carbon plan for a local precinct within the context of their municipal-level plans, whereas Melaka and Iskandar will undertake both a municipal-level plan for one of the municipalities and a precinct plan. The GEF incremental activities that will augment these baseline activities to deliver Output 1.1.3 are as follows:

    - Confirmation of boundaries and scope and prepare partnerships for low carbon local planning in each participating city. Cities will be facilitated to confirm boundaries for the demonstration areas and the emission scope for planning. The activity will include stakeholder consultation and preliminary analysis to further confirm demonstration area suitability and approach. The activity will establish

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 data system (see output 1.1.2) – this will involve data collection and GHG inventory system (from Output 1.1.2) to establish an appropriate GHG emissions inventory and estimation of baselines for the cities. Data obtained from this activity will be used to update MURNInet (see Output 2.1.1).
- Based on the analysis and finding of the baseline scenarios and abatement potential, cities will define low carbon objectives and GHG emission reduction targets. Resolution for the adoption of the targets will be developed. Sectoral assessments will be conducted in cities where priority sectors have not yet been ascertained. This exercise will draw on available LCCF guidance and strengthen the balance of local development priorities and national emission reduction agenda.
- Based on the results of the abatement potential assessment and consistent with identified GHG emission reduction targets, cities will determine priority abatement options and identify planning and investment options. This activity will deliver lessons to improve the decision support tools identified in Output 1.1.2.
- Preparation and approval of low carbon development and investment plans for each city – This will involve state and local authorities developing, reviewing and working on the pertinent requirements towards securing the approval of plans for the implementation of the identified low carbon options. For each investment program, the cost of each options will be determined, measurable indicators will be set, and possible funding sources will be identified (which will be addressed in Output 3.1.5). The scaling up of investment schemes demonstrated in Component 3 will also be analysed.

80. These activities will be coordinated by FDTCP and MEGTW and form part of capacity development and institutional strengthening to enable MEGTW to mainstream green technology within national planning systems.

*2.7.2 **Component 2: Awareness and Institutional Capacity Development.***

81. This component will address the lack of awareness and technical capacity and strengthen the institutional arrangements of national ministries, state and local level for low carbon climate resilient development and integrated urban planning. The expected outcomes of this component are: (Outcome 2.1) the expedient appraisal, approval and implementation of strategic urban development plans/program and projects, and; (Outcome 2.2) major cities are aware of, and are planning and implementing low carbon technology applications for integrated urban development. This component together with the experiences and tools demonstrated in Component 1 will reduce, if not eliminate, the pertinent information barriers, as well as the institutional capacity shortfalls in planning, implementing and monitoring of integrated urban development. The following outputs will contribute to achievement of these outcomes:

82. *Output 2.1.1: Strengthened and operational coordination mechanisms for effective implementation of low carbon city policy.* This output will be used in strengthening coordination both vertically between federal and local levels, and horizontally across stakeholders at each level. There are no plans under the BAU scenario to establish an operational mechanism therefore the proposed set of activities under this output are fully additional.

- Identification of gaps and overlapping mandates among key municipalities, federal agencies and facilitate discussion and agreement in order to clarify structures and terms of reference and to raise awareness on function and purpose. This will involve a detailed institutional capacity needs assessment and preparation of approved institutional arrangements and supporting guidance materials. In particular, this activity will serve to clarify the extent to which specific functions relevant to low carbon development are mainstreamed within agencies and will ensure these functions are put in place. A stock take review of local and international best practices will be conducted to provide guidance. The audience for institutional capacity needs assessment and supporting guidance material will be the staff of the local authorities responsible for planning and delivery of local development regulatory services. In addition, at the state and regional (e.g. Iskandar) levels, the relevant authorities involved in preparation of state spatial plans and guidelines, development planning and budgeting; and the State Green Technology Committees. The leadership on Green technology from MEGTW and the strong partnerships between cities and the FDTCP are the main bases for ensuring key policy makers have a strong ownership of assessment findings.
- 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. In particular, the linkages between cities, federal and state agencies and the Green Technology Committees and planning mechanisms at the national and state levels will be clarified. It is envisaged that these improved institutional arrangements will stimulate integrated actions across key urban systems by encouraging vertical, horizontal and inter-sectorial cooperation.
- Implementation of a national green technology and low carbon city benchmarking system for development application appraisal and approval by municipalities. This will involve strengthening FDTCP's existing benchmarking scheme and indicators of MURNInets, which is used by FDTCP and the National Physical Planning Committee to monitor relative performance of municipalities. Indicators for green technologies and low carbon integrated urban development will be developed with cities and integrated with the MURNInets scheme. These new indicators will be further integrated into the monitoring processes of the NPP, NUP and Sustainability Assessment (SA) as per other MURNInets indicators. The necessary additional data collection instruments to populate the MURNInets will be implemented. Guidance materials for cities for MURNInets will be updated to reflect new benchmarking mechanisms.
- Preparation and dissemination of information and tools for streamlining local planning control processes for low carbon development proposals. The emphasis on planning control processes will commence with pre-application engagement of developers through to enforcement and will draw on current best practices identified by MUWHLG. In particular, a business process assessment will be undertaken to identify bottlenecks and identify appropriate mitigation measures. This will lead to clear direction and mandatory guidelines for city authorities, policy makers, project developers and others.
- Establishment and strengthening of existing city-level one-stop service centres so as to mainstream green technology and climate change advisory functions. A private sector facing extension will be integrated in support of Output 1.1.1 for streamlining engagement with entrepreneurs, investors and project developers. The aim is to provide advice on integrating low carbon considerations in their investments; facilitate the preparation of low carbon urban projects and expedite approval processes.

83. *Output 2.2.1: Completed 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. The baseline activities comprise the awareness and capacity development activities that are being imparted as a part of the (a) LCCF (such as trainings on low carbon planning, design, financing; and the on-going formulation of stakeholder engagement strategies); (b) LECB (on institutional arrangements on GHG Inventories, database management, etc.). The baseline activities also includes existing training on integrated development currently provided by MUWHLG through the Local Government Training Institute (LGTI), and by the Malaysian Institute of Planners. The following GEF incremental activities will enhance the baseline activities to deliver Output 2.2.1:

- Conduct of a capacity needs assessment to gauge the current level of understanding among participating local authorities with regards low carbon climate resilient urban development planning.
- Preparation and conduct of "training of trainer" courses on integrated urban planning for low carbon climate resilient development for staff and associates of the LGTI of the MUWHLG and the Malaysian Institute of Planners. Training programmes will be mainstreamed within on-going baseline training programmes. Trainers will conduct a series of trainings over the duration of the project. The training will separately target policy decision makers, state and local government officers, NGOs and CBOs, technical specialists and financing institutions.
- Conduct of demand-driven training and on-the-job technical advisory services for state and city officers - To ensure trainees are utilizing what they learned, a resource group of participating trainers and technical specialists will be organized and supported to provide demand-driven training and on-the-job technical support for state and city officers on preparation of GHG inventories, calculation of MACCs, priority setting and development of low carbon scenarios, etc. This activity will draw on the tools and experience developed in Output 1.1.3 and embeds these in national training and technical assistance structures to support normative planning in cities. Consequently, the coordination of these demand-driven capacity development services will be in sync with local normative planning cycles to ensure that training objectives are timely and aligned with immediate needs. Periodic surveys will be undertaken to provide on-going assessment of training needs and feedback on training programme effectiveness.

84. *Output 2.2.2: Operational knowledge management systems for low carbon city development.* The output will enhance current knowledge management systems associated with low carbon cities in Malaysia that presently are ad-hoc or top-down driven. The baseline activities contributing to this output is related to the (a) review and update of LCCF to ensure that lessons and best practice are used to refine and evolve the framework, strengthen ownership by cities and that it is adopted and implemented in all participating cities as appropriate; (b) MEGTW will 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, MEGTW's annual International Greentech and Eco Products Exhibition and Conference Malaysia (IGEM) forms the baseline activity. GEF incremental activities that will support the delivery of Output 2.2.2 includes:

- Establishment of a National Low Carbon Cities Network (NLCCN) including links to global networks for experience sharing. This activity will build on existing networks of green technology practitioners, planners, academics and architects and other organisations and be administratively hosted by MGTC. NLCCN events will be organised including an annual forum, site visits, web portal, and access to

information and resources. The Annual Forum will be held in conjunction with IGEM and will be the flagship-networking event for NLCCN. Clearinghouse materials will be accessible online and provide the physical platform for National Low Carbon Cities Network and communications activities. The NLCCN will be the custodian of the knowledge products produced under the Project and will be a key channel for communications and partnership building for the Project.

- Facilitate linkages with other regional and global networks such as C40, Green Climate Cities Network, World Mayors Council on Climate Change, ICLEI.
- Preparation of the GTALCC National Communications Strategy and Plan – This plan will be prepared in collaboration with the NLCCN and its partners and provide a concrete set of actions for promoting the Project, disseminating knowledge products, raising general public awareness on green technology in cities, and promote uptake of low carbon development by cities. This will include regular preparation of media releases, articles for newspapers, radio reports, and video pieces for web and TV. A regular social media presence will also be maintained and regular surveys of decision makers and practitioners undertaken to assess impact of communications and knowledge products. In particular, communications products will seek to document the voices of local people with regards green technology and low carbon urban development. The clearinghouse discussed above will provide the physical platform for NLCCN and communications activities.
- Preparation and dissemination of knowledge products for specific target groups on designing, implementing, and financing green technology applications. This activity will pro-actively identify and document key learning and instruments derived from the project. In particular, a web-based manual for cities on application of the LCCF and the approaches and tools will be developed. This will be integrated into the Web portal for the Project.
- Collection of case studies and dissemination of lessons and best practices for development of integrated urban systems for low carbon cities. One of the strategies for this activity is partnering with green technology practitioners, universities, and Malaysian Institute of Planners to prepare detailed case studies and analysis of best practices and lessons. Products will be prepared to target key audiences from general public, planners and decision makers, and practitioners. In all cases, products will be targeted for publication appropriately, either as formal technical reports, general media articles, or in peer-reviewed publications.

*2.7.3 **Component 3: Low Carbon Technology Investments in Cities***

85. This component will address barriers to access and investment in green technologies within an integrated urban development context. Financing and incentive mechanisms will be facilitated to drive investment in green technologies. Importantly, concrete investment activities will be directly supported to ensure that investments are made during the course of the project. The expected outcomes of this component are: (Outcome 3.1) increased investment in low carbon technology applications in cities, and (Outcome 3.2) more low carbon projects implemented in Malaysian cities. The following outputs will contribute to achievement of these outcomes:

86. *Output 3.1.1: Applied design considerations into BRT for enhanced GHG emission reduction potential.* This output will enhance the operation of the BRT Phase 1 system in Iskandar Malaysia and improved the design of BRT Phase 2. As the BRT Phase 1 construction and operation will commence soon (see section 1.5.4), 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. Separately, the BRT Phase 2 feasibility and detailed engineering design is being planned. These baseline activities will be augmented by the following GEF incremental activities to adequately deliver Output 3.1.1:

- Stock-taking on the design and implementation practices for maximizing emission reductions and climate proofing of urban transport projects in Malaysia, including BRTs. This activity is timely as several major BRT investments are currently under preparation or in the early stages of construction. These include Sunway (Subang), Klang Valley and IRDA which each exhibit different institutional, legal, financial and technical differences which have potential to impact on emission reductions from BRT investments. In addition, the study will provide responsive feedback to local and federal agencies on best practices and the linkages between BRT policy and low carbon and climate resilient urban infrastructure.
- Preparation of detailed recommendations on low carbon climate resilient strategies that will be incorporated in design process of BRT Phase 2 in Iskandar Malaysia, based on the results of the stock take study. This will include detailed analysis and modelling of emission reduction potential and techno-economic analysis of low carbon design options and consider both "hard" capital intensive (such as integrating energy efficient measures; passive solar designs at the stations; secure bicycle parking facilities and promoting bicycle use as feeder service, etc.), and "soft" practices (e.g. operational design such as customer service, comfort, convenience, safety and security measures; customer focused communications and marketing strategies, etc.) to encourage ridership of passengers. It will stimulate broader linkages with regards integration of urban systems (e.g. spatial planning, urban greening to ensure high quality pedestrian access; etc.). In particular, linkages with integrated land-use planning to maximise transport oriented development options, such as high density hubs, will be examined. The guidelines for climate proofing of urban transport systems will be tested through application to the design of BRT Phase 2. This will include the preparation of preliminary risk screening tools and climate impact and vulnerability assessment to assist in the identification of key resilience measures, in particular, maintenance practices, alignment, construction material selection, shoulder landscaping and exposure prevention measures.
- Design and implementation of a personal GHG emission calculator and dashboard that will be incorporated in the BRT Operational Management Systems (BOMS) – this will involve a detailed analysis, design and implementation of a web and mobile solution, which provides feedback to customers on their mobility options and assists them to track their individual GHG emission. The results of this activity will lead to changes in behaviour and greater awareness of personal transport options by providing tools to help riders assess their travel options and the resultant GHG emissions. An examination of the use of pre-emptive alerts to provide personalised guidance on managing anticipated travel problems in the near term (e.g. inform riders of delays or schedule alternatives), as well as psycho-social feedback (e.g. changing the way people think about GHG emissions), gamification (e.g. enable people to set their own low carbon travel targets and track their performance), social media, and other means to elicit long-term behaviour change will be carried out. Additionally, ridership analysis and customer feedback monitoring will be undertaken to enhance the operations and the ridership strategy of the BRT management and bus operators. By enhancing operations and services, these activities will consequently lead to increased BRT ridership of passengers.
- Design, pilot and institutionalize a GHG monitoring and reporting framework – Linked with the BOMS, the framework will assist in a robust bottom up quantification of GHG emissions. The activity will strengthen data collection and management systems and ensure credibility and accountability of the BRT project's GHG reductions. The results will feedback into the Transportation Master Plan and Low Carbon Plan for Iskandar Malaysia.

87. *Output 3.1.2: Leveraged investments to support the scaling up of low carbon public transport systems.* This output addresses a key barrier to the uptake of low carbon vehicles by facilitating a dedicated financing mechanism to assist public transport operators adopt low carbon vehicles. The delivery of this output will entail building on the successful demonstrations of electric buses undertaken by MEGTW and MGTC, which have identified financing risks as a barrier to operator investment. The planned Green Mobility Fund is the key baseline activity (as described in section 1.5.3) and is intended to provide financing and risk mitigation measures to public bus transport providers to convert to low carbon transport options. MEGTW will design and implement the financing scheme. GEF funds will not be used as seed capital but will provide technical assistance to strengthen the design and operation of the Fund. The baseline activities also include the on-going trials of electric and hybrid buses by MEGTW, Putrajaya and Melaka for city routes. The GEF incremental activities to deliver Output 3.1.2 include:

    - Preparation of feasibility study for adoption of low carbon vehicles including electric buses for public transport in cities and associated clean energy charging stations. Assessments of investment and operational requirements for conversion of BRT, city bus, stage and intercity bus services to low carbon vehicles will be carried out in all participating cities. In Melaka, for instance, this will be linked to the assessment of expanding the electric bus scheme for tourism and in Iskandar Malaysia this will link with BRT Phase 1 and provide inputs to Output 3.1.1 and Outputs 3.2.1 and 3.2.2. The study will include an in-depth assessment of charging stations powered by renewable energy, either from direct connections to renewable generation or by purchase through the electricity markets. The study will also lay the foundation for monitoring and evaluation of the impacts from EV bus operation - both in terms of GHG emission reductions as well as social development impacts.
    - Preparation of viable business cases for municipal fleets and public transport operators for the adoption of low carbon vehicles. This activity will involve detailed assessment of the potential for investment in low carbon vehicles in the context of their individual business situation. Participating cities and up to 10 separate transport operators will prepare business plans for these investments, which they can then use to leverage finance. This activity will assist in uptake of low carbon buses in Output 3.1.1 and electric cars and scooters in Output 3.2.1.
    - Preparation of action plan for scaling-up financing for low carbon public transport providers. This activity prepares an action plan for implementation by participating financial intermediaries, MEGTW to scale-up low carbon vehicle investment. It builds on the previous activities to combine the knowledge of low carbon vehicle financing, market analysis and feasibility studies, timelines, and details of financier interest and operator demand. The action plan will outline essential steps and actions to be taken to facilitate approvals for investments in low carbon public transport vehicles. This activity will further support Output 3.1.1 and Output 3.2.1.
    - Conduct of training for financial intermediaries on low carbon transport investments. This activity will involve training to loan officers and other financial service intermediaries on evaluating viability of green mobility technologies. This will include officers from SME Bank, other national development banks, commercial banks, and leasing and insurance service providers at federal and local levels. Workshops will be used to focus on helping financial intermediaries and banks to assess the low carbon vehicle market, and develop appropriate financing products. Consequently, this will help securing support from financial intermediaries in financing demonstration projects in Output 3.2.1.

88. *Output 3.1.3 Validated and scaled-up green technology incentive scheme in target cities for households and SMEs.* This output strengthens the existing baseline project,

the Green Rebate Scheme in Petaling Jaya and the proposed project in Cyberjaya/ Sepang that provides rebates to households on their land assessment tax for adopting a suite of green technologies and practices (as described in section 1.5.4). It is primarily a financing and incentive project which directly promotes investment by households and SMEs in green technology. This output will result in coalescing of other sources of incentive funding, a broadening of the scope for green technology investments, and a scaling-up to enhance participation. The delivery of this output will be made possible by the following incremental GEF activities:

- Preparation of business plan for councils for sustainable performance-based green technology schemes targeting households and SMEs. In particular, this activity will include a retrospective assessment of the Petaling Jaya on-going incentive scheme and a review of Malaysian and international best practices (e.g. carbon banking). A market assessment will be carried out to identify possible incentives (in addition to those provided by city authorities), financial intermediaries and partners, and to characterise the green technology areas most likely to attract investment. The business plan will identify potential implementation partners for cities, funding mechanisms, substantiate market potential, identify means for scaling-up, and provide an implementation plan.
- 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. Cities will develop and put in place the enabling policies and programmes required to implement the incentive scheme according to the adopted business plan and will complement Output 1.1.1. This will include the establishment of the programme and setting up a monitoring and customer feedback systems to track performance and monitor participation.
- Preparation and implementation of marketing and awareness building programme to accelerate participation in incentive scheme. The local council will carry out the prepared programme to ensure scaling-up is rapid and effective. This will involve campaigns in local media, through neighbourhood groups, green technology partner programmes and through social media.

89. *Output 3.1.4: Leveraged investments in low carbon urban systems based on low carbon development plans.* 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 according to their plans. In particular, the delivery of this output includes preparation of technical design and implementation documentation for priority integrated urban systems projects specifically identified in the plans of Output 1.1.3. Financing through non-traditional financing options will be pursued, such as public private partnership opportunities, feed-in tariff concessions. These will be pursued through direct facilitation of deals with private sector and through collaboration with sector ministries and private investment promotion agencies. The output will catalyse investment opportunities arising from the planning actions of Component 1 and strengthen the incentive for local council to continue to take a low carbon integrated approach. GEF support is required for technical assistance in the preparation of the project designs and mobilising investment and build partnerships.

90. *Output 3.1.5: Approved pilot NAMA proposal for low carbon urban development.* 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. GEF incremental activities will extend the baseline activities of the LECB programme that supports the development and capacity building work related to national and sectoral NAMA frameworks including identification of design options and implementation arrangements, financing framework and MRV systems. Delivery of the output will closely align with the work conducted under Component 1. Activities will

require careful coordination with MNRE on the national NAMA activities. Specific GEF incremental activities that will supplement the delivery of Output 3.1.5 include the following:

- Preparation of an integrated citywide planning, targets and prioritization of actions to be included in the urban NAMAs – This will draw down from the outputs of Component 1.
- Conduct of a market readiness assessment and project screening that will lead to the identification of most bankable projects including the ones that will be identified in Output 1.1.3.
- Development of an institutional framework – this includes the identification of key stakeholders and institutions who will be involved in all aspects and at all phases of the pilot NAMA starting from design through to implementation. A stakeholder engagement strategy will be formulated. The NAMA institutional framework will include identification of the most appropriate governance structure, clearly defined roles, responsibilities and process of interaction of the entities involved. Since the development and implementation of the pilot urban NAMA will involve a wide range of stakeholders from national and subnational governments to non-government entities, agreements will be secured to ensure consistency and prevent contradictions during the pilot urban NAMA process.
- Development of a robust MRV framework to track progress; ensure accountability and transparency of the mitigation actions of the pilot urban NAMA as well as to facilitate access to international support. An MRV plan will be prepared comprising (a) roles and responsibilities of key stakeholders; (b) identification of parameters to measure the impacts of the urban pilot NAMA; (c) guidelines on measurement and reporting of data and impacts – this will be built on the on-going work of the LECB and follow the existing national guidelines such as those under the Third National Communications and BURs as well as international reporting on NAMAs - to ensure consistency and comparability across other NAMAs; and (d) reporting and verification process.
- Preparation of a financing strategy for leveraging new and additional financing for the NAMA either through public private partnerships or from government, financial institutions and international partners. An initial financing plan will be prepared and potential financiers will be identified and approached early on in the NAMA development stage. The plan will identify financing streams for the pilot NAMA; cost information on the proposed mitigation measures as well as those associated in the NAMA development process such as expenses for documentation, institutional arrangements, third party services for MRV, etc. The initial financing plan will be adjusted and finalized upon consultations with the government, key stakeholders and investors.
- Preparation of a bankable detailed design document for a pilot urban NAMA - this involves a comprehensive description of measures to reduce GHG emissions from the urban sector; conformation with existing national and sectoral development plans and policies; establishment of baseline and alternative GHG emission scenarios; elaboration of key impacts and co-benefits of the NAMA; firmed implementation modalities and stakeholders engagement strategy; final budget and financing plan; formalised MRV plan.

91. It is not anticipated that implementation of the urban pilot NAMA will commence during the period of the Project. However, Output 3.1.5 will prepare the way for subsequent implementation.

92. *Output 3.2.1 Operationalised electric vehicles and charging station infrastructure.* This output builds on the enabling actions of Component 1, in particular Output 1.1.1 and Output 1.1.3 that strengthen the capacity of cities to plan and develop an integrated

approach, in this case to last-mile mobility solutions and the adoption of low carbon personal transport options. This output will demonstrate for cities the benefits of working with local entrepreneurs to develop an integrated service platform for EVs. The baseline activities are those related to the EV cars and bike sharing initiatives (described in section 1.5.4) where the private sector operators are developing an EV ecosystem across Malaysia cities. COMOS is planning significant expansion of its services in Kuala Lumpur, Melaka and Penang. Eclimo is planning expansion to Putrajaya and Kuala Lumpur, Penang. In this endeavour, a strong collaboration between private sector and local authorities is essential to ensure that EVs are integrated into urban planning. The EVs targeted at improving last-mile connectivity will be promoted, thereby, enhancing other public transport modes. Strengthening of local planning will ensure EV infrastructure eco-system supports enhanced connectivity and reduced car ownership. To achieve Output 3.2.1 the following supplemental GEF incremental activities are required:

- Install charging stations and parking bays for electric cars and electric scooters. This activity will support councils during planning to consider the strategic location of EV charging stations to maximise the utility of EVs, especially shared vehicles, for reducing vehicle trips and maximising inter-modal transfer. Integration with renewable energy installations to provide low emission charging options will be considered. In particular, locations will seek to maximise the utilisation and effectiveness of mass transit systems by addressing last-mile connectivity constraints.
- In consultation with local authorities and private EV service providers, an EV infrastructure roadmap will be prepared in 3 participating cities. This will be based on the feasibility study prepared in Output 3.1.2 and additional analysis of suitable EV charging infrastructure service needs and models. This activity will inform the development of guidelines and policy for EV charging mainstreaming under Output 1.1.1.
- EV charging infrastructure will be installed for municipal fleets. To enhance this opportunity, GEF support will be provided for the procurement of equipment for at least 30 EV car-charging stations and 100 scooter charging spots, strategically located for use by local authorities in delivery of municipal services. GEF support is essential for encouraging municipalities in leading by doing - which in turn can create a ripple effect in prompting corporates, local businesses and residents alike to switch to low carbon mobility options. The support in particular will encourage cities such as Petaling Jaya, which is considering the replacement of existing municipal fleet with EVs and other low carbon vehicles. This activity will assist the authorities to design, plan and prepare associated parking bays and scooter storage in accordance with local guidelines and the adopted EV infrastructure roadmaps. Importantly, this will create early lessons for them to promote a strategic distribution of charging points essential to ensure that EV deployment is connected with other transport services and economic activities to promote widespread application. This way, business viability, diversify utility, and enhance emission reduction potential of the EV ecosystem will increase-ultimately leading cities towards a low carbon pathway. Cities will be supported to undertake planning and preparation of charging station sites in collaboration with private sector EV operators and key stakeholders.
- Design and implement schemes to upscale use of electric car and electric scooter sharing in cities. Whilst cities may themselves be users of EVs, the output will reflect a strengthening of the broader EV ecosystem and an open (vendor neutral) charging infrastructure approach thereby enabling private sector innovation. Building on the findings of Output 3.1.2, 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, and enabling policy and guidance materials will be prepared.

93. Private operators and cities (for municipal fleets) will cover cost of EVs.

94. *Output 3.2.2 A commissioned BRT system operating in Iskandar Development Region.* The implementation of the BRT system in Iskandar Malaysia is one of the main demonstration pieces of the Project and will be enhanced through the GEF incremental activities highlighted in Component 1 and with specific enhancement from Outputs 3.1.1 and 3.1.2. In particular, Component 1 will support at least two cities in Iskandar Malaysia, who currently do not have any low carbon plans in place, to prepare low carbon plans which will integrate the regional BRT initiative with local mobility and other sectors issues. The activity being the construction and commissioning of BRT Phase 1 and 2 in Iskandar Malaysia. No GEF support is required for this output.

95. *Output 3.2.3: A commissioned city cycleway in Putrajaya.* This output strengthens the progress towards Putrajaya's Green City 2025 Action 1, sub-action 1-1, which is to make Putrajaya a "Bikeable and Walkable city". Putrajaya will be supported under Component 1 to undertake a precinct level plan with a view to showcasing the benefits of an integrated approach to non-motorised transport planning. This output will ensure that the cycleway will be demonstrated and effective in the context of the local plan. This will maximise the potential for non-motorised interconnectivity between residential areas and office areas in order to promote use of bicycles (including electric bikes proposed under Output 3.2.1) by commuters and tourists. The baseline activities include the planning, design and operation of the cycleway. Programmes for rider safety and awareness raising and a community-based marketing to promote cycling as a healthy alternative for fun and the daily commute will be developed and implemented. GEF support will augment the baseline activities through the following incremental activities:

    - Stocktake of bicycle sharing schemes in Malaysia and the region to inform design to ensure integration of transport modalities for cycleway and to attract riders.
    - Preparation of a pilot bicycle-sharing scheme either as a partnership with private sector or community organisations. To identify the best bicycle-sharing business model and preferred operator a business plan competition will be held to select the most sustainable and viable proposal. Incremental activities - such as business development planning, procurement of an initial fleet of 150 bicycles and installation of 15 bike storage facilities in strategic locations such as the Putrajaya MRT station to maximize modal transfers - will be carried out. The city will cover costs of the construction and operation of the cycleway.

96. *Output 3.2.4 Operationalised on-site waste processing projects in Petaling Jaya.* 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 the private service providers the council will develop awareness raising and marketing programmes, and a monitoring systems for the operation will be established. It will strengthen partnerships between Petaling Jaya council, and technology and service providers and remove barriers to the scaling-up of onsite composting and biogas production. These baseline activities will be complemented by GEF incremental activities to deliver Output 3.2.4:

    - Review of standards and preparation of policy and guidelines regarding on-site processing of waste and integration with building systems and urban services. 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. These sites will demonstrate a mix of small, medium and communal scale systems being able to process 100kg, 300kg and 500kg per day respectively and consider business models for individual and communal ownership. The Council will prepare a detailed business case for a pubic private partnership arrangement and potential financial instruments (including extension of the green technology incentive scheme developed under Output 3.1.3) to enhance uptake.

97. The delivery of these activities will assist in linking the output with Component 1 and will be driven by local level planning in order to ensure that on-site waste processing supports other urban services both in terms of supply (diversion of food waste from landfills) and demand (provision of compost for council's urban landscaping and potential generation of electricity and heat from biogas). Component 2 will support broader awareness raising on these technologies and sharing of lessons and best practices with other cities. The private sector will cover costs of the construction and operation of at least 95 systems.

2.8 Key Indicators, Risks and Assumptions

98. The project success indicators are shown in the Project Result Framework on page 46 and the annual target values for these indicators are summarized in Annex 2 – Annual Targets. Progress towards these target values will be monitored throughout implementation.

99. The key risks to the project implementation and the realisation of outcomes will be monitored throughout the implementation of the Project. 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 and is detailed in the Offline Risk Log in Annex 3 – Risk Analysis. This Risk Log will serve as a management tool and will be reviewed and updated during implementation.

100. The main assumptions for the project are: 1) continued support from government for a low carbon approach to urban development, and 2) continued stable economic development. The likelihood of contrary circumstances occurring is considered low, however the potential impact should they occur would be high. Consequently, mitigation of these risks has been addressed by closely engaging Government at all levels across a range of institutions and in various capacities. In particular, MEGTW, MUWHLG, MNRE, and state and city authorities have been involved in the project design and have clearly defined roles and responsibilities. Continued political support will be maintained by involving high level decision makers in the activities of the project, especially in public events, and maintaining a regular high level briefing and feedback on project progress. The economy being highly dependent on global economic factors is beyond the control of the project. However, by virtue of the focus on planning at the sub-national level and the emphasis on an integrated approach, especially with regards cross-sectoral coordination, the impact of economic turndown in any particular sector is diffused.

2.9 Financing Modality (co-financing)

101. The Project utilises GEF funding to motivate the alternative scenario through technical assistance and capacity building. However, GEF funds do not cover all these costs

and existing public and private support will be available for intended activities. This will include both direct funding of project costs from the cash budgets of UNDP, Government and private sector participants, and also in-kind contributions, such as staff time, office space, and other shared resources. During project formulation commitments were received for cash and in-kind contributions from all the participating cities as well as MEGTW and UNDP. These co-financing letters are included in Annex 4 – Co-Financing Letters and Agreements. All cities have included sufficient co-finance to support the proposed activities in which they are involved.

102. The project also supports (through technical assistance) the establishment of a financing instrument, being the Green Mobility Fund; through which it intends to assist bus operators, finance their conversion to low emission buses. The initial seed funding is secured and included in the co-financing commitments of MEGTW. Similarly, co-finance support for establishment, operation and seed funding for Petaling Jaya's green technology incentive schemes is included in their co-finance letter although during the course of the project this incentive will leverage additional investment from participants.

103. The project will work with local authorities to mainstream low emission development into local planning, programme and projects and to demonstrate an integrated approach to development. This will include putting in place the enabling partnership, policy and regulatory mechanisms and for demonstration of low emission transport and improved waste management projects. In the case of Putrajaya this involves strengthening a pioneer cycleway project. Similarly, in Iskandar Malaysia the project will strengthen the BRT project in terms of planning and BOMS systems development. The co-financing for these activities is included in the commitment letter for Putrajaya and Iskandar Malaysia respectively.

104. By supporting the local level in this way, the Project also intends to convince and attract private sector service providers to invest and scale-up their low carbon city services. During the course of the project formulation several major private sector firms, being CH Green Sdn Bhd, CMS Consortium Sdn Bhd, and Eclimo Sdn. Bhd. pledged their support and willingness to participate through scaling-up, investment and coordination in the participating cities. This supports the project's expectations that substantial investment in electric buses, cars and scooters, and in on-site waste management systems will be leveraged.

Table 1: Summary of the Project financing (USD)

Source of funds	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Amount Year 5	Total
GEF	1,019,464	1,542,186	944,627	612,183	236,334	4,354,795
Co-financing						
UNDP	122,800	122,800	62,800	22,800	22,800	354,000
MEGTW	5,649,401	5,649,789	5,649,918	5,650,047	129,672	22,728,826
Iskandar Malaysia	1,689,085	2,952,013	24,153,103	113,628	113,994	29,021,823
Petaling Jaya	372,697	384,003	398,603	416,703	454,114	2,026,120
Putrajaya	723,281	408,372	93,098	93,281	93,464	1,411,495
Cyberjaya/ Sepang	16,667	16,667	16,667	10,000	10,000	70,000
Sub-total Co-finance	8,573,931	9,533,644	30,374,189	6,306,459	824,044	55,612,266
TOTAL GEF+ Co-finance	9,593,395	11,075,830	31,318,816	6,918,642	1,060,378	59,967,060

Leveraged Co-finance						
COMOS Sdn Bhd.	9,139,432	19,886,435	25,337,539	31,520,505	32,460,568	118,344,479
Eclimo Sdn Bhd.	4,659,306	4,659,306	4,848,580	10,369,085	10,369,085	34,905,363
CH Green Sdn Bhd.	382,965	953,628	1,741,956	2,747,950	5,059,937	10,886,435
Sub-total Leveraged Co- finance	14,181,703	25,499,369	31,928,075	44,637,540	47,889,590	164,136,278
TOTAL	23,775,098	36,575,199	63,246,891	51,556,182	48,949,968	224,103,338

2.10 Cost Effectiveness

105. The cumulative direct GHG emission reductions from the Project is estimated to be 346,442 tonnes CO2eq by End of Project and 2,152,032 tonnes CO2eq over the lifetime of project investment. The GEF contribution for the Project is US$4,354,794. This gives a direct CO_2 unit abatement cost (UAC) of US$2.02 per tonne of CO_2eq.

106. The Project will also strengthen national planning systems broadly and this is expected to present economic benefits. The Project will boost investor confidence and generate lessons and knowledge on the promotion and application of green technologies, and integrated urban systems. In particular, participating cities where the main economic drivers are closely linked to low carbon development agenda, such as tourism (e.g. Melaka) and attracting foreign direct investment (Iskandar Malaysia), will further leverage the low carbon green technology gains for broader economic benefits. This will catalyse further green technology investments and generate replication and indirect GHG emission reductions.

2.11 Sustainability, Replicability, and Impacts

107. The project will ensure *sustainability* of the project results by:

- Strengthening the national planning and development system of the country and mainstreaming a low carbon approach down to the local level. This will be achieved by strengthening the regulatory framework including the standards and guidelines used by local planners, and improving coordination and policy linkages between federal and local level. Processes for appraising and approving development proposals will be clarified and enforced so as to improve development application processing times and ensure delivery of low carbon options.
- Giving cities experience of the benefits of an integrated approach where planning and development is coordinated vertically, horizontally (especially with private sector) and across sectors. Urban systems will be more interconnected and efficient and provide improved services.
- Decision-making will be evidence-based and therefore more likely to deliver beneficial and lasting change. Tools will make planning more effective and transparent and less likely to be shortcut or subject to ad hoc interventions.
- More people will have detailed knowledge of green technologies and low carbon approaches. This will enable them to develop and plan green technology investments; promote adoption of more efficient technologies; access finance and mobilise resources; establish effective partnerships between public and private interests. This will improve the performance of urban systems.
- Diversifying sources of low carbon finance for local development by mainstreaming low carbon issues into public planning and financing mechanisms, enabling public private partnerships, diversifying local level

incentive mechanisms, and strengthening access to global carbon finance for cities.

108. Through these actions the project will improve the likelihood that low carbon development actions demonstrated during the project will be sustained. In the final years of the project a NAMA pilot will be developed which will build on the experiences of the project and identify follow-on actions towards long term goals and further strengthen likelihood that impact will be achieved.

109. The project is first of its kind in Malaysia as it promotes an integrated and holistic approach to urban development planning. The project is innovative due to: a) its city-focus - no previous low carbon project in the country has taken the approach at this scale and scope; and b) the harmonization and enhancement of baseline activities and other project actions to promote integrated urban planning and the adoption of green technologies. This integration across urban systems, across subsumed territorial boundaries, and between levels has not previously been addressed in Malaysia in a harmonized and coordinated way.

110. To encourage replicability the project has adopted a balance between capacity building, activities to create an enabling environment for low carbon investment, and concrete investments. The selection of cities and investment projects (Component 3) underpins the strategic approach in that it presents concrete actions involving key green technologies which are relevant to the major development challenges of most of the participating cities, being electricity, transport, and waste management. An emphasis on awareness raising and knowledge management (Component 2) will pro-actively identify lessons to inform replication and scaling-up and the institutional arrangements will be put in place to ensure then this reaches federal (through MGTC and MEGTW) and local level (through one-stop-centres). In particular, a learning-by-doing approach is promoted whereby a specific low carbon planning action will be supported in each city. This will be followed up with on-going capacity development and technical assistance during the normal local planning cycles to ensure low carbon options are broadly considered. During the 5 years of the project each city complete a local planning cycle and the project will align and support this at each stage. The project will then support resource mobilisation either through public private partnerships, engaging public financing mechanisms, or from global carbon markets. Specifically, the replication of investment projects such as BRT, EV charging stations and bikeways will be encouraged through evidence based planning (component 1) and awareness raising and knowledge management (Component 2) that will pro-actively engage decision makers from the partnering cities and will be shared broadly across Malaysia, thereby, informing replication and scaling-up of these (and the other green technologies). Through enabling actions (e.g. promotion of PPPs, strengthening of community and private sector participating in planning) and through the sharing of best practices and demonstration of bankable business plans, the participation of private sector will be encouraged. Consequently, this will lead to further investment and replication of green technology investments including BRTs, EVs and cycleways.

111. 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 presents a major burden on public budgets and represents 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. However in reducing GHG emissions a concomitant reduction in Common Air Pollutants and other Volatile Organic Compounds is expected.
- 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.
- Gender benefits are expected primarily through an increased awareness of the benefits of participation of community and marginal groups in local level planning and development processes and the availability of gender disaggregated data relating to low emission development.

112. A potential negative impact of the project will be in the displaced economic activities associated with fossil fuels. A reduction in the use of fossil fuel vehicles will decrease fuel usage and to some extent the need for traditional mechanics and is likely to impact on jobs within that supply chain. Whilst new “green” jobs are likely to take up these jobs (and more), this transition is likely to lead to some disruption in the short term.

3 PROJECT RESULTS FRAMEWORK

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP (2013-2015): *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 and an enhanced national framework for biodiversity management of the central forest spine in Peninsular Malaysia and the heart of Borneo.*
Country Programme Outcome Indicators: Indicator 2.2: Percentage increase in the use of renewable energy sources in the total national electricity generation mix. Indicator 2.3: Establishment of framework on sustainable financing options for widespread green technology applications in low-carbon cities initiatives and effective management of biodiversity endowments in Sabah, Sarawak and the central forests in Peninsular Malaysia
Primary applicable Key Environment and Sustainable Development Key Result Area: 1. Mainstreaming environment and energy OR2. Catalysing environmental finance OR 3. Promote climate change adaptation OR 4. Expanding access to environmental and energy services for the poor.
Applicable GEF Strategic Objective and Program: Promote Energy Efficient, Low-Carbon Transport and Urban Systems
Applicable GEF Expected Outcomes: Sustainable transport and urban policy and regulatory frameworks adopted and implemented; Increased investment in less-GHG intensive transport and urban systems; GHG emissions avoided
Applicable GEF Outcome Indicators: Number of cities adopting sustainable transport and urban policies and regulations; Volume of investment mobilized; Tonnes of CO_2equivalent avoided.

Strategy	Indicator	Baseline	Targets	Source of verification	Critical Assumptions
Project Objectives 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	• Cumulative Direct GHG Project emission reductions (ER) resulting from the Project technical assistance and investments by end-of-project, tCO2 eq.	0	346,442	• Project final reports • Annual monitoring reports	• Economic growth in the country will continue • Government support for low carbon development will continue
Outcome 1.1 Major cities implemented and adopted integrated low carbon urban	• Number of cities[24] which have gazetted low carbon development plans by Year 3 • Number of participating cities which have GHG inventories less than 5 years old by Year 2	0[25] 2[26]	5 5	• Official documents on low carbon policies • City authority website or public register	• Cities continue to pursue low carbon development

[24] Unless otherwise stated, indicators apply to participating cities only.

[25] Whilst come cities have prepared low carbon action plans or strategies with external support these have not been formally adopted by councils and do not drive core budgeting and planning.

[26] Putrajaya (2009) and Iskandar Malaysia (2012) currently have GHG inventories although these do not link with national inventory

development plans and/or programmes.	• Number of cities which have officially adopted GHG reduction targets by EOP	0	3	• GHG Inventory web portal of National Government	
Outcome 2.1 Expedient appraisal, approval and implementation of strategic urban development plans/program and projects.	• Number of cities exceeding national benchmarks for appraisal and approval processes for local low carbon development projects • Average annual number of low carbon city projects per city identified in local plans, commencing implementation starting by Year 3.	0[27] 0[28]	5 2	• National benchmarking system review, and city authority register/ website • minutes of • One-stop-centre annual report • Annual review of LCCF programme • minutes of Council project committee meetings • Council annual reports	• Participating councils are supported and engaged by federal agencies to implement the national planning agenda
Outcome 2.2 Major cities are aware of, and are planning and implementing low carbon technology applications for integrated urban development.	• Number of cities where evidence-based low carbon planning is integrated with normal urban development planning processes by Year 4 • 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	1[29] 0	5 50%, 75%	• State Spatial Plan, District Local Plan, Municipal Council Plan and Strategic Action Plan documents • Post-training survey (1 year after) of state and council officers involved in urban development planning	• Councils are able to undertake a local planning cycle during the period of the project.
Outcome 3.1 Increased investment in low carbon technology applications in cities	• Total amount of new investment leveraged through local plans of participating cities for low carbon projects by EOP • Average amount of new investments by participants in council green incentive schemes starting in Year 3	0 $48,400[30]	$30 million[31] $1,200,000[32]	• Project annual progress report & report of financing facility • City budget reports • Incentive scheme	• Green Mobility Fund will be capitalised by Government as planned

[27] The existing benchmark system does not yet include benchmarks.

[28] In the participating cities there have been low carbon projects, however these are developed outside of the planning process and are not represented in local development plans.

[29] Iskandar Malaysia

[30] Data obtained from MBPJ 2014.

[31] Expecting 2 projects per year per city from Year 3 at $1 million per project

[32] Target is based on projected growth and assumes 50% growth pa, with average investment of $3500

	• Amount of new investment leveraged for low carbon transport in participating cities by Year 3 • Value of approved pilot Urban NAMA project in Year 5	$0 $0	$153 million[33] $10 million[34]	monitoring and evaluation system report • Inception, Mid-term and Final report, APR/PIR, NAMA Proposals	• Government continues to support NAMA framework and approach
Outcome 3.2 More low carbon projects implemented in Malaysian cities	• Number of low carbon projects implemented in participating cities by Year 4 • Number of operating electric cars by year 3 and year 5 • Number of operating electric scooters by year 3 and year 5 • Number of operating recharge stations in year 3 and year 5 • % completion of BRT phase 1 by start of Year 3 • Number of commercial onsite waste processing plants operating by EOP	0 200[35] 350[36] 15[37] 0 1[38]	5 794/1504[39] 3550/8750 155/670[40] 100% 95[41]	• Official project documents	• Government and private sector partners deliver projects according to schedule

[33] Based on indicated investments to be made by Eclimo and COMOS Sdn. Bhd.
[34] Based on expected amount from similar NAMA projects
[35] Proton trial in Cyberjaya and Putrajaya
[36] Estimate from Eclimo, KFC delivery scooters and private scooters in Putrajaya and Iskandar
[37] MEGTW and MGTC pilot sites
[38] Pilot site at central markets in Petaling Jaya, two other non-commercial sites at UTM not included
[39] According to COMOS and Eclimo business plan (2014)
[40] According to IRDA BRT Phase 1 plan
[41] According to CH Green Sdn. Bhd business plan (2014)

4 TOTAL BUDGET AND WORK PLAN

Award ID:	00085917	Project ID(s):	00093379
Award Title:	Green Technology Application for Development of Low Carbon Cities (GTALCC)		
Business Unit:	MYS 10 / PIMS No. 4283		
Project Title:	Green Technology Application for Development of Low Carbon Cities (GTALCC)		
PIMS no._____			
Implementing Partner (Executing Agency)	Ministry of Energy, Green Technology and Water (MEGTW)		

GEF Outcome/Atlas Activity	Responsible Party/ Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	See Budget Note:
OUTCOME 1.1: Major cities implemented and adopted integrated low carbon urban development plans and/or programmes	**MEGTW**	**62000**	**GEF**	71200	International Consultant	78,000	102,000	0	0	0	180,000	1
				71300	Local Consultant	123,367	192,633	87,524	70,810	20,667	495,001	2
				71600	Travel	10,625	22,625	1,200	900	0	35,350	3
				72200	Equipment	0	0	0	0	0	0	
				74500	Miscellaneous	0	0	0	0	0	0	
				75700	Training, Workshops and Conference	80,033	118,667	36,350	36,350	6,600	278,000	4
					Sub-total	292,025	435,925	125,074	108,060	27,267	988,351	
OUTCOME 2.1:	**MEGTW**	**62000**	**GEF**	71200	International Consultant	12,000	0	0	0	0	12,000	5
				71300	Local Consultant	61,400	119,900	25,650	25,650	15,900	248,500	6
				71600	Travel	11,875	3,375	0	0	0	15,250	7
				72200	Equipment	0	0	0	0	0	0	
				74500	Miscellaneous	0	0	0	0	0	0	

				75700	Training, Workshops and Conference	38,500	38,417	25,917	25,917	14,250	143,001	8
					Sub-total	123,775	161,692	51,567	51,567	30,150	418,751	
OUTCOME 2.2: Major cities are aware of, and are planning and implementing low carbon technology applications for integrated urban development.	**MEGTW**	**62000**	**GEF**	71200	International Consultant	36,000	0	0	0	0	36,000	9
				71300	Local Consultant	76,350	70,175	65,300	65,300	42,875	320,000	10
				71600	Travel	7,350	17,850	17,850	17,850	3,600	64,500	11
				72200	Equipment	4,000	2,200	0	0	0	6,200	12
				74500	Miscellaneous	2,500	0	1,417	1,417	1,417	6,751	13
				75700	Training, Workshops and Conference	35,650	16,275	35,650	35,650	21,775	145,000	14
					Sub-total	161,850	106,500	120,217	120,217	69,667	578,451	
OUTCOME 3.1: Increased investment in low carbon technology applications in cities	**MEGTW**	**62000**	**GEF**	71200	International Consultant	60,000	108,000	102,000	12,000	0	282,000	15
				71300	Local Consultant	97,000	125,500	146,575	153,583	12,000	534,658	16
				71600	Travel	57,200	27,500	13,542	2,833	0	101,075	17
				72200	Equipment	25,000	25,000	0	0	0	50,000	18
				74500	Miscellaneous	0	4,500	4,500	0	0	9,000	19
				75700	Training, Workshops and Conference	15,000	34,500	15,200	10,700	0	75,400	20
					Sub-total	254,200	325,000	281,817	179,116	12,000	1,052,133	
OUTCOME 3.2:	**MEGTW**	**62000**	**GEF**	71200	International Consultant	24,000	24,000	0	0	0	48,000	21
				71300	Local Consultant	54,714	128,214	44,500	76,071	12,000	315,499	22
				71600	Travel	0	0	0	0	0	0	
				72200	Equipment	67,900	268,300	135,800	12,500	0	484,500	23
				74500	Miscellaneous	0	60,986	131,652	35,652	31,208	259,498	24
				75700	Training, Workshops and Conference	0	2,569	0	0	0	2,569	25
					Sub-total	146,614	484,069	311,952	124,223	43,208	1,110,066	

Project management				71200	International Consultant	0	0	14,000	0	14,000	28,000	26
				71300	Local Consultant	0	0	7,000	0	7,000	14,000	27
				71400	Contractual Svc – Individual	26,000	26,000	26,000	26,000	26,000	130,000	28
				71600	Travel	4,000	0	4,000	0	4,000	12,000	29
	MEGTW/ UNDP	**62000**	**GEF**	72200	Equipment	3,000	0	0	0	0	3,000	30
(including M&E Costs See Table 3**)**				74500	Miscellaneous	0	0	0	0	0	0	
				75700	Training, Workshops and Conference	5,000	0	0	0	0	5,000	31
				74500	UNDP Cost Recovery Charge – DPC	3,000	3,000	3,000	3,000	3,042	15,042	32
					Sub-total	41,000	29,000	54,000	29,000	54,042	207,042	

PROJECT TOTAL	**1,019,464**	**1,542,186**	**944,627**	**612,183**	**236,334**	**4,354,794**	

Budget Notes

1. International urban planning and policy expert (also CTA), public private partnership expert, GHG expert and review policies and guidelines, prepare GHG data systems and planning; supported by local specialists
2. National consultants support International experts in urban planning policy and GHG accounting systems; develop tools and systems for GHG accounting; support cities with training and community engagement, Web developers to develop GHG tools and web portal software
3. Travel for international consultants and local missions for support for planning and GHG inventories
4. City level and national stakeholder workshops to review planning guidelines, PPP guidelines, and training on guidelines; national and sub-national stakeholder workshop on GHG data frameworks; working meetings with data providers; GHG tools validation workshop; city planning workshops (5); target setting and sectoral engagement workshop in each city;
5. CTA reviews institutional arrangements and established performance indicators;
6. National urban planning specialist supports data collection and systems requirements spec for benchmarks and performance indicators, streamlining of workflows; training of one-stop-centre staff; Develop additional features for website for clearing house functions; provide training for Green Tech Committees;
7. Field missions for institutional review; performance monitoring and benchmark consultations;
8. Workshops for institutional review; performance system design and training; awareness training for green tech committee and focal points; targeted workshops for tools and information on streamlining
9. International CC and low carbon specialist for review and update of LCCF; with support of National consultants
10. Provide demand driven TA for state and city planners during planning; Initiate NLCCN; Undertake Knowledge, Awareness and Perceptions survey; Development of knowledge products on green tech; case studies and best practices for integrated urban systems; LCCF review and best practices;
11. Travel to cities for training and per diems; travel and per diem for demand driven TA;
12. Data projector; Additional computing facilities for clearing house
13. Training materials and handouts; printing;
14. Training of trainer sessions; training sessions (by trainers); on-demand training during planning; Annual NLCCN conference; Design workshop for communications plan; LCCF review session; training on website management for clearing house;

15. International BRT specialist for BRT design review, phase 2 recommendations, and GHG monitoring system; LC financing specialist for green mobility financing, training of FIs, sustainable incentive scheme; Urban NAMA expert;
16. National expert to develop GHG emissions calculator for BRT system and engineer system; provide legal counsel and economic analysis for Green mobility fund and incentive scheme; LC specialist and business analyst to prepare business plans for bus operators; prepare marketing for incentive scheme; city planning and technical experts for design of priority projects; infrastructure financing expert to support cities mobilize resources; prepare implementation framework and finance for urban NAMA; adapt MRV framework for urban NAMA and prepare NAMA proposal; Web and mobile app developer; environmental monitoring systems specialist; technical specialists for project design;
17. Travel and per diems for international consultant and local field missions; study tour (12 persons, 7 days);
18. Remote monitoring system to pilot in 50 busses for real time performance monitoring.
19. Marketing materials and advertising for incentive scheme
20. BRT review meetings; customer testing of BRT feedback system; stakeholder and validation workshop for green mobility fund; design workshop and customer testing for incentive scheme; high level meetings to mobilize PPPs for new projects; urban NAMA stakeholder and MRV workshop;
21. Waste processing specialist to do review of standards and preparation of guidelines, feasibility study and business case;
22. National consultant to upscale EVs scheme, prepare pilot cycle sharing scheme; Marketing specialist to raise awareness on cycling scheme and waste processing; Support study on waste processing and scale-up;
23. Installation of 30 EV and 100 scooter recharge points; 150 bicycles/electric scooters for share scheme; monitoring system for 30 waste processing plants
24. Marketing materials and advertising and promotional activities; Construction of bike racks; public awareness and marketing campaign for cycleway and onsite waste; undertake site survey for waste processing
25. Training on installation and operation of recharge points.
26. International expert for mid- and terminal- evaluations;
27. National consultant for mid- and terminal- evaluation, lessons learned reports
28. Salary for NPM and Project Assistant
29. Travel to site for data collection for monitoring; travel and per diems for international and local evaluation specialists;
30. IT equipment for NPM and PA
31. Inception workshop; training session on project governance for NSC, TAG, PMU and city focal points;
32. Direct Project Costing for UNDP

5 MANAGEMENT ARRANGEMENTS

1. The management arrangements for the project are depicted in Figure 3.

2. The project will be Nationally-Executed (NEX) by the Malaysian Government with the implementing partner being the Ministry of Energy, Green Technology and Water (MEGTW). The overall governing body will be the National Steering Committee (NSC) which will be a multi-stakeholder body co-chaired by MEGTW and Federal Department of Town and Country Planning (FDTCP) of the Ministry of Urban Wellbeing, Housing and Local Government (MUWHLG). This arrangement recognises the comparative strengths and mandates of the two ministries, as MEGTW is the policy lead on green technology and low carbon development whilst the MUWHLG is mandated with the support for local Government and local planning. This is an innovative approach in Malaysia for green technology and seeks to further strengthen mainstreaming within national systems. The NSC will also include representation from sectoral ministries, and beneficiaries, being the participating city authorities, communities of the participating cities, and private sector from the participating cities; and sponsor, being UNDP.

3. In addition to its role on the NSC, UNDP will also provide project assurance and guidance from its Country Office (CO) in Kuala Lumpur and the Bangkok Regional Hub (BRH), in so far as is required for normal GEF and UNDP monitoring and evaluation.

4. 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. This includes ensuring that resources are available for the project delivery in a timely manner and that the monitoring and evaluation systems are in place and effective. The NSC will ensure reporting to UNDP and GEF is timely and accurate. The NSC will be responsible for approving any minor changes in the Project Document and for alerting GEF Secretariat to significant deviations. The GEF Secretariat must first approve significant changes in the Project Document. The NSC will be co-chaired by either the Secretary General or the Deputy Secretary General of MEGTW and MUWHLG. The NSC will meet at least biannually.

5. Due to the cross-cutting nature of low carbon development the NSC will be supported by a Technical Advisory Group (TAG) which will include multi-domain technical and policy specialists from participating ministries, cities and key stakeholder groups. This will include senior technical specialists from private sector, universities, METGW, MUWHLG, Ministry of Natural Resources and Environment (MNRE) and UNDP and others as required by the NSC. The TAG is not a decision making body but will be called upon to provide objective and independent technical expertise to the NSC to support project oversight and monitoring. The TAG will do this by providing the NSC with an informed review of project management reports, technical reports, and other outputs of the project. This will include a periodic review of the project risks and issues, including those reported by the Project Manager in the project risk and issues logs. The project's Chief Technical Advisor (CTA) will chair the TAG. The TAG will meet bi-annually, prior to the NSC meetings, and as otherwise required by the NSC.
6. The National Project Director (NPD) will be appointed by MEGTW and will be the custodian of the Project Document and as such will be responsible for overseeing compliance with the agreed work plan and budget. The NPD will ensure that

subsequent revisions to the Project Document are verified and approved by the NSC and in accordance with the requirements of the Government and GEF. The NPD will be responsible for delivery of project objectives, for all project reporting including submission of Annual Work Plans (AWP), APR/PIRs and financial reports. The NPD will oversee the effective communications and coordination with all parties involved in the project and will verify that resources committed to the project are available. This includes in-kind commitments, which will be monitored and reported during project reviews. The NPD will report to the NSC any issues, internal or external to the project, which are likely to effect the delivery of results.

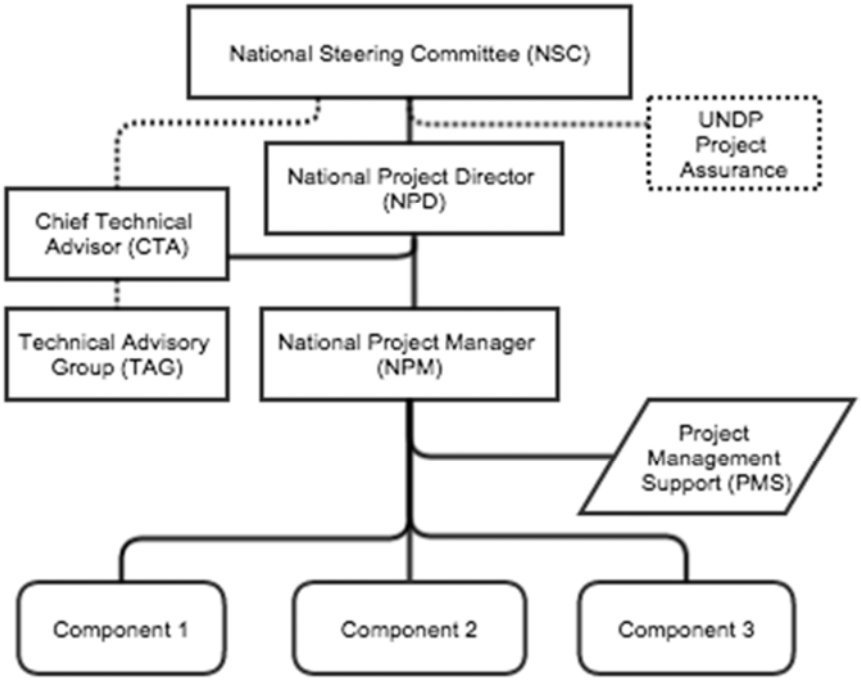
7. A Chief Technical Advisor (CTA) will provide strategic advise and technical oversight for the project to ensure that all outputs are high quality and consistent with the effective delivery of results according to the Project Document. The CTA will be a senior technical specialist and will report programmatically to the Co-Chair of the NSC and the NPD. The CTA will chair the TAG and will advise the NSC and NPD on any technical issues or risks which may impact on the results of the project, and will work closely with the NPM on a day-to-day basis to support the project's technical decision making. During the inception phase of the project the CTA will assist the NPD in review and update the baseline and indicators, risk and issues log, and undertake an inception workshop with all key stakeholders to orient the project. The CTA will subsequently provide guidance on the setup of the results monitoring systems and will participate in monitoring of project activities.

8. The National Project Manager (NPM) will be responsible for the day-to-day delivery of the project activities in accordance with the agreed Project Document. The NPM will be recruited by the project and will report programmatically to the NPD and administratively to the UNDP. The NPM establishes the project team, maintains the project management plan and facilitates procurement and scheduling of activities. The NPM prepares all project management and financial reports, and; ensures effective communication and coordination of the project team and partners; establishes the result monitoring systems and facilitates all project evaluations and reviews; and keeps track of project risks and issues in the project's risk and issues log.

9. In order to support the NPM in the administration and delivery of the project, a full time Project Assistant will be appointed and will be co-located at the project office in MEGTW. The TORs for the contracted staff, being the NPM and the Project Assistant are included in Annex 5 - Terms of Reference.

10. To ensure effective coordination of the project each city will identify a high level focal point within their structure that will provide coordination and ensure logistic support for all activities supported by the project in their domain.

Figure 3: Management structure for GTALCC project



6 MONITORING FRAMEWORK AND EVALUATION

1. The project will be monitored through the following M& E activities. The M& E budget is provided in the Table below.

Project start:

2. Project Inception Workshop will be held within the first 2 months of project start with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

3. The Inception Workshop should address a number of key issues including:

   - Assist all partners to fully understand and take ownership of the project. Detail the roles; support services and complementary responsibilities of UNDP CO and RCU staff vis-à-vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.
   - Based on the project results framework and the relevant GEF Tracking Tool if appropriate, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
   - Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
   - Discuss financial reporting procedures and obligations, and arrangements for annual audit.
   - Plan and schedule Project Board meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first Project Board meeting should be held within the first 12 months following the inception workshop.

   An Inception Workshop report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

Quarterly:

4. Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform. Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high. Note that for UNDP GEF projects, all financial risks associated with financing mechanisms are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical). Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot. Other ATLAS logs can be used to monitor issues, lessons learned etc. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

Annually:

5. The Annual Project Review/Project Implementation Reports (APR/PIR) is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements.

6. The APR/PIR includes, but is not limited to, reporting on the following:

    - Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
    - Project outputs delivered per project outcome (annual).
    - Lesson learned/good practice.
    - AWP and other expenditure reports
    - Risk and adaptive management
    - ATLAS QPR
    - Portfolio level indicators (i.e. GEF focal area tracking tools) are used by most focal areas on an annual basis.

Periodic Monitoring through site visits

7. UNDP CO and the UNDP RCU will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the PSC may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and PSC members.

Mid-term of project cycle:

8. The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation (July 2017). The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Centre (ERC).

9. The relevant GEF Focal Area Tracking Tools will also be completed during the mid-term evaluation cycle.

End of Project:

10. An independent Final Evaluation will take place three months prior to the final Project Board meeting and will be undertaken in accordance with UNDP and GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental

benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF.

11. The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response that should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Centre (ERC). The relevant GEF Focal Area Tracking Tools will also be completed during the final evaluation.

12. During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also layout recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

Learning and knowledge sharing:

13. Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyse, and share lessons learned that might be beneficial in the design and implementation of similar future projects. Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

Project Monitoring and Review Meetings:

14. In addition to the GEF M&E framework, the project activities will be closely monitored by UNDP according to the NIM CPAP the following will be conducted:

    - National Steering Committee Meetings - The National Steering Committee (NSC) will meet after the receipt of each project report or at least twice a year, whichever is greater and address project issues raised by the Project Manager, review project progress reports and provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily according to the project document. A final NSC meeting should also be held at the end of project completion to agree to and endorse the final findings and outcomes of the project and to make recommendations towards project closure.
    - Technical Advisory Group (TAG) or Project Review Committee (PRC) Meetings - The Technical Working Group Committee (TWG) or Project Review Committee (PRC) will meet as regularly as required to assist the NSC in monitoring and advising the technical implementation of the project and its activities. The TWG acts as the technical advisors to the NSC, and regularly reviews the progress of all project components. TWG will recommend projects to be endorsed by NSC.
    - Annual Project Review Meeting - This internal review meeting will be chaired by EPU as the co-signee of the project document during the fourth quarter of the year to assess the performance of the project based on the Annual Work Plan (AWP) submitted at the beginning of the calendar year as well as the Annual Progress Report submitted during the fourth quarter of each calendar year. The review will involve all key project stakeholders and the Implementing Partner, and will focus on the extent to which progress have been made towards achievement of the outputs and that they remain aligned to appropriate outcomes as outlined in the project document. This review should update output targets and results achieved. In the last year of the project, the review will be a final assessment.

- Final Project Review Meeting - A Final Project Review meeting will be conducted towards the end of the project completion. Its purpose is to assess the performance and success of the project. It should look at sustainability of the results, including the contribution to related outcomes (and the status of these outcomes) and capacity development. It will also review lessons learned and recommendations that might improve design and implementation of other UNDP-funded projects. The meeting will discuss the Final Project Review Report that should be submitted two weeks prior to the Final Project Review Meeting.

Progress Reporting Documents

- Quarterly progress
- Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high.
- Mid-Year Progress Report (MYPR) - A Mid-Year Progress Report shall be prepared by the Project Manager, approved by NPD and shared with the NSC by 30 June of each project year. As a minimum requirement, the Mid-Year Progress Report shall utilize the standard template for the Annual Project Report (APR) covering a six month period.
- Annual Progress Report (APR) - An Annual Progress Report shall also be prepared by the Project Manager and shared with the NSC by the end of the last quarter of each year. The Annual Progress Report shall highlight risks and challenges, the summary of results achieved, and lessons learnt of the project for that reporting year
- Final Project Review Report - This document which is prepared by the implementing partner is a structured assessment of progress based on the chain of results initially defined in the Project Document and Annual Work plan (AWP) and will include information on financial allocations of expenditure. It may be supplemented by additional narrative to meet specific reporting needs of stakeholders, especially the donor(s). This report will be discussed at the Final Project Review meeting mentioned above. The following should be submitted together with the report:
    - Lessons learnt log - summarizing the information captured throughout the implementation of the project
    - Minutes of NSC meetings
    - Minutes of TWG meetings
    - Annual signed CDRs
    - Statements of cash position (if applicable)
    - Statements of assets and equipment

Financial Monitoring and Quality Assurance

- Combined Delivery Reports - The Combined Delivery Report (CDR) is the report that reflects the total expenditures and actual obligations (recorded in Atlas) of a Project during a period. This report is prepared by UNDP using Atlas and shared with the implementing partner on a quarterly basis and at the end of each year. The Implementing Partner is required to verify each transaction made and sign the quarterly issued CDR report. Statements of cash position as well as assets and equipment should also be submitted together with the CDR on a yearly basis.
- Audit - The Government will provide the UNDP Resident Representative with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of UNDP (including GEF) funds according to the

established procedures set out in the programming and finance manuals. The project will be conducted according to UNDP financial regulations and rules and applicable audit policies. The audit will be conducted by the legally recognized auditor of the Government, or by a commercial auditor engaged by the Government.

- Compliance with the Minimum Operating Security Standards - The project will comply with the UNDP MOSS

Communications and visibility requirements:

- Full compliance is required with GEF and UNDP's Branding Guidelines. These can be accessed at http://intra.undp.org/coa/branding.shtml, and specific guidelines on UNDP logo use can be accessed at: http://intra.undp.org/branding/useOfLogo.html. Amongst other things, these guidelines describe when and how the UNDP logo needs to be used, as well as how the logos of donors to UNDP projects need to be used. For the avoidance of any doubt, when logo use is required, the UNDP logo needs to be used alongside the GEF logo. The GEF logo can be accessed at: http://www.thegef.org/gef/GEF_logo. The UNDP logo can be accessed at http://intra.undp.org/coa/branding.shtml.
- Full compliance is also required with the GEF's Communication and Visibility Guidelines (the "GEF Guidelines"). The GEF Guidelines can be accessed at: http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08_Branding_the_GEF%20final_0.pdf.
- Amongst other things, the GEF Guidelines describe when and how the GEF logo needs to be used in project publications, vehicles, supplies and other project equipment. The GEF Guidelines also describe other GEF promotional requirements regarding press releases, press conferences, press visits, visits by Government officials, productions and other promotional items.
- Where other agencies and project partners have provided support through co-financing, their branding policies and requirements should be similarly applied.

Table 2: Monitoring and Evaluation work plan and budget

Type of M&E activity	**Responsible Parties**	**Budget US$** *Excluding project team staff time*	**Time frame**
Inception Workshop and Report	▪ Project Manager ▪ CTA ▪ UNDP CO, UNDP GEF	Indicative cost: 10,000	Within first three months of project start up
Measurement by Means of Verification of project results.	▪ UNDP GEF RTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members.	To be finalized in Inception Phase and Workshop.	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement by Means of Verification for Project Progress on *output and implementation*	▪ Oversight by Project Manager ▪ CTA ▪ Project team	To be determined as part of the Annual Work Plan's preparation.	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	▪ Project manager and team ▪ CTA ▪ UNDP CO ▪ UNDP RTA ▪ UNDP EEG	Part of Project Management Budget	Annually

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team staff time*	Time frame
NSC meetings	▪ Project Manager	Indicative cost: 10000 (total for 5 years)	Following Inception Workshop and at least annually thereafter.
Periodic status/ progress reports	▪ Project manager and team	Part of Project Management Budget	Quarterly
Mid-term Evaluation	▪ Project manager and team ▪ CTA ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost: 40,000	At the mid-point of project implementation.
Final Evaluation	▪ Project manager and team ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost: 40,000	At least three months before the end of project implementation
Project Terminal Report	▪ Project manager and team ▪ UNDP CO ▪ External Consultant	Part of Project Management Budget	At least three months before the end of the project
Lessons Learned Report	▪ Project manager and team ▪ CTA (for first 3 years) ▪ UNDP CO ▪ External Consultant	Part of Project Management Budget	Yearly
Audit Interim/ NEX Audit (as per OAI requirements)	▪ UNDP CO ▪ Project manager and team ▪ National Audit Department ▪ Private sector auditors (if necessary)	Indicative cost: 15,000 (total for five years)	Yearly
Visits to field sites	▪ UNDP CO ▪ UNDP RCU (as appropriate) ▪ NSC members ▪ Government representatives	Part of Project Management Budget	Yearly
TOTAL indicative COST Excluding project team staff time and UNDP staff and travel expenses		US$ 115,000	

7 LEGAL CONTEXT

1. This document together with the CPAP signed by the Government and UNDP which is incorporated herein by reference, constitute together a Project Document as referred to in the Standard Basic Assistance Agreement (SBAA); as such all provisions of the CPAP apply to this document. All references in the SBAA to "Executing Agency" shall be deemed to refer to "Implementing Partner", as such term is defined and used in the CPAP and this document.

2. Consistent with the Article III of the Standard Basic Assistance Agreement (SBAA), the responsibility for the safety and security of the Implementing Partner and its personnel and property, and of UNDP's property in the Implementing Partner's custody, rests with the Implementing Partner. To this end, the Implementing Partner shall:
   - Put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
   - Assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

3. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of the Implementing Partner's obligations under this Project Document [and the Project Cooperation Agreement between UNDP and the Implementing Partner].

4. The Implementing Partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm. This provision must be included in all sub-contracts or sub-agreements entered into under/further to this Project Document".

8 ANNEX 1 – DETAILED CO_2 EMISSION CALCULATIONS

1. This section elaborates the CO_2 emissions under baseline and project scenario of the investment activities included in the Project. The direct and indirect emissions reductions calculations are based on the available internationally accepted methodologies and tools. The key references applied are:

    - *STAP Manual for Calculating Greenhouse Gas Benefits of Global Environment Facility Transportation Projects*, October 2011 (hereby refered to as the "STAP Manual") including the BRT GEF TEEMP and Bikeway GEF TEEMP models
    - Relevant methodologies and tools approved for Clean Development Mechanism (CDM) by United Nations Framework Convention on Climate Change (UNFCCC)
        - AMS-III.C. – Emission Reductions by Electric and Hybrid Vehicles, version 13.0[42]
        - AMS-III.F. – Avoidance of Methane Emissions through Composting, version 11.0[43]
        - AMS-III.AE. – Energy Efficiency and Renewable Energy Measures in New Residential Buildings, version 1.0[44]

2. There are seven investment activities that will lead to direct GHG emission reductions during the Project implementation period. The direct project emissions and indirect emission reductions have been summarized in Table 3 with detailed calculations in the proceeding sections.

[42] https://cdm.unfccc.int/filestorage/A/L/X/ALXDWR72U914EYGQ68P3TJINHSBV0Z/EB61_repan19_Revison_AMS_III_C_ver13.pdf?t=c2Z8bmkzZjNtfDBBOobkVZISDf0PtZft1rjJ

[43] https://cdm.unfccc.int/filestorage/E/3/Q/E3QBKLVIDCR248PZY5XJ906U17GWFN/EB67_repan20_Revision%20of%20AMS-III.F_ver11.0.pdf?t=MUJ8bmkzZXhzfDCzaLid902sRJaTHzEJSGOM

[44] https://cdm.unfccc.int/filestorage/C/D/M/CDM_AMS02DI2P0YCXF0W6W3D6HV1KX6NWQ8O0/EB48_repan14_AMS_III.AE_ver01.pdf?t=ZWp8bmkzZXh2fDDgQya6bbI5PKLgkysksvrm

Table 3: Summary of GHG Emission Reduction (tonnes of CO2eq) for the Project

Investment Activity	Enhancing BRT emission reduction potential	Replacement of diesel buses with electric buses	Scaled-up green technology incentive scheme	Replacement of petrol scooters with electric scooters	Promotion of car sharing using electric vehicles	Expansion of cycling path and setup of bicycle sharing	On-site food waste to biogas & compost processing	Total
Related Project Outputs	Output 3.1.1 & 3.2.2	Output 3.1.2	Output 3.1.3	Output 3.2.1	Output 3.2.1	Output 3.2.3	Output 3.2.4	
Direct Project Emission Reductions by EOP (tCO_2e)	312,641	318	13,752	1,621	1,378	8,317	8,415	346,442
Lifetime Direct Project Emission Reductions (tCO_2e)	2,084,271	794	27,504	3,243	2,756	16,634	16,831	2,152,032
Total Indirect Project Emission Reductions (BU) (tCO_2e)	2,929,267	2,167	215,471	6,775	2,349	24,125	78,878	3,259,032
Total Indirect Project Emission Reductions (TD) (tCO_2e)	12,607,047	482,587	8,141,436	1,750,190	247,450	512,539	1,273,360	25,014,609

1) Enhancing BRT Emission Reduction Potential

1. The calculations of GHG emission reductions are in accordance with the STAP Manual. To determine direct project emissions, the BRT GEF TEEMP model is used. There is no financing mechanism established and so post-project direct emissions are not considered. In order to calculate indirect emission reductions, the BU and TD approaches are used to estimate a possible range of impacts as per the STAP Manual.

2. The cumulative direct emission reductions estimated during the Project intervention from 2015 – 2019 are presented below:

Table 4: Annual Direct Project Emission Reductions from the Enhancement of BRT from 2015 – 2019

Emissions (tCO_2e)	**2015**	**2016**	**2017**	**2018**	**2019**	**EOP TOTAL**
Total Emission Reductions	0	0	9,803	141,631	161,206	312,641

Table 5: Lifetime Direct Project Emission Reductions from 2017 - 2036[45]

Emissions (tCO_2e)	**TOTAL**
Sum of Average Annual Emission Reduction	104,214
Average useful lifetime of investment (year)	20
Lifetime Direct Reductions	**2,084,271**

Table 6: Key Variables and Data Used in the Estimation of Direct Project Emission Reductions

No.	**Variables**	**Values**	**Remarks**
1.	Days in operation per year	240	*Financial and Commercial Study - Draft Final Report, Iskandar Malaysia Bus Rapid Transit System,* Ernst & Young Solutions LLP, 2013 (page 147)
2.	Length of BRT (km) in 2017	102	Detail Planning Study (page i), GEF TEEMP manual
3.	BRT ridership ('000)/day in year 2017	1,593	*Financial and Commercial Study - Draft Final Report, Iskandar Malaysia Bus Rapid Transit System,* Ernst & Young Solutions LLP, 2013 (pages 61 & 147) assuming average growth rate of approximately 11.4% p.a.
4.	Mode shift to BRT for car in year 2017	63%	Detail Planning Study (page i)
5.	Mode shift to BRT for taxi in year 2017	2%	*Financial and Commercial Study - Draft Final Report, Iskandar Malaysia Bus Rapid Transit System,* Ernst & Young Solutions LLP, 2013
6.	Mode shift to BRT for bus in year 2017	12%	*Financial and Commercial Study - Draft Final Report, Iskandar Malaysia Bus Rapid Transit System,* Ernst & Young Solutions LLP, 2013

3. Key assumptions used in the calculations are:

   - There is no replacement of fleets during the project period
   - The BRT ridership will increase annually by 2% due to awareness programmes and the intervention from GEF for years 2017, 2026 and 2036. This value is considered conservative when compared to the default value of 10% which is the percent population reached by eco-driving training programmes as

[45] With reference to Figure 3 of the GEF manual, page 13 for the calculations and assumed that the secondary direct effects are negligible for all the projects. The average lifecycle of 20 years for infrastructure was used in the calculations.

provided in *Appendix 1: Data Required and Defaults Provided for Eco-Driving Module* of the STAP Manual

4. The indirect emission reductions are estimated as follows for Bottom Up and Top Down approaches.

Table 7: Total Indirect Project Emission Reductions (BU and TD) from 2020 – 2029

Emissions (tCO_2e)	**TOTAL**
Direct Project Emission Reductions by EOP	312,641
Replication factor, RF	9
Total Indirect Project Emission Reductions (BU)	**2,929,267**
Technical and economic potential GHG savings, P10	63,035,235
GEF causality factor, CF	20%
Total Indirect Project Emission Reductions (TD)	**12,607,047**

5. In addition to Iskandar, BRT projects are under development in Klang Valley and Subang whereas other major cities and regions on Peninsula Malaysia are considering BRT investments, including Greater Klang Valley[46], Penang[47] and Melaka[48]. As these areas witness rapid urban expansion, the probability for replication in Iskandar, Kuala Lumpur, Putrajaya, Selangor (Klang Valley), Johor, Melaka and Penang is high. Besides, the GEF supported activities will improve the probability of replication by enhancing the GHG emission reduction potential and improving the overall visibility and viability of the BRT project. Therefore a replication factor of 9 is a realistic estimate. A level 1 causality factor is adopted and a CF value of 20% is used in the calculations according to the general guidelines provided in page 18 of the STAP Manual.

Table 8: Summary of GHG Emission Reductions for Enhancement of BRT project

Emissions (tCO_2e)	**TOTAL**
Direct Project Emission Reductions by EOP	312,641
Lifetime Direct Reductions	2,084,271
Total Indirect Project Emission Reductions (BU)	2,929,267
Total Indirect Project Emission Reductions (TD)	12,607,047

2) Replacement of Diesel Buses with Electric Buses

6. The calculations of Direct Project emission reductions are in accordance with the the CDM methodology, AMS-III.C.[49] – Emission Reductions by Electric and Hybrid Vehicles, version 13.0. GEF funds is not being used as a seed capital for establishing the fund, hence, post-project direct emissions are not considered. In order to calculate indirect emission reductions, the BU and TD approaches are used to estimate a possible range of impacts as per the STAP Manual.

7. The cumulative direct emission reductions estimated during the Project intervention from 2015 – 2019 are presented below:

[46] http://www.spad.gov.my/projects/2013/bus-rapid-transit-brt
[47] http://www.thestar.com.my/Lifestyle/Features/2014/07/18/Alleviating-traffic-congestion
[48] http://umpir.ump.edu.my/7768/1/NURULAIN_BINTI_ZAINI.PDF
[49] https://cdm.unfccc.int/filestorage/A/L/X/ALXDWR72U914EYGQ68P3TJINHSBV0Z/EB61_repan19_Revison_AMS_III_C_ver13.pdf?t=c2Z8bmkzZjNtfDBBOobkVZISDf0PtZft1rjJ

Table 9: Annual Direct Emission Reductions from Replacement of Diesel Busses with Electric Buses from 2015 – 2019

Emissions (tCO_2e)	2015	2016	2017	2018	2019	EOP TOTAL
Baseline Emissions	0	518	863	863	863	**3,107**
Project Emissions	0	465	775	775	775	**2,790**
Total Emission Reductions	0	53	88	88	88	**318**

Table 10: Lifetime Direct Project Emission Reductions from 2015 - 2024[50]

Emissions (tCO_2e)	TOTAL
Sum of Average Annual Emission Reduction	79
Average useful lifetime of investment (year)	10
Lifetime Direct Reductions	**790**

Table 11: Key Variables and data used in the estimation of Direct Project Emissions Reductions

No.	Variables	Values	Remarks
1	Specific diesel consumption of buses (g/km)	420.00	Density of diesel oil: 0.84kg/L & diesel bus fuel efficiency: 50 litre/100 km
2	Net calorific value of diesel consumed by buses (J/g)	43,000.00	IPCC - Default Net Calorific Values (NCVs) and Lower and Upper Limits of the 95% Confidence Intervals (diesel oil), Table 1.2
3	Emission factor of diesel consumed by buses (gCO_2/J)	0.0000741	IPCC - Road Transport Default CO_2 Emission Factors and Uncertainty Ranges, Table 3.2.1 (diesel oil)
4	Technology improvement factor for buses	0.99	Default value, AMS-III.C., version 13
5	Specific electricity consumption by electric bus per km in urban conditions (kWh/km)	1.47	Obtained from MGTC - Electric Mobility Stakeholders' Workshop by Malaysian Green Technology Corporation, 15 May 2014
6	CO_2 emission factor of electricity consumed by electric bus ($kgCO_2/kWh$)	0.74	Obtained from IGES - List of Grid Emission Factor (Peninsular Malaysia: 0.741 tCO_2/MWh in year 2012)
7	Average technical transmission and distribution losses for providing electricity	0.08	Obtained from TNB 2012 Annual Report
8	No. of trips per day	3.4	Detail Planning and Pre-Engineering Study for the Proposed Phase 1 Iskandar Malaysia Bus Rapid Transit System Implementation as Part of RMK-10 Urban Public Transport Improvement Project, page 4-2

8. The estimate of indirect impacts uses the BU and TD approaches as per the STAP Manual. The summary of calculations are presented below.

Table 12: Total Indirect Project Emission Reductions (BU and TD) from 2020 – 2029

Emissions (tCO_2e)	TOTAL
Direct Project Emission Reductions by EOP	318
Total Emission Reductions / CO_2 direct	318

[50] With reference to Figure 3 of the GEF manual, page 13 for the calculations and assumed that the secondary direct effects are negligible for all the projects. The average lifecycle of 10 years for vehicles and equipment was used in the calculations.

Replication factor, RF	7
Total Indirect Project Emission Reductions / CO_2 indirect BU	**2,167**
Technical and economic potential GHG savings, P10	804,312
GEF causality factor, CF	60%
Total Indirect Project Emission Reductions / CO_2 indirect TD	**482,587**

9. The GEF project will play a key role in demonstrating 50 electric buses in city and BRT bus routes as an alternative to diesel buses. GEF project activities will ensure the value proposition and experience of these buses is highly visible to bus operators and it is expected that these lessons will contribute greatly to replication. The replication factor of 7 is selected based on the number of diesel based buses in cities such as Kuala Lumpur, Putrajaya, Selangor (Klang Valley), Johor, Melaka and Penang by year 2015. A level 3 causality factor is assumed with the value of 60% used in the calculations according to the general guidelines provided in page 18 of the STAP Manual.

Table 13: Summary of Project Emission Reductions for Replacement of Diesel Busses with Electric Busses Project

Emissions (tCO_2e)	**TOTAL**
Direct Project Emission Reductions by EOP	318
Lifetime Direct Reductions	794
Total Indirect Project Emission Reductions (BU)	2,167
Total Indirect Project Emission Reductions (TD)	482,587

3) Scaled-up Green Technology Incentive Scheme

10. The calculations to determine the direct project GHG emission reductions are in accordance with the the CDM methodology, AMS-III.AE. – Energy Efficiency and Renewable Energy Measures in New Residential Buildings, version 1.0. GEF funding is not used as a seed fund to establish the incentive scheme, hence, post-project direct emissions are not considered. In order to calculate indirect emission reductions, the BU and TD approaches are used to estimate a possible range of impacts as per the STAP Manual.

11. The following formulas are used to determine baseline, project emissions and resulting project direct emission reductions:

    *Baseline Emissions = Total residential premises under the jurisdiction of MBPJ * Average carbon emission per residential premise per year*
    Project Emissions = Total project emissions for residential premises participating in green incentive scheme + Total Project Emissions for residential premises in Petaling Jaya not participating in green incentive scheme
    *Total project emissions for residential premises participating in green incentive scheme = Total projected residential premises participation in green incentive scheme * Average carbon emission per residential premise per year*
    *Total project emissions for residential premises in Petaling Jaya not participating in green incentive scheme = Total projected residential premises not participating in green incentive scheme * Average carbon emission per residential premise per year*

12. The cumulative direct emission reductions estimated during the Project intervention from 2015 – 2019 are presented below.

Table 14: Annual Direct Project Emissions Reductions from Scaled-up Green Technology Incentive Scheme in Petaling Jaya from 2015 – 2019

Emissions (tCO_2e)	**2015**	**2016**	**2017**	**2018**	**2019**	**EOP TOTAL**
Baseline Emissions	744,030	758,911	774,089	789,571	805,362	**3,871,963**
Project Emissions	741,663	756,410	771,409	786,644	802,086	**3,858,211**
Total Emission Reductions	**2,368**	**2,501**	**2,680**	**2,927**	**3,276**	**13,752**

Table 15: Lifetime Direct Project Emission Reductions 2015 – 2024

Emissions (tCO_2e)	**TOTAL**
Sum of Average Annual Emission Reduction	2,750
Average useful lifetime of investment (year)	10
Lifetime Direct Reductions	**27,504**

13. Key variables, data and specific assumptions used in the estimations are presented below.

Table 16: Key variables and data used in the estimation of Direct Project Emissions Reductions

No.	**Variables**	**Values**	**Remarks**
1	Average energy use per residential premise per month	112	WCPJ (Working with the Community on Energy Efficiency at Household Level in Petaling Jaya), Anthony Tan Kee Huat, 2006, pages 13 & 36 (kWh/person)
2	Average number per residential premise	4	Economic Planning Unit, Prime Minister's Department Malaysia (2012) – Household Income and Poverty Statistics
3	Grid Emission Factor	0.741	Study on grid connected electricity baselines in Malaysia 2012 - published by Malaysian Green Technology Corporation (MGTC) (tCO2e / MWh)
4	Growth rate for residential premises	2%	Malaysia Market Property Report 2013, slide no. 14 The 2% increment is including the new development and refurbishment
5	Total residential premises under the jurisdiction of MBPJ (2011)	172,549	PJ Council Annual Report 2011, page viii
6	Average energy use per household per month after implementing energy efficiency methods	85%	For conservative purposes, the 15% reduction is only based on assumptions of LED light replacement with an average saving of 65% from conventional lights and savings from solar heater
7	Projection for household participation from 2016 – 2019	50%	The average percentage increment of participation from 2011 – 2013 is 47.3%, assuming with an additional 2.7%, the projection of increment is 50%

14. The estimates of indirect impacts uses the BU and TD approaches as per the STAP Manual and are presented below.

Table 17: Total Indirect Project Emission Reductions of CO_2 (BU and TD) from 2020 – 2029

Emissions (tCO_2e)	**TOTAL**
Direct Project Emission Reductions by EOP	13,752
Total Emission Reductions / CO_2 direct	13,752
Replication factor, RF	16
Total Indirect Project Emission Reductions / CO_2 indirect BU	**215,471**
Technical and economic potential GHG savings, P10	20,353,589
GEF causality factor, CF	40%
Total Indirect Project Emission Reductions / CO_2 indirect TD	**8,141,436**

15. Petaling Jaya council has been promoting the incentive scheme widely both within its jurisdiction and sharing the lessons with other cities. Looking at the growing trend of popularity of the initiative among the local authorities in Malaysia, major areas which are envisioned to follow the footsteps of Petaling Jaya including Selangor, Melaka, Johor, Penang, Kuala Lumpur and Putrajaya. These urban areas have a population of approx. 90 times that of Petaling Jaya. Although, it is not anticipated that all of the above mentioned districts / areas will participate in the incentive scheme in the near future. Hence, it is conservatively estimated that at least 16 cities or urban areas with an equivalent size of the Petaling Jaya population are envisaged to replicate this project. A level 2 causality factor is used in the calculations according to the general guidelines provided in page 18 of the STAP Manual.

Table 18: Summary of Project Emission Reductions from Scaled-up Green Technology Incentive Scheme

Emissions (tCO_2e)	**TOTAL**
Direct Project Emission Reductions by EOP	13,752
Lifetime Direct Reductions	27,504
Total Indirect Project Emission Reductions (BU)	215,471
Total Indirect Project Emission Reductions (TD)	8,141,436

4) Replacement of Petrol Scooters with Electric Scooters

16. The determination of direct project GHG emission reductions are in accordance with the CDM methodology, AMS-III.C. – Emission Reductions by Electric and Hybrid Vehicles, version 13.0. There is no financing mechanism established and so, post-project direct emissions are not considered. In order to calculate indirect emission reductions, the BU and TD approaches are used to estimate a possible range of impacts as per the STAP Manual.

17. The cumulative direct emission reductions estimated during the Project intervention from 2015 – 2019 are presented below:

Table 19: Annual Direct Emissions Reductions from the Replacement of Petrol Scooters with Electric Scooters from 2015 – 2019

Emissions (tCO_2e)	**2015**	**2016**	**2017**	**2018**	**2019**	**EOP TOTAL**
Baseline Emissions	198	396	634	1,148	1,663	**4,039**
Project Emissions	119	237	379	687	995	**2,417**
Total Emission Reductions	**79**	**159**	**254**	**461**	**668**	**1,621**

Table 20: Lifetime Direct Project Emission Reductions from 2015 – 2024

Emissions (tCO_2e)	**TOTAL**
Sum of Average Annual Emission Reduction	324
Average useful lifetime of investment (year)	10
Lifetime Direct Reductions	**3,243**

Table 21: Key variables and data in the estimation of Direct Project Emissions

No	Variable	Value	Remarks
1.	Specific gasoline consumption of motorcycles (g/km)	13.32	GHG Protocol's tool for stationary combustion & GEF TEEMP BRT-Default Value use. Density of Motor Gasoline: 0.74kg/L & Motor Gasoline Fuel Efficiency at 50kmph: 55.56km/litre
2.	Net calorific value of gasoline consumed by motorcycles (J/g)	44,300.00	IPCC - Default Net Calorific Values (NCVs) and Lower and Upper Limits of the 95% Confidence Intervals (Motor Gasoline), Table 1.2
3.	Emission factor of gasoline consumed by motorcycles (gCO_2/J)	0.0000693	IPCC - Road Transport Default CO_2 Emission Factors and Uncertainty Ranges, Table 3.2.1 (Motor Gasoline)
4.	Technology improvement factor for motorcycles	0.99	AMS-III.C., version 13, Default value
5.	Specific gasoline consumption by motorcycle per km in urban conditions (g/km)	13.32	GHG Protocol's tool for stationary combustion & GEF TEEMP BRT-Default Value used Density of Motor Gasoline: 0.74kg/L & Motor Gasoline Fuel Efficiency at 50kmph: 55.56km/litre
6.	Net calorific value of gasoline consumed by motorcycle (J/g)	44,300.00	IPCC - Default Net Calorific Values (NCVs) and Lower and Upper Limits of the 95% Confidence Intervals (Motor Gasoline), Table 1.2
7.	CO_2 emission factor of gasoline consumed by motorcycle (gCO_2/J)	0.0000693	IPCC - Road Transport Default CO2 Emission Factors and Uncertainty Ranges, Table 3.2.1 (Motor Gasoline)
8.	Specific electricity consumption by electric scooter per km in urban conditions (kWh/km)	0.03	Eclimo electric scooter product brochure/specification
9.	CO_2 emission factor of electricity consumed by electric scooter ($kgCO_2/kWh$)	0.74	IGES - List of Grid Emission Factor (Peninsular Malaysia: 0.741 tCO_2/MWh in year 2012)
10.	Average technical transmission and distribution losses for providing electricity	0.08	TNB 2012 Annual Report

18. The estimate of indirect impacts uses the BU and TD approaches as per the STAP Manual and are presented below.

Table 22: Total Indirect Project Emission Reductions (BU and TD) from 2020 – 2029

Emissions (tCO_2e)	**TOTAL**
Direct Project Emission Reductions by EOP	1,621
Replication factor, RF	4
Total Indirect Project Emission Reductions / CO_2 indirect BU	**6,775**
Technical and economic potential GHG savings, P10	4,375,475
GEF causality factor, CF	40%
Total Indirect Project Emission Reductions / CO_2 indirect TD	**1,750,190**

19. The private sector is driving the e-scooter initiative and it is envisaged that replication in adjoining cities and regions is forthcoming, in particular, expansion in additional cities of Iskandar, within the state of Melaka as well as Greater Kuala Lumpur. Based on this as well as the projected number of motorcycles / scooters in households in these cities, a replication factor of 4 has been selected. A level 2 causality factor has been estimated with the value of 40% according to the general guidelines provided in page 18 of the STAP Manual.

Table 23: Summary of Project Emission Reductions for Replacement of Petrol Scooters with Electric Scooters Project

Emissions (tCO_2e)	**TOTAL**
Direct Project Emission Reductions by EOP	1,621

Lifetime Direct Emission Reductions	3,243
Total Indirect Project Emission Reductions (BU)	6,775
Total Indirect Project Emission Reductions (TD)	1,750,190

5) Promotion of Car Sharing using Electric Vehicles

20. The calculations of direct project GHG emission reductions are in accordance with the CDM methodology, AMS-III.C. – Emission Reductions by Electric and Hybrid Vehicles, version 13.0. There is no financing mechanism established and so, post-project direct emissions are not considered. In order to calculate indirect emission reductions, the BU and TD approaches are used to estimate a possible range of impacts as per the STAP Manual.

21. The cumulative emission reductions estimated during the Project intervention from 2015 – 2019 are presented below:

Table 24: Annual Direct Emissions Reductions from Promotion of Car Sharing using Electric Vehicles from 2015 – 2019

Emissions (tCO_2e)	**2015**	**2016**	**2017**	**2018**	**2019**	**EOP TOTAL**
Baseline Emissions	42	139	263	418	577	**1,438**
Project Emissions	2	6	11	18	24	**60**
Total Emission Reductions	**40**	**133**	**252**	**400**	**553**	**1,378**

Table 25: Lifetime Direct Project Emission Reductions from 2015 – 2024

Emissions (tCO_2e)	**TOTAL**
Sum of Average Annual Emission Reduction	276
Average useful lifetime of investment (year)	10
Lifetime Direct Reductions	**2,756**

Table 26: Key variables and data for Direct Project Emissions

No.	**Variables**	**Values**	**Remarks**
1.	Specific gasoline consumption of passenger cars (g/km)	59.20	GHG Protocol's tool for stationary combustion & GEF TEEMP BRT-Default Value used Density of Motor Gasoline: 0.74kg/L & Motor Gasoline Fuel Efficiency at 50kmph: 12.50km/liter
2.	Net calorific value of gasoline consumed by passenger cars (J/g)	44,300.00	IPCC - Default Net Calorific Values (NCVs) and Lower and Upper Limits of the 95% Confidence Intervals (Motor Gasoline), Table 1.2
3.	Emission factor of gasoline consumed by passenger cars (gCO_2/J)	0.0000693	IPCC - Road Transport Default CO_2 Emission Factors and Uncertainty Ranges, Table 3.2.1 (Motor Gasoline)
4.	Technology improvement factor for passenger cars	0.99	AMS-III.C., version 13, Default value
5.	Specific natural gas consumption of taxis (g/km)	59.20	Natural Gas Vehicles: A Feasibility Study Natural Gas Fuel Efficiency: 16.8 km/kg
6.	Net calorific value of natural gas consumed by taxis (J/g)	48,000.00	IPCC - Default Net Calorific Values (NCVs) and Lower and Upper Limits of the 95% Confidence Intervals (Natural Gas), Table 1.2
7.	Emission factor of natural gas consumed by taxis (gCO_2/J)	0.0000561	IPCC - Road Transport Default CO2 Emission Factors and Uncertainty Ranges, Table 3.2.1 (Compressed Natural Gas)

No.	Variables	Values	Remarks
8.	Technology improvement factor for taxis	0.99	AMS-III.C., version 13, Default value
9.	Specific electricity consumption by electric car per km in urban conditions (kWh/km)	0.10	Tech Vehicle online magazine [51] Average of Nissan Twizy, Renault Leaf and Renault Zoe, source in 'Reference' tab
10.	CO_2 emission factor of electricity consumed by electric car ($kgCO_2/kWh$)	0.74	IGES - List of Grid Emission Factor (Peninsular Malaysia: 0.741 tCO_2/MWh in year 2012)
11.	Average technical transmission and distribution losses for providing electricity	0.08	TNB 2012 Annual Report

22. The estimate of indirect impacts uses the BU and TD approaches as per the STAP Manual and are presented below.

Table 27: Total Indirect Project Emission Reductions (BU and TD) from 2020 – 2029

Emissions (tCO_2e)	**TOTAL**
Direct Project Emission Reductions by EOP	1,378
Total Emission Reductions / CO_2 direct	1,378
Replication factor, RF	2
Total Indirect Project Emission Reductions / CO_2 indirect BU	**2,349**
Technical and economic potential GHG savings, P10	1,237,249
GEF causality factor, CF	20%
Total Indirect Project Emission Reductions / CO_2 indirect TD	**247,450**

23. A modest replication factor of 2 has been selected based on the number of motorcars, hire-and-drive cars and taxis which is envisaged to be replaced by the EV cars in cities and states across Malaysia likely to adopt the business model. A causality factor of 1 has been attributed in the top down indirect approach.

Table 28: Summary of Project Emission Reductions for Car Sharing Using Electric Vehicles Project

Emissions (tCO_2e)	**TOTAL**
Direct Project Emission Reductions by EOP	1,378
Lifetime Direct Reductions	2,756
Total Indirect Project Emission Reductions (BU)	2,349
Total Indirect Project Emission Reductions (TD)	247,450

6) Expansion of Cycling Path and Setup of Bicycle Sharing

24. The calculations of direct project GHG emission reductions are in accordance with the STAP Manual and the bikeway GEF TEEMP model. There is no financing mechanism established and so, post-project direct emissions are not considered. In order to calculate indirect emission reductions, the BU and TD approaches are used to estimate a possible range of impacts as per the STAP Manual.

25. The cumulative emission reductions estimated during the Project intervention from 2015 – 2019 are presented below.

[51] Online Tech Vehicle Magazine; http://www.technologicvehicles.com/en/green-transportation-news/1961/consumption-of-electric-cars-the-top-13-in-wh-km#.U_WiJPmSyaI

Table 29: Annual Direct Project Emission Reductions from Expansion of Cycling Path and Setup of Bicycle Sharing from 2015 – 2019

Emissions (tCO_2e)	**2015**	**2016**	**2017**	**2018**	**2019**	**EOP TOTAL**
Baseline Emissions	11,047	16,107	23,485	34,242	49,927	**134,808**
Project Emissions	11,047	15,730	22,399	31,896	45,418	**126,491**
Total Emission Reductions	**0**	**377**	**1,085**	**2,346**	**4,509**	**8,317**

Table 30: Lifetime Direct Project Emission Reductions from 2015 – 2024

Emissions (tCO_2e)	**TOTAL**
Sum of Average Annual Emission Reduction	1,663
Average useful lifetime of investment (year)	10
Lifetime Direct Reductions	**16,634**

26. Key assumptions and variables used in the calculations of direct project emission reductions are:

- Total project length for Phase 1 is 22.8km[52]
- Length of bikeway in Phase 2 is 50% of total length of Phase 1[53]
- Putrajaya has all the vehicle types, except for 3-wheelers and jeepney/RTV. Both of these vehicle types will not be considered in the calculations. Data and inputs on mode share, average trip lengths for various modes, number of trips per day are derived from *the PGC2015 Technical Report Compilation.*
- The base year data of 'Mode Share' and 'Average Trip Length' in 2015 is assumed to be the same as year 2007. All value on mode share and average trip distance are estimated according to the sources [54]
- Percentage of motorcar is 99.06% and taxi is 0.94% which are under the 'Automobile' category[55]
- Total number of trips/day is estimated using the information available in the *Technical Report of Putrajaya Green City 2015, Baseline and Preliminary Study, August 2011*

27. The estimates of indirect impacts uses the BU and TD approaches as per the STAP Manual and are presented below.

Table 31: Total Indirect Project Emission Reductions (BU and TD) from 2020 – 2029

Emissions (tCO_2e)	**TOTAL**
Direct Project Emission Reductions by EOP	8,317
Total Direct Post-Project Emission Reductions from 2020 – 2029	0
Total Emission Reductions / CO_2 direct	8,317
Replication factor, RF	3
Total Indirect Project Emission Reductions / CO_2 indirect BU	**24,125**
Technical and economic potential GHG savings, P10	854,232
GEF causality factor, CF	60%
Total Indirect Project Emission Reductions / CO_2 indirect TD	**512,539**

[52]Cadangan Penambahan Laluan Basikal (Program Bikable City)

[53] Based on budget in the Cadangan Penambahan Laluan Basikal

[54] Technical Report of Putrajaya Green City 2015, Baseline and Preliminary Study, August 2011, Appendix 7.1 and 7.2, page 100

[55] Road Transport Department, Table 1.2: Total Motor Vehicles by Type and State, Malaysia, Until 31 December 2013

28. A replication factor of 3 has been selected based on the market potential and the local co-benefits evident from the project. For instances, cities such as Petaling Jaya[56] and Subang Jaya are considering road upgrades to include cycleways. Petaling Jaya is conceptualizing an additional 3 phases for their cycleway network. An initial assessment on the current promising planning for a bicycle-sharing system involves Penang Island. Likewise, a level 3 causality factor, has been attributed to the calculations according to the general guidelines provided in page 18 of the *STAP Manual.*

Table 32: Summary of Project Emission Reduction for Cyclepath and Bicycle Sharing Project

Emissions (tCO_2e)	**TOTAL**
Direct Project Emission Reductions by EOP	8,317
Lifetime Direct Reductions	16,634
Total Indirect Project Emission Reductions (BU)	24,125
Total Indirect Project Emission Reductions (TD)	512,539

7) On-site Food Waste to Biogas & Compost Processing

29. The calculations of direct project GHG emission reductions are in accordance with the the CDM methodology, AMS-III.F. – Avoidance of Methane Emissions through Composting, version 11.0. There is no financing mechanism established and so, post-project direct emissions are not considered. In order to calculate indirect emission reductions, the BU and TD approaches are used to estimate a possible range of impacts as per the STAP Manual.

30. The cumulative emission reductions estimated during the Project intervention from 2015 – 2019 are presented below:

Table 33: Annual Direct Emissions Reductions from On-site Food Waste to Biogas & Compost Processing from 2015 – 2019

Emissions (tCO_2e)	**2015**	**2016**	**2017**	**2018**	**2019**	**EOP TOTAL**
Baseline Emissions	83	477	1,366	2,897	5,674	**10,496**
Project Emissions	39	136	307	570	1,029	**2,081**
Total Emission Reductions	**43**	**341**	**1,059**	**2,328**	**4,644**	**8,415**

Table 34: Lifetime Direct Project Emission Reductions from 2015 – 2024

Emissions (tCO_2e)	**TOTAL**
Sum of Average Annual Emissions Reduction	1,683
Average useful lifetime of investment (year)	10
Lifetime Direct Reductions	**16,831**

Table 35: Key variables and data used in the estimation of Direct Project Emissions Reductions

No.	**Variables**	**Values**	**Remarks**
1.	Quantity of food waste or compost (t/yr)	329 in 2015 and 8,578 by 2019	CHG Business Plan. 100% food waste will be converted to compost

[56] http://www.thestar.com.my/story/?file=%2F2012%2F4%2F5%2Fcentral%2F11041845

No.	Variables	Values	Remarks
2.	Model correction factor to account for model uncertainties	0.85	Emissions from solid waste disposal sites, version 06.0.1, page 9, Table 3 Application B for humid/wet condition
3	Fraction of methane captured at SWDS and flared (tCO_2/MWh)	0	Emissions from solid waste disposal sites, version 06.0.1, page 13
4	Oxidation factor	0.1	Emissions from solid waste disposal sites, version 06.0.1, page 9
5	Fraction of methane in SWDS gas	0.5	Emissions from solid waste disposal sites, version 06.0.1, page 9
6	Fraction of degradable organic carbon (DOC) by volume	0.5	Emissions from solid waste disposal sites, version 06.0.1, page 10
7	Fraction of DOC by weight	0.15	Emissions from solid waste disposal sites, version 06.0.1, page 11 (% wet waste) for food, food waste, beverages and tobacco is 15%
8	Methane correction factor	0.8	Emissions from solid waste disposal sites, version 06.0.1, page 10 0.8 for SWDS not meeting the criteria of managed SWDS and which have depths of greater than or equal to 5 meters
9	Amount of organic waste prevented from disposal due to dumping	1.00	Emissions from solid waste disposal sites, version 06.0.1, page 14 100% of the food waste dumped to the landfill
10	Decay rate of waste type j	0.4	Emissions from solid waste disposal sites, version 06.0.1, page 12 Tropical (MAT>20°C), Wet (MAP> 1000mm) Food, food waste, sewage sludge, beverages and tobacco is 0.4
11	Default value for the specific quantity of electricity consumed per tonne of waste composted (MWh/t)	0.01	Project and leakage emissions from composting, version 01.0.0, page 8
12	Emission factor of methane per tonne of waste composted (tCH_4/t)	0.002	Project and leakage emissions from composting, version 01.0.0, page 8
13	Default emission factor of nitrous oxide per tonne of waste composted (wet basis) (tN_2O/t)	0.0002	Project and leakage emissions from composting, version 01.0.0, page 8
14	Global warming potential of nitrous oxide (tCO_2e/tN_2O)	310	Project and leakage emissions from composting, version 01.0.0, page 9

31. Further assumptions are based on the following:
    - 100% of the food waste dumped to the landfill
    - The power consumption for the anaerobic digester (AD) is sourced from grid and there is no fossil fuel consumed by the AD
    - There is no wastewater co-composted by the project activity
    - There is no manure composted by the project activity
    - There is no methane captured and combusted
    - There is no project emissions of methane from run-off wastewater ($PE_{RO,y}$) as the project is not a co-composting project

32. The estimates of indirect impacts uses the BU and TD approaches as per the STAP Manual and are presented below.

Table 36: Total Indirect Project Emission Reductions (BU and TD) from 2020 – 2029

Emissions (tCO_2e)	TOTAL
Direct Project Emission Reductions by EOP	8,415

Total Emission Reductions / CO_2 direct	8,415
Replication factor, RF	9
Total Indirect Project Emission Reductions / CO_2 indirect BU	**78,878**
Technical and economic potential GHG savings, P10	6,366,801
GEF causality factor, CF	20%
Total Indirect Project Emission Reductions / CO_2 indirect TD	**1,273,360**

33. Food waste management is a major issue in Malaysia and the project is envisaged to be replicated in across food markets; produce markets, and in multi-resident situations. It is therefore, estimated that there is a maximum potential for at least 9 projects in local authorities in Kuala Lumpur, Putrajaya, Selangor (Klang Valley), Johor, Melaka, Penang, Majlis Perbandaran Kuantan and Majlis Bandaraya Ipoh. As a conservative means, this replication factor is envisaged based on city budget and waste management plans for individual cities[57]. Level 1 causality factor has been selected.

Table 37: Summary of Project Emission Reductions for On-site Food Waste to Biogas and Compost Processing Project

Emissions (tCO_2e)	TOTAL
Direct Project Emission Reductions by EOP	8,415
Lifetime Direct Reductions	16,831
Total Indirect Project Emission Reductions (BU)	78,878
Total Indirect Project Emission Reductions (TD)	1,273,360

[57] Development of a National Strategic Plan for Food Waste Management in Malaysia http://www.uncrd.or.jp/content/documents/Hanoi%203R%20Forum%20PS5_Malaysia.pdf

9 ANNEX 2 – ANNUAL TARGETS

Strategy	Indicator	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	Target
Project Objectives 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	• Cumulative Direct -project CO2 emission reductions (ER) resulting from the Project technical assistance and investments by end-of-project, tCO2 eq.	0	2,530	6,094	21,316	171,498	346,442	346,442
Outcome 1.1 Major cities implemented and adopted integrated low carbon urban development plans and/or programmes.	• Number of cities which have gazetted low carbon development plans by Year 3 • Number of participating cities which have GHG inventories less than 5 years old by Year 2 • Number of cities which have officially adopted GHG reduction targets by EOP	0 2 0		3 5 1	5	 2	5 5 3	5 5 3
Outcome 2.1 Expedient appraisal, approval and implementation of strategic urban development plans/program and projects.	• Number of cities exceeding national benchmarks for appraisal and approval processes for local development projects • Average annual number of low carbon city projects per city identified in local plans, commencing implementation starting by Year 3.	0 0	1	1	3 2	5 2	5 2	5 2
Outcome 2.2 Major cities are aware of, and are planning and implementing low carbon technology applications for integrated urban development.	• Number of cities where evidence-based low carbon planning is integrated with normal urban development planning processes by Year 4 • 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	1 0	1	2 50%	3 50%	5 75%	5 75%	5 75%
Outcome 3.1 Increased investment in low carbon technology applications in cities	• Total amount of new investment leveraged through local plans of participating cities for low carbon projects by EOP • Average amount of new investments by participants in council green incentive schemes starting in Year 3 • Amount of new investment leveraged for low carbon transport in participating cities by Year 3 • Value of approved pilot Urban NAMA project in Year 5	0 $48,400 $0 $0			$10 million $1.2 million $100 million	$20 million $153 million	$30 million $153 million $10 million	$30 million $1.2 million $153 million $10 million

Outcome 3.2 More low carbon projects implemented in Malaysian cities	• Number of low carbon projects implemented in participating cities by Year 4 • Number of operating electric cars by year 3 and year 5 • Number of operating electric scooters by year 3 and year 5 • Number of operating recharge stations in year 3 and year 5 • % completion of BRT phase 1 by start of Year 3 • Number of commercial onsite waste processing plants operating by EOP	0 200 350 15 0 1			 794 3550 155 100% 50	5	5 1504 8750 670 100% 95	5 794/1504 3550/8750 155/670 100% 95

10 ANNEX 3 – RISK ANALYSIS

OFFLINE RISK LOG

Project Title: Green Technology Application for the Development of Low Carbon Cities (GTALCC)				Project ID:			Date:		
#	**Description**	**Date Identified**	**Type**	**Impact / Probability**	**Countermeasures / Management Response**	**Owner**	**Submitted, updated by**	**Last Update**	**Status (Compared with previous evaluation)**
1	Risk Due to climate change impacts on urban systems		Environmental	Medium/ Medium	The project will assist policy makers and city authorities address climate change risks through comprehensive urban planning processes that will consider climate resilient strategies	National Project Manager			
2	Change in support from Government on LCC		Political	High / Low	Engage key decision makers at all stages of project, especially in public forums; Provide regular briefings and updates; Clear roles and responsibilities for Government at all level; Promote lessons and achievements widely; Engage central planning and financing ministries; ensure commitments are well communications	National Project Manager			
3	Unstable economic growth in Malaysia		Economic	High / Low	An integrated approach diffuses impacts on any sector in particular. Reducing dependency on imported fossil fuel reduces exposure to global economy	National Project Manager			
4	High staff mobility in Government and project team		Institutional	High / Medium	Establish clear succession strategy; Maintain effective briefing and engagement with Government partners to ensure alignment of agendas; Maintain a pool of candidates and consultants for project roles;	National Project Manager			

5	Weak coordination between ministries and with cities		Institutional	High / Medium	Early and regular engagement of key stakeholders; Clear MOUs aligned with work plan; Work with existing structures	National Project Manager			
6	Lack of access to quality data		Technical	High / Medium	Raise awareness and establish safeguards for data sharing; make costs transparent; Establish high level data sharing agreements /MOUs; Ensure data vetted; train relevant personnel;	National Project Manager			
7	Capture of outputs by political interests		Political	Medium / Medium	Communicate strategy and raise awareness at all levels. Specifically Output 2.1.1 will seek to establish improved legal frameworks and practices for community engagement in planning and development project appraisal.	National Project Manager			
8	Lack of interest from private sector on low carbon investments in cities		Economic	Low/Medium	The project supports a model in which the Government provided an enabling environment to spur private investment and the private sector provides innovative approaches to catalyse investment. The approach is to prepare high quality feasibility studies, investment appraisals and business plans to facilitate investment decision making.	National Project Manager			
9	Change in commitment or fortunes of private sector participants leading to withdrawal from investment projects		Economic	Medium / Medium	Based project design on board approved co-financing commitments; Establish an open and transparent approach to market development and avoid locking to one technology or service provider; maintain broader linkages with sector to ensure multiple players in the marketplace	National Project Manager			
10	Non-implementation of new technologies due to high cost		Technical	Medium/ Medium	Assist in selecting the most appropriate technologies taking into account the socio-economic profiles and local market conditions. Strengthen market-demand through awareness and facilitation of back-able investments.	National Project Manager			

11 ANNEX 4 – CO-FINANCING LETTERS AND AGREEMENTS.

1. Co-financing Letters are provided as separate attachments. Included are letters from the following co-financiers:
    - UNDP
    - MEGTW
    - Putrajaya
    - Petaling Jaya
    - Sepang
    - IRDA

12 ANNEX 5 – TERMS OF REFERENCE

National Project Director (NPD)

National Project Director is a staff member of the Government of Malaysia's implementing agency of a UNDP-supported project and in this case is the Senior Undersecretary of the Green Technology Division of MEGTW. His/her main responsibility is to coordinate project activities among the main parties to the project: the Government co-coordinating authority, the consultant, and UNDP. Specifically, s/he works in close collaboration with the National Project Manager as well as UNDP and the responsibilities include:

- Provides effective direction for project implementation in line with the activities stated in the project document;
- Ensure that the project document and project revisions requiring Government's approval are processed through the Government co- coordinating authority , in accordance with established procedures;
- Approve work plans and execution of activities in discussion with NPM and UNDP;
- Mobilize national institutional mechanisms for smooth progress of project;
- Review and approve project outputs and reports;
- Provide direction and guidance to the project team for the successful implementation of the project;
- Recommend any new foreseeable activities, for approval;
- Approve financial transaction where appropriate, in line with the established government or UNDP procedures;
- Report project progress and financial status for endorsement by the NSC.

National Project Manager

The Project Manager will focus on the administrative, operational and technical aspects of the project. S/he will be 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 specific tasks of the National Project Manager are:

- Liaise and work closely with the project partners and beneficiaries
- Prepare and submit report regularly to NPD, the NSC and TAG on the project's progress
- Maintain close contact with designated focal points from UNDP and other stakeholders, indicating any estimated changes to the work plan, and proposing a budget revision when appropriate
- Ensure that the requisite allocations are available in accordance with the agreed budget and established schedules of payment, if any, in consultation with EPU and UNDP
- Analyze and review consultant's report and/or propose possible intervention for recommendation to NPD for approval
- Coordinate and facilitate the work of multiple component teams engaged in the implementation of project activities
- Work closely with UNDP in drafting and preparation of relevant Terms of Reference (TOR) for consultants / project advisors.
- Monitor the project funds and resources. Prepare progress and financial reports of the project when required.

- Maintain an up-to-date accounting system and information system to ensure accuracy and reliability of country reporting
- Be actively involved in the preparation of relevant knowledge products (including publications and reports)
- Where necessary and upon advice by UNDP, perform the function of ATLAS External User, creating requisitions and vouchers, and other relevant ATLAS processes
- Duration: 5 years, annual renewable contract

Qualifications and skills:

- Master's degree or equivalent in Energy/Environmental Management, Engineering or urban development related discipline. Bachelor's degree with sufficient project experience will be considered;
- At least 10 years of professional experience at senior level (including project management) and technical ability to manage a large project and a good technical knowledge in the fields related to private sector development, climate change, energy efficiency and institutional development and/or regulatory aspects;
- Robust understanding of a multi-disciplinary and multi-agencies approach in implementing climate change mitigation programmes
- Effective interpersonal skills and negotiation skills proven through successful interactions with all levels of project stakeholder groups, including senior government officials, financial sectors, private entrepreneurs, technical groups and communities. S/he should have ability to effectively coordinate a complex, multi-stakeholder project and to lead, manage and motivate teams of international and local consultants to achieve results.
- Good capacities for strategic thinking, planning and management and excellent communication skills in English and Bahasa Malaysia.
- Knowledge of UNDP project implementation procedures, including procurement, disbursements, and reporting and monitoring will be an added advantage.

Project Assistant

- The Project Assistant shall report directly to the National Project Manager and shall be responsible for:
- Providing administrative, financial and logistic support to the project team;
- Executing secretarial tasks and related activities;
- Prepare financial reports and other relevant transaction detail as required by UNDP
- Coordinate and assist in project documentation and follow ups from the respective project coordinators/managers (i.e. Quarterly Reports, APR/PIR reports and other project related documents)
- Managing schedules and project implementation within specified project constraints;
- Undertaking secretariat services to specific project activities
- Providing backup support to the team
- Duration: 5 years, with the possibility of renewal annual contract.

Qualifications and skills:

- Minimum qualification is Bachelor's degree in Business Administration, Science, Accounting or any other relevant field
- At least 3 years of experience
- Strong command over English and Bahasa Malaysia.
- Experience in project management and the energy sector are preferred.

13 ANNEX 6 – LETTER OF AGREEMENT

Attachment

DESCRIPTION OF UNDP COUNTRY OFFICE SUPPORT SERVICES

1. Reference is made to consultations between the Ministry of Energy, Green Technology and Water, the institution designated by the Government of Malaysia and officials of UNDP with respect to the provision of support services by the UNDP country office for the nationally managed project 'Green Technology Application Low Carbon Cities (Project ID: 00093379)'

2. In accordance with the provisions of the letter of agreement signed on 15 Jan 2015 and the project document, the UNDP country office shall provide support services for the Project described below.

4. Support services to be provided:

Support services (insert description)	Schedule for the provision of the support services	Cost to UNDP of providing such support services (where appropriate)	Amount and method of reimbursement of UNDP (where appropriate)
1. Recruitment of project staff	Will be determined during the inception phase	Use of UNDP's Universal Price List (current)	Will be deducted from project budget
2. Hiring of consultants	Will be determined during the inception phase	Use of UNDP's Universal Price List (current)	Will be deducted from project budget
3. Procurement of Goods and services	Will be determined during the inception phase	Use of UNDP's Universal Price List (current)	Will be deducted from project budget
4. Direct payments to vendors	As and when payment instruction is received from KeTTHA	Use of UNDP's Universal Price List (current)	Will be deducted from project budget

5. Assistance may consist of any other form which may be agreed by the Government and UNDP.

6. Description of functions and responsibilities of the parties involved:
   a. KeTTHA to determine the type of services to be provided by UNDP, in line with the AWPs;
   b. KeTTHA will be consulted by UNDP in the process of providing the support services;
   c. UNDP will conduct all provisions of the services using UNDP's procurement/recruitment/financial rules;
   d. UNDP will update KeTTHA quarterly, on the cost of the provision of the services.
7. All decisions related to the support services provided by UNDP shall be made upon agreement/ approval of the government.