

National Low Carbon Cities Masterplan

Measure - Manage - Mitigate

National Low Carbon Cities Masterplan

First Edition, 2021

GTALCC
GREEN TECHNOLOGY APPLICATION FOR THE DEVELOPMENT OF LOW CARBON CITIES

About GTALCC Project

The Green Technology Application for the Development of Low Carbon Cities (GTALCC) is a project sponsored by the United Nations Development Programme (UNDP) - Global Environment Facility (GEF) and implemented by the Ministry of Environment and Water (KASA) with the Sustainable Energy Development Authority (SEDA) Malaysia as the lead consultant. It is a five (5) year project beginning in mid-2017 that aim to remove barriers to integrated low carbon urban planning and development in Malaysian cities through policy support, awareness & capacity building and demonstration projects.

Published by:

Ministry of Environment and Water (KASA)
Blok F11, Kompleks F
Lebuh Perdana Timur, Presint 1
Pusat Pentadbiran Kerajaan Persekutuan
62000 **PUTRAJAYA**
MALAYSIA

Disclaimer :

The copyright and intellectual property rights belong to the Ministry of Environment and Water (KASA). No part of this publication may be reproduced, copied, stored in any retrieval system or transmitted in any form or by any means- electronic, mechanical, photocopying, recording or otherwise; without prior permission of KASA.

Perpustakaan Negara Malaysia Cataloguing-in-Publication Data
National Low Carbon Cities Masterplan : Measure - Manage - Mitigate /
KEMENTERIAN ALAM SEKITAR DAN AIR.
ISBN 978-967-19266-4-2 (hardback)
1. Sustainable urban development -- Malaysia.
2. City planning -- Environmental aspects -- Malaysia.
3. Sustainable development -- Malaysia.
4. Government publications -- Malaysia.
I. Malaysia. Kementerian Alam Sekitar dan Air.
307.7609595

Table of Contents

Acknowledgements 07
Abbreviations and Acronyms 08
Executive Summary 11

CHAPTER 01
Introduction

1.1 Climate Change and Its Impact 23
1.2 Cities, Urbanization and GHG Emissions 25
1.3 Global Efforts in Addressing Climate Change 27
1.4 Malaysia's Efforts in Addressing Climate Change 31

CHAPTER 02
Defining Low Carbon Cities

2.1 Definition 39
2.2 The 3M Approach 41
2.3 Focus Sectors of Low Carbon Cities 43

CHAPTER 03
Low Carbon Pathway for Malaysian Cities

3.1 Recognizing the Challenges 45
3.2 Shaping the Pathway of Low Carbon Development in Malaysia 52

CHAPTER 04
Key Action Plans

4.1 Framework of National Low Carbon Cities Masterplan 55
4.2 Key Directions and Targeted Outcomes 57
4.3 Summary of Key Actions 60
4.4 Details of Key Actions Under Key Drivers 63
4.5 Details of Key Actions Under Key Enablers 87

CHAPTER 05
Implementation Plans

5.1 Timeline for Key Actions 113
5.2 Target Cities (Local/Regional Authorities) 116
5.3 Other Cities 118
5.4 Absolute VS Intensity Reduction 119
5.5 Absolute Carbon Reduction Targets 120
5.6 Managing Implementation 122
5.7 Critical Success Factors 124

APPENDICES

Appendix 1

1.1 Comparison of National Low Carbon Cities Masterplan (NLCCM) and other low carbon city policy tools/framework in Malaysia 126

Acknowledgements

We would like to acknowledge and thank all the following individuals, departments, agencies, and ministries for their contributions in the formulation of the National Low Carbon Cities Masterplan.

INTERNATIONAL

- Global Environment Facility (GEF)
- United Nations Development Programme (UNDP)

FEDERAL MINISTRIES

- Ministry of Environment and Water
- Ministry of Energy and Natural Resources
- Ministry of Federal Territories
- Ministry of Finance
- Ministry of Housing and Local Government
- Ministry of Transport
- Ministry of Works

FEDERAL AGENCIES AND COMMISSIONS

- Bahagian Perubahan Iklim
- Department of Statistics Malaysia
- Economic Planning Unit
- PLANMalaysia@Semenanjung Malaysia
- Sustainable Energy Development Authority of Malaysia (SEDA)

REGIONAL

- East Coast Economic Region Development Council (ECERDC)
- Iskandar Regional Development Authority (IRDA)
- Northern Corridor Implementation Authority (NCIA)
- Regional Corridor Development Authority(RECODA)
- Sabah Economic Development and Investment Authority (SEDIA)

STATE GOVERNMENTS AND AGENCIES

- Environment Protection Department, Sabah
- Jabatan Perancang Bandar and Wilayah Negeri Sabah
- Melaka Green Technology Corporation
- Penang Green Council
- PLANMalaysia by State
- State Economic Planning Unit /State Economic Planning Department

LOCAL AUTHORITIES

- Ampang Jaya Municipal Council
- Bintulu Municipal Council
- Hang Tuah Jaya Municipal Council
- Ipoh City Council
- Iskandar Puteri City Council
- Johor Bahru City Council
- Kajang Municipal Council
- Klang Municipal Council
- Kota Kinabalu City Hall
- Kota Samarahan Municipal Council
- Kuala Lumpur City Hall
- Kuala Terengganu City Council
- Kuantan City Council
- Kuching North City Hall
- Kuching South City Hall
- Kulai Municipal Council
- Melaka Historic City Council
- Miri City Council
- Pasir Gudang City Council
- Penang Island City Council
- Petaling Jaya City Council
- Pontian District Council
- Putrajaya Corporation
- Seberang Perai City Council
- Sepang Municipal Council (Cyberjaya)
- Shah Alam City Council
- Sibu Municipal Council
- Subang Jaya City Council

UNIVERSITIES AND PROFESSIONAL BODIES

- Centre for Environment, Technology and Development, Malaysia (CETDEM)
- Curtin University Malaysia
- Institution of Engineers Malaysia (Sabah Chapter)
- Malaysian Institute of Architects (Sabah Chapter)
- Malaysian Institution of Planners (MIP)
- University Malaysia Sabah

REPORT COVER PHOTO

- Unsplash Ambassador // The CHUTTERSNAP Empire

Abbreviations and Acronyms

11 MP	The Eleventh Malaysia Plan, 2016-2020
12 MP	The Twelfth Malaysia Plan 2021-2025
13 MP	The Thirteenth Malaysia Plan 2026-2030
14 MP	The Fourteenth Malaysia Plan 2031-2035
15 MP	The Fifteenth Malaysia Plan 2036-2040
16 MP	The Sixteenth Malaysia Plan 2041-2045
17 MP	The Seventeenth Malaysia Plan 2046-2050
100RC	100 Resilient Cities
3M	Measurement, Management and Mitigation
AEMAS	ASEAN Energy Management Scheme
AFOLU	Agriculture, Forestry and Other Land Uses
APAD	Agensi Pengangkutan Awam Darat
BPI	Bahagian Perubahan Iklim
BRT	Bus Rapid Transit
BPEN	Bahagian Perancang Ekonomi Negeri
C40	C40 Cities Climate Leadership Group
CO_2	Carbon Dioxide
COGEN	Cogeneration
COP15	2009 United Nations Climate Change Conference
COP21	2015 United Nations Climate Change Conference
EPU	Economic Planning Unit
EXCO	Executive Council
FGDs	Focus Group Discussions
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GTALCC	Green Technology Application for the Development of Low Carbon Cities
GPC	Global Protocol for Community-Scale Greenhouse Gas Emission Inventories
ICLEI	Local Governments for Sustainability
IWK	Indah Water Konsortium
JKR	Jabatan Kerja Raya/Public Works Department
JPA	Public Service Department
JPS	Jabatan Pengairan dan Saliran/Department of Irrigation and Drainage
JPSPN	Jabatan Pengurusan Sisa Pepejal Negara/Department of National Solid Waste Management
KPKT	Kementerian Perumahan dan Kerajaan Tempatan/Ministry of Housing and Local Government
KWP	Kementerian Wilayah Persekutuan/Ministry of Federal Territories
LEDS	Low-Emission Development Strategies
LCCF	Low Carbon City Framework and Assessment System

LRT	Light Rapid Transit
MNKT	Majlis Negara Kerajaan Tempatan
MBPJ	Petaling Jaya City Council
MEPS	Minimum Energy Performance Standards
KASA	Ministry of Environment and Water
MOT	Ministry of Transport/Kementerian Pengangkutan Malaysia
MRT	Mass Rapid Transit
MRV	Monitoring, Reporting and Verification
NCCP	National Climate Change Policy
NGOs	Non-Governmental Organisations
NLCCM	National Low Carbon Cities Masterplan
NPP-3	Third National Physical Plan
NUP2	National Urbanization Policy 2
NUA	New Urban Agenda
OSC	One Stop Centre
RE	Renewable Energy
SEDA MALAYSIA	Sustainable Energy Development Authority Malaysia
SDGs	Sustainable Development Goals
SIRIM	Standard and Industrial Research Institute of Malaysia
SUDS	Sustainable Urban Drainage System
TOD	Transit Oriented Development
UGB	Urban Growth Boundary
UNEP	United Nation Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Programme
UPEN	Unit Perancang Ekonomi Negeri
WtE	Waste-to-Energy

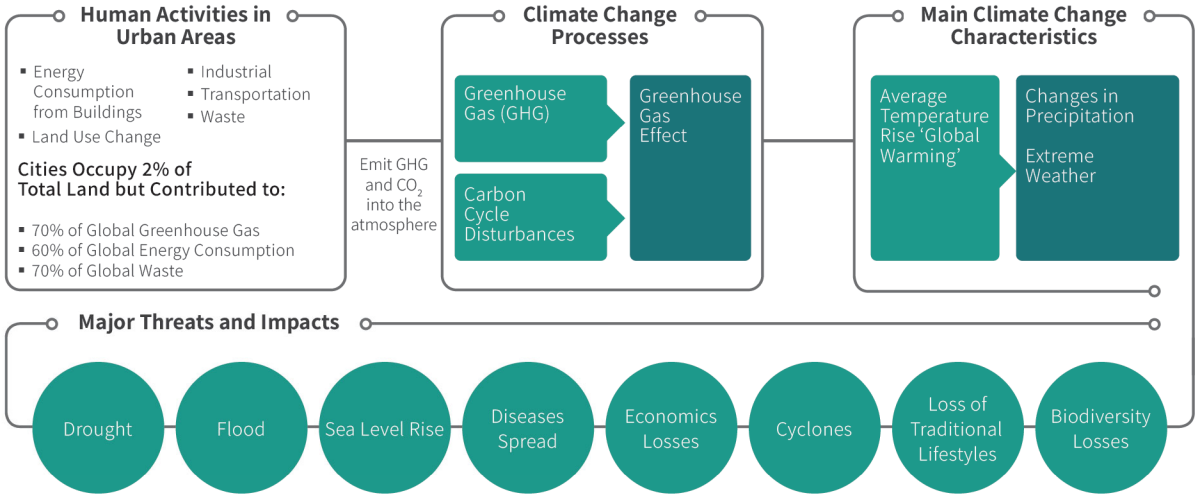


Executive Summary

1.0 Cities, Urbanization and GHG Emissions

Cities are the main engines for a dynamic economic growth and the focal points of most population. However, the process of urbanisation has contributed significantly to the increase of GHG emissions. Thus, fostering urban development in the most sustainable manners can reduce energy demand, consumption and GHG emissions.

Cities and Urbanisation Increase the Proliferation of CO_2 and GHG Emissions



2.0 Definition of Low Carbon Cities

There is no single or universal definition for low carbon development or low carbon cities. However, the masterplan has defined Low Carbon Cities as follows :

A low carbon city is defined as a city that implements low carbon strategies to meet its environmental, social and economic needs of the city. The city measures, manages and mitigates greenhouse gas emissions to reduce its contribution to climate change.

The definition emphasizes on **three (3)** main elements :

1. **Pursue a systematic approach** – i.e. establish documented strategies and action plans;
2. **Employ area wide strategies** – i.e. cover all potential emission sectors within city boundary; and
3. **Set ambitious GHG reduction target** – i.e. establish baseline/peak as well as short and long term reduction targets. Note: 'ambitious' refers to GHG reduction target that surpass the national GHG target and towards carbon neutrality.

Essentially, low carbon cities are defined as cities with specific strategies, plans and targets on how to reduce GHG emissions that covers all potential emitting sectors within the city boundary.

3.0 The 3M Approach

The 3M Approach is introduced to guide cities to position themselves as major players in climate change mitigation, as well as set an example for the development of emission reduction strategies at the local level. The 3M Approach consists of three (3) actions below:

MEASUREMENT
of the GHG emissions by establishing a baseline and providing periodic monitoring

MANAGEMENT
of the low carbon development in terms of policy, targets and planning

MITIGATION
of the GHG emissions through design and implementation of programmes and projects

It is essential that cities **measure and establish an inventory** of their GHG emissions for :

- Assessing and monitoring their efforts in addressing climate change
- Evaluating mitigation options in assessing the effectiveness of policies and measures
- Making long-term emission projections (i.e. setting targets)

- It is also imperative that cities develop as well as update strategies/action plans to serve as a guide in the implementation of mitigation measures at local level.
- These **documented strategies or action plans** signify the systematic approach in carrying out the cities' reduction strategies.

- Mitigation is being referred to **measures and actions** taken to reduce GHG emissions.

Note :
Adaptation is not directly part of the 3M Approach as adaptation addresses the impacts of climate change. All adaptation measures are based on reducing vulnerability to climate impacts. But adaptation can be part of the mitigation effort to establish a more resilient city.

4.0 Key Challenges

Seven (7) Key Challenges were recognized as barriers to low carbon pathway in most Malaysian cities.

Policies and Direction

- Inconsistent implementation
- Gap in transition from top to bottom
- No specific reference to low carbon agenda
- Intensity versus absolute targets

Implementation and Execution

- Inconsistent implementation
- Not mandatory
- Absence of dedicated unit/entity at all levels

Source of Funding and Financing

- Insufficient and still lacking
- No dedicated fund
- Legal barriers for local government to generate additional income
- Lack of incentives

Low Carbon Development in Urban Planning

- Weak integration between low carbon reduction strategies and existing development's document
- Conflicting and competing development priorities

Community Participation

- Weak in public appreciation and understanding
- Lack of opportunities to participate

Capacity, Capability and Readiness

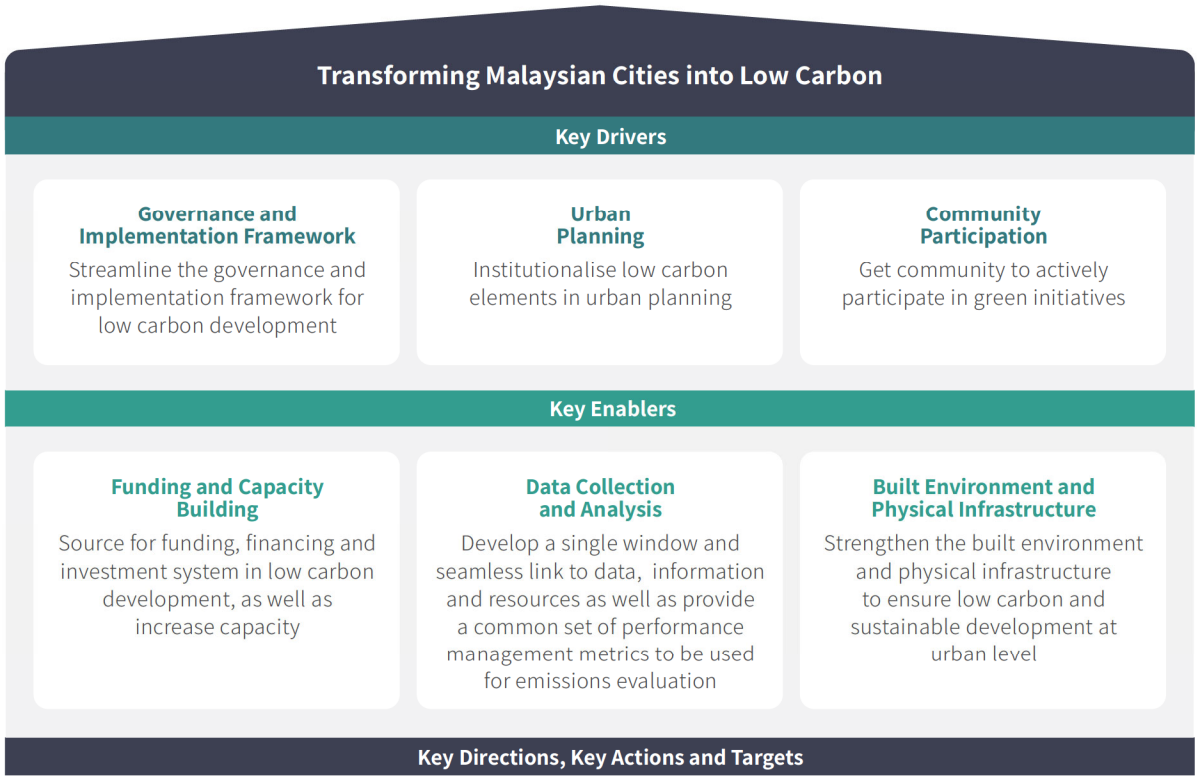
- Shortage of capable people
- Lack of skills and understanding
- Lack of subject matter experts

Data for GHG Inventory

- Weak in availability and access
- Lack of proper data
- Weak in accuracy
- Inconsistent methodology

5.0 Framework of National Low Carbon Cities Masterplan

The strategic framework of National Low Carbon Cities Masterplan intends to transform Malaysian Cities into low carbon whilst pushing the low carbon development in Malaysia to the next level.



KEY DRIVERS
Are needed to effect transformative change

Governance and Implementation Framework
The strategies and actions developed are related to streamlining the governance and implementation framework for low carbon development in Malaysia.

Urban Planning
The strategies and actions developed are related to instituting low carbon and carbon sink elements in urban planning.

Community Participation
The strategies and actions developed are related to getting community to actively participate in green initiatives.

KEY ENABLERS
Assist in providing greater impact

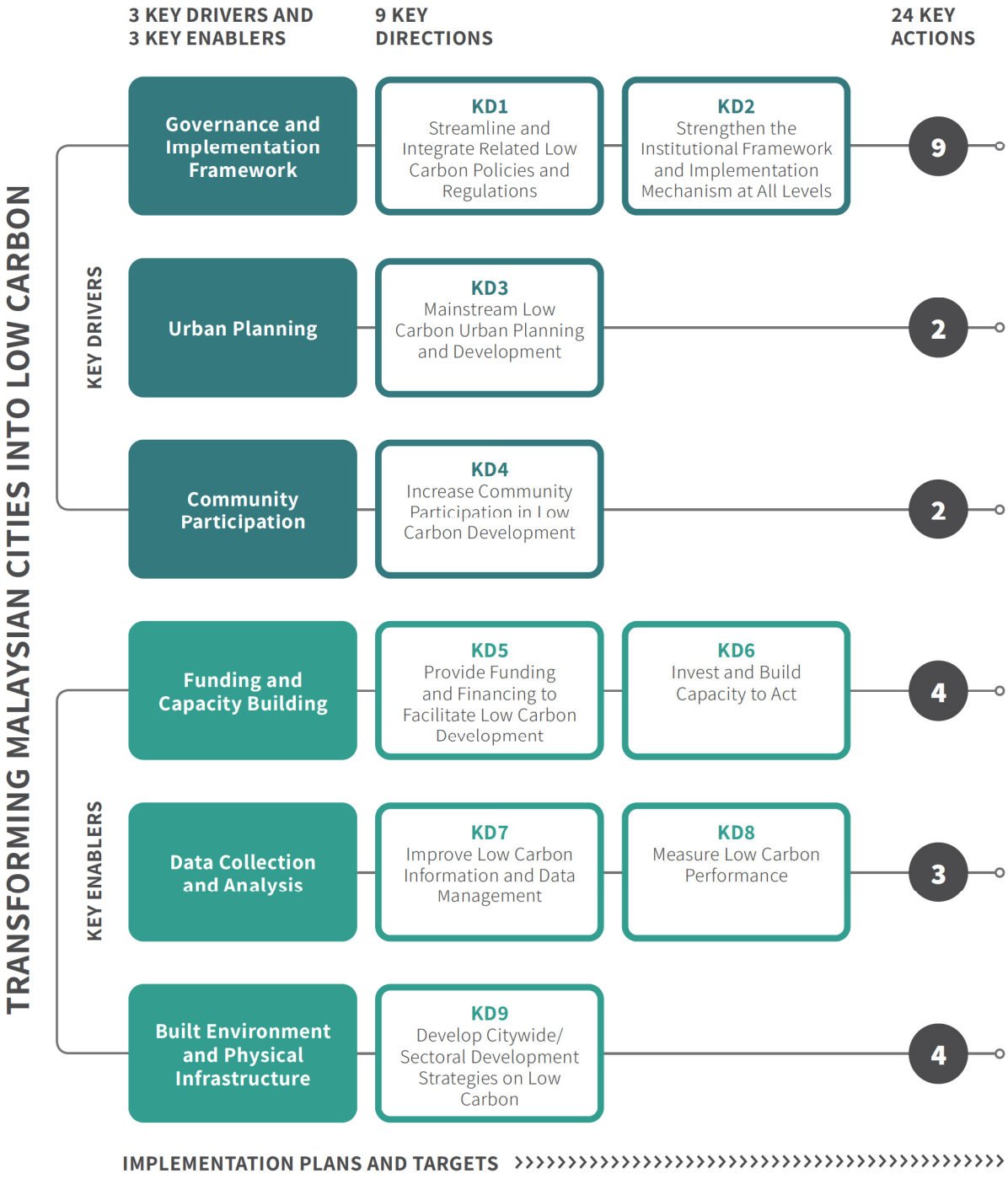
Funding and Capacity Building
The strategies and actions developed are related to ensure sustainable development at urban level.

Data Collection and Analysis
The strategies and actions developed are related to putting an effort in developing a single window and seamless link to data, information and resources as well as providing a common set of performance management metrics to be used for carbon evaluation.

Built Environment and Physical Infrastructure
The strategies and actions developed are related to strengthening the built environment and physical infrastructure to ensure sustainable development at urban level.

6.0 Synopsis of the Action Plans

In shaping the pathway of low carbon development in Malaysia, the following action plans are recommended to drive the transformation.



9 Key Directions and 24 Key Actions

Key Drivers for Low Carbon Development

KD1 : Streamline and Integrate Related Low Carbon Policies and Regulations

Action 1.1	Align Existing Regulation and Laws to Support Low Carbon Cities Development
Action 1.2	Align National Climate Change Policy (NCCP) to Support Low Carbon Cities Development
Action 1.3	Establish Absolute Carbon Reduction Targets for Targeted Cities (2021 - 2050)
Action 1.4	Establish Policies to Enable Top Down Approach for Low Carbon Implementation at State Level
Action 1.5	Integrate Low Carbon Guidelines and Components into Existing and New Planning Development Documents
Action 1.6	Promote Agriculture, Forestry and Other Land Uses (AFOLU) as Part of GHG Reduction Measures

KD2 : Strengthen the Institutional Framework and Implementation Mechanism at All Levels

Action 2.1	Improve the Governance and Implementation Structure at Federal and State Levels
Action 2.2	Strengthen the Implementation Mechanism at the Ground Level

KD3 : Mainstream Low Carbon Urban Planning and Development

Action 3.1	Embed Low Carbon Elements in Urban Planning and Development
Action 3.2	Develop Standard Guideline of GHG Emission Reduction Strategies for Easy and Consistent Implementation at Ground Level

KD4 : Increase Community Participation In Low Carbon Development

Action 4.1	Nurture Active Participation and Awareness through Effective Communication Plan
Action 4.2	Use Education to Foster Human Behavioural Changes to Sustainable Practices

Key Enablers for Low Carbon Development

KD5 : Provide Funding and Financing to Facilitate Low Carbon Development

Action 5.1	Create Specific Low Carbon Development Fund and Budget to Implement Low Carbon Programmes and Initiatives
Action 5.2	Create Alternative Funding to Finance Low Carbon Initiatives and Programmes at Local Level

KD6 : Invest and Build Capacity to Act

Action 6.1	Develop and Place Dedicated Officers at State and Local Levels to Increase Productivity and Create Holistic Manpower Support System
Action 6.2	Develop and Nurture Knowledge, Expertise and Skills in Low Carbon Development Area at State and Local Levels

KD7 : Improve Low Carbon Information and Data Management

Action 7.1	Establish Proper and Efficient System of Data Collection and Management for GHG Inventory Purposes
Action 7.2	Develop Central Online System on GHG Emission Reporting and Data Management to be Used at All Levels

KD8 : Measure Low Carbon Performance

Action 8.1	Align Performance-Based Tools to Global Protocol For Community-Scale Greenhouse Gas Emission Inventories (GPC)

KD9 : Develop Citywide/Sectoral Development Strategies on Low Carbon

Action 9.1	Spatial Planning and Development
Action 9.2	Energy
Action 9.3	Transportation
Action 9.4	Waste

7.0 Target Cities

A total of 33 local and regional government has been selected as Target Cities. The main criteria for the selection is the total number of population in the city/area must exceed 300,000 - based on the 2010 census data by the Department of Statistics of Malaysia - with exception for Putrajaya Corporation, Kulai Municipal Council, Pasir Gudang City Council, Pontian District Council, Sepang Municipal Council and Hang Tuah Jaya Municipal Council.

Category	Selection	Justification
City Council	**18** out of 18	▪ All City Councils are selected as they meet the 2010 census data criteria of population exceeding 300,000 ▪ Under the Ministry Of Housing & Local Government requirement, City Council must have a total number of population exceeding 500,000
Municipal Council	**12** out of 36	▪ 12 local authorities are selected based on the selection criteria – with the exception of Kulai Municipal Council, Pasir Gudang City Council, Hang Tuah Jaya Municipal Council and Sepang Municipal Council.
District Council	**1** out of 95	▪ Pontian District Council (part of Iskandar Malaysia and participating city of the GTALCC project).
Economic Region	**1** out of 5	▪ Iskandar Malaysia (participating city of the GTALCC project).
Modified Local Authority	**1** out of 5	▪ Putrajaya Corporation (participating city of the GTALCC project).
Total Number Selected	**33**	▪ *Note : The source for the population criteria is based on the number of population retrieved from Key Summary Statistics For Local Authority Areas, Malaysia, 2010.*

Details of 33 Selected Target Cities

Group 1	Group 2	Group 3
1. Hang Tuah Jaya Municipal Council 2. Iskandar Malaysia 3. Iskandar Puteri City Council 4. Johor Bahru City Council 5. Kuala Lumpur City Hall 6. Kulai Municipal Council 7. Melaka Historic City Council 8. Pasir Gudang City Council 9. Penang Island City Council 10. Petaling Jaya City Council 11. Pontian District Council 12. Putrajaya Corporation 13. Seberang Perai City Council 14. Sepang Municipal Council 15. Shah Alam City Council	1. Alor Setar City Council 2. Ampang Jaya Municipal Council 3. Ipoh City Council 4. Kajang Municipal Council 5. Klang Municipal Council 6. Kuching North City Hall 7. Kuching South City Council 8. Miri City Council 9. Selayang Municipal Council 10. Seremban City Council 11. Subang Jaya City Council	1. Kota Bharu Municipal Council 2. Kota Kinabalu City Hall 3. Kuala Terengganu City Council 4. Kuantan City Council 5. Sandakan Municipal Council 6. Sungai Petani Municipal Council 7. Tawau Municipal Council

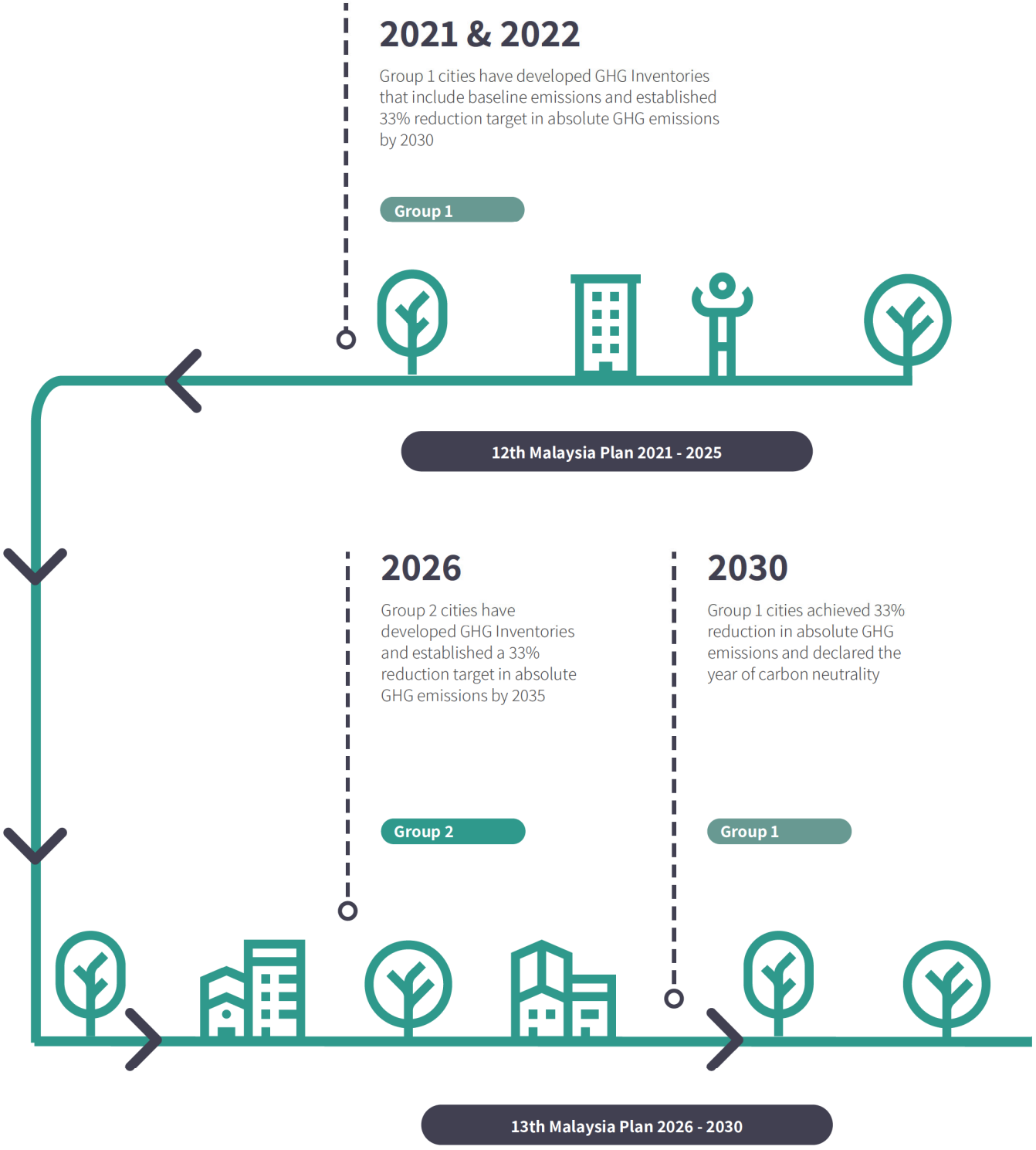
8.0 Other Cities

Cities that are not selected as Target Cities, but are keen in implementing mitigation measures to reduce GHG emissions can undertake the following actions as vital steps in paving the pathway to low carbon cities or low carbon development.



9.0 Absolute Carbon Reduction Targets

The timeline and absolute carbon reduction targets for Target Cities by 2030 until 2050 are as follows :



2050

Group 1 cities achieved carbon neutrality

Group 3 cities achieved 66% reduction in absolute GHG emissions and would be carbon neutral by 2060

Group 1 | Group 3

2045

Group 2 cities achieved 66% reduction in absolute GHG emissions and would be carbon neutral by 2055

Group 2



17th Malaysia Plan 2046 - 2050

16th Malaysia Plan 2041 - 2045

2031

Group 3 cities have developed GHG Inventories including baseline emissions and established 33% reduction target in absolute GHG emissions by 2040

Group 3

2035

Group 2 cities achieved 33% reduction in absolute GHG emissions and declared year of carbon neutrality

Group 2

2040

Group 1 cities achieved 66% reduction in absolute GHG emissions.

Group 3 cities achieved 33% reduction in absolute GHG emissions and declared year of carbon neutrality

Group 1 | Group 3



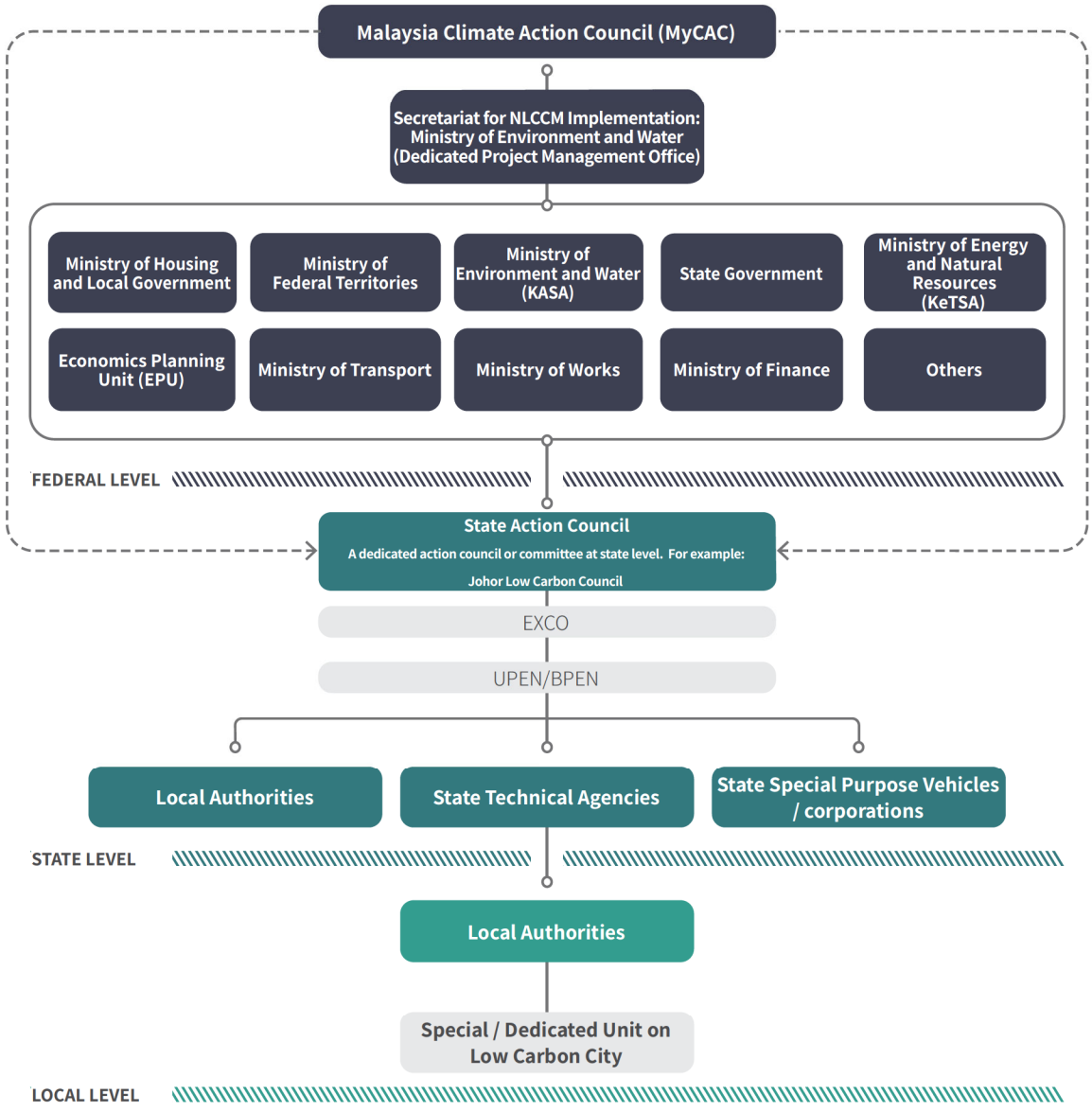
14th Malaysia Plan 2031 - 2035

15th Malaysia Plan 2036 - 2040

10.0 Managing Implementation

The proposed governance structure as shown in the diagram below plays an important role to ensure that multi-level and cross-sectoral participation and collaboration take place at all levels in pursuing low carbon development efforts. Entities such as National Action Council, State Action Council and Special/ Dedicated Unit are proposed to be a part of the key actions in this masterplan. Details of their roles are explained in Chapter 4 under Action 2.1 and Action 2.2.

In ensuring that the masterplan is being implemented at all levels, the role of Project Management Office (PMO) as the Secretariat in this structure is crucial. There is an apparent need to continue the role of PMO for the purpose of improving existing coordination and managing the implementation collectively.





01 Introduction

1.1
Climate Change and Its Impact

1.2
Cities, Urbanization and GHG Emissions

1.3
Global Efforts in Addressing Climate Change

1.4
Malaysia's Efforts in Addressing Climate Change

1.1

Climate Change and Its Impact

Climate change is a long-term change in the earth's climate that occurs either naturally or by human interference. The main reason for recent climate change is due to the accumulation of heat trapping greenhouse gases (GHG) mainly produced by human activities. Because of this, the atmosphere is trapping more heat, causing average temperature to rise, in turn altering the climate. A warmer and unstable climate also results in increased frequency in extreme events such as floods and droughts, regardless of latitude. These various and different natural disasters have shown that the overall climate is not only warming up but has also been disrupted.

The largest element in GHG is carbon dioxide or CO_2 – comprising more than 80% of all GHG. As CO_2 emissions are very much linked to human activities, they must be limited. Increase in GHG emissions has been responsible for the recent climate change phenomena such as the global warming of the atmosphere. A continued increase in warming will lead to more extreme conditions which in turn generate a wide range of economic and social consequences.

Economic Consequences

Climate change has caused extreme weather like tornadoes, wildfires, hurricanes, flood and droughts, in which the loss created by these extreme condition in terms of monetary value is monumental. Scientist estimated that GDP would fall 15% if temperatures rose by 2 degree Celsius. It is estimated that climate change threatens 1.2 billion jobs (Source : The World Employment and Social Outlook 2018). The industries most at risk are agriculture, fisheries, and forestry.

Social Consequences

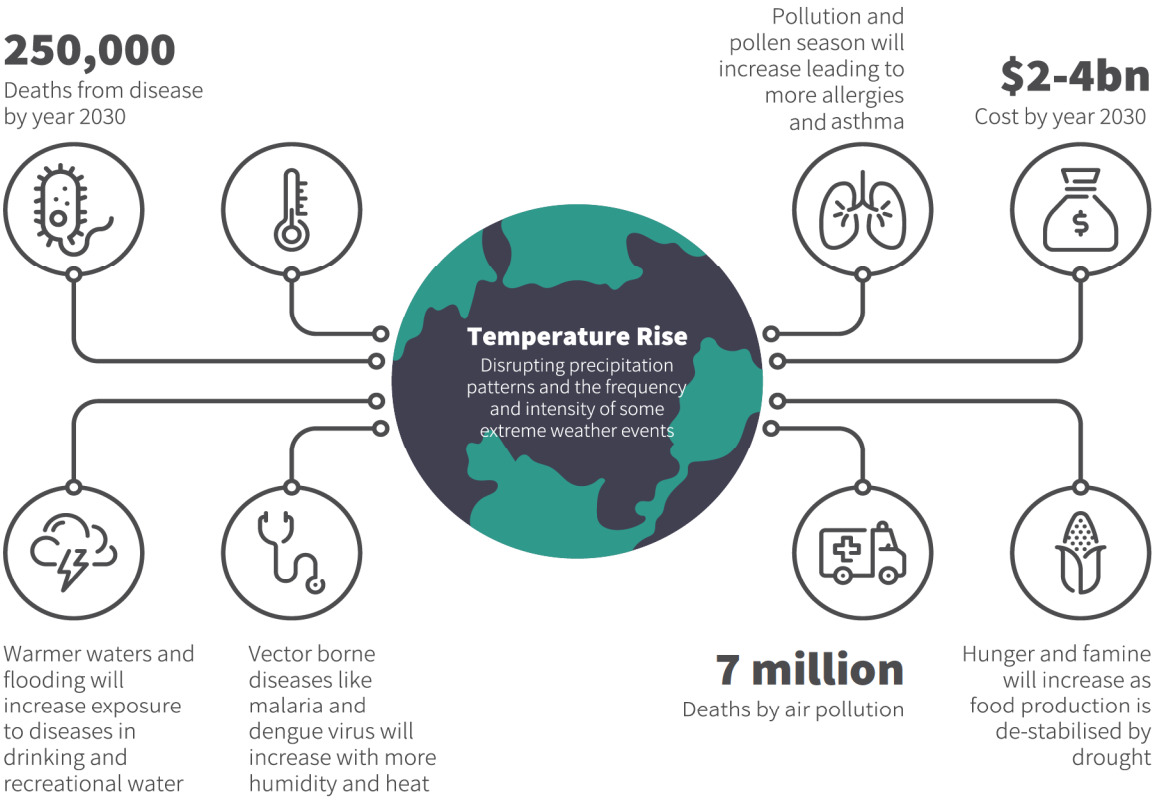
With regards to social impact, climate change is causing mass migration around the world. This is because people are leaving flooded coastlines, drought-stricken farmlands and areas of extreme natural disasters. It has been recorded that extreme weather has displaced 22.5 million people since year 2008 (Source: United Nations High Commissioner for Refugees). Fundamentally, social progress will be greatly affected if the natural environment is being degraded continuously. Therefore, environmental damages must be minimized via the way the economy operates.

Looking at the economic, social and environmental impact of climate change, there is a need for new patterns of development in order to ensure growing human demand is no longer met at the expense of the environment, but instead embraces the restoration and protection of ecological systems.

Mitigating the impacts of climate change requires an eclectic approach as this is a complex dilemma that cannot be solved from just one angle. The government can play an instrumental role by accounting for the impacts of climate change when designing and implementing policies, programmes and investments

Figure 1.1

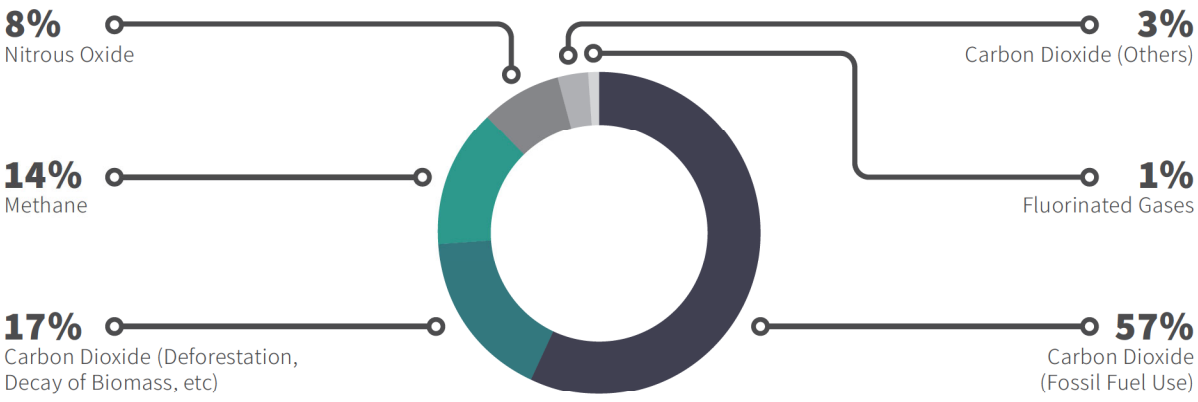
How Climate Change Could Impact the World



Source : World Health Organisation

Figure 1.2

Composition of Global GHG



Source : Environment Canada data

1.2

Cities, Urbanization and GHG Emissions

Cities are the main engine for a dynamic economic growth and the focal points of population. Cities' services and industrial sectors are the major contributors to the Gross Domestic Product (GDP). However, human and economic activities in urban areas tend to consume more energy, water and food.

Urbanisation refers to an increasing proportion of a population residing in urban areas or cities in comparison to rural areas. Obviously, the promise of jobs and prosperity, among other factors, pulls people to cities. Currently, half of the global population already live in cities, and by 2050 two-thirds of the world's population are expected to live in urban areas. For Malaysia, the urbanisation rate in 2015 was recorded at 75% and projected rate for 2020 and 2040 are at 78% and 84% respectively.

However, urbanisation also bring along some threats; of which is an increase in CO_2 emissions which directly impacted the GHG emissions and climate change. A study cited that a 1% increase in urbanisation correlates with a 0.95% increase in emissions. (Source: researchgate.net).

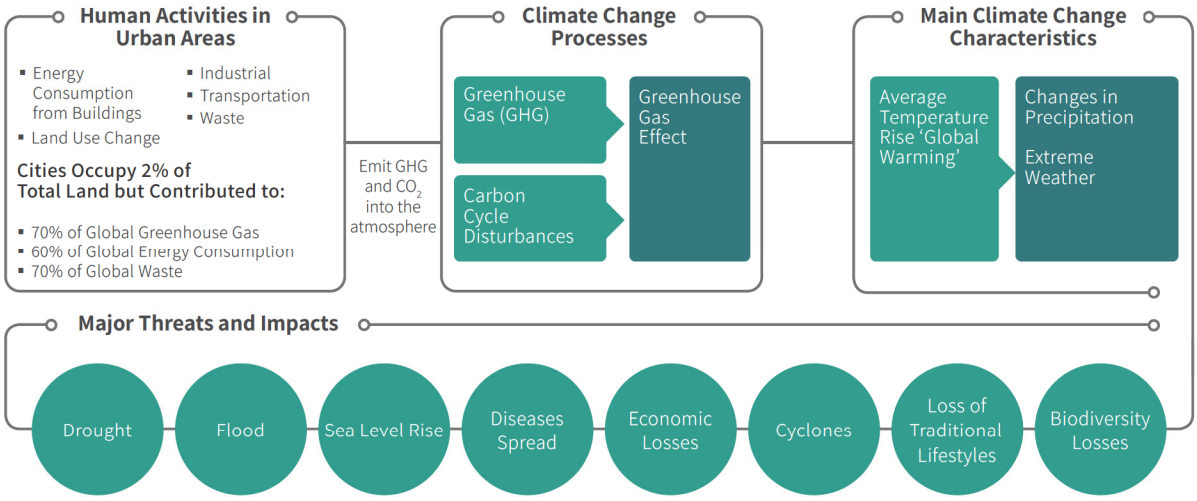
Cities today occupy approximately 2% of the total land, however cities contributed to 70% of global GHG emissions (Source : www.c40.org). Not only that, cities also contributed to 60% and 70% of global energy consumption and waste respectively.

In Peninsular Malaysia, cities and towns occupy less than 10% of the total land. However, as being reported in the Malaysia Third National Communication 2018, GHG emissions for year 2014 accounted for approximately 317,626.83 CO2eq (Gg); and 95% of it was from urban activities or sectors such as energy consumption, industry and waste disposal.

It is apparent that urban activities are contributing significantly to the increase of emission in GHG. Thus, fostering urban development in the most sustainable manners can reduce energy demand/consumption and GHG emissions. As a result, it makes cities more efficient in energy consumption and carbon reduction while simultaneously enhances economic productivity and improves the well-being of urban residents.

Figure 1.3

Cities and Urbanisation Increase the Proliferation of CO_2 and GHG Emissions



Source : Adopted from UNEP



1.3

Global Efforts in Addressing Climate Change

a) International Policies and Agreement

Among notable efforts at the global level were the formulation of Sustainable Development Goals (SDGs) and the New Urban Agenda (NUA). However, the concept of low carbon development was rooted in the United Nations Framework Convention on Climate Change (UNFCCC) adopted in Rio de Janeiro Earth Summit in 1992. It has been generally introduced by using the term low-emission development strategies (LEDS) which is also known as low-carbon development strategies.

The initial proposal to introduce LEDS was put forward in Conference of the Parties (COP15), Copenhagen in 2009 which recognized LEDS as indispensable to sustainable development. In the context of conference, COP15 recognised that climate change is one of the present day greatest challenges and actions should be taken to keep any temperature increase to below 2°C. Thus, LEDS is crucial to reduce vulnerability to climate change impacts and also to address and integrate climate change with development objectives.

The effort of LEDS has been further promoted and linked to The Paris Agreement and the 2030 Sustainable Development Goals (SDGs), to serve as the catalyst for enhancing country-level action to meet the ambitions of addressing climate change and reducing GHG emissions.

In 2016, The New Urban Agenda (NUA) was adopted at the Habitat III Conference in Quito, Ecuador as part of a global framework for sustainability. The NUA represents a shared vision to create equitable, prosperous, low-carbon and resilient cities.

Sustainable Development Goals (SDGs)

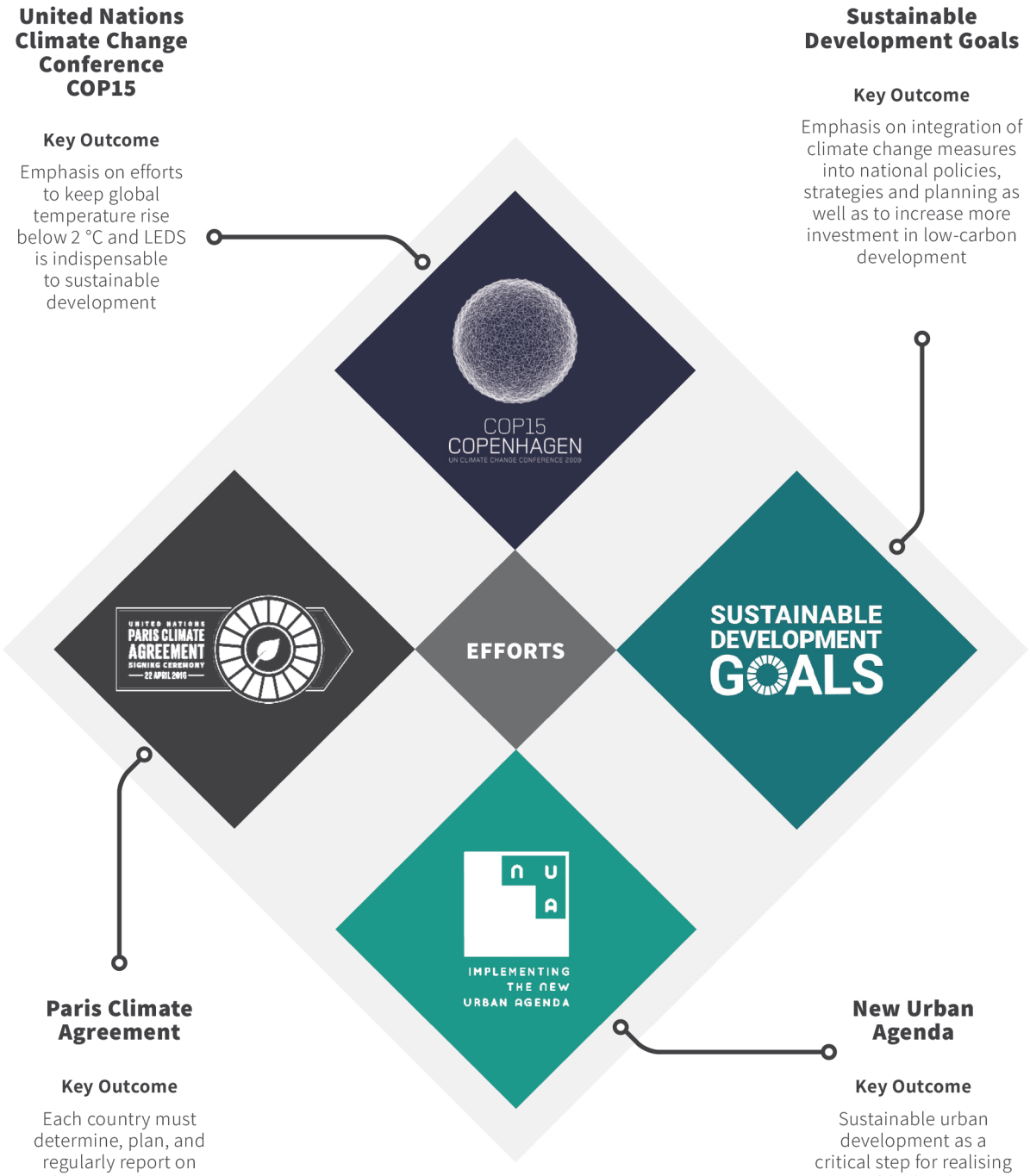
SDGs are action plans to end poverty and hunger, promote good education, health and well-being, achieve clean water and sanitation, promote affordable and clean energy, and reach gender equality as well as increase effort in combating climate change and GHG reduction.

New Urban Agenda (NUA)

NUA outlines how cities should be planned and managed to best promote sustainable urbanisation. It is a roadmap for building cities that can serve as engines of prosperity and centres of cultural and social wellbeing while protecting the environment.

Figure 1.4

Integrated and coordinated manner at all levels with the partcipation of relevant actors and sectors for a sustainable urban development.



b) Cities Commitment

Cities are economic powerhouse that contribute to 70% of the world's GHG emissions. With nearly 68% of the world's population projected to live in cities by 2050, cities are going to be where the battle for climate change is lost or won. Across the globe, cities are scaling up their collective efforts to tackle climate change.

Many cities are committing and making progress in reducing their greenhouse gas footprints. For the purpose of sharing knowledge and pushing for change, cities have resorted to forming alliances as a commitment to implementing ambitious climate goals. A few notable alliances by cities are briefly discussed below :

C40

C40 is a city-level NGO active on climate action, a global network of the world's megacities (i.e. large metropolitan areas with population of more than 10 million people) committed to addressing climate change by developing and implementing policies and programme that generate measurable reductions in both greenhouse gas emissions and climate risks. The organisation supports cities to collaborate effectively, share knowledge and drive meaningful, measurable and sustainable action on climate change. C40's portfolio now counts with more than 90 megacities acting to hinder climate change. It is estimated the C40 actions have already reached more than 650 million people and prevented the emission of 2.4 Gt CO_2 equivalent.

ICLEI

ICLEI – Local Governments for Sustainability, founded in 1990 as the International Council for Local Environmental Initiatives, is a global network of cities, towns and regions committed to building a sustainable future. The international network was established when more than 200 local governments from 43 countries convened at its inaugural conference, the World Congress of Local Governments for a Sustainable Future, at the United Nations in New York in September, 1990. Today, the ICLEI network includes more than 1,750 local and regional governments in 100+ countries.

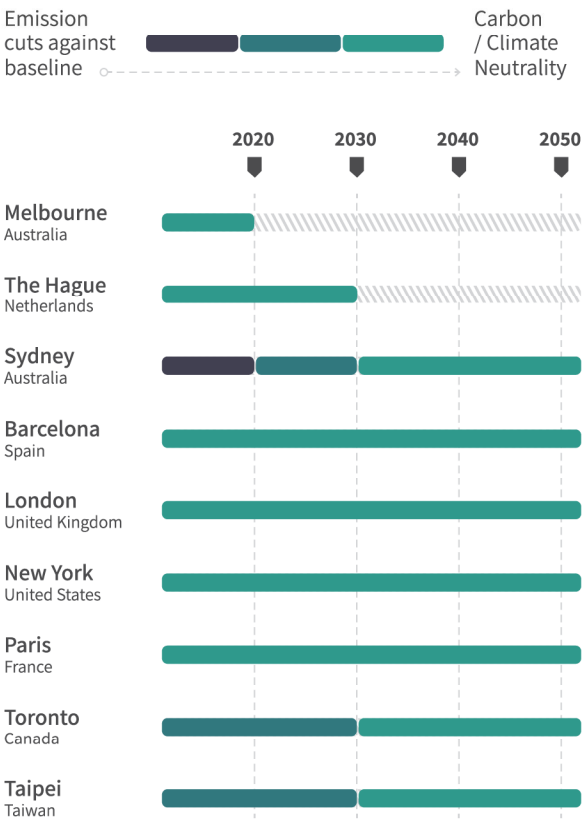
100 RESILIENT CITIES (100RC)

Pioneered by The Rockefeller Foundation, (100RC) is dedicated to helping cities around the world become more resilient to the physical, social and economic challenges that are a growing part of the 21st century. 100RC supports the adoption and incorporation of a view of resilience that includes not just the shocks — earthquakes, fires, floods, etc. — but also the stresses that weaken the fabric of a city on a day to day or cyclical basis. Examples of these stresses include high unemployment; an overtaxed or inefficient public transportation system; endemic violence; or chronic food and water shortages. By addressing both the shocks and the stresses, a city becomes more able to respond to adverse events, and is more able to deliver basic functions in both good times and bad, to all populations.

Some of the cities are doing the most to address climate change. According to bloomberg.com, the following cities are setting out the most rigorous plans to achieve carbon or climate change neutrality by 2050.

Figure 1.5

Pushing Green Ambition



Note : Includes only cities with target of 50% or more cut in emissions from their respective baseline year

Source : CDP Climate A List, Bloomberg



1.4

Malaysia's Efforts in Addressing Climate Change

a) Policies Addressing Climate Change

Malaysia has been very supportive in terms of formulation and implementation of policies that address climate change. Several related policies are developed by the government to ensure that climate resilient development is able to fulfil the national agenda of sustainability. The first attempt took place in 2002 when the government implemented the national policy on the environment that laid out principles and strategies for Malaysia to exploit its natural resources in a more sustainable manner while developing its economy at the same time. Subsequently, more policies emerged as the government realised that climate change does not involve environmental issues alone but also affects economic growth and social aspect.

Table 1.1 briefly discussed the related policies formulated by the government. These policies provided guidelines and directions for government agencies, NGOs and the public in general on issues and challenges related to climate change.



Table 1.1

Local Policies that Address Climate Change

Year	Policy	Description
2002	National Policy on the Environment	This policy aims to achieve a clean, safe, healthy and productive environment for the present and future generation. It also aims to conserve the country's unique and diverse cultural and natural heritage through active participation of all society.
2009	National Green Technology Policy	This policy involves several sectors that have direct impact on the environment; namely energy, building, transport, water and waste management. It is based on four (4) pillars: ▪ Energy – promote energy efficiency; ▪ Environment – conserve and minimise impact on the environment; ▪ Economy – enhance growth through green technology application; and ▪ Social - improve quality of life.
2009	National Policy On Climate Change	This policy aims to achieve the following: ▪ Mainstream climate change through wise management of resources and enhanced environmental conservation resulting in strengthened economic competitiveness and improved quality of life; ▪ Integrate responses into national policies, plans and programmes to strengthen the resilience of development from arising and potential impacts of climate change; and ▪ Strengthen institutional and implementation capacity to better harness opportunities to reduce negative impacts of climate change. In this policy, the main action is to come out with relevant adaptation and mitigation strategy to specifically addresses issues in the agriculture sector as agriculture and climate change are inter-related.
2010	National Renewable Energy Policy and Action Plan	This policy aims to effectively reduce GHG emissions and environmental pollution. It facilitates the growth and development of renewable energy while maintaining the environment. It also aims to enhance the utilisation of indigenous energy resources to contribute towards national electricity supply security and sustainable socio-economic development.
2011	Renewable Energy Act 2010	This policy aims to stimulate the renewable energy industry by providing appropriate economic incentives. The incentive in place is the Feed-In Tariff (FIT) system. This system is expected to reduce carbon emissions and pollution, encourage energy efficiency measures and reduce dependency on fossil fuels. Thus this act is also one of the mitigation measures towards climate change.
2016	National Solid Waste Management Policy	This policy aims to minimise municipal solid waste through 3R, promote waste to energy projects and improve waste management in general. It has targeted that 18% of waste generated is to be treated by high technology applications such as thermal heat plants and that recycling rate by 2020 is at 22%.
2016	National Policy On Biological Diversity 2016–2025	This policy aims to improve carbon stocks and promote green/carbon tax and carbon offset scheme. It has targeted that at least 20% of terrestrial areas as well as 10% of coastal and marine areas are to be conserved.

b) Commitment that Addressing Climate Change

Malaysia has been very committed in addressing climate change related issues and has been actively involved in international conventions. Table 1.2 below shows a summary of activities that Malaysia has actively participated.

Table 1.2

List of Activities participated in Addressing Climate Change

No	Year	Commitment
1	1989	Ratification of Montreal Protocol
2	1992	Participation at Earth Summit
3	1994	Ratification of United Nation Framework Convention on Climate Change (UNFCCC)
4	1994	Establishment of National Committee on Climate Change
5	2000	Submission of Initial National Communication
6	2002	Ratification of Kyoto Protocol and Participation at Earth Summit
7	2008	Establishment of Cabinet Committee on Climate Change
8	2009	▪ Participation in UNFCCC COP 15 ▪ **Malaysia Pledged to Reduce GHG Emissions Intensity per GDP by 40% by 2020 as Compared to 2005 Level**
9	2009	Establishment of National Policy and Climate Change
10	2009	Establishment of Green Technology and Climate Change Council
11	2011	Submission of Second National Communication
12	2012	Participation in the United Nation Conference on Sustainable Development
13	2015	▪ Participation in COP 21 and Paris Agreement ▪ **Malaysia Pledged to Reduce GHG Emissions Intensity per GDP by 45% by 2030 as Compared to 2005 Level**
14	2016	Submission of Third National Communication and Biennial Update Report (BUR)
15	2016	Ratification of Paris Agreement
16	2017	Ratification of Doha Amendment to the Kyoto Protocol

c) National Documents Addressing Climate Change

To date, the government has produced several documents that tackled climate change issues, both directly and indirectly. Table 1.3 shows a summary of said documents.

Table 1.3

List of Documents Addressing Climate Change

Document	Year	Key Focus / Proposals Related to Climate Change	Commitment
The Eleventh Malaysia Plan (11 MP), 2016-2020	2016	▪ Strengthening the enabling environment for green growth ▪ Adopting the sustainable consumption and production concept ▪ Conserving natural resources ▪ Strengthening resilience against climate change and natural disasters	By 2020: ▪ Up to 40% of reduction in CO_2 emission intensity of GDP compared to 2005 level ▪ 2,080 MW in renewable energy installed capacity ▪ Recycling rate of household waste at 22%
Mid-Term Review of the Eleventh Malaysia Plan	2018	▪ Increasing contribution of renewable energy in power generation ▪ Optimising energy use through demand side management practices ▪ Encouraging low-carbon mobility ▪ Promoting green buildings ▪ Strengthening waste management ▪ Expanding green markets ▪ Developing agricultural low-carbon system for crops and livestock as well as analysing carbon sequestration of crops ▪ Applying carbon sequestration principle through conserving natural resources	By 2020: ▪ At least 10% of coastal and marine areas gazetted as protected areas ▪ At least 17% of terrestrial and inland water areas gazetted as protected areas ▪ 45% of reduction in GHG emissions intensity to GDP by year 2030 relative to the level in year 2005 ▪ 8,885 MW renewable energy installed capacity ▪ Recycling rate of household waste at 30%

Third National Physical Plan (NPP-3)	2016	▪ Addressing the effects of climate change through the reduction of greenhouse gases with the use of sustainable infrastructure and development of low-carbon cities
		▪ Emphasizing on low carbon and green infrastructure development
			▪ Reduction of carbon dioxide (CO_2) emissions intensity – 40% target by 2020, 45% target by 2030 and 50% target by 2040.
			▪ To achieve 50% forest coverage by the 2040
			▪ Target Share of Public Transportation (2040)
			  ▪ Peninsular Malaysia - 50%
			  ▪ Kuala Lumpur - 60%
			  ▪ Putrajaya/Cyberjaya - 60%
			  ▪ Johor Bahru - 50%
			  ▪ Georgetown - 50%
			  ▪ Kuantan - 50%
			  ▪ Kota Kinabalu - 40%
			  ▪ Labuan - 40%

Table 1.3

List of Documents that Addressed Climate Change (cont'd)

Document	Year	Key Focus / Proposals Related to Climate Change	Commitment
National Urbanization Policy 2 (NUP 2)	2016	▪ Promoting healthy low carbon lifestyle and environment ▪ Reducing carbon emission through green infrastructure development ▪ Applying carbon sequestration principle through more green spaces and environment protection	N/A
Green Technology Master Plan 2017 - 2030	2017	▪ Mainstreaming green technology development ▪ Providing a conducive environment for green technology development	By 2030 : ▪ Renewable Energy (RE) - 30% ▪ Energy Efficiency - 15% of reduction in electricity consumption ▪ Public Transportation share - 40% (All cities) ▪ 28% Recycling rate ▪ Build 3 Waste-to-Energy (WTE) thermal plants ▪ 20% of NRW ▪ 100% sludges to be recycled ▪ 33% treated effluent to be recycled

d) City Level Actions/Efforts

Many municipalities in Malaysia understand and recognise that cities are a key contributors to climate change as urban activities are the main sources of greenhouse gas emissions. Thus, local authorities are at the forefront in addressing emerging environmental issues.

In addressing climate change, most local authorities are either guided by local guidelines/framework or rely on international organisations/bodies related to low carbon development to implement of GHG reduction measures at city level.

A few cities are members of city alliances such as C40 (C40 Cities Climate Leadership Group), ICLEI (Local Government for Sustainability) and GCOM (Global Covenant of Mayors) in committing and making progress in shrinking their GHG emissions.

Members of the alliances are as follows :

- C40 – Kuala Lumpur City Hall;
- ICLEI - Langkawi, Seberang Perai City Council, Melaka State Government, Melaka City Council, Hang Tuah Jaya Municipal Council and Alor Gajah Municipal Council; and
- GCOM – Seberang Perai City Council, Iskandar Malaysia, Putrajaya Corporation, Tawau Municipal Council, Kuala Lumpur City Hall and Iskandar Puteri City Council.

With regards to local guidelines/framework, the Low Carbon City Framework and Assessment System (LCCF) was formulated by the government in 2011. LCCF aims to initiate Local level actions at local to reduce GHG emissions via the implementation of low carbon strategies and measures at city level. As of June 2019, a total of 52 local authorities have adopted or joined the LCCF programme.

Nevertheless, some cities have developed their own action plans to reduce GHG emissions as shown in Figure 1.6. these cities are proven examples for other cities in pursuing low carbon development.



Figure 1.6

Cities with Low Carbon Development Action Plans

1. **Low Carbon Island Model**
   Langkawi as First Low Carbon Island
2. **Seberang Perai City Council**
   Low Carbon Projects and Programmes
3. **Putrajaya Corporation**
   Towards Putrajaya Green City 2025 (2011)
4. **Kuala Lumpur City Hall**
   Kuala Lumpur Low Carbon Society Plan 2030 (2018)
5. **Petaling Jaya City Council**
   MBPJ Low Carbon City Action Plan 2015- 2030
   City Climate Action Plan (2015)
6. **Shah Alam City Council**
   Shah Alam Low Carbon City Action Plan (2017)
7. **Ampang Jaya Municipal Council**
   Low Carbon City Action Plan 2017- 2022 (2017)
8. **Kajang Municipal Council (Bandar Baru Bangi)**
   Bandar Baru Bangi Low Carbon City Action Plan 2035 (Draft)
9. **Sepang Municipal Council (Cyberjaya)**
   Cyberjaya Smart and Low Carbon City Action Plan 2030 (2017)
10. **Hang Tuah Jaya Municipal Council**
    Hang Tuah Jaya Green City Plan (2017)
11. **Melaka City Council**
    Melaka Green City Action Plan (2014)
12. **Iskandar Regional Development Authority**
    Low Carbon Society Blueprint for Iskandar Malaysia 2025 (2013)
13. **Miri City Council**
    Making Miri a Green, Sustainable City



02 Defining Low Carbon Cities

2.1
Definition

2.2
The 3M Approach

2.3
Focus Sectors of Low Carbon Cities

2.1 Definition

There is no single or universal definition for low carbon development or low carbon cities. In general, many global organisations (such as The World Bank, United Nation Environment Programme (UNEP) and ICLEI to name a few), cities and government authorities have defined the above terms based on their differing focus areas and targets. As such, the definition eventually becomes subjective as it is being derived from the perspective of different organisations or entities, and very much dependent on area of interest of the said entities. However, in general, most of the organisations did mention about the needs to lower GHG emissions as their ultimate goal.

Even though there is no common definition to constitute what low carbon cities are, the masterplan has defined Low Carbon Cities as follows:

Definition of Low Carbon Cities

A low carbon city is defined as a city that implements low carbon strategies to meet the environmental, social and economic needs of the city. The city measures, manages and mitigates greenhouse gas emissions to reduce its contribution to climate change.

The definition emphasizes on three (3) main elements :

- Pursue a systematic approach – i.e. establish documented strategies or action plans;
- Employ area wide strategies – i.e. cover major potential emission sectors within city boundary; and
- Set ambitious GHG reduction target – i.e. establish baseline/peak as well as short and long term reduction targets. Note: **'ambitious'** refers to GHG reduction target that surpass the national GHG target and towards carbon neutrality.

Cities are required to fulfill the three (3) requirement above to be on the path towards low carbon cities. The following section on the 3M Approach shows how the above elements intertwined and how cities can employ the approach to change their carbon emission trajectories. Essentially, low-carbon cities are cities that have comprehensive actions and definitive targets to reduce their environmental impact and GHG emissions, as well as contribute minimally to climate change.

Figure 2.1

Varying Definition of Low Carbon Development/Cities

The World Bank

The term Low-Emission Development Strategies (LEDS) first emerged under the United Nations Framework Convention on Climate Change (UNFCCC) in 2008. LEDS are generally used to describe forward-looking national economic development plans or strategies that encompass **low-emission and/or climate-resilient economic growth**.

United Nation Environment Programme (UNEP)

Definition for low carbon development is centred around **using less carbon for growth** and is a common feature among low carbon development initiatives. Low carbon development in cities or low carbon city development allows municipalities to take advantage of integrated planning in a manner that ensures emission reduction strategies and socio-economic growth are not mutually exclusive.

ICLEI

A low-carbon city recognizes its responsibility to act. It pursues a step-by-step approach towards **carbon neutrality, urban resilience and energy security, supporting an active green economy and stable green infrastructure**.

Low Carbon Cities Framework (Malaysia)

Low Carbon City can be defined as a city that comprises societies that **consume sustainable green technology, green practices and emit relatively low carbon or GHG as compared with present day practice to avoid the adverse impacts on climate change**.

United Nation Environment Programme (UNEP)

Definitions of a low-carbon city focus on how cities change their **carbon emission trajectories** independent of their initial carbon endowments, but in ways that do not compromise economic development and liveability.

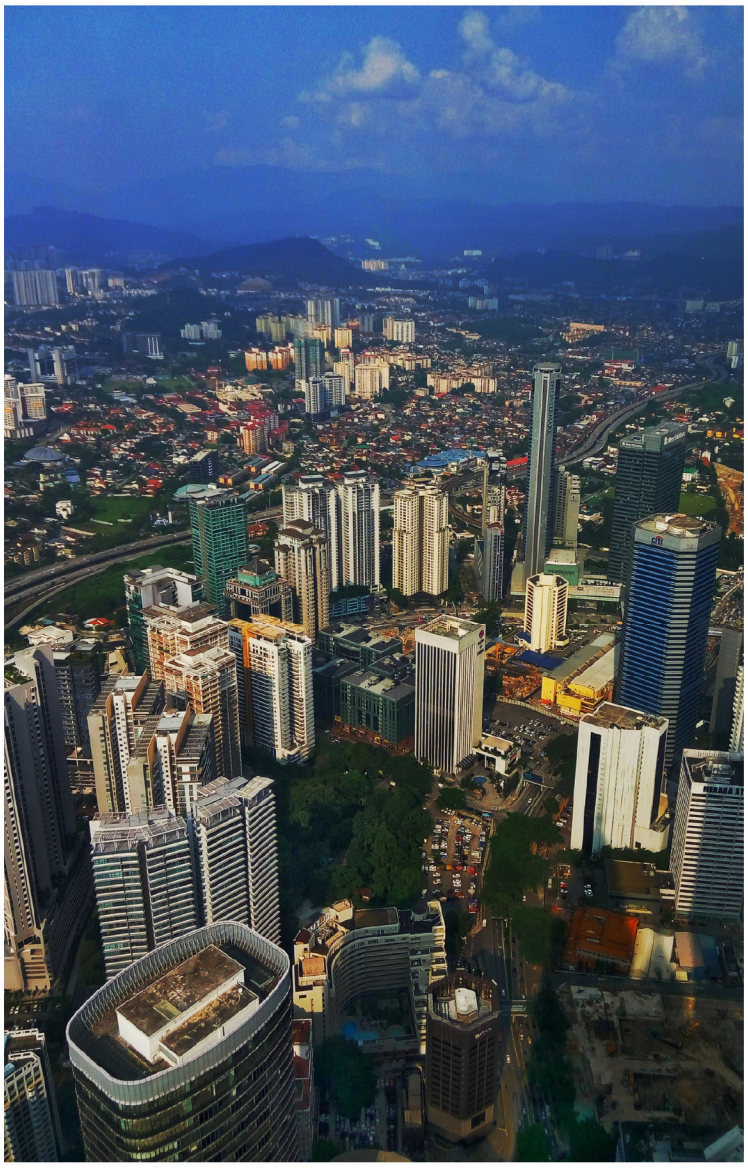
2.2

The 3M Approach

Low carbon cities are defined as cities that have specific strategies, plans and targets on how to reduce GHG emissions, covering all potential emission sectors within the city boundary.

The global trend now is more people living in cities than in rural areas. People living and economic activities in urban areas tend to contribute significantly to carbon emissions, which are the main component and driver of GHG emissions and climate change respectively.

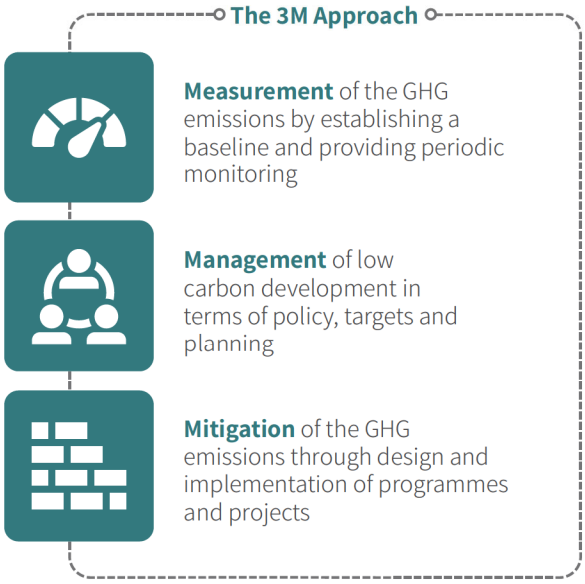
By taking the lead on low carbon development, cities are able to directly address local issues and contribute to the reduction of GHG emissions. Under this masterplan, the 3M Approach is introduced to guide cities to position themselves as major players in climate change mitigation, as well as set an example for the development of emission reduction strategies at the local level.



The 3M Approach consists of three (3) actions as shown in Figure 2.2 below.

Figure 2.2

The 3M Approach



Measurement

It is essential that cities measure and establish an inventory of their GHG emissions for:

- Assessing and monitoring their efforts in addressing climate change;
- Evaluating mitigation options in assessing the effectiveness of policies and measures; and
- Making long-term emissions projections (i.e. setting targets).

Management

It is imperative that cities develop as well as update strategies/action plans to serve as a guide in the implementation of mitigation measures at local level. These documented strategies or action plans signify the systematic approach as previously discussed, in carrying out the cities' reduction strategies.

Mitigation

Mitigation refers to measures and actions taken to reduce GHG emissions. As such, mitigation attends to the causes of climate change (i.e. the accumulation of GHG in the atmosphere).

Note :
Adaptation is not directly part of the 3M Approach as adaptation addresses the impacts of climate change. All adaptation measures are based on reducing vulnerability to climate impacts. But adaptation can be part of the mitigation effort to establish a more resilient city.

The 3M Approach in the development of low carbon cities provides cities with a common framework to identify, implement, monitor and measure low carbon interventions that will not only lower GHG emissions, but will also balance urban development needs and environmental impacts.

Cities are to focus on systematic processes and how they can change their carbon emission trajectories by using the 3M approach – Measurement, Management and Mitigation.

2.3

Focus Sectors of Low Carbon Cities

Low carbon transition for the cities requires them to develop mitigation measures that cover all potential emitting sectors. This masterplan focuses on four (4) key sectors that cities need to address, which are essential in their own rights and are indispensable features of a truly low carbon city.

4 FOCUS SECTORS

Spatial Planning and Development

- Incorporation and integration of low carbon reduction strategies and carbon sink elements into all stages of development, programme planning, implementation as well as all aspects of policy making.

Transportation

- Incorporation of strategies that increase the usage of public transportation and improving public transportation infrastructure are essential part of an effective urban development strategy.
- Incorporation of strategies that prioritise lower emission vehicles or lower emission options (such as walking, cycling, etc.) as the alternative of carbon intensive transportation modes.

Energy

- Incorporation of strategies that give attention to green technology and smart city application when striving for energy and resource efficiency. The application of technology can produce significant economic, social and environmental benefits in urban areas.
- Incorporation of strategies which encourage and support desired changes in the behaviour and performance of the water industry, its suppliers and end-users for the purpose of reducing carbon emission attributed to energy use.
- Incorporation of strategies that emphasize on improving energy and environmental performance of building construction and operations are an opportunity to reduce significantly energy consumption and GHG emissions.

Waste

- Incorporation of strategies that view municipal waste as a resource represents an important opportunity to both reduce emissions and achieve economic gains. It also signals good governance to citizens by improving local environmental conditions.

03 Low Carbon Pathways for Malaysian Cities

3.1
Recognising the Challenges

3.2
Shaping the Pathway of Low Carbon Development in Malaysia

3.1

Recognising the Challenges

The current global phenomenon is shifting rapidly towards ensuring cities to adopt clean and green development. As discussed previously, Malaysia has also jumped into the green bandwagon since 2009 when the national target of 40% GHG intensity reduction by 2020 was first set, and then further pledged to reduce by 45% by 2030.

However, implementing and carrying out low carbon development initiatives in Malaysian cities proved to be a challenge at all levels (i.e. at federal, state and local levels). Feedback from key stakeholders related to low carbon development were compiled in a series of focus group discussions (FGDs).

Seven (7) key challenges identified in the FGDs as barriers to low carbon pathway to most Malaysian cities are:

- Policies and Directions;
- Implementation and Execution;
- Data for GHG Inventory;
- Source of Funding and Financing;
- Capacity, Capability and Readiness;
- Community Participation; and
- Low Carbon Development in Urban Planning.

The summary of these seven (7) key challenges is illustrated in Figure 3.1.

Further deliberation on the key challenges indicated that they can be categorized as primary and secondary issues. They are interconnected and it is found that secondary issues arise from the primary issues. Figure 3.2 illustrates the relationship between the key challenges.



Figure 3.1

Summary of Key Challenges to Low Carbon Pathway

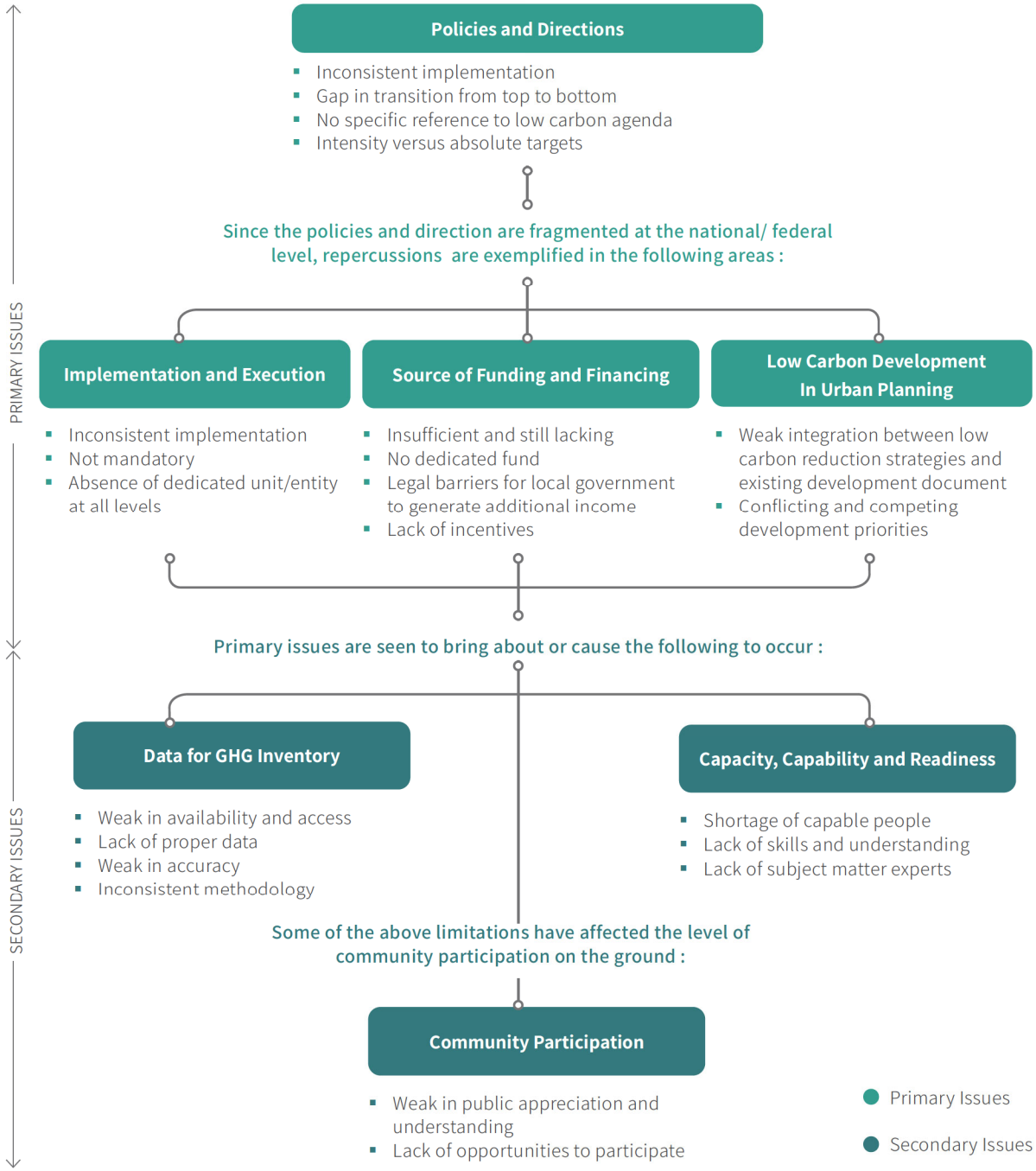


Source : Findings From NLCCM Focus Group Discussions, 2018-2019

It is important to understand the relationship of these key challenges as solving the primary issues may resolve or lessen the effect of secondary issues to the whole landscape of low carbon development in the country.

Figure 3.2

Inter-Connected Relationship among Key Challenges



Summary of findings of each key challenge are briefly discussed below :

a) Policies and Directions

- At present, existing policies are too broad and all-encompassing and do not necessarily make direct (and specific) reference to low carbon cities agenda. The inclusion of low carbon cities agenda in separate or related policies would help to propagate and expedite the understanding and implementation of low carbon cities agenda as a whole;

- Most of the targets and initiatives for low carbon initiatives and programmes are ending soon (mostly in 2020), therefore, continuity plans (e.g. deployment of new targets and initiatives) need to be formulated and implemented at the soonest;

- PLANMalaysia and local authorities are among the key players in low carbon efforts, thus there is a need to invite additional members such as Ministry of Federal Territories (KWP), Ministry of Housing and Local Government (KPKT) and Ministry of Transport (MOT) to ensure better governance, coordination and implementation in the future;

- It is also apparent that there is low 'buy in' or support from the State level to propagate low carbon implementation at the local level;

- The national carbon reduction target needs to be cascaded down to the state and local authority levels;

- At present, there is a lack of policies integration from top to bottom. Some policies even work in silo and do not incorporate or make reference to low carbon agendas, although they are principally aligned. It is also important to note that different states have different agenda or priorities;

- Local authorities may have limited scope on some low carbon matters which are under federal authorities;

- The effectiveness of low carbon policies largely depends on local implementation in which the federal government has indirect control. The state structure plan and local plan are important for the transition of low carbon efforts in the local implementation;

- The mapping of contributions to national commitment is unfocused which also leads to unclear scope and entity of enforcement; and

- Intensity versus absolute targets.

b) Implementation and Execution

- Directions and communications on low carbon development are currently imbalanced. Directions and communications are often one way (from top to bottom) without agencies at the lower tier able to question or contest;
- There is also a lack of transparency and reporting (both bottom and top). Information pertaining to resources are often kept within the agencies;
- The mandate for low carbon implementation from the state down to local government is lacking and weak;
- The implementation of low carbon initiatives is non-mandatory which makes it optional to the local authorities whether to adopt the implementation or not, thus making the implementation haphazard;
- The local authorities motivation/interest to implement low carbon initiatives comes from the mayor and not from federal or state government. Mayors have limitations in term of influence and power;
- The current structure of implementation mechanism at the local level shows that there is no single or universal structure to lead low carbon initiatives. In addition, it should involve all agencies instead of relying solely on local authorities;
- There is a lack of manpower and designated agencies to monitor low carbon initiatives performance; and
- There is no ownership in driving the initiatives and lack of continuity in carrying low carbon initiatives.

c) Data for GHG Calculation

- The accuracy and availability of data are presently still very low. Nevertheless, some progress were achieved through the improvement of methodologies, guidelines and standards for GHG calculation;
- The coverage of data collected is very low. For example, data collected for waste stands at only 50% from total existing data. to ensure better coverage, agencies/entities responsible for collating and analysing the data need to be identified;
- In addition, the obstacles for data collection- especially on the lack of funds and data transparency between local governments and stakeholders- need to be removed due to the issues of data mismatch and incompatibilities;
- Currently, there is a serious shortage of subject matter experts on GHG Calculation. Apart from Malaysian Green Technology and Climate Change Centre and a few cities, many do not have the expertise to calculate their GHGs;
- Also, identifying data activity and emission factors for GHG inventories has been a major challenge;
- Tools redundancy is also a challenge as there are currently too many tools available which resulted in overlaps and confusion. In aligning (the results from the tools) with GPC reporting structure, there must be a standard tool for local authorities and other stakeholders to use;
- Emphasis should be given to performance based tools as they seem to be more effective to measure carbon quantitatively; and
- LCCF calculation does not consider the inclusion of forest and agriculture. It is also not aligned with GPC method of GHG accounting.

d) Source of Funding and Financing

- Funds are still lacking and insufficient – despite some allocations from various sources (both local and international) - the total amount of money accrued is still too small and at ad-hoc basis, and therefore not strong enough to push the low carbon agenda to the intended level;
- The sectoral funding for low carbon initiatives is still weak and the limited financial support makes it challenging to start low carbon projects;
- There is presently no central body to regulate funds at the federal level. Even though some efforts have been taken by some states and cities on this matter, the overall progress however is still very slow;
- Many cities are unable to generate additional incomes (e.g. from the reviewing of parking fee, taxes, and charges) to finance their low carbon initiatives and programmes. There are many reasons for this – but the most significant one is the interference of the state and politicians;
- Public-private partnership helps to fund low carbon cities programmes in many cities all over the world. Unfortunately in Malaysia, the number of partnerships is still very small, and inclined towards bigger cities and urban areas; and
- The absence of incentives (monetary and in-kind) for local authorities, developers and community for them to participate, monitor and measure the initiatives.

e) Low Carbon Development in Urban Planning

- Lack of integration between low carbon reduction strategies and existing development documents such as Structure Plans and Local Plans;
- Most cities and towns find themselves in conflict with competing socio-economic goals while pursuing the path to an environmentally sustainable and low-carbon future;
- In general, the urban development strategy and policies are prone to be affected by various external factors, including sudden changes in political environment and development opportunities. This makes it difficult for local councils to maintain a long-term vision of low-carbon urban development that is socially and economically sustainable;
- There is a weak scientific basis in designing and integrating urban functions, facilities and resource allocation. This makes it difficult for local authorities to address it during the earlier stages of development;
- Many cities and towns struggle to integrate emerging urban functions and facilities related to energy, transport and waste to efficiently deliver basic services. Additionally, challenges such as lack of technical and financial capacity hinder their ability to respond to these challenges in a timely manner; and
- Lack of technical support and advise to regenerate old township areas towards low carbon township development.

f) Capacity, Capability and Readiness

- There is a lack of inter-department and inter-agencies collaboration in low carbon initiatives. For example, at state level, local authorities usually champion the initiatives, and planning department usually leads the implementation at local authority level;
- Apparently, there is a lack of human resources and skills when it comes to implementing and driving the initiatives;
- The supply of human resources that is capable of developing and implementing low carbon is limited. Government through Public Service Department (JPA) should encourage/provide more positions for low carbon career path especially in the audit and carbon calculating areas;
- The lack of skills, awareness and expertise might lead to slow 'buy-in' from the state and local government; and
- Shortage of subject matter experts has also posed a challenge to implement relevant programmes and initiatives.

g) Community Participation

- The public awareness and appreciation towards low carbon efforts are still weak, which affect their participation in the implementation of low carbon initiatives at the ground level; and
- The lack of community participation has resulted in less opportunities for public-private partnership initiatives.

3.2

Shaping the Pathway of Low Carbon Development in Malaysia

it is essential to address the key challenges discussed in the previous chapter to propogate transition of the cities in the country to low carbon cities. However, the level of efforts done by some of the cities should be taken into consideration before putting forth / formulating proper measures and actions that will catapult the pathway to low carbon cities. .

The pathway to low carbon cities development is guided by various blueprints and action plans at the city level. As local governments are mostly responsible for leading the low carbon initiatives, some of them have developed blueprints or action plans to serve as a guide in the implementation.

Some cities have engaged in low carbon initiatives without having action plans as guidance. As being discussed in Chapter 1, other cities used Low Carbon Cities Framework and Assessment System (LCCF) to help implement impactful initiatives. Currently, a total of 52 local authorities have joined the LCCF program implemented by Malaysian Green Technology and Climate Change Centre.

The numerous number of action plans and programmes/projects at the city level indicate support towards the development of low carbon city at the ground level.

Another factor that also helped in the development of low carbon cities in Malaysia is the Green Technology Application For The Development of Low Carbon Cities (GTALCC) Project. GTALCC is a 5-year project that facilitates the implementation of low carbon initiatives in Malaysian cities with an aim to generate GHG emissions reductions of 346,442 tonne CO_2 eq by the end of the project in 2030. There are five (5) participating cities in this programme. They are:

- Iskandar Regional Development Authority (Five (5) local authorities in Iskandar Malaysia);
- Petaling Jaya City Council;
- Putrajaya Corporation;
- Sepang Municipal Council; and
- Hang Tuah Jaya Municipal Council.

As illustrated in Figure 1.6 of Chapter 1, a total of 13 cities have developed their own low carbon action plans to systematically implement low carbon initiatives in their cities. These include five (5) participating cities and eight (8) other cities that are not included in the GTALCC project.

The action plans are structured in a way so that it will first address the key challenges mentioned in the previous sections. Applicable to all cities, the objective of the action plans are to accelerate and amplify low carbon development in the cities..

However, the masterplan has identified respective cities, which are deliberated in Chapter 5, to advance the cities to the next level in terms of opportunities and strategies for low carbon development and transformation.

Figure 3.3 shows the formulation of key actions under this masterplan in a nutshell. The framework is discussed in detail in Chapter 4.

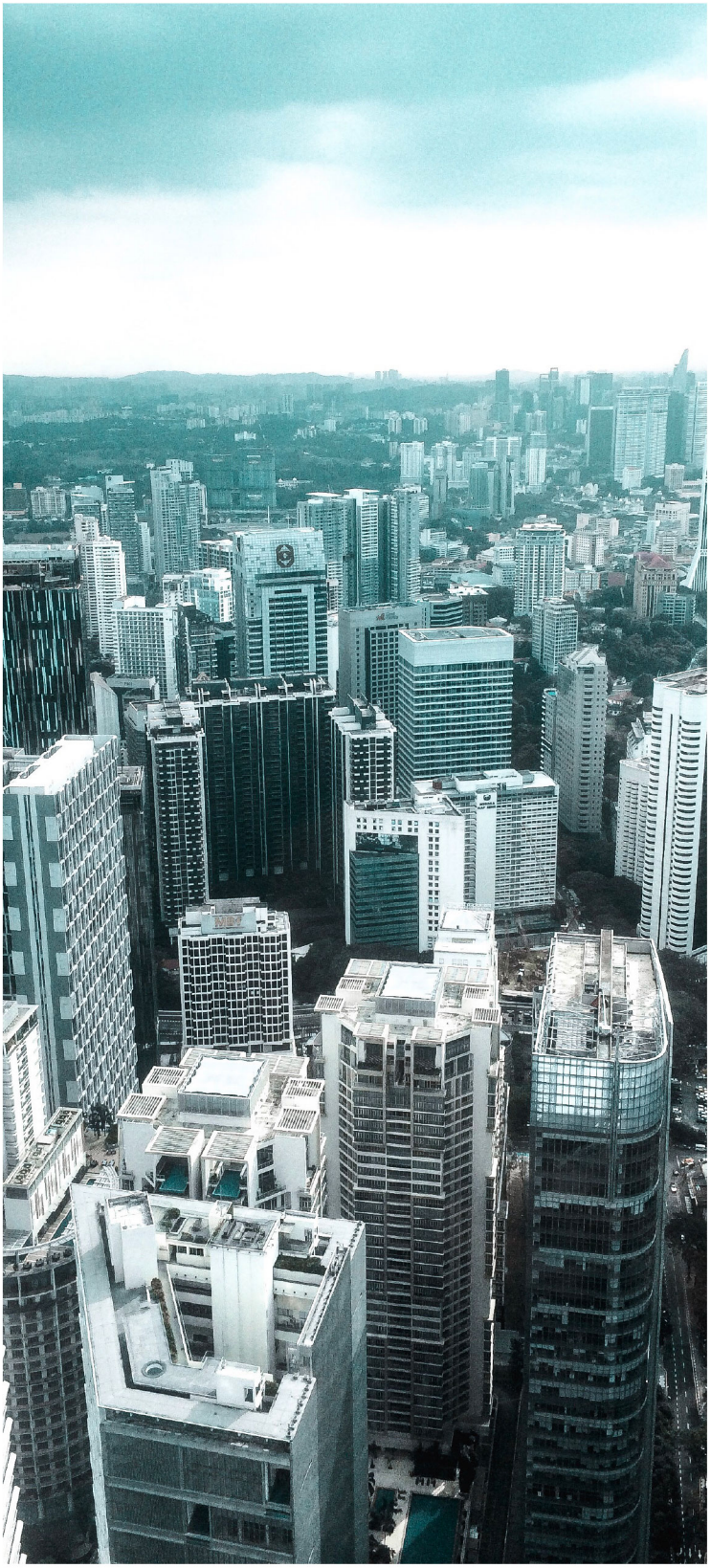
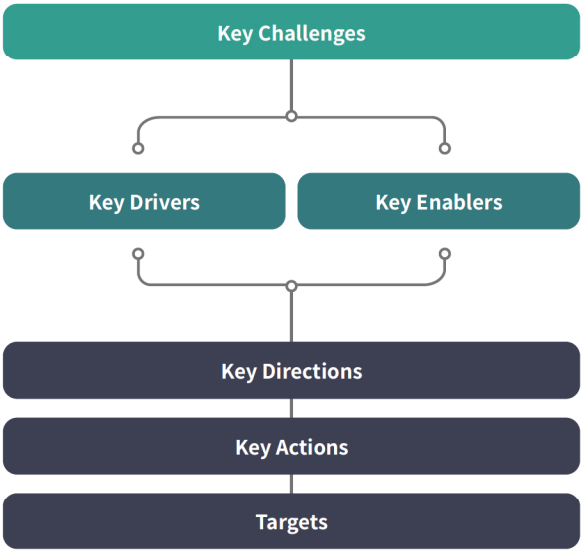


Figure 3.3

Formulation of Key Action Plans



04 Key Actions Plan

4.1
Framework of National Low Carbon Cities Masterplan

4.2
Key Directions and Targeted Outcomes

4.3
Summary of Key Actions

4.4
Details of Key Actions Under Key Drivers

4.5
Details of Key Actions Under Key Enablers

4.1

Framework of National Low Carbon Cities Masterplan

Analysis from numerous engagements with stakeholders identified six (6) pertinent areas that need significant shift from the current way of implementing low carbon development. They are essential steps that key stakeholders need to consider in paving the pathway to low carbon cities.

The six (6) areas are as follows:

1. Governance and Implementation Framework

The strategies and actions developed under this area are related to streamlining the governance and implementation framework for low carbon development in Malaysia.

2. Urban Planning

The strategies and actions developed under this area are related to instituting low carbon and carbon sink elements in urban planning.

3. Community Participation

The strategies and actions developed under this area are related to getting community to actively participate in green initiatives.

4. Funding and Capacity Building

The strategies and actions developed under this area are related to sourcing for funding, financing and investment system in low carbon development, as well as increasing/building capacity and ability to drive the low carbon implementation and development efficiently.

5. Data Collection and Analysis

The strategies and actions developed under this area are related to putting an effort in developing a single window and seamless link to data, information and resources as well as providing a common set of performance management metrics to be used for carbon evaluation.

6. Built Environment and Physical Infrastructure

The strategies and actions developed under this area are related to strengthening the built environment and physical infrastructure to ensure sustainable development at urban level.

The key areas are further categorised into "DRIVERS" and "ENABLERS". Drivers are needed to effect transformative change. Enablers assist in providing greater impact in accelerating and amplifying low carbon development in cities throughout the country.

Figure 4.1 outlines the strategic framework for National Low Carbon Cities Masterplan that aims not only to transform Malaysian Cities into Low Carbon, but also push the low carbon development in Malaysia to the next level.

Figure 4.1

Framework of National Low Carbon Cities Masterplan



4.2

Key Directions and Targeted Outcomes

This section outlines the Key Directions under each Driver and Enabler. Key Directions serve as guide and outline measurable goals. Targeted outcomes are the desired impact from the execution of actions.



Table 4.1

Summary of Key Directions and Targeted Outcomes

Key Drivers and Key Enablers	Key Directions		Targeted Outcomes
Key Drivers			
Governance and Implementation Framework	**KD1**	Streamline and Integrate Related Low Carbon Policies and Regulations	▪ An umbrella policy that integrates and aligns other sectoral policies and regulations ▪ A specific policy document that is directly related to low carbon-built environment at the national level ▪ Clear targets for low carbon initiatives and GHG emissions reductions post year 2020 at various levels ▪ Integration of key ministries (i.e. MESTECC, KPKT, KWP) in pursuing low carbon development ▪ Strong support from state government in implementing low carbon initiatives at the local level
	KD2	Strengthen the Institutional Framework and Implementation Mechanism at All Levels	▪ Strengthened top-down and bottom-up approach in the implementation of low carbon initiatives ▪ Clear universal structure or mechanism at state and local levels ▪ Clear Champion(s) at all levels
Urban Planning	**KD3**	Mainstream Low Carbon Urban Development and Planning	▪ Clear and integrated approach in low carbon urban development and planning
Community Participation	**KD4**	Increase Community Participation in Low Carbon Development	▪ Active and higher participation rate of community in low cardon development initiatives

Table 4.1

Summary of Key Directions and Targeted Outcomes (cont'd)

Key Driver and Key Enablers	Key Directions		Targeted Outcomes
Key Enablers			
Funding and Capacity Building	**KD5**	Provide Funding and Financing to Facilitate Low Carbon Development	▪ Ample and available funding and financing for low carbon development and investment from both public and private sectors ▪ Easy access to low carbon development funds ▪ Leverage both local and international funds ▪ Attractive incentives for low carbon initiatives
	KD6	Invest and Build Capacity to Act	▪ Apparent increase in capacity and skills to drive the low carbon implementation and development at various levels
Data Collection and Analysis	**KD7**	Improve Low Carbon Information and Data Management	▪ A single window and seamless link to data, information and resources for GHG inventory purposes
	KD8	Measure Low Carbon Performance	▪ A common set of performance management metrics to be used for GHG inventory and evaluation
Built Environment and Physical Infrastructure	**KD9**	Develop Citywide/ Sectoral Development Strategies on Low Carbon	▪ A systematic and user-friendly urban development approach or guideline to help cities, townships and urban areas to reduce GHG emissions

4.3

Summary of Key Actions

The summary of all the Key Actions under each Key Directions is outlined in this section. Details of each of the Key Actions are elaborated next.

Each key action is then assessed using the following two (2) parameters and scales :

Ease of Implementation

The level of complexity in implementing the key actions

1 — 2 — 3 — 4 — 5

Easy — Hard

Champion(s)

The main driver(s) for each action

F — S — L — FS — SL

Federal — State — Local — Federal and State — State and Local

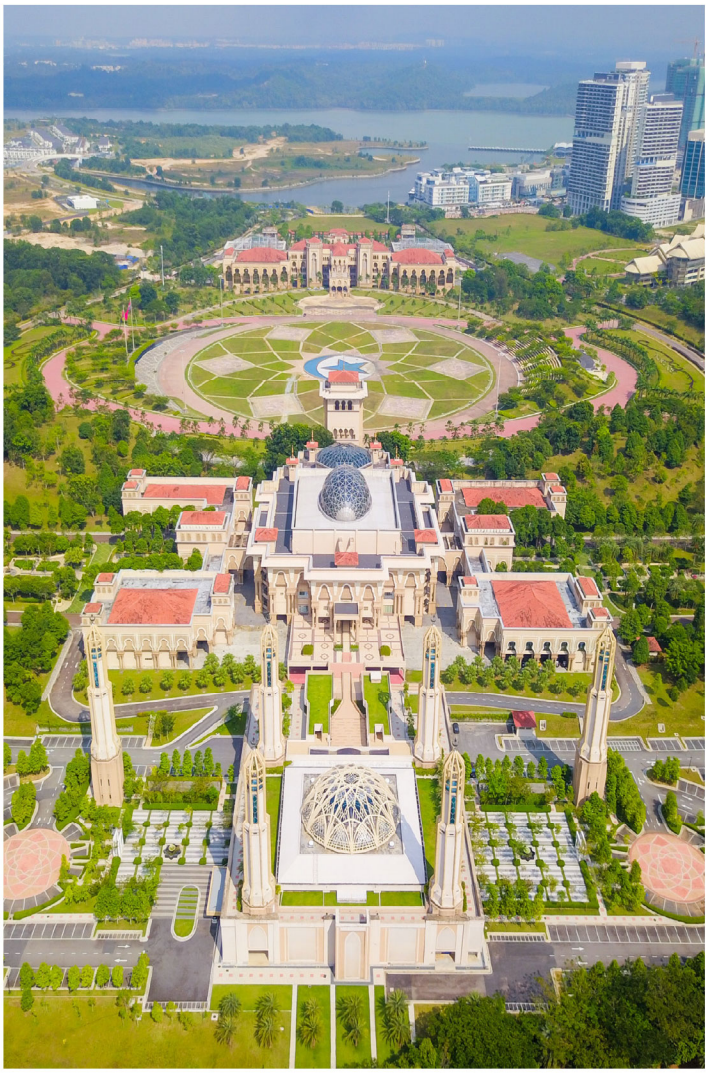


Table 4.2 shows the assesment of the key directions and key actions based on the two (2) parameters.

Table 4.2

Summary of Key Actions

Key Directions and Key Actions		Ease of Implementation	Key Champion(s)
KD1: Streamline and Integrate Related Low Carbon Policies and Regulations			
Action 1.1	Align Existing Regulation and Laws to Support Low Carbon Cities Development	4	F
Action 1.2	Align National Climate Change Policy (NCCP) to Support Low Carbon Cities Development	4	F
Action 1.3	Establish Absolute Carbon Reduction Targets for Targeted Cities (2021 - 2050)	2	FS
Action 1.4	Establish Policies to Enable Top Down Approach for Low Carbon Implementation At State Level	3	FS
Action 1.5	Integrate Low Carbon Guidelines and Components Into Existing and New Planning Development Documents	3	FS
Action 1.6	Promote Agriculture, Forestry and Other Land Uses (AFOLU) as Part of GHG Reduction Measures	3	F
Action 1.7	Align Definition and Approach for Low Carbon Cities at All Levels	3	F
KD2: Strengthen the Institutional Framework and Implementation Mechanism at All Levels			
Action 2.1	Improve the Governance and Implementation Structure at Federal and State Levels	4	FS
Action 2.2	Strengthen the Implementation Mechanism at the Ground Level	3	SL
KD3: Mainstream Low Carbon Urban Planning and Development			
Action 3.1	Embed Low Carbon Elements In Urban Planning and Development	3	F
Action 3.2	Develop Standard Guideline of GHG Emissions Reduction Strategies for Easy and Consistent Implementation at Ground Level	2	F
KD4 : Increase Community Participation in Low Carbon Development			
Action 4.1	Nurture Active Participation and Awareness Through Effective Communication Plan	2	F
Action 4.2	Use Education to Foster Human Behavioural Changes to Sustainable Practices	3	F

Key Directions and Key Actions		Ease of Implementation	Key Champion(s)
KD5 : Provide Funding And Financing To Facilitate Low Carbon Development			
Action 5.1	Create Specific Low Carbon Development Fund and Budget to Implement Low Carbon Programmes And Initiatives	3	F
Action 5.2	Create Alternative Funding to Finance Low Carbon Initiatives and Programmes at Local Level	4	SL
KD6 : Invest and Build Capacity to Act			
Action 6.1	Develop and Place Dedicated Officers at State and Local Levels to Increase Productivity and Create Holistic Manpower Support System	3	F
Action 6.2	Develop and Nurture Knowledge, Expertise and Skills in Low Carbon Development Area at State and Local Levels	2	SL
KD7 : Improve Low Carbon Information and Data Management			
Action 7.1	Establish Proper and Efficient System of Data Collection and Management for GHG Inventory Purposes	3	F
Action 7.2	Develop Central Online System on GHG Emissions Reporting and Data Management to be Used at All Levels	3	F
KD8 : Measure Low Carbon Performance			
Action 8.1	Align Performance-Based Tools to Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)	4	F
KD9 : Develop Citywide/Sectoral Development Strategies on Low Carbon			
Action 9.1	Spatial Planning and Development	2	L
Action 9.2	Energy	2	L
Action 9.3	Transportation	3	L
Action 9.4	Waste	3	L

4.4

Details of Key Actions Under Key Drivers

The Framework of Low Carbon Cities Masterplan has identified three (3) Key Drivers that are needed to affect transformative change in the landscape of Malaysia's low carbon development. The Key Actions identified under this section are guided by these Key Drivers, and are further described in the following pages.

Transforming Malaysian Cities into Low Carbon

Key Drivers

KEY DRIVER 1

Governance and Implementation Framework

- **Key Direction 1 :** Streamline and Integrate Related Low Carbon Policies and Regulations
- **Key Direction 2 :** Strengthen the Institutional Framework and Implementation Mechanism at All Levels

KEY DRIVER 2

Urban Planning

- **Key Direction 3 :** Mainsteam Low Carbon Urban Planning and Development

KEY DRIVER 3

Community Participation

- **Key Direction 4 :** Increase Community Participation in Low Carbon Development

Addressing the Following Key Challenges

Policies and Directions

- Inconsistent implementation
- Gap in transition from top to bottom
- No specific reference to low carbon development
- Unclear national target (intensity rather than absolute)

Implementation and Execution

- Inconsistent implementation
- Not mandatory
- Absence of dedicated unit/ entity at all levels

Community Participation

- Weak in public appreciation and understanding
- Lack of opportunities to participate

Low Carbon Development in Urban Planning

- Weak integration between low carbon reduction strategies and existing development document
- Conflicting and competing development priorities

KEY DRIVER 01

Governance and Implementation Framework



KEY DIRECTION 01

Streamline and Integrate Related Low Carbon Policies and Regulations

KEY DIRECTION 02

Strengthen the Institutional Framework and Implementation Mechanism at All Levels

KEY DIRECTION 01

Streamline and Integrate Related Low Carbon Policies and Regulations

Targeted Outcomes

- An umbrella policy that integrates and aligns other sectoral policies and regulations;
- A specific policy document that is directly related to low carbon-built environment at the national level;
- Clear targets for low carbon initiatives and GHG emission reductions post-2020 at various levels;
- Integration of key ministries (i.e. KASA, KPKT, KeTSA etc.) in pursuing low carbon development; and
- Strong support from state government in implementing low carbon initiatives at the local level.

Key Direction 1 has been developed to address the following issues:

01	Existing policies are too broad and all-encompassing and do not necessarily make direct (and specific) reference to low carbon cities development
02	Inconsistency in the sectoral targets at the national level
03	Most of the targets for low carbon initiatives and programmes will end soon (mostly in 2020), therefore, continuity plans (e.g. through the employment of new targets and initiatives) need to be formulated and implemented at the soonest
04	Low buy in or support from State level to propagate the implementation of low carbon cities development at local level
05	Agriculture, Forestry and Other Land Uses (AFOLU) are not part of the criteria for Low Carbon reduction strategies even though major land use activities for certain towns in Malaysia are AFOLU

Key Actions :

Action 1.1	Align Existing Regulation and Laws to Support Low Carbon Cities Development
Action 1.2	Align National Climate Change Policy (NCCP) to Support Low Carbon Cities Development
Action 1.3	Establish Absolute Carbon Reduction Targets for Targeted Cities (2021 - 2050)
Action 1.4	Establish Policies to Enable Top Down Approach for Low Carbon Implementation at State Level
Action 1.5	Integrate Low Carbon Guidelines and Components into Existing and New Planning Development Documents
Action 1.6	Promote Agriculture, Forestry and Other Land Uses (AFOLU) as Part of GHG Reduction Measures
Action 1.7	Align Definition and Approach for Low Carbon Cities at All Levels

ACTION 1.1

Align Existing Regulation and Laws to Support Low Carbon Cities Development

F

Champion(s)
- Ministry of Housing and Local Government
- Ministry of Federal Territories
- Ministry of Environment and Water

Supporting Agencies
- PLANMalaysia
- SEDA Malaysia
- Malaysian Green Technology and Climate Change Centre
- Federal Technical Agencies
- State Government
- State Technical Agencies
- Local Authorities

KPI to Measure Progress
- Amendment to the existing regulation and laws

Funding Sources
- Federal

Timeline
- Medium-Long Term (3 to 5 years)

Addressing Issues

1

Measures to be Taken

1. Enhance and make provision with regards to low carbon development in the regulations and laws through the following:

Acts	Recommendations
Local Authorities Act 1976 (Act 171)	Written statement on the role of local authorities in low carbon development (Under Section 101).
Town and Country Planning Act 1976 (Act 172)	Written statement on low carbon and climate resilient development in development plans (Under Section 6B, 8, 12 and 16B).
Federal Territory (Planning) Act 1982 (Act 267)	Written statement on low carbon and climate resilient development in development plans (Under Section 10 and 13).
Solid Waste and Public Cleansing Management Act 2007 (Act 672)	Written statement on GHG emission reduction though waste reduction strategies (Under Section 101).
Environmental Quality Act 1974 (Act 127)	Written statement on prohibition and control of pollution (such as GHG emission) (Under Section 21 and 22).
	Undertaken environmental audit to prevent, reduce or control the adverse impact of GHG emission on the environment (Under Section 33A and 34A).
Street, Drainage And Building Act 1974 (Act 133)	Written statement on low carbon and climate resilient development in Development Plans (Under Part I-V).

ACTION 1.2

Align National Climate Change Policy (NCCP) to Support Low Carbon Cities Development

F

Champion(s)
- Ministry of Environment and Water
- Ministry of Housing and Local Government
- Ministry of Federal Territories

Supporting Agencies
- PLANMalaysia
- SEDA Malaysia
- Malaysian Green Technology and Climate Change Centre
- Federal Technical Agencies
- State Government
- State Technical Agencies
- Local Authorities

KPI to Measure Progress
- Amendment to the current National Policy on Climate Change

Funding Sources
- Federal

Timeline
- Medium-Long Term (3 to 5 years)

Addressing Issues

1

Measures to be Taken

1. Re-position National Policy on Climate Change as the umbrella policy and framework in low carbon development:

Level	Recommendations
Federal	▪ Written statement on GHG emission reduction through low carbon cities initiatives and climate-resilient development as the key principles and action in the policy. ▪ Facilitate the harmonisation of existing relevant national policies (i.e. waste management, energy, natural conservation, urbanisation and rural development policies) and development plan (i.e. National Physical Plan) to address climate change adaptation and mitigation as well as to promote climate-resilient development. ▪ More promotion and engagement to emphasis on the translation of policy from federal level to state and local level. ▪ Set an absolute target for GHG emissions in year 2030 and beyond.

2. State and local levels can provide support by playing the following

Level	Recommendations
State	▪ Facilitate the harmonisation of existing state policies and development plan to address climate change adaptation and mitigation as well as promote climate-resilient development.
Local	▪ Facilitate the harmonisation of existing local plan to address climate change adaptation and mitigation as well as promote climate-resilient development.

ACTION 1.3

Establish Absolute Carbon Reduction Targets for Targeted Cities (2021 - 2050)

FS

Champion(s)
- Ministry of Environment and Water
- Ministry of Housing and Local Government
- Ministry of Federal Territories
- State Government

Supporting Agencies
- PLANMalaysia
- SEDA Malaysia
- Malaysian Green Technology and Climate Change Centre
- Federal Technical Agencies
- State Technical Agencies
- Local Authorities

KPI to Measure Progress
- Performance evaluation on GHG emission reduction achievement
- Announcement of new targets on GHG emission reduction post year 2020 at various levels and sectors

Funding Sources
- Federal

Timeline
- Medium-Long Term (3 to 5 years)

Addressing Issues

2 3

Measures to be Taken

1. Conduct performance evaluation on current GHG emission reduction achievement to ensure better implementation and governance in new policies and initiatives for the period of 2021 - 2030 and 2030 – 2050.
2. Align low carbon targets according to sectors at all levels.

Level	Recommendations
Federal	▪ Conduct performance evaluation on existing low carbon and sustainable target and initiatives: - GHG emission reduction by sectors (energy, transportation, water, waste, agriculture and industry sectors); - Renewable energy regeneration; - Recycling rate; and - Use of public transportation (modal split) by major cities. ▪ Re-align and consolidate low carbon targets according to sectors at national level for the period of year 2020 - 2030. These targets include the following: - GHG emission reduction for energy sector (electricity, transportation, water, waste, agriculture and industry sectors); - Renewable energy regeneration; and - Recycling rate target.
State	▪ Conduct performance evaluation on state's existing low carbon and sustainable targets and initiatives. ▪ Establish new targets to facilitate low carbon development at state level.

3. Local level can provide support by playing the following roles:

Level	Recommendations
Local	▪ Conduct performance evaluation on existing low carbon programmes and initiatives at municipal level. ▪ Establish new targets to facilitate low carbon development and implementation at municipal level.

ACTION 1.4

Establish Policies to Enable Top Down Approach for Low Carbon Implementation at State Level

FS

Champion(s)
- Ministry of Environment and Water
- Ministry of Housing and Local Government
- Ministry of Federal Territories
- State Government

Supporting Agencies
- PLANMalaysia
- SEDA Malaysia
- Malaysian Green Technology and Climate Change Centre
- State Technical Agencies
- Local Authorities

KPI to Measure Progress
- Adoption of state level implementation framework
- Policies and guidelines established by state

Funding Sources
- Federal

Timeline
- Medium- Long Term (3 to 5 years)

Addressing Issues

3 4

Measures to be Taken

1. Engage state government to get buy-in at state level.
2. Ensure clear implementation plans at state level.

Level	Recommendations
National	▪ Relevant federal agencies to engage state government to get buy-in and support on low carbon development and implementation at state level. ▪ Develop implementation framework as guideline to streamline low carbon development at state level.
State	▪ Establish a low carbon reduction action plans and policies to ensure better low carbon development and implementation at state level. ▪ Align all low carbon reduction strategies and policies with national targets and priorities.

3. Local level can provide support by playing the following roles:

Level	Recommendations
Local	▪ Establish a low carbon reduction action plans and policies to ensure better low carbon development and implementation at municipal level. ▪ Align all low carbon reduction strategies and policies with state targets and priorities.

ACTION 1.5

Integrate Low Carbon Guidelines and Components into Existing and New Planning Development Documents

FS

Champion(s)
- Ministry of Housing and Local Authorities
- Ministry of Federal Territories
- Ministry of Environment and water
- State Government

Supporting Agencies
- PLANMalaysia
- SEDA Malaysia
- Malaysian Green Technology and Climate Change Centre
- Federal Technical Agencies
- State Technical Agencies
- Local Authorities

KPI to Measure Progress
- Mandate to incorporate Low Carbon Cities' policies and strategies into development plans

Funding Sources
- Federal

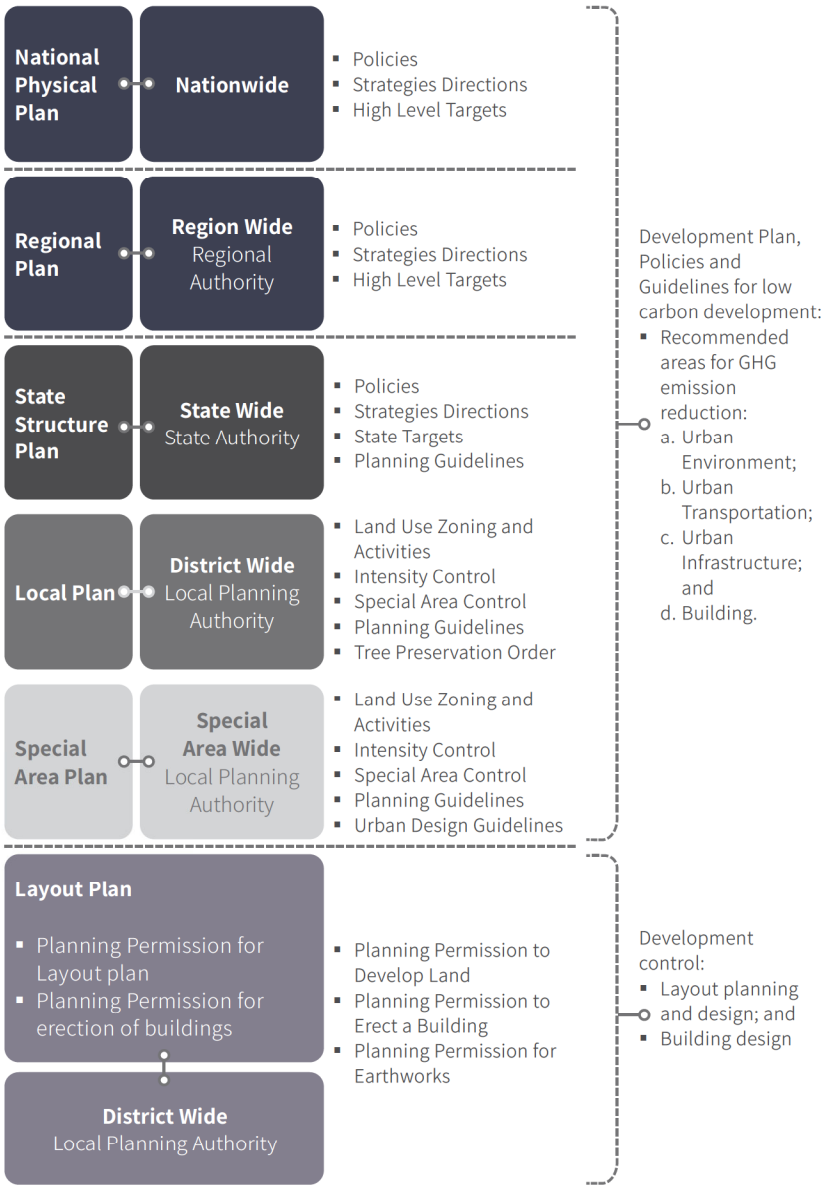
Timeline
- Medium-Long Term (3 to 5 years)

Addressing Issues

3 4

Measures to be Taken

1. Streamline and adopt an integrated planning approach in order to embed Low Carbon Cities' policies, targets and roadmap into existing and new development system (e.g. National Physical Plan, Regional Plan, State Structure Plan and Local Plan).
2. Identify key strategies in GHG emission reduction through development plans.
3. Ensure the consistency of low carbon strategies, priorities and targets at all levels.



ACTION 1.6

Promote Agriculture, Forestry and Other Land Uses (AFOLU) as Part of GHG Reduction Measures

F

Champion(s)
- Ministry of Energy and Natural Resources
- Ministry of Environment and Water

Supporting Agencies
- State Government
- PLANMalaysia
- SEDA Malaysia
- Malaysian Green Technology and Climate Change Centre
- Department of Agriculture
- Department of Environment
- Department of Forestry
- Local Authorities

KPI to Measure Progress
- Policies and strategic carbon reduction measures related to AFOLU
- Development of measurement tools related to AFOLU

Funding Sources
- Federal

Timeline
- Medium-Long Term (3 to 5 years)

Addressing Issues

5

Measures to be Taken

1. Promote AFOLU as one of the criteria for low carbon reduction strategies.

Level	Recommendations
National	▪ Recognise and incorporate AFOLU as one of the criteria for low carbon action plans. ▪ Identify and incorporate key strategies and actions on GHG emission reduction through AFOLU in the national and state policies as well as in the development plans.

2. State and local levels can provide support by playing the following roles:

Level	Recommendations
State	▪ Identify and incorporate key strategies and actions on GHG emission reduction through AFOLU in the state policies and development plans.
Local	▪ Identify and incorporate the key strategies and actions on GHG emission reduction through AFOLU in the development plans at municipal level.

Agriculture, Forestry and other Land Uses (AFOLU) are among major sources of GHG emissions. However, AFOLU play an important role in economic growth for some of the cities and towns in Malaysia. Thus, the recommended strategies for AFOLU are as follows:



Agriculture

- Increase the carbon storage capacity of soil;
- Restrict the use of nitrogen fertilizers; and
- Adopt modern technologies in farming and livestock activities to reduce pollution and GHG emissions.



Forestry and Other Land Uses

- Increase carbon stocks of the forest areas through better forest management; and
- Reduce land conversion from development.

ACTION 1.7

Align the Definition And Approach For Low Carbon Cities At All Levels

F

Champion(s)
- Ministry of Environment and Water
- Ministry of Housing and Local Government
- Ministry of Federal Territories

Supporting Agencies
- SEDA Malaysia
- Malaysian Green Technology and Climate Change Centre
- PLANMalaysia
- State Government
- Local Authorities

KPI to Measure Progress
- Adoption of Low Carbon Cities definition and 3M Approach in the implementation of low carbon development at all levels

Funding Sources
- Federal

Timeline
- Medium-Long Term (3 to 5 years)

Addressing Issues

1 2 3

Measures to be Taken

1. Streamline low carbon cities definition to ensure consistency in the implementation of GHG emission reduction measures.
2. Ensure the development of comprehensive action plans and set definitive targets to reduce GHG emissions and contribute minimally to climate change.
3. Align and integrate low carbon cities methodology of '3M Approach' (i.e. Measurement, Management and Mitigation) at all levels to ensure consistency in the implementation of GHG emission reduction measures.

Level	Recommendation
Federal	▪ Streamline low carbon cities definition in Low Carbon Cities Framework, National Physical Plan, National Urbanisation Policy and other relevant national documents. ▪ Align the existing low carbon cities methodology with '3M Approach' in national policies and development plans.

4. State and local levels can provide support by playing the following roles:

Level	Recommendation
State	▪ Align the existing low carbon cities methodology with '3M Approach' in state policies and development plans.
Local	▪ Align the existing low carbon cities methodology with '3M Approach' in relevant development plans at municipal level.

The 3M Approach



Measurement of the GHG emissions by establishing a baseline and providing periodic monitoring



Management of the low carbon development in terms of policy, targets and planning



Mitigation of the GHG emissions through design and implementation of programmes and projects

KEY DIRECTION 02

Strengthen the Institutional Framework and Implementation Mechanism at All Levels

Targeted Outcomes

- Strengthened top-down and bottom-up approach in the implementation of low carbon initiatives;
- Clear universal structure/mechanism at state and local levels; and
- Clear Key Champion(s) at all levels.

Key Direction 2 was developed to address the following issues :

01	Lack of policies integration horizontally (i.e. among many ministries and agencies) and vertically (i.e. from federal to state and local level). In addition, some policies work in silo and do not incorporate or make reference to low carbon development
02	No dedicated unit or committee for low carbon implementation and development at many state and local levels
03	The mandate for low carbon implementation from state down to local government is lacking and weak
04	Low buy in from key stakeholders

Key Actions :

Action 2.1	Improve the Governance and Implementation Structure at Federal and State Levels
Action 2.2	Strengthen the Implementation Mechanism at the Ground Level

ACTION 2.1

Improve the Governance and Implementation Structure at Federal and State Levels

F

Champion(s)
- Ministry of Environment and Water
- Ministry of Housing and Local Government
- Ministry of Federal Territories
- State Government

Supporting Agencies
- PLANMalaysia
- SEDA Malaysia
- Malaysian Green Technology and Climate Change Centre
- Federal Technical Agencies
- State Technical Agencies
- Local Authorities

KPI to Measure Progress
- Adoption of policies regulations/directions related to low carbon development

Funding Sources
- Federal

Timeline
- Short Term (< 3 years)

Addressing Issues

1

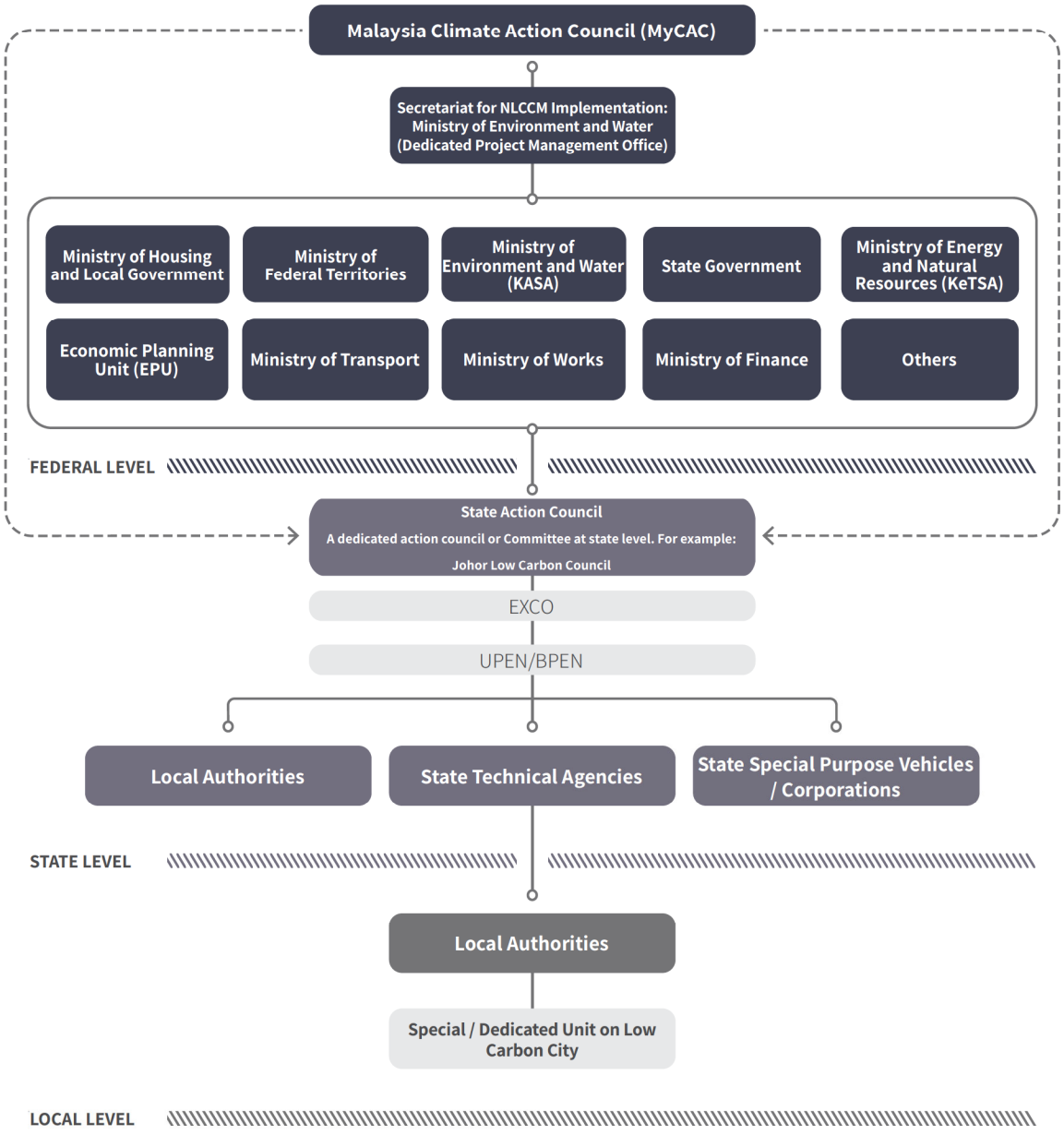
Measures to be Taken

1. Leverage on Malaysia Climate Action Council (MyCAC) as the National Action Council to strengthen multi-level and cross-sectoral participation in low carbon development efforts at the federal level.
2. Establish State Action Council to effectively implement and monitor all directions received from the federal level on low carbon development (i.e. strengthen the top down approach).

Recommended Key Roles and Members of National Action Council

Key Roles:	Members
▪ Setting up policy and development directions for low carbon; ▪ Securing, providing and allocating specific budget/funds for low carbon development; and ▪ Evaluating and approving strategic development framework for low carbon development.	▪ YAB Deputy Prime Minister – Chairman; ▪ YB Minister of the Ministry of Environment and Water; ▪ YB Minister of the Ministry of Finance; ▪ YB Minister of the Ministry of Housing and Local Government; ▪ YB Minister of the Ministry of Federal; Territories; ▪ YB Minister of the Ministry of Energy and Natural Resources; ▪ YB Minister of the Ministry of Transport; ▪ YB Minister of the Ministry of Works; ▪ YB Minister at the Prime Minister department (EPU); ▪ Chief Secretary of the Government of Malaysia; and ▪ YB State EXCOs.

Proposed Governance and Implementation Structure at Federal and State Levels



ACTION 2.2

Strengthen the Implementation Mechanism at the Ground Level

SL

Champion(s)
- State Government
- Local Authorities
- PLANMalaysia

Supporting Agencies
- Malaysian Green Technology and Climate Change Centre
- SEDA Malaysia
- State Technical Agencies
- Professional Bodies and Organisation

KPI to Measure Progress
- Establishment of State Action Council and its mandate
- Establishment of Special/ Dedicated Unit by local authorities

Funding Sources
- State
- Municipality

Timeline
- Short Term (< 3 years)

Addressing Issues

2 3 4

Measures to be Taken

1. Mandate the State Action Council to champion and monitor low carbon development at State level.
2. Establish or set up a Special/Dedicated Unit at Local Authorities level to strengthen the multi-level and cross-sectoral collaboration in pursuing low carbon development efforts.

Recommended Key Roles and Members of State Action Council

Key Roles:

- Implementing directions from National Action Council and MNKT on low carbon development;
- Setting up special state policies and development directions on low carbon;
- Securing, providing and allocating specific budget/funds for low carbon development; and
- Monitoring the progress and performance of low carbon development at state level.

Champions:

- YB State EXCO; and
- UPEN/BPEN.

Working Committee and Members:

- Local Authorities; and
- Technical Agencies.

Recommended Key Roles and Members of Special/Dedicated Unit

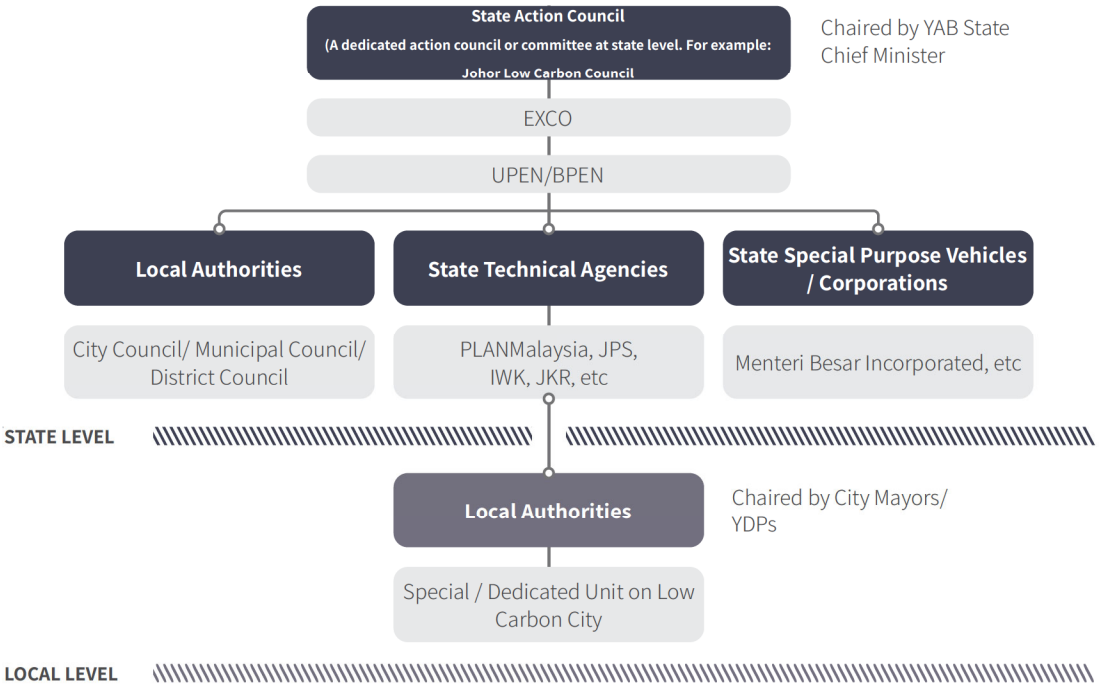
Key Roles:

- Carrying out development directions from State Action Council on low carbon development;
- Setting up implementation plans of low carbon development at municipal level;
- Securing, providing and allocating specific budget/fund for low carbon development; and
- Monitoring the implementation of low carbon development programmes and projects at local level.

Champions:

- City Mayor / YDP – Chairman;
- Municipal Secretary;
- Director of Low Carbon Special / Dedicated Unit; and
- Between three (3) to five (5) dedicated officers.

Proposed Implementation Mechanism at Ground Level



KEY DRIVER 02

Urban Planning



KEY DIRECTION 03

Mainstream Low Carbon Urban Planning and Development

KEY DIRECTION 03

Mainstream Low Carbon Urban Planning and Development

Targeted Outcome

- Clear and integrated approach in low carbon urban planning and development

Key Direction 3 was developed to address the following issues :

01	Some proposals on low carbon action plans are difficult to implement at local level – no clear guideline for GHG emission reduction strategies and intervention in design and planning stages
02	Lack of integration between low carbon reduction strategies and existing development documents such as Structure Plan and Local Plan
03	Apparent weakness in designing and integrating urban functions, facilities and resource allocation in the early stages of development

Key Actions :

Action 3.1	Embed Low Carbon Elements in Urban Planning and Development
Action 3.2	Develop Standard Guideline of GHG Emission Reduction Strategies for Easy and Consistent Implementation at Ground Level

ACTION 3.1

Embed Low Carbon Elements in Urban Planning and Development

F

Champion(s)
- Ministry of Housing and Local Government
- Ministry of Federal Territories
- Ministry of Environment and Water

Supporting Agencies
- PLANMalaysia
- SEDA Malaysia
- Malaysian Green Technology and Climate Change Centre
- Federal Technical Agencies
- State Government
- State Technical Agencies
- Local Authorities

KPI to Measure Progress
- Compulsory inclusion of low carbon development approval at OSC

Funding Sources
- Federal

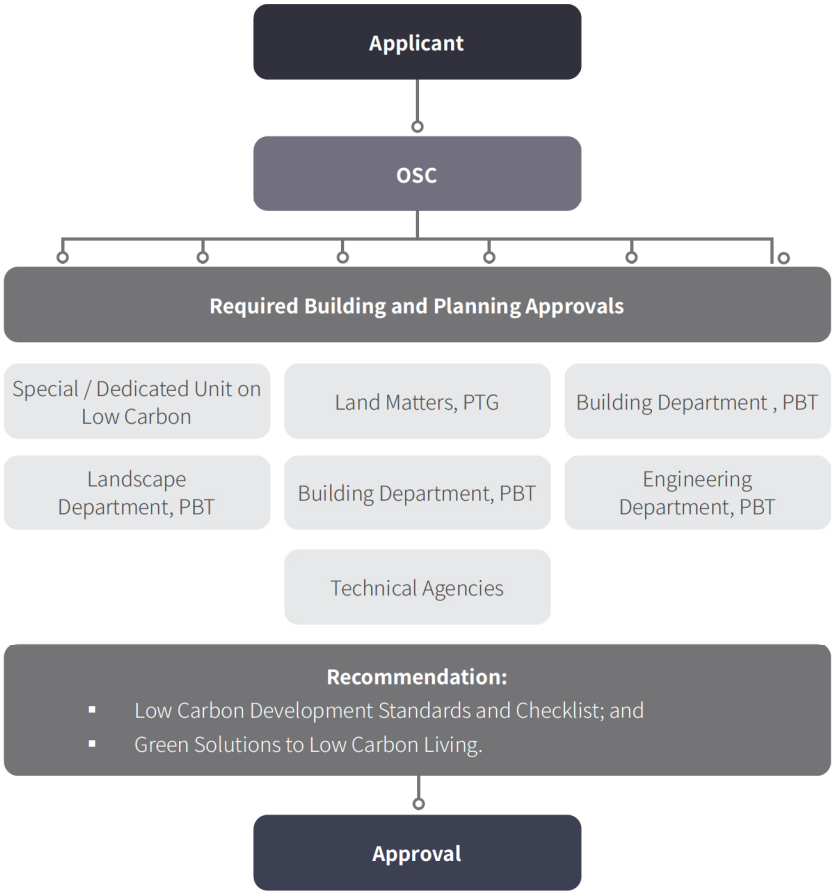
Timeline
- Medium-Long Term (3 to 5 years)

Addressing Issues

1 2 3

Measures to be Taken

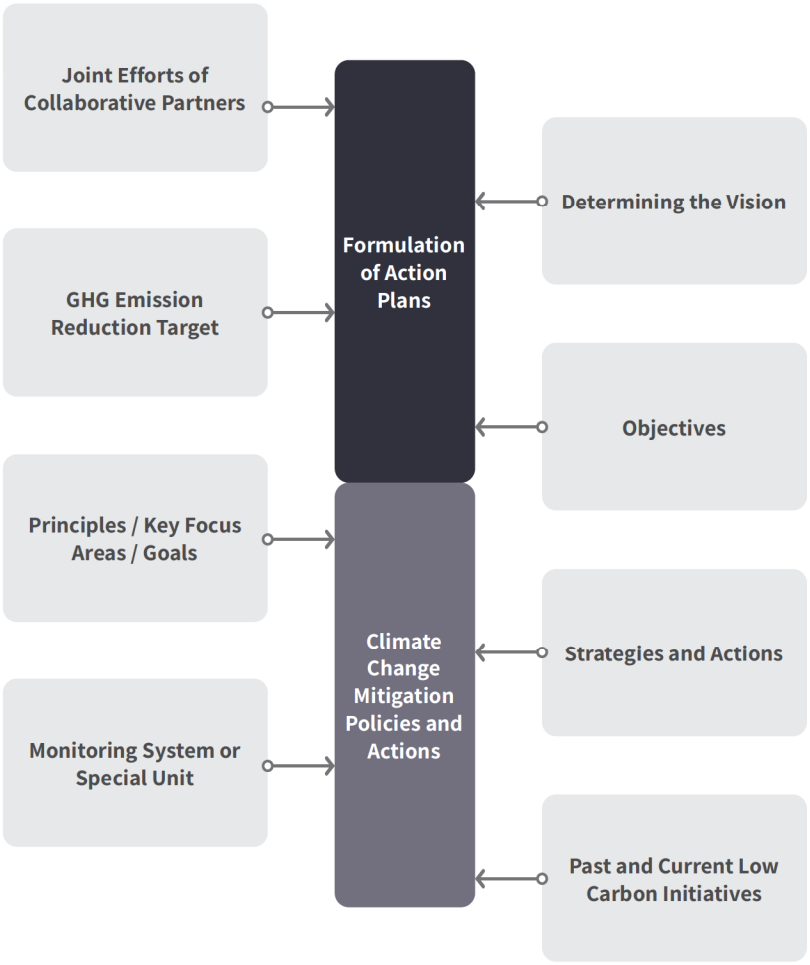
1. Include low carbon development in planning approval submission:
   - Set of standards on low carbon approval in OSC; and
   - Technical agencies are also expected to utilize green tools to test and analyse the development.
2. For applicants - prior to submission of Building Approval, it is essential that the establishment of low carbon guidelines is to be introduced in design and planning stage:
   - To establish awareness on low carbon development to developers and private owners before Planning Permission Approval.
3. Introduce incentive schemes on low carbon development at Planning Permission approval:
   - Property Tax Rebate Scheme for implementing green initiatives.



Measures to be Taken

1. Develop national standard guidelines for GHG emission reduction strategies and intervention in design and planning stages for easy reference by local authorities and other stakeholders.
2. Determine sectoral targets for low carbon action plans:
   - All approved and mandated targets set by the National Action Council and State Action Council are to be aligned at the state and local levels.
3. Ensure the parameters to measure GHG comply with GPC standard :
   - Develop a template as a guideline for local authorities to refer to as different local authorities have different capabilities and capacities; and
   - Develop or customise user-friendly tools for measuring GHG emissions.

Suggested Elements to Be Used in Developing/Reviewing Low Carbon Action Plans :



ACTION 3.2

Develop Standard Guideline of GHG Emission Reduction Strategies for Easy and Consistent Implementation at Ground Level

F

Champion(s)
- Ministry of Environment and Water
- Ministry of Housing and Local Government
- Ministry of Federal Territories

Supporting Agencies
- PLANMalaysia
- SEDA Malaysia
- Malaysian Green Technology and Climate Change Centre
- Local Authorities
- Professional Bodies and Organisation

KPI to Measure Progress
- Standard guideline for GHG emission reduction strategies and intervention

Funding Sources
- Federal
- State
- International Donors
- Municipality

Timeline
- Short Term (< 3 years)

Addressing Issues

1 2 3

KEY DRIVER 03

Community Participation



KEY DIRECTION 04

Increase Community Participation in Low Carbon Development

KEY DIRECTION 04

Increase Community Participation in Low Carbon Development

Targeted Outcome

- Active and higher participation rate of the community in low carbon development.

Key Direction 4 has been developed to address the following issues :

01	The public awareness and appreciation towards low carbon efforts are still weak, which affect their participation in the implementation of low carbon initiatives at the ground level.
02	Outreach and educational programmes on low carbon lifestyles are still lacking among communities, students and youths, As such, it is quite difficult to empower the public to participate.

Key Actions :

Action 4.1	Nurture Active Participation and Awareness through Effective Communication Plan
Action 4.2	Use Education to Foster Human Behavioural Changes to Sustainable Practices

ACTION 4.1

Nurture Active Participation and Awareness through Effective Communication Plan

F

Champion(s)
- Ministry of Communication & Multimedia
- Ministry of Environment and Water
- Ministry of Housing and Local Government
- Ministry of Federal Territories

Supporting Agencies
- PLANMalaysia
- SEDA Malaysia
- Malaysian Green Technology and Climate Change Centre
- Local Authorities
- NGOs
- Community Associations

KPI to Measure Progress
- Framework for communication plan
- Number of community-based projects

Funding Sources
- Federal

Timeline
- Short Term (<3 years)

Addressing Issues

(1) (2)

Measures to be Taken

1. Establish framework for communication plan to engage community at various levels to create awareness and encourage participation in low carbon practices and initiatives.
2. Actively utilise various communication tools to increase coverage in terms of area, gender, race and age. Some examples include:
   - Public Relations;
   - Social Media;
   - Printed Media;
   - Mass Media;
   - Advertising;
   - Sponsorship; and
   - Events.
3. Leverage and optimise the use of technology and social media for effective communication.
4. Publicise all pertinent information on low carbon development (such as action plans and GHG emission reduction targets) to create and increase awareness.

Key role of each level in ensuring the communication plan works:

Level	Recommendation
Federal	▪ Highlight the application and importance of communication plans at all levels.
State	▪ Translate the communication plans into actions.
Local	▪ Devise and implement actions that involve community and local people. ▪ Devise and implement more outreach programmes ▪ Increase frequency of outreach programmes

ACTION 4.2

Use Education to Foster Human Behavioural Changes to Sustainable Practices

F

Measures to be Taken

1. Incorporate elements of low carbon/sustainable development in current school education, syllabus and/or co-curriculum activities.
2. Establish awareness and education on low carbon/sustainable development to developers and communities.
3. Implement demonstration projects for public and students to participate and appreciate a low carbon lifestyle. The aims are:
   - To influence lifestyle in order to nurture human behaviours to long-term sustainable practices; and
   - To allow people to practice and experience low carbon lifestyle through the projects so that they would be able to understand and appreciate the efforts.

Key role(s) of each level in ensuring sustainable practices:

Level	Recommendation
Federal	▪ Emphasize in the National Blueprints on the importance of participatory planning and early education on low carbon development.
State	▪ Provide various foundations and platforms on how community and students can be involved in helping the country and the city to achieve certain GHG emission reduction target.
Local	▪ Create and use various platforms to engage with community, students and other key stakeholders for their idea, thoughts sharing and participation. ▪ Actively involve stakeholders and communities in any hearing process/involvement of low carbon planning.

Champion(s)
- Ministry of Education
- Ministry of Environment and Water
- Ministry of Housing and Local Government
- Ministry of Federal Territories

Supporting Agencies
- PLANMalaysia
- SEDA Malaysia
- Malaysian Green Technology and Climate Change Centre
- State Government
- State Education Department
- Local Authorities
- NGOs

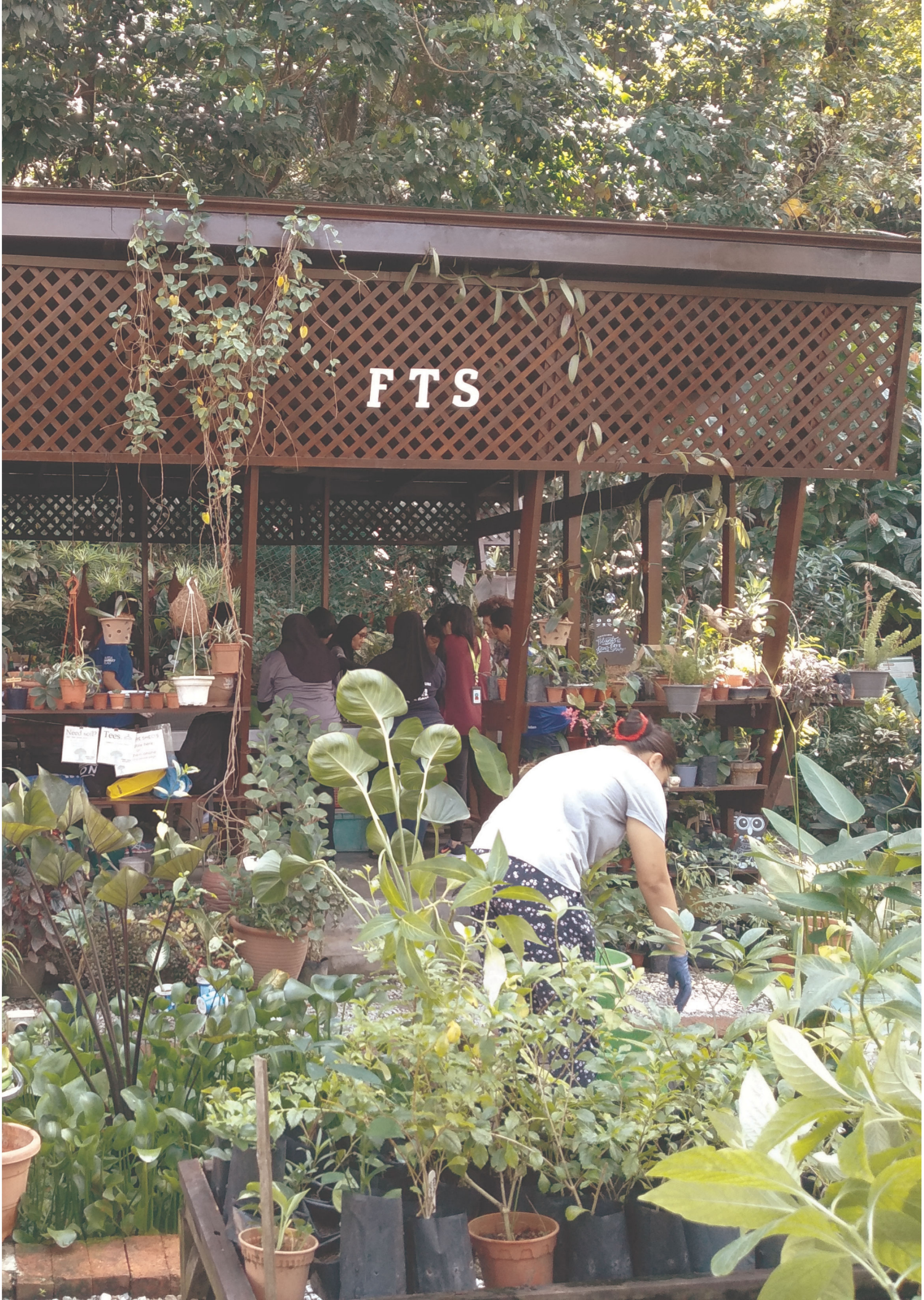
KPI to Measure Progress
- Number of schools adopting or implementing green education
- Development of green education modules for public and students

Funding Sources
- Federal
- State

Timeline
- Short Term (< 3 years)

Addressing Issues

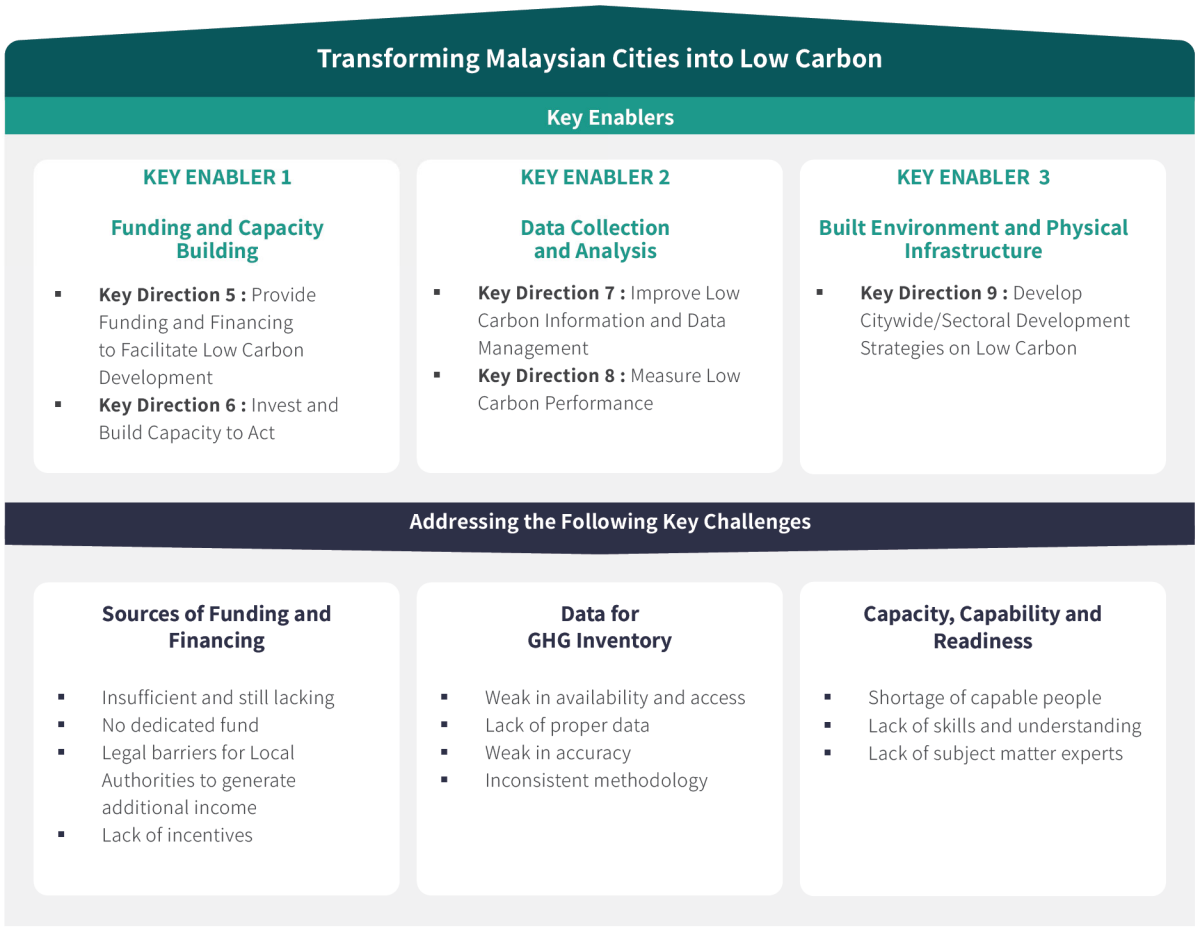
1 2


FTS

4.5

Details of Key Actions under Key Enablers

The Framework of Low Carbon Cities Masterplan has also identified three (3) Key Enablers that are needed to assist in providing greater impact in accelerating and amplifying low carbon development in cities throughout the country. The Key Actions identified under this section are guided by these Key Enablers, and are further described in the following pages.



Source : NLCCM Analysis, 2019

KEY ENABLER 01

Funding and Capacity Building



KEY DIRECTION 05

Provide Funding and Financing to Facilitate Low Carbon Development

KEY DIRECTION 06

Invest and Build Capacity to Act

KEY DIRECTION 05

Provide Funding and Financing to Facilitate Low Carbon Development

Targeted Outcomes

- Ample and available funding and financing for low carbon development and investment from both public and private sectors;
- Easy access to low carbon development funds;
- Leverage both local and international funds; and
- Attractive incentives for low carbon initiatives.

Key Direction 5 was developed to address the following issues :

01	Lack of financial provision for low carbon initiatives is hampering the implementation of low carbon initiatives and plans.
02	No central body to regulate funds at the federal level. Even though some efforts are being taken by several States and cities to address this issue, the overall progress is still very slow.
03	Many cities are unable to generate additional income (e.g. from the reviewing of parking fee, taxes, and charges) to finance their low carbon initiatives and programmes due to political and legal constraints.
04	Public-private partnership helps to fund low carbon cities programmes in many cities all over the world. Unfortunately in Malaysia, the number of partnerships is still very small and are inclined towards big cities and urban areas.

Key Actions :

Action 5.1	Create Specific Low Carbon Development Fund and Budget to Implement Low Carbon Programmes And Initiatives
Action 5.2	Create Alternative Funding to Finance Low Carbon Initiatives and Programmes at Local Level

ACTION 5.1

Create Specific Low Carbon Development Fund and Budget

F

Champion(s)
- Ministry of Finance
- Ministry of Environment and Water
- Ministry of Housing and Local Government
- Ministry of Federal Territories

Supporting Agencies
- PLANMalaysia
- SEDA Malaysia
- Malaysian Green Technology and Climate Change Centre
- State Government
- Local Authorities

KPI to Measure Progress
- Amount of budget allocated/secured for low carbon development
- Amount of fund received from international donors
- Number of Public-Private partnership or collaboration

Funding Sources
- Federal
- State
- International Donors
- Local Authorities

Timeline
- Short term (<3 years)

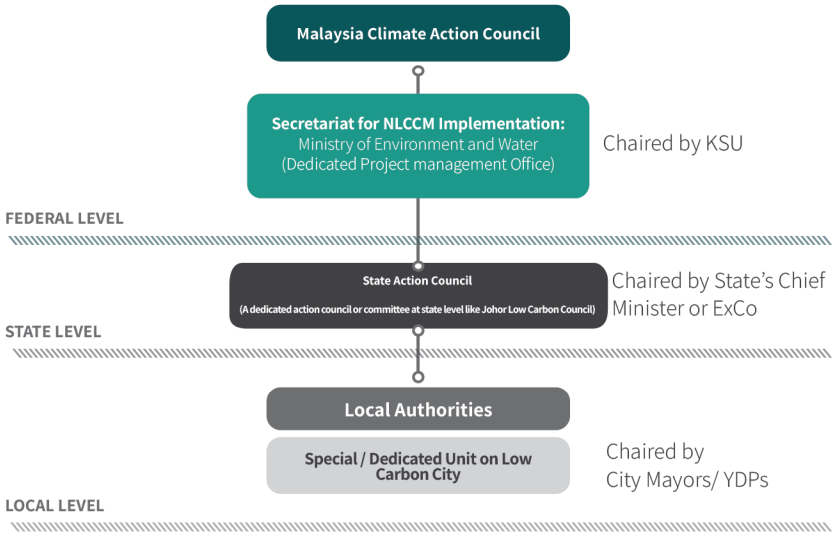
Addressing Issues

1 2

Measures to be Taken

1. Allocate and secure yearly budget/funding and financing from the federal government to support low carbon development programmes.
2. Mandate the Malaysia Climate Action Council (MyCAC) with the task to secure these yearly budget and other source of funding for development, training and financing purposes.
3. Develop long term action plans and GHG emission reduction targets for low carbon development so that bigger amount of fund can be obtained from or under the respective Malaysia Plan.
4. More active role by the government to seek and secure monetary and technical assistance from international donors to further support low carbon projects/initiatives.
5. Promote more Public-Private Partnership related to low carbon projects at federal, state and local levels to ease the financial burden.
6. Procedures relevant to budget allocation that hinder or slow down the implementation of low carbon programmes and initiatives.
7. Adopt policies that expedite the securing of local and international funds.
8. Ensure active involvement of National Action Council and State Action Council to support low carbon development.
9. Ensure that the State and Local Authorities would also be able to allocate yearly budget for low carbon development.
10. Provide and develop transparent mechanism in distributing the funds secured to respective states/implementing agencies and projects.
11. Establish Climate Change Trust Fund to finance projects that improve climate resilience of the nation in key sectors.

The proposed governance structure in Action 2.1 and 2.2 plays important role in securing funds and budget for low carbon development.



ACTION 5.2

Create Alternative Funding to Finance Low Carbon Initiatives and Programmes at Local Level

SL

Champion(s)
- State Government
- Local Authorities

Supporting Agencies
- Malaysian Green Technology and Climate Change Centre
- SEDA Malaysia
- PLANMalaysia
- State Technical Agencies
- Professional Bodies and Organisation
- Private Organisations

KPI to Measure Progress
- Number of Public-Private Partnerships fostered
- Amount of fund received from local and international donors
- Application of carbon tax and charges

Funding Sources
- Federal
- State
- Municipality
- Private Sectors
- International Donors

Timeline
- Short term (<3 years)

Addressing Issues

1 2 3 4

Measures to be Taken

1. Promote more Public-Private Partnership for low carbon initiatives at local level by giving incentives either monetary or in-kind.
2. Review the possibility of development charges in Town and Country Planning Act to be used for climate action plans.
3. Establish pollution charges for companies who contribute to pollution.
4. Establish long term mechanism like pollution tax and parking tax to fund low carbon programmes such as transport or waste management activities.
5. Explore international funding options for low carbon development.
6. Develop and introduce third party financing. Enabling "pay as you save" type of repayment that reduces capital constraints and cost pressure on industries while increasing potential demand for energy-efficient equipment and creating a profitable activity for new market players.

Opportunities for Financial Assistance From International Organisations

Fund Name	Description	Source
Green Climate Fund (GCF)	The Fund promotes paradigm shift towards low-emission and climate-resilient development pathways, reduce greenhouse gas emissions and adapt to the impacts of climate change.	UNFCCC
Asia Pacific Economic Cooperation (APEC) Support Fund	Supports capacity building initiatives contributing to the promotion of energy efficiency and low carbon measures in the APEC region.	Voluntary contribution from APEC's Member: Japan, Chinese Taipei and United States.
Resilient Cities Asia Pacific (RCAP)	Resilient Cities Asia-Pacific series provides an Asia-Pacific platform for urban resilience and climate change adaptation where dialogues are conducted to forge partnerships, with the ultimate goal of identifying implementable solutions and creating lasting impacts for cities in the region	NA
Horizon 2020 Funding (2014-2020)	Research and Innovation Programme.	EU
United Nations Industrial Development Organisation (UNIDO)	To assist in the protection of the global environment and to promote environmental sustainable development.	UN
Cross-UK Government Prosperity Fund	To help promote economic and sustainable growth in emerging economies.	UK Government



KEY DIRECTION 06

Invest and Build Capacity to Act

Targeted Outcome

- Apparent increase in capacity and skills to drive the low carbon implementation and development at various levels.

Key Direction 6 has been developed to address the following issues :

01	Shortage of subject matter experts or officers with good knowledge on sustainable or low carbon development to effectively implement and execute programmes and initiatives.
02	Lack of resources and skills to lead low carbon development initiatives, leading to difficulties and unsuitable personnel driving the implementation.
03	Lack of knowledge, expertise and technical skills.
04	Lack of readiness in terms of capacity and capability among many local authorities.

Key Actions :

Action 6.1	Develop and Place Dedicated Officers at State and Local Levels to Increase Productivity and Create Holistic Manpower Support System
Action 6.2	Develop and Nurture Knowledge, Expertise and Skills in Low Carbon Development Area at State and Local Levels

ACTION 6.1

Develop and Place Dedicated Officers at State and Local Levels to Increase Productivity and Create Holistic Manpower Support System

F

Champion(s)
- Ministry of Environment and Water
- Ministry of Housing and Local Government
- Ministry of Federal Territories
- Public Service Department

Supporting Agencies
- PLANMalaysia
- Malaysian Green Technology and Climate Change Centre
- SEDA Malaysia
- State Government
- Local Authorities

KPI to Measure Progress
- Establishment of special or dedicated unit for low carbon development at local level
- Number of dedicated officers established
- Number of personnel with required skills set groomed

Funding Sources
- Federal

Timeline
- Short term (<3 years)

Addressing Issues

1 2 3 4

Measures to be Taken

1. Develop multi-disciplinary officers at State Action Council and Special/Dedicated Unit at local level :

   - Ensure officers to take key tasks in planning, implementing and monitoring low carbon development and initiatives;
   - Set a common system, goal and language at every level of government for clear instructions and information;
   - Enhance human resources' capability and capacity at Special/ Dedicated Unit for better implementation through bottom-up approach;
   - Set and develop dedicated personnel at various levels; and
   - Ensure State government's commitment to work with local authorities in managing shared responsibilities ranging from planning, implementing and monitoring of low carbon development.

2. Determine the right job scopes pertaining to the field of sustainability for officers with diverse backgrounds (ranging from environmental to planning) :

   - Public Service Department (JPA) to set innovative positions for low carbon career path at local authority's level and be put under the Special/Dedicated Units/OSC; and
   - To include contractual job positions as well.

Potential Job Scopes for Sustainability or Environmental Planning Backgrounds at Local Level

Level	District Council	Municipal Council	City Council
Sustainability Officers and Positions	▪ Sustainability representatives in each department ▪ Sustainability team is positioned at the same level as departments.	▪ Establishment of Special Unit positioned above Departments or under Mayor ▪ Background of expertise in environmental, sustainability and climate change.	▪ Establishment of Special Unit positioned above Departments or under the Mayor ▪ Background of expertise in environmental, sustainability and climate change.
Collecting Data	Data assumptions of per capita Malaysia to measure the city's GHG consumption.	Efficient data retrieval from sources such as TNB and others. Data gathered from the local authority's department to be shared with the special unit.	Data is real time information shared by agency resources which is easily accessible.
GHG Inventory	GHG inventory requires external assistance (e.g. professionals).	Dedicated Officers are able to develop GHG inventory annually.	GHG inventory with more innovative simulation software.
Monitoring	Monitoring of low carbon blueprint or action implemented on ground.	Monitoring of low carbon blueprint or action implemented on ground together with GHG monitoring.	Monitoring can be translated into solutions to tackle or enhance low carbon activities.

Source : Malaysian Institute of Planners



ACTION 6.2

Develop and Nurture Knowledge, Expertise and Skills in Low Carbon Development Area at State and Local Levels

SL

Champion(s)
- State Government
- Local Authorities

Supporting Agencies
- PLANMalaysia
- Malaysian Green Technology and Climate Change Centre
- SEDA Malaysia
- Professional Bodies and Organisations
- Institution of Higher Learning
- Training Institutions

KPI to Measure Progress
- Number of subject matter experts
- Number of expertise in GHG inventory
- Number of personnel/staff/ people being trained
- Development of training modules

Funding Sources
- Federal
- State

Timeline
- Short Term (< 3 Years)

Addressing Issues

1 2 3 4

Measures to be Taken

1. Develop low carbon planning tools for cities :

   - Utilise existing or current practices for low carbon tools in Malaysia as guidance or benchmark;
   - Ensure that local authorities are provided with, assisted and taught about these planning tools by respective agencies/ organisations; and
   - Streamline all these tools with GPC.

2. Develop more training and workshops to facilitate learning opportunities related to low carbon development :

   - Establish periodical and structured training where establishment of curriculum is crucial to support continuous learning;
   - Provide more training and workshops on low carbon development at city/town level; and
   - Ensure that experts in GHG inventory work with state and local authorities for the purpose of knowledge transfer. The need for calculating GHG emissions is crucial for the purpose of measuring progress.

3. Set up Low Carbon Cities Network to facilitate peer learning opportunities to impart knowledge to others within Local Authorities :

   - Special/Dedicated unit to engage in inter-department collaboration for implementing and monitoring low carbon projects, programmes and initiatives;
   - Establish innovative ways to ensure easy access to information and practices; and
   - Share among peers and practice new skills and knowledge that are obtained either from international or local organisation.

Type of Training That Comes With Real-Life Practice to Sustain Knowledge and Skills

Category	District Council	Municipal Council	City Council
Training	Training with limited budget	Periodical and structured training	Periodical and structured training with higher knowledge on low carbon development
Peer Learning	Sharing knowledge from special unit		

Source : Malaysian Institute of Planners



KEY ENABLER 02

Data Collection and Analysis



KEY DIRECTION 07

Improve Low Carbon Information and Data Management

KEY DIRECTION 08

Measure Low Carbon Performance

KEY DIRECTION 07

Improve Low Carbon Information and Data Management

Targeted Outcome

- A single window and seamless link to data, information and resources for GHG inventory purposes.

Key Direction 7 has been developed to address the following issues :

01	Lack of inter-agency collaboration from local level up to federal level, making data collection exercise very difficult.
02	The accuracy, availability and coverage of data are still very low. Lack of transparency and reporting structure on data resources from bottom to top level.
03	Some data resources and information are often kept at the bottom level.
04	Lack of information and resource sharing between internal department at local and state levels.

Key Actions :

Action 7.1	Establish Proper and Efficient System of Data Collection and Management for GHG Inventory Purposes
Action 7.2	Develop Central Online System on GHG Emissions Reporting and Data Management to Be Used at All Levels

ACTION 7.1

Establish Proper and Efficient System of Data Collection and Management for GHG Inventory Purposes

F

Champion(s)
- Ministry of Environment and Water
- Ministry of Housing and Local Government
- Ministry of Federal Territories

Supporting Agencies
- SEDA Malaysia
- Malaysian Green Technology and Climate Change Centre
- PLANMalaysia
- Department of Statistics Malaysia
- State Government
- Local Authorities
- Federal Technical Agencies
- State Technical Agencies
- Private Organisation

KPI to Measure Progress
- Establishment of seamless framework/mechanism for data collection/input, calculation as well as reporting

Funding Sources
- Federal
- State
- Local Authorities

Timeline
- Short term (<3 years)

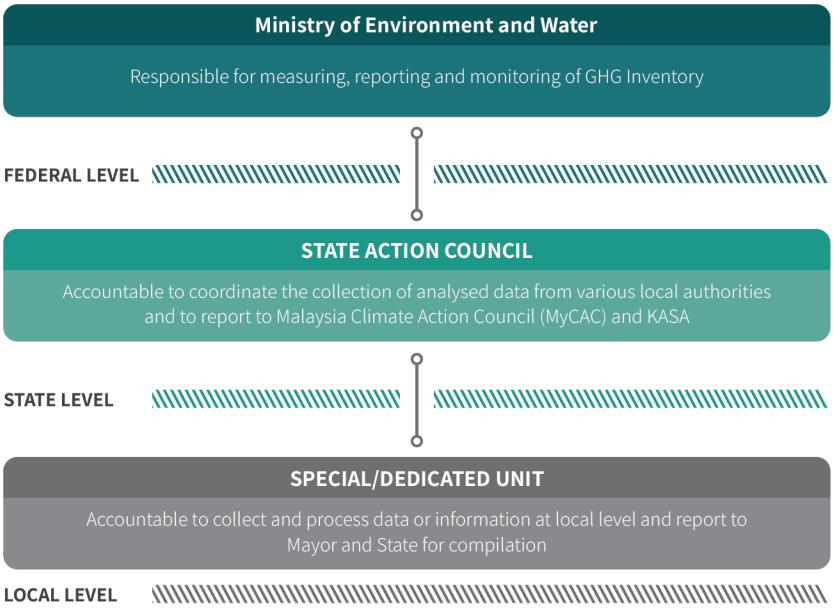
Addressing Issues

1 2 3 4

Measures to be Taken

1. Establish framework for data collection and analysis for national, state and local levels.
2. Establish clear, transparent and standardised mechanism for data sharing among agencies and departments that can be used at state and local levels.
3. State government via the State Action Council to mandate all related technical agencies (both federal and state) to share and make available data required for GHG Inventory. Data required is to be based on city or local authority's boundary (i.e. geographical boundary).
4. For local authorities under the Federal Territories, Ministry of Federal Territories to mandate all related technical agencies to share and make available data required for GHG Inventory.
5. Establish innovative ways of data sharing and collection using web or apps for faster and smoother operation.
6. Establish more innovative ways of calculating GHG inventory using simulation software and data sharing system.
7. Establish reporting mechanism of GHG inventory that go through all levels (local, state and federal).
8. Establish common data sharing platform to facilitate flow of data.
9. High level engagement with data owners such as utility providers, oil and gas companies, waste management companies and public transport companies. Data owners must share disaggregated data within the boundaries of the local authorities.

The Proposed Governance Structure in Action 2.1 and 2.2 Plays Important Role in Ensuring that Proper and Efficient Collection and Management of Data for GHG Inventory Can Be Established.



ACTION 7.2

Develop Central Online System on GHG Emission Reporting and Data Management to Be Used at All Levels

F

Champion(s)
- Ministry of Environment and Water
- Ministry of Housing and Local Government
- Ministry of Federal Territories

Supporting Agencies
- SEDA Malaysia
- PLANMalaysia
- Malaysian Green Technology and Climate Change Centre
- State Government
- Local Authorities
- Technical Agencies

KPI to Measure Progress
- Establishment of central depository of GHG Inventory

Funding Sources
- Federal

Timeline
- Short term (<3 years)

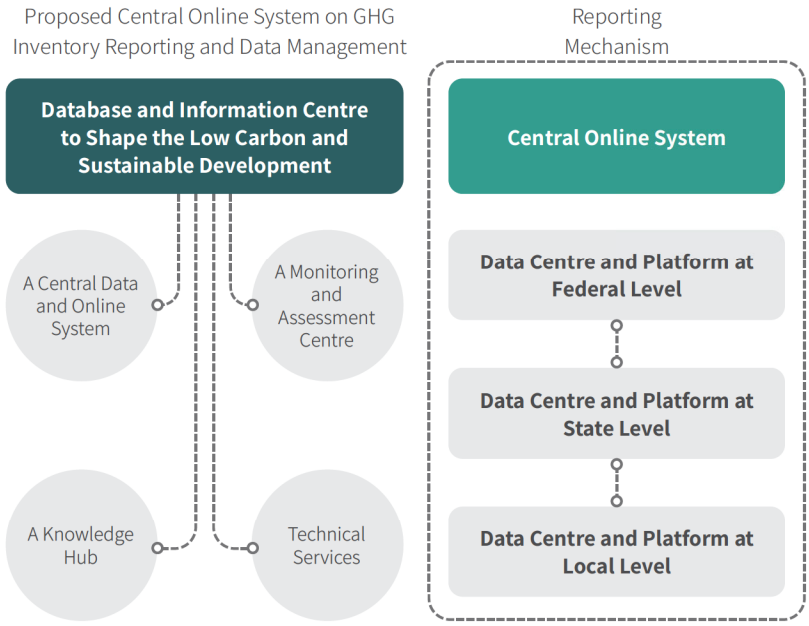
Addressing Issues

1 2 3 4

Measures to be Taken

1. Develop a standardised template to enable local authorities to perform data collection and reporting based on Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC).
2. Create a platform to allow users to access and collect information under a single window.
3. Develop a Monitoring, Reporting and Verification (MRV) tools to evaluate GHG emissions reduction for projects implemented in the cities.
4. Set up advanced and sustainable data system by integrating with various sectors, agencies and sources.
5. Set up inventory system for the collection of analysed data from various local authorities and report to technical working committee at national level.
6. Streamline the disclosure of data from technical agencies and utilities companies to promote consistency.

Level	Recommendation
Federal	Central online platform that further assist technical working committee to measure, report and monitor GHG Inventory for reporting to UNFCCC.
State	Central online platform that enables State Action Council to coordinate the collection of analysed data from various local authorities and to report to technical working committee.
Local	Central online platform that enables Special/Dedicated Unit to collect and process data/information at local level and report to Mayor and State for compilation.



KEY DIRECTION 08

Measure Low Carbon Performance

Targeted Outcome

- A common set of performance management metrics to be used for GHG inventory and evaluation.

Key Direction 8 has been developed to address the following issues :

01 The accuracy and availability of data are presently still very low.

02 Lack of data sharing among stakeholders especially at the Federal level.

03 No specific methodology or system in GHG Inventory or assessment.

04 Lack of evaluation and assessment on current status and achievement on low carbon development.

05 Need to standardize performance-based tools to measure and monitor carbon assessment.

06 Currently, there are too many redundant tools for inventory and evaluation purposes. A standard tool that align the results with the GPC reporting structure for local authorities and other stakeholders must be made available.

Key Actions :

Action 8.1 Align Performance-Based Tools to Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)

ACTION 8.1

Align Performance-Based Tools to Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)

F

Measures to be Taken

1. Promote the usage of performance-based tools for calculating GHG Inventory at local level.
2. As for Low Carbon Cities Framework and Assessment System (LCCF) :
    - Revise the existing sectoral elements in LCCF; and
    - Set up and appoint a team of experts or examiners to take lead in aligning LCCF with GPC
3. Identify sectoral breakdown in GHG emission reduction strategies at a state level.
4. Undertake research on low carbon strategies/action plans and assist in data delivery at local level.

Champion(s)
- Ministry of Environment and Water
- Ministry of Housing and Local Government
- Ministry of Federal Territories

Supporting Agencies
- SEDA Malaysia
- Malaysian Green Technology and Climate Change Centre
- PLANMalaysia
- State Government
- Local Authorities
- Technical Consultants
- Professional Bodies

KPI to Measure Progress
- Alignment to GPC
- Establishment of sectoral targets

Funding Sources
- Federal

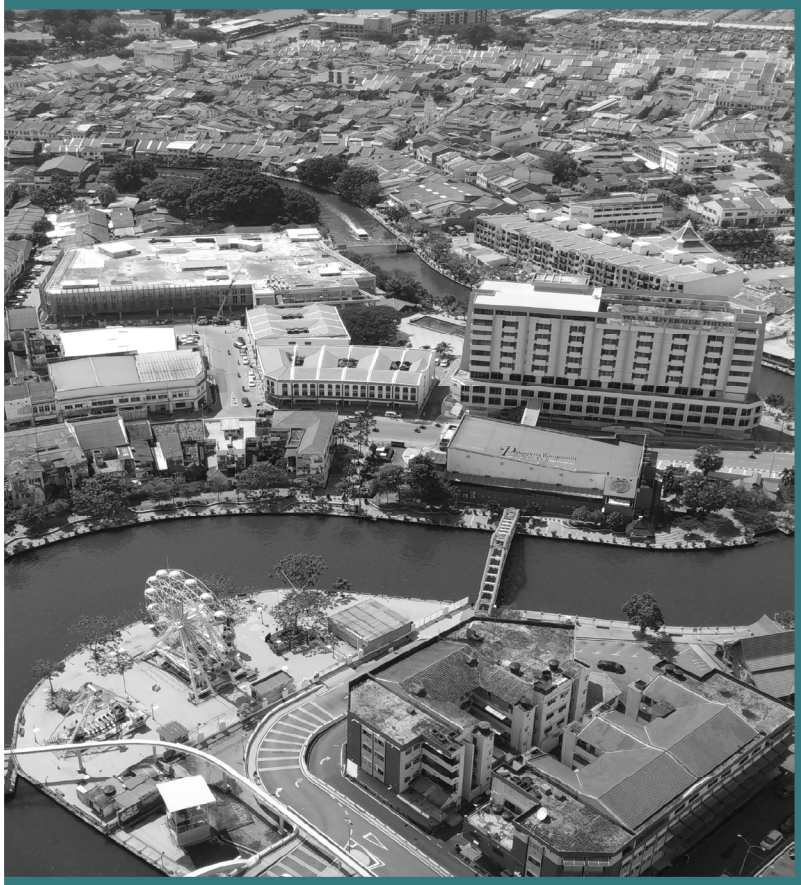
Timeline
- Short term (<3 years)

Addressing Issues

5 6

KEY ENABLER 03

Built Environment and Physical Infrastructure



KEY DIRECTION 09

Develop Citywide/Sectoral Development Strategies on Low Carbon

KEY DIRECTION 09

Develop Citywide/Sectoral Development Strategies on Low Carbon

Targeted Outcome

- A systematic and user-friendly urban development approach/guideline to help cities, townships and urban areas to reduce GHG emission.

Key Direction 9 has been developed to address the following issues :

01 Weak integration of urban planning with low carbon development strategies to reduce GHG emissions at cities and township level.

02 Weak progress in designing and integrating urban functions, facilities and resource allocation making it difficult for local authorities to address this issue during the early stages of development.

Cities are the main engine of dynamic economic growth but at the same time consume more than 60% of global energy consumption and contribute to 70% each of GHG emissions and global waste. Thus, fostering urban development in the most sustainable manner is utmost important.

As discussed in Chapter 2, four (4) focus sectors have been identified to help cities to develop mitigation measures covering all potential emission sectors at the urban level. As different cities and townships face diverse challenges, cities must prioritise their actions based on their own capabilities and targets.

Key Sectoral Actions provide guidance and aim to be translated at local development plan level (i.e. Local Plan) and in any low carbon cities action plans for better implementation and impact.

Key Sectoral Actions :

Action 9.1 Spatial Planning and Development

Action 9.2 Energy

Action 9.3 Transportation

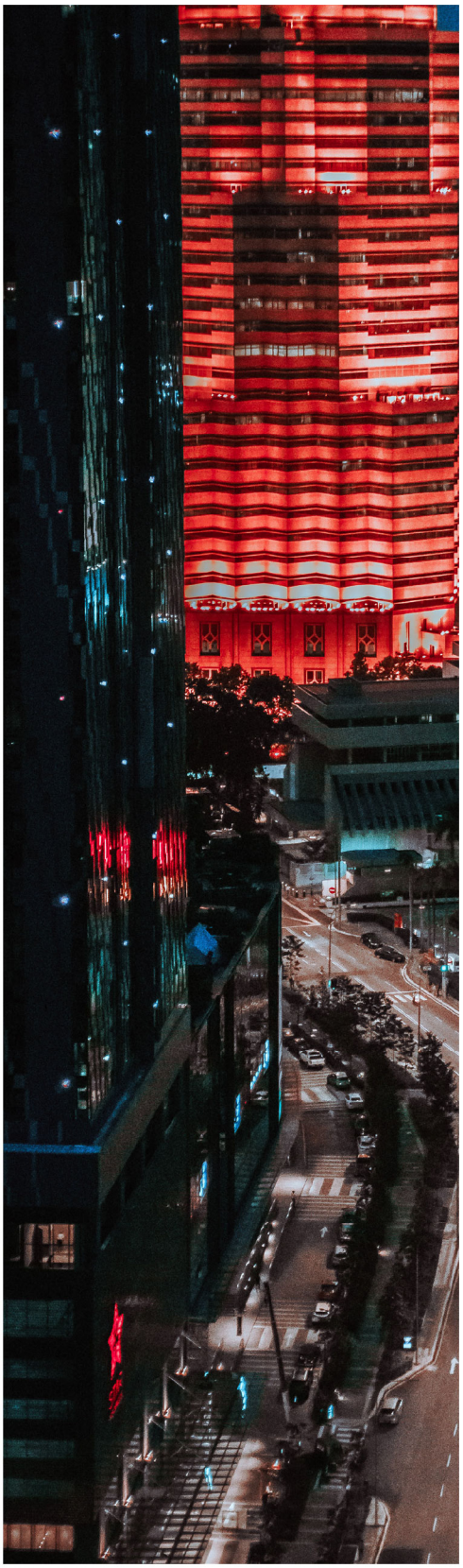
Action 9.4 Waste

ACTION 9.1

Spatial Planning and Development

No.	Approaches	Possible Interventions for the Next Five (5) Years
1	Identification of the Urban Boundary	▪ Define the urban growth boundary (UGB) through land use planning policy or any development plans to curb urban sprawl into rural areas and natural conservation areas.
2	Infill Development and Brownfield or Greyfield Redevelopment	▪ Undertake detailed study and development strategy plan for brownfield and greyfield sites in urban areas. ▪ Showcase infill and brownfield or greyfield regeneration project.
3	Urban Regeneration	▪ Promote urban regeneration within transit nodes and corridors. ▪ Promote urban regeneration at old residential, commercial and industrial areas. ▪ Establish urban regeneration policy through land use planning policy or any development plans at the municipal level.
4	Development Within Transit Nodes and Corridors	▪ Prioritise development within transit nodes and corridors. ▪ Promote TOD within transit nodes and corridors. ▪ Review land-use development and re-development policies to incorporate TOD concept.
5	Mixed-Use and Compact Development	▪ Encourage intensity of land uses via mixed-use zone in development plans. ▪ Ensure plot ratio control by limiting the floor area requirements for development types such as: commercial, industrial and mixed-use.
6	Urban Heat Island (UHI) Effect	▪ Incorporate urban form guidelines to achieve natural climate conditions in development plans. ▪ Encourage mixture of high-rise and low-rise buildings and innovative building orientation for sunlight and wind. ▪ Encourage innovative building designs incorporating features such as roof gardens and vertical gardens. ▪ Increase percentage of tree coverage and vegetation coverage. ▪ Use water-retentive pavement or other pavement materials that help to reduce heat. ▪ Develop green parking spaces to limit the impacts of urban heat island effect. ▪ Use of light-colored concrete, white roofs and green roofing.
7	Natural Assets and Biodiversity	▪ Preserve and conserve forests, wetlands and water bodies through land use planning policy or any development plans. ▪ Conduct biodiversity enrichment and conservation programme to ensure the sustainability of the forest and mangrove ecosystem. ▪ Enhance urban biodiversity through the enhancement of existing habitats and creation of new habitats.
8	Green Open Space	▪ Gazette more green open spaces. ▪ Enhance public open spaces and parks through more tree planting and better vegetation coverage. ▪ Identify the strategies to increase open spaces and parks ratio to 2 hectares per 1,000 population.

No.	Approaches	Possible Interventions for the Next Five (5) Years
9	Promote Shared Facilities and Amenities	▪ Develop planning and building guidelines to encourage multiuse of public amenities and community centre buildings. ▪ Develop planning guidelines for multiuse of public use spaces.
10	Industrial Development	▪ Regenerate old industrial areas to a better and managed industrial parks. ▪ Develop new managed industrial parks that adopts any concept relating to eco-industrial park or low carbon industrial park. ▪ Adopt clean and green technology in industrial processes
11	Number of Trees	▪ Ensure more tree planting programmes and campaigns. ▪ Increase the percentage of tree coverage in urban areas.
12	Clean and Green Technologies	▪ Adopt clean and green technology in manufacturing sectors.
13	Agriculture	▪ Increase the carbon storage capacity of soil. ▪ Restrict the use of nitrogen fertilisers. ▪ Adopt modern technologies in farming and livestock activities to reduce pollution and greenhouse gases emission.
14	Forestry and Other Land Uses	▪ Promote the use of reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks (REDD+) as a tool to combat climate change through reducing net emissions of greenhouse gases. ▪ Increase carbon stock of the forest areas through better forest management. ▪ Reduce land conversion from development.
15	Green Building Recognition	▪ Increase the number of buildings that have been certified as Green Building at municipal level.
16	Passive and Active Designs	▪ Prioritise the use of active and passive design solutions on new buildings. ▪ Adopt climate-resilient design solutions on new buildings. ▪ Use of active and passive design solutions to retrofit the old buildings.
17	Sustainable Urban Drainage System (SUDS)	▪ Demonstrate and develop SUDS to manage surface water drainage and reduce flood risk.
18	Water Harvesting	▪ Implement and enforce rainwater harvesting at the source. ▪ Encourage and provide incentives to install the rainwater harvesting system.



ACTION 9.2

Energy

No.	Approaches	Possible Interventions for the Next Five (5) Years
1	Energy Optimisation	▪ Use energy efficient method and green technology to reduce energy consumption at municipal level. ▪ Establish renewable energy policies at municipal level. ▪ Establish energy efficient policies and energy consumption reduction targets at municipal level. ▪ Introduce development of Smart Grid system at city level. ▪ Introduce Green Building requirement for all new buildings within Local Authority planning approval. ▪ Reduce energy use and adverse energy-related environmental effects by employing district cooling strategies.
2	Minimum Energy Performance Standards (MEPS)	▪ Promote energy efficient lighting through awareness programmes, enforcement of Minimum Energy Performance Standards (MEPS) and labelling.
3	Renewable Energy	▪ Encourage the use of renewable energy such as solar energy, waste to energy, biomass, wind and geothermal heat through any policies and development plans. ▪ Develop long-term plan for electricity tariff rate for higher renewable mix. ▪ Enhance cross sectoral collaboration in research and development and commercialisation to develop localised technology.
4	Energy Audits and Energy Management in Buildings and Industries	▪ Introduce matching grants where free energy audit will be provided to large and medium sized commercial buildings, industries, large Government facilities provided that the business owner is willing to invest an amount of energy saving measures equal to the cost of the energy audit.
5	Cogeneration (COGEN)*	▪ Promote COGEN in industries and commercial buildings by implementing key strategic measures to reduce barriers.
6	Energy Consumption	▪ Implement Energy Management System for buildings and certification either from SIRIM for MS ISO 50001 and AEMAS (under Malaysian Green Technology and Climate Change Centre) for Energy Management Gold Standard. ▪ Adopt energy efficient building technology to improve energy efficiency and reduce energy consumption. ▪ Encourage all large-scale commercial and government buildings to submit Energy Audit Report. ▪ Monitor the energy consumption and performance through measurement, reporting, and verification (MRV). ▪ Promote energy-efficient design of new buildings through Building Codes. ▪ Retrofit the old buildings into energy efficient buildings.

** Note: According to COGEN Europe, Cogeneration (Combined Heat and Power or CHP) is the simultaneous production of electricity and heat, both of which are used.*

ACTION 9.3

Transportation

No.	Approaches	Possible Interventions for the Next Five (5) Years
1	Development of Public Transportation Services and Networks	▪ Develop modes of public transportation services in urban area. These modes of public transportation include city buses, trams, rapid transit (MRT/LRT/Commuter/Monorail) and BRT. ▪ Provide feeder systems to/from public transport stations and stops. ▪ Expand the existing transit service coverage in urban areas. ▪ Improve public transit system accessibility and expand the coverage area in urban areas. ▪ Provide public bus services in urban areas. ▪ Increase public bus efficiency and coverage in urban areas.
2	Pedestrian and Cycling Network	▪ Identify and demarcate areas for car free zone. ▪ Provide dedicated and continuous pedestrian walkways and cycling lane in current and future developments. ▪ Formulate a walkable city/pedestrian master plan for existing cities, centres and neighbourhoods. ▪ Provide facilities for pedestrians and cyclists in urban areas. ▪ Develop a comprehensive interconnected network of pedestrian and cycling facilities in order to connect to any of the key locations within urban areas as well as to transit stations. ▪ Provide walking and cycling facilities to support access and mobility to/from public transit nodes.
3	Low Carbon and Green Vehicles	▪ Promote low carbon and environmentally friendly buses. ▪ Promote low carbon and environmentally friendly vehicles through policies and incentives provision. ▪ Provide suitable infrastructure for cleaner vehicles and fuels.



ACTION 9.4

Waste

No.	Approaches	Possible Interventions for the Next Five (5) Years
1	Recycling and Waste Separation	▪ Implement segregation at source of construction waste. ▪ Reuse and recycle some of the construction material and waste. ▪ Foster more partnerships with local NGOs to encourage the public to recycle waste and reduce waste generation. ▪ Establish waste reduction policies at municipal level. ▪ Establish municipal waste collection and recycling goals at municipal level. ▪ Establish more recycling centres at community level. ▪ Promote more awareness programmes on 3R campaign at community level. ▪ Introduce waste composting programmes at community level. ▪ Develop composting site near to supermarkets and farmers' markets to encourage composting of expired agriculture produce.
2	Waste Reduction	▪ Adopt cleaner production and green technology in industrial processes in order to reduce waste generation at industrial areas.
3	Landfill Operation	▪ Introduce policies improvement and technology upgrading in landfill operation. ▪ Establish material recovery facilities (MRF) for further segregation process of waste collection from lorries to reduce landfill contribution.
4	Resource Recovery	▪ Promote waste and resource recovery in agricultural and forestry sectors. ▪ Emphasize the efficient use of waste as a resource. ▪ Promote resource recovery from other sources of organic waste. ▪ Introduce Extended Producer Responsibility (EPR) in facilitating growth in resource recovery.
5	Waste To Energy	▪ Promote recovery of landfill gases and energy from waste. ▪ Encourage the use of waste to energy technology at municipal level.
6	Wastewater Treatment	▪ Construct recycled (non-potable) water infrastructure. ▪ Promote and utilize recycled effluent. ▪ Ensure all buildings and residential areas are properly connected to centralised sewerage treatment system.




TRADERS HOTEL
pullman

05 Implementation Plans

5.1
Timeline For Key Actions

5.2
Target Cities (Local/Regional Authorities)

5.3
Other Cities

5.4
Absolute VS Intensity Reduction

5.5
Absolute Carbon Reduction Targets

5.6
Managing Implementation

5.7
Critical Success Factors

5.1

Timeline for Key Actions

Implementation is a complex process, with responsibilities and key deliverables to be shared across three (3) levels of government (i.e. federal, state and local).

The implementation process requires the setting of objectives/targeted outcomes, assigning roles and responsibilities, building a feasible strategy and portfolio of interventions to meet the objectives/targeted outcomes as well as setting the timeline for each intervention. In the end, the success of the implementation depends greatly at the outset of robust planning.

In this masterplan, the timeline is referred to the amount of time needed to implement certain action as well as the impact that can be seen within that specific time period.

The timeline is given in accordance to the priority of project and divided into Short-Term and Medium-Long Term duration as follows:

Short Term	Medium-Long Term
Implementation and impact in less than 3 years	Implementation and impact in between 3 – 5 years

Champion(s)

- **F** Federal
- **S** State
- **L** Local
- **FS** Federal and State
- **SL** State and Local

Table 5.1 illustrates the timeline for all key actions.

Table 5.1

Timeline for Key Actions

Key Directions and Key Actions

KD1 : Streamline and Integrate Related Low Carbon Policies and Regulations

F	**Action 1.1**	Align Existing Regulations and Laws to Support Low Carbon Cities Development	**Medium-Long Term**
F	**Action 1.2**	Align National Climate Change Policy (NCCP) to Support Low Carbon Cities Development	**Medium-Long Term**
FS	**Action 1.3**	Establish Absolute Carbon Reduction Targets for Targeted Cities (2021 - 2050)	**Medium-Long Term**
FS	**Action 1.4**	Establish Policies to Enable Top Down Approach for Low Carbon Implementation at State Level	**Medium-Long Term**
FS	**Action 1.5**	Integrate Low Carbon Guidelines And Components into Existing and New Planning Development Documents	**Medium-Long Term**
F	**Action 1.6**	Promote Agriculture, Forestry and Other Land Uses (AFOLU) as Part of GHG Reduction Measures	**Medium-Long Term**
F	**Action 1.7**	Align Definition and Approach for Low Carbon Cities at All Levels	**Medium-Long Term**

KD2 : Strengthen the Institutional Framework and Implementation Mechanism at All Levels

FS	**Action 2.1**	Improve the Governance and Implementation Structure at Federal and State Levels	**Short Term**
SL	**Action 2.2**	Strengthen the Implementation Mechanism at the Ground Level	**Short Term**

KD3 : Mainstream Low Carbon Urban Planning and Development

F	**Action 3.1**	Embed Low Carbon Elements in Urban Planning and Development	**Medium-Long Term**
F	**Action 3.2**	Develop a Standard Guideline of GHG Emission Reduction Strategies for Easy and Consistent Implementation at Ground Level	**Short Term**

KD4 : Increase Community Participation in Low Carbon Development

F	**Action 4.1**	Nurture Active Participation and Awareness through an Effective Communication Plan	**Short Term**

F	**Action 4.2**	Use Education to Foster Human Behavioural Changes to Sustainable Practices	**Short Term**

KD5 : Provide Funding and Financing to Facilitate Low Carbon Development

F	**Action 5.1**	Create Specific Low Carbon Development Fund and Budget to Implement Low Carbon Programmes and Initiatives	**Short Term**
SL	**Action 5.2**	Create Alternative Funding to Finance Low Carbon Initiatives and Programmes at Local Level	**Short Term**

KD6 : Invest and Build Capacity to Act

F	**Action 6.1**	Develop and Place Dedicated Officers at State and Local Levels to Increase Productivity and Create Holistic Manpower Support System	**Short Term**
SL	**Action 6.2**	Develop and Nurture Knowledge, Expertise and Skills in Low Carbon Development Area at a State and Local Levels	**Short Term**

KD7 : Improve Low Carbon Information and Data Management

F	**Action 7.1**	Establish Proper and Efficient System of Data Collection and Management for GHG Inventory Purposes	**Short Term**
F	**Action 7.2**	Develop Central Online System on GHG Emission Reporting and Data Management to Be Used at All Levels	**Short Term**

KD8 : Measure Low Carbon Performance

F	**Action 8.1**	Align Performance-Based Tools to Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)	**Short Term**

KD9 : Develop Citywide/Sectoral Development Strategies on Low Carbon

L	**Sector 9.1**	Spatial Planning and Development	**Medium-Long Term**
L	**Sector 9.2**	Energy	**Medium-Long Term**
L	**Sector 9.3**	Transportation	**Medium-Long Term**
L	**Sector 9.4**	Waste	**Medium-Long Term**

5.2

Target Cities (Local/Regional Authorities)

Target Cities in this section are referred to the local authorities that have been selected to implement mitigation measures or initiatives to transform their cities, towns or urban areas into low carbon. A total number of 33 local/regional authorities have been selected as Target Cities. These target cities are selected based on their number of population that have exceeded 300,000 based on 2010 census data by the Department of Statistics of Malaysia. However, the rule excluded Kulai Municipal Council, Pasir Gudang City Council, Pontian District Council, Sepang Municipal Council, Hang Tuah Jaya Municipal Council and Putrajaya Corporation.

Kulai Municipal Council, Pasir Gudang City Council and Pontian District Council are part of Iskandar Malaysia. Iskandar Malaysia, Sepang Municipal Council, Hang Tuah Jaya Municipal Council and Putrajaya Corporation - which are participating cities in the Green Technology Application for the Development of Low Carbon Cities (GTALCC) Project – are included due to their advanced involvement in low carbon initiatives for the past several years.

The breakdown of the target cities are as follows :

Table 5.2

Selected Target Cities

Category	Selection	Justification
City Council	**18** out of 18	▪ All City Councils have been selected as they meet the selection criteria of having number of population exceeding 300,000 ▪ Under Ministry Of Housing & Local Government requirement, City Council must have total number of population exceeding 500,000
Municipal Council	**12** out of 36	▪ 12 local authorities have been selected based on the selection criteria – with an exception of Kulai Municipal Council, Pasir Gudang City Council, Hang Tuah Jaya Municipal Council and Sepang Municipal Council.
District Council	**1** out of 95	▪ Pontian District Council (part of Iskandar Malaysia and participating city of the GTALCC project).
Economic Region	**1** out of 5	▪ Iskandar Malaysia (participating city of the GTALCC project).
Modified Local Authority	**1** out of 5	▪ Putrajaya Corporation (participating city of the GTALCC project).
Total Number Selected	**33**	▪ *Note : The source for the population criteria is based on the number of population retrieved from Key Summary Statistics For Local Authority Areas, Malaysia, 2010.*

The selected Target Cities are grouped accordingly based on their advanced involvement in low carbon development for the past five (5) years :

Figure 5.1

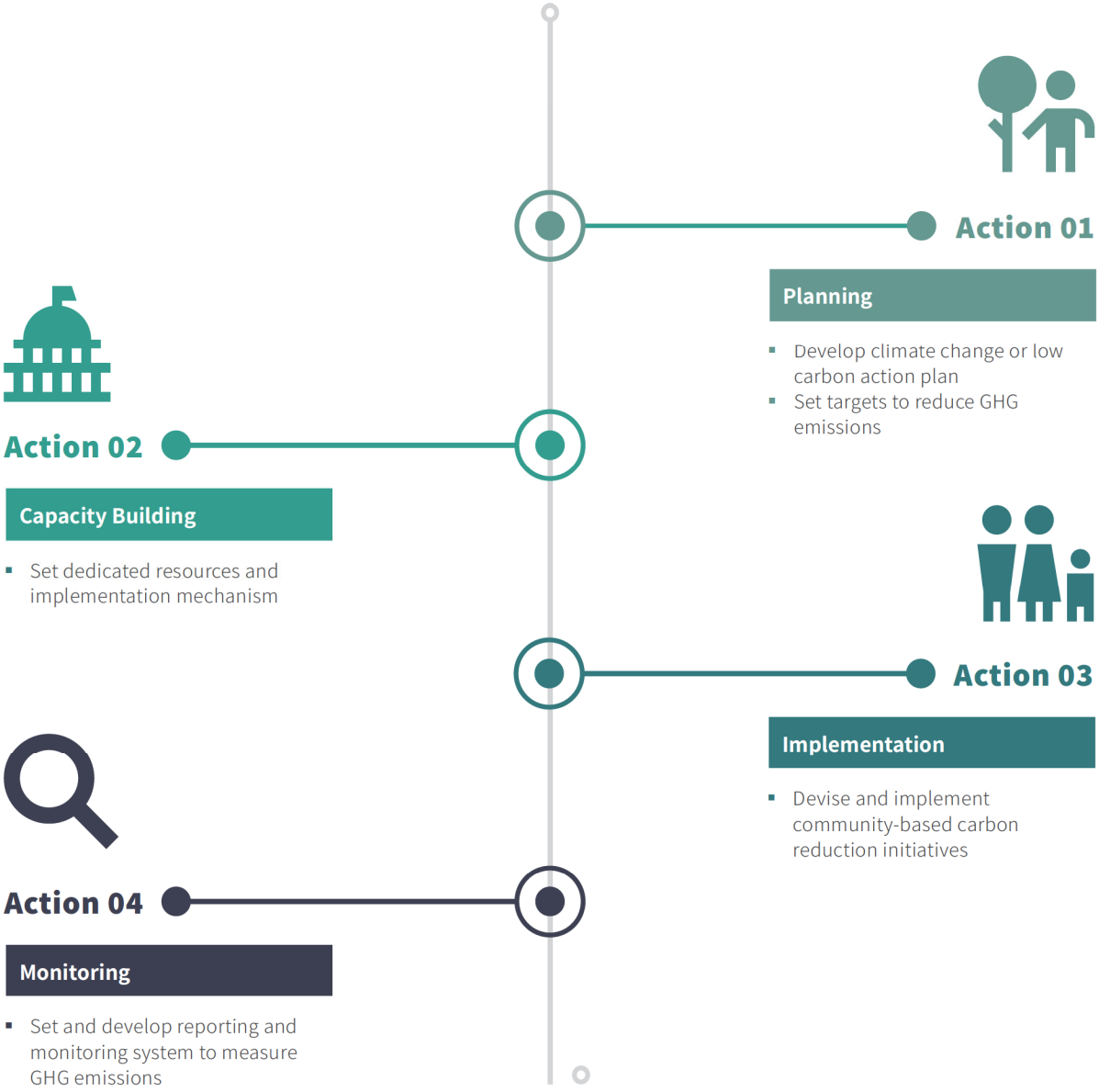
Details of the 33 Selected Target Cities

Group 1	Group 2	Group 3
1. Hang Tuah Jaya Municipal Council	1. Alor Setar City Council	1. Kota Bharu Municipal Council
2. Iskandar Malaysia	2. Ampang Jaya Municipal Council	2. Kota Kinabalu City Hall
3. Iskandar Puteri City Council	3. Ipoh City Council	3. Kuala Terengganu City Council
4. Johor Bahru City Council	4. Kajang Municipal Council	4. Kuantan City Council
5. Kuala Lumpur City Hall	5. Klang Municipal Council	5. Sandakan Municipal Council
6. Kulai Municipal Council	6. Kuching North City Hall	6. Sungai Petani Municipal Council
7. Melaka Historic City Council	7. Kuching South City Council	7. Tawau Municipal Council
8. Pasir Gudang City Council	8. Miri City Council	
9. Penang Island City Council	9. Selayang Municipal Council	
10. Petaling Jaya City Council	10. Seremban City Council	
11. Pontian District Council	11. Subang Jaya City Council	
12. Putrajaya Corporation		
13. Seberang Perai City Council		
14. Sepang Municipal Council		
15. Shah Alam City Council		



5.3 Other Cities

Cities that are not selected as the Target Cities but are keen to reduce GHG emissions through mitigation measures can employ the following actions in chartering the pathway for low carbon cities or low carbon development.



5.4

Absolute vs Intensity Reduction

There are two (2) ways to measure carbon emissions reduction – Absolute versus Intensity. Absolute reduction refers to the total quantity of greenhouse gas emissions, whereas intensity is the volume of emissions per unit GDP. Reducing emissions intensity means that less pollution is being created per unit of GDP. However, total emissions will grow parallel to GDP.

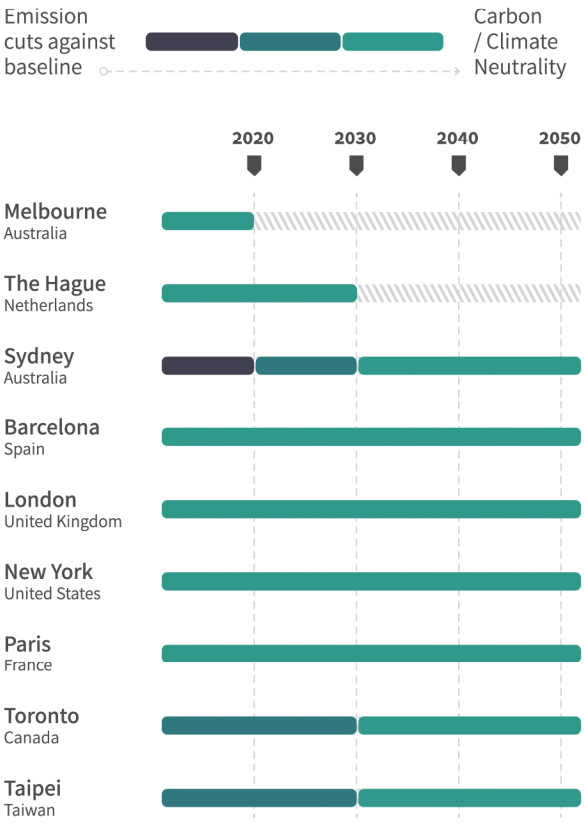
A more concrete measure of emissions reduction as it refers to the reduction of total quantity of emissions. Total emissions must decrease to tackle climate change. Hence, the most relevant measure is absolute reduction.

Developed countries, like the US and Europe, have submitted absolute emissions reduction targets reflecting their intent to reduce their total emissions. Figure 5.2 illustrated the cities that have embarked on the most rigorous absolute reduction plans to achieve carbon neutrality by year 2050.

The masterplan outlined the selected cities' absolute reduction target in the following section.

Figure 5.2

Towards Carbon Neutrality by year 2050



Note : Includes only cities with target of 50% or more cut in emissions from their respective baseline year

Source : CDP Climate A List, Bloomberg

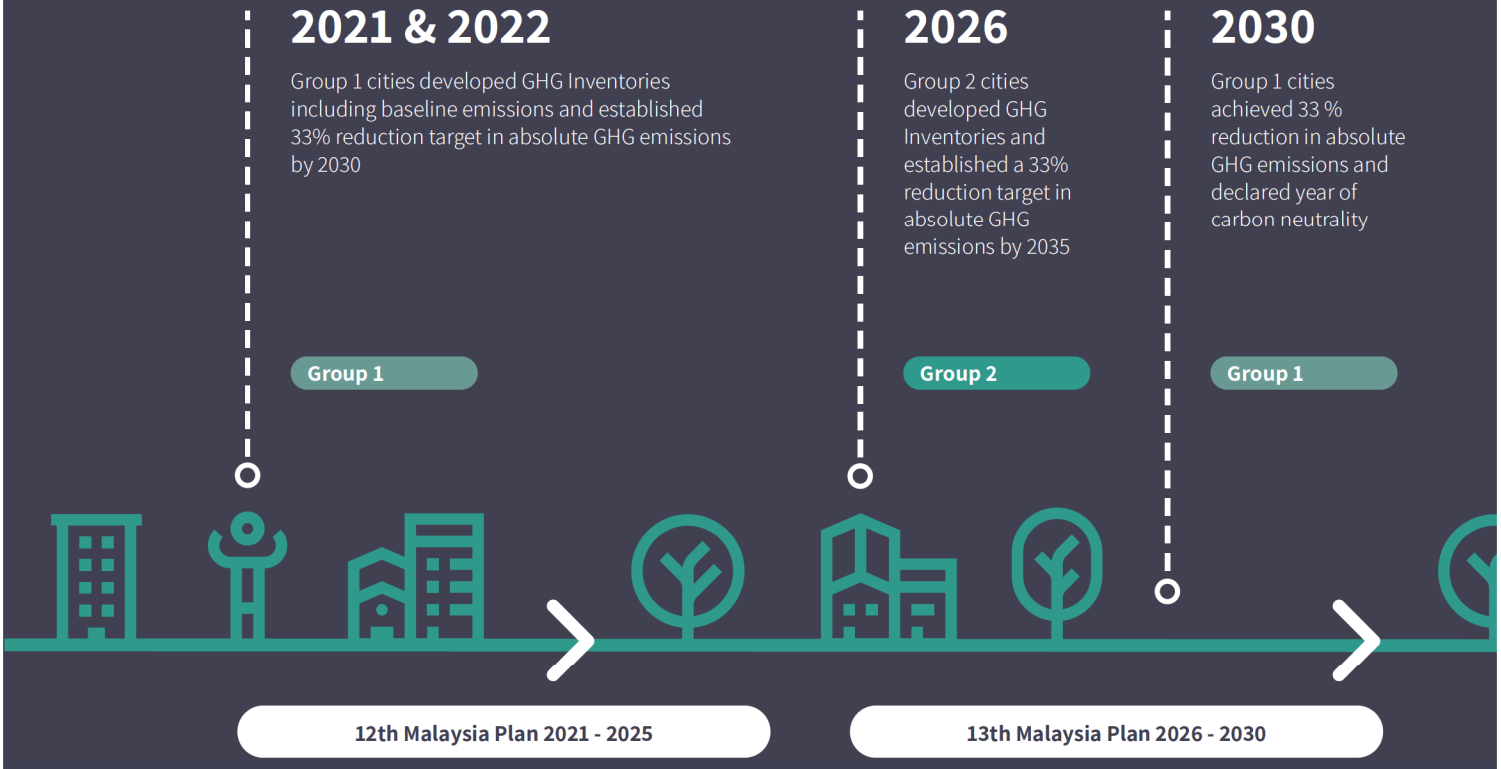
5.5

Absolute Carbon Reduction Targets

Figure 5.3 shows the proposed absolute carbon reduction targets for the 33 selected Target Cities by 2030 until 2050.

Figure 5.3

Absolute Carbon Reduction Targets for 33 Target Cities



2050

Group 1 cities achieved carbon neutrality

Group 3 cities achieved 66% reduction in absolute GHG emissions and would be carbon neutral by 2060

Group 1 | Group 3

2045

Group 2 cities achieved 66% reduction in absolute GHG emissions and would be carbon neutral by 2055

Group 2



17th Malaysia Plan 2046 - 2050

16th Malaysia Plan 2041 - 2045

2031

Group 3 cities developed GHG Inventories including baseline emissions and established 33% reduction target in absolute GHG emissions by 2040

Group 3

2035

Group 2 cities achieved 33% reduction in absolute GHG emissions and declared year of carbon neutrality

Group 2

2040

Group 1 cities achieved 66% reduction in absolute GHG emissions.

Group 3 cities achieved 33% reduction in absolute GHG emissions and declared year of carbon neutrality

Group 1 | Group 3



14th Malaysia Plan 2031 - 2035

15th Malaysia Plan 2036 - 2040

5.6

Managing Implementation

The governance structure as proposed in Action 2.1 plays an important role in ensuring that multi-level and cross sectoral participation and collaboration takes place at all levels when pursuing low carbon development efforts.

The Ministry of Environment and Water (KASA) as the secretariat for the implementation of NLCCM must be supported by a dedicated team to manage the implementation of the NLCCM at federal, state and cities level.

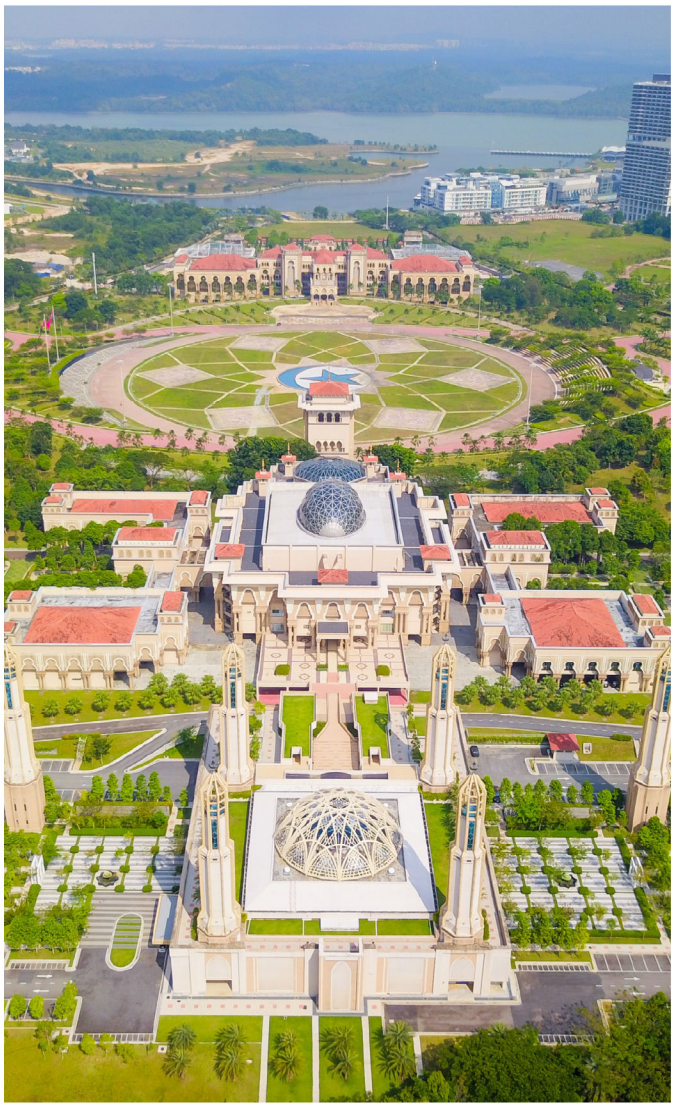
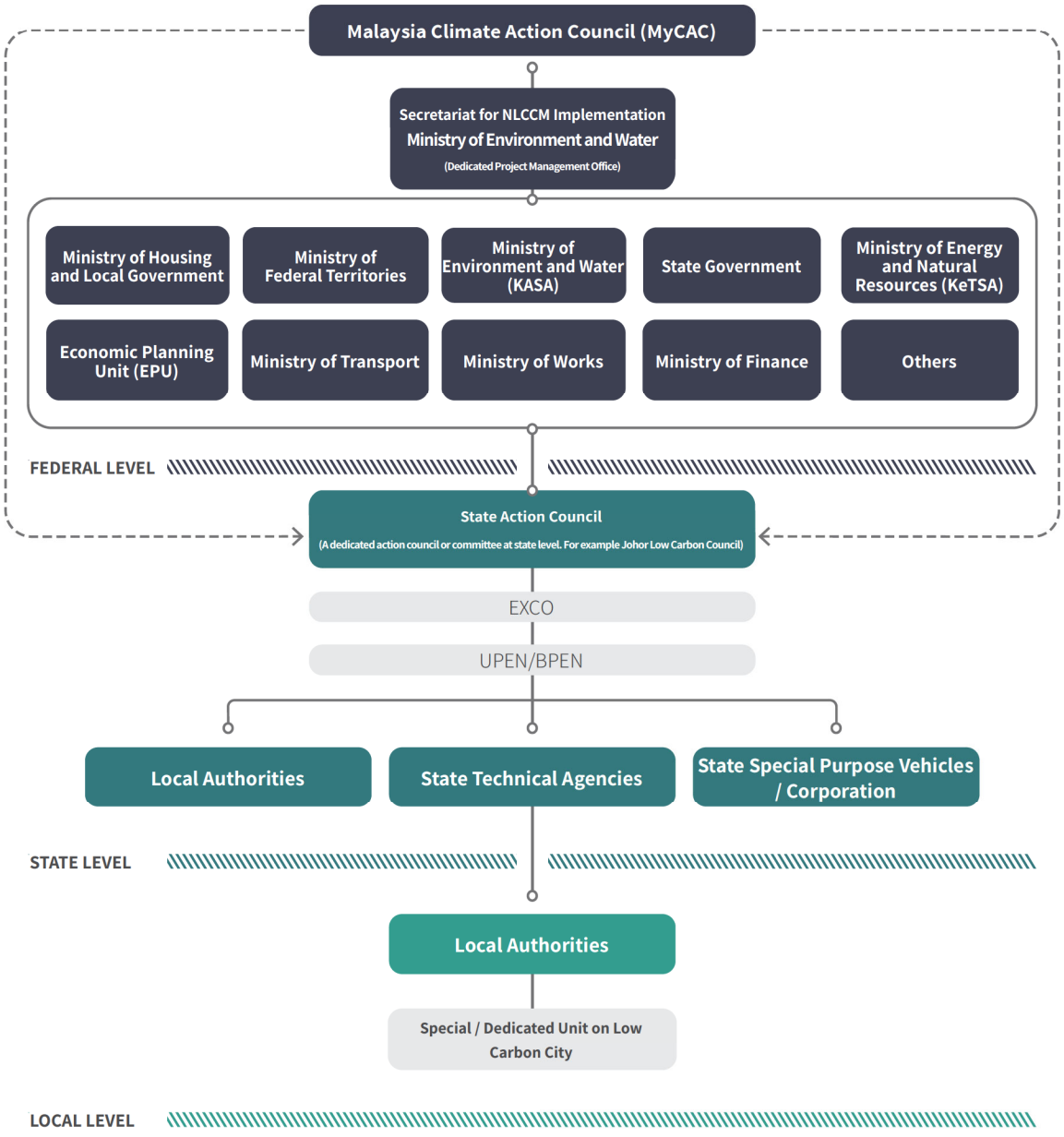


Figure 5.4

Proposed Governance Structure for the implementation of NLCCM at Federal, States and Cities (local government) Levels



5.7 Critical Success Factors

Clear Implementation Mechanism and Direction at Federal and State Levels

The establishment of National Action Council and State Action Council is vital to facilitate and monitor nationwide low carbon development and implementation.



These councils are tasked to set up policies and directions for low carbon development, provide incentives for strategic investments to promote low carbon development, and also guide implementation plans and resources for each action to ensure better deliverables and implementation of low carbon development at each stage and level.

All parties have a key role in convening government agencies, fostering partnerships with private organisations, international bodies and local community groups as well as determining resource allocation to implement actions to make cities and townships more efficient in carbon emissions reduction and performance.

Dedicated Funding and Resources Allocation in the Transition to Low Carbon Cities and Society

The allocation of dedicated funding and resources to kick-start the low carbon strategies and actions is also vital as these funding and resources will support the following :

- Setting up relevant and multi-disciplinary units and resources for low carbon implementation;
- Implementing low carbon mitigation measures and demonstration projects;
- Securing more expertise to advice and guide the technical implementation of low carbon development;



- Organizing and facilitating training opportunities related to low carbon development; and
- Implementing community engagement initiatives and awareness.

Dedicated Champions at Local Level

A special unit at local level is crucial to ensure better implementation by local authorities. This unit plays a key role as low carbon champions and are responsible for the following tasks at the local level :

- Setting up development directions of low carbon;
- Recommending incentives for strategic investments;
- Evaluating and approving strategic development framework of low carbon development;
- Ensuring the success of planning and implementation of low carbon development; and
- Leveraging networks and resources to support the implementation of low carbon.

Appendices

Appendix 1:

Comparison of National Low Carbon Cities Masterplan (NLCCM) and other low carbon city policy tools/ framework in Malaysia

The NLCCM is developed as a policy document to guide policymakers at all levels of government- federal, state and local authorities in the implementation of low carbon cities. This document is prepared to address the gaps in policies to meet the country's GHG reduction goals in mitigating climate change.

The NLCCM does not intend to replace existing policy tools used by local authorities in pursuing low carbon city goals. This document is an extension of the National Climate Change Policy established in 2009. The masterplan outlines absolute GHG reduction targets for the 33 biggest cities and regions in Malaysia in 3 different phases on implementation. The ambitious GHG reduction targets which exceeds Malaysia's GHG reduction commitment is intentional to drive more impactful GHG mitigation projects in meeting the targets.

The comparison between the NLCCM and other known low carbon cities policy framework and other reporting standards is summarised in the following table:

Low carbon cities policy tools / GHG reporting standards	Description
National Low Carbon Cities Masterplan (NLCCM)	▪ Developed for Ministry of Environment and Water in 2019 by the Green Technology Application for the Development of Low Carbon Cities (GTALCC) Project with UNDP Malaysia / Global Environment Facility (GEF) fund. ▪ The 3M Approach – Measurement, Management & Mitigation ▪ Policy support for all levels of government ▪ A hybrid document of bottom up and top down policy measures ▪ Roll-out plan in tandem with the 5-years Malaysia Plan (Rancangan Malaysia) ▪ Target: Carbon neutrality for the 33 biggest cities and regions of Malaysia by 2050 and beyond
Low Carbon Cities Framework and Assessment System (LCCF)	▪ Launched in 2011; Version 2 launched in 2017 ▪ Implemented by Malaysian Green Technology and Climate Change Center (MGTC) ▪ Consists of a framework and assessment system which allows for performance of carbon reduction measures in a city or a township ▪ MGTC introduced the LCC Challenge 2030 a programme to accelerate the transformation towards low carbon cities. The goal of the program is to establish 200 low carbon zones in state capitals and major urban areas by 2030. The LCCF document will be used as a reference in this program. Participating cities annual GHG emission reduction in energy, water, mobility and waste is assessed.
Low Carbon Society (LCS)	▪ The Low Carbon Society (LCS) blueprints of Putrajaya, Iskandar Malaysia and Kuala Lumpur incorporates a methodology using the internationally recognised Asia—Pacific Integrated Model (AIM) to project GHG emissions under various scenarios i.e. Business as Usual (BAU) and Counter Measure (CM) ▪ The term "Low Carbon Society" in the LCS blueprints is created to project the blueprints as a people-centric plan. ▪ All the LCS blueprints were developed by Universiti Teknologi Malaysia-Low Carbon Asia Research Centre (UTM-LCARC) based on a research collaboration between UTM-LCARC, Kyoto University, Okoyama University and the National Institute of Environmental Studies
Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (GPC)	▪ GHG Protocol standard developed by World Resources Institute (WRI), C40 Cities Climate Leadership Group and Local Governments for Sustainability (ICLEI) ▪ Launched in 2014 ▪ The GPC is a robust framework for accounting and reporting city-wide GI IG emissions. ▪ Local authorities and regional authority which have used GPC as a reporting standard: Majlis Bandaraya Petaling Jaya, Majlis Perbandaran Ampang Jaya, Majlis Perbandaran Hang Tuah Jaya, Dewan Bandaraya Kuala Lumpur and Iskandar Regional Development Authority (IRDA) ▪ One of the key actions in the NLCCM is to align the existing GHG reporting format to GPC

The adoption and implementation of NLCCM and the use of other policy tools can be demonstrated through the following examples:

Example 1 – Majlis Bandaraya Petaling Jaya (MBPJ)

Majlis Bandaraya Petaling Jaya (MBPJ) with the assistance of Carbon Trust developed the MBPJ Low City Action Plan 2015 – 2030. MBPJ adopted NLCMM in which their GHG reduction targets are aligned with the masterplan's targets. As a Group 1 city, MBPJ is required to update their current GHG inventory by 2022 using the GPC standard and reduce GHG emissions by 33% in 2030, 66% in 2040 and becoming carbon-neutral in 2050. MBPJ may adopt the LCCF as a guide to develop programs to reduce GHG emissions. For example, the LCCF performance criteria B 2-1: Passive and Active Designs which require implementation of energy efficiency measures in new and existing buildings. MBPJ may also participate in the LCC Challenge 2030 and get recognise for their efforts in reducing GHG emissions. reducing GHG emissions. MBPJ is also encouraged to update their GHG inventory based on the GPC accounting and reporting principles from time to time.

Example 2 – Majlis Bandaraya Pasir Gudang (MBPG)

Majlis Bandaraya Pasir Gudang (MBPG) is a local authority in the Iskandar Malaysia region whose low carbon city action blueprint is driven by the Low Carbon Society Blueprint for Iskandar Malaysia 2025. MBPG also has their own Low Carbon Society Action Plan 2025 which outlines city specific programs and policy directions to reduce GHG emissions in Pasir Gudang. MBPG and Iskandar Malaysia adopted the 3M approach as well as realigned their GHG reduction targets accordingly. If MBPG wishes to adopt the LCCF and participate in the LCC Challenge 2030, their current LCS action plan is more than adequate to fit in the LCCF requirements. MBPG is also encouraged to report their city-wide GHG emissions based on the GPC accounting and reporting principles from time to time.

Example 3 – Majlis Bandaraya Kuala Terengganu (MBKT)

Based on the NLCCM, Majlis Bandaraya Kuala Terengganu (MBKT) is part of Group 3 cities where they are required to establish a baseline of GHG emissions before 2031. MBKT will be provided with the necessary assistance to develop a low carbon city action plan based on the 3M approach in the NLCCM. MBKT may refer to LCCF or other low carbon city policy tools or framework during the development of their low carbon city action plans. They may participate in the LCC Challenge 2030 by identifying a low carbon zone within the city boundary and receive recognition for their GHG emission reduction measures. MBKT is also encouraged to report their city-wide GHG emissions based on the GPC accounting and reporting principles from time to time.

National Low Carbon Cities Masterplan
First published in year 2021

ISBN 978-967-19266-4-2