



Urban Environment

UE 1 SITE SELECTION

- 1-1 Development Within Defined Urban Footprint
- 1-2 Infill Development
- 1-3 Development Within Transit Nodes And Corridor
- 1-4 Brownfield and Greyfield Redevelopment
- 1-5 Hill Slope Development

UE 2 URBAN FORM

- 2-1 Mixed-use Development
- 2-2 Compact Development
- 2-3 Road and Parking
- 2-4 Comprehensive Pedestrian Network
- 2-5 Comprehensive Cycling Network
- 2-6 Urban Heat Island (UHI) Effect

UE 3 URBAN GREENERY AND ENVIRONMENTAL QUALITY

- 3-1 Preserve Natural Ecology, Water Body and Biodiversity
- 3-2 Green Open Space
- 3-3 Number of Trees



Urban Infrastructure

UI 1 INFRASTRUCTURE PROVISION

- 1-1 Land Take for Infrastructure and Utility Services
- 1-2 Earthwork Management
- 1-3 Urban Storm Water Management and Flood Mitigation

UI 2 WASTE

- 2-1 Construction and Industrial Waste Management
- 2-2 Household Solid Waste Management

UI 3 ENERGY

- 3-1 Energy Optimization
- 3-2 Renewable Energy
- 3-3 Site-wide District Cooling System

UI 4 WATER MANAGEMENT

- 4-1 Efficient Water Management



Urban Transport

UT 1 SHIFT OF TRANSPORT MODE

- 1-1 Single Occupancy Vehicle (SOV) Dependency

UT 2 GREEN TRANSPORT INFRASTRUCTURE

- 2-1 Public Transportation
- 2-2 Walking and Cycling

UT 3 CLEAN VEHICLES

- 3-1 Low Carbon Public Transportation
- 3-2 Low Carbon Private Transportation

UT 4 TRAFFIC MANAGEMENT

- 4-1 Vehicle Speed Management
- 4-2 Traffic Congestion and Traffic Flows Management



Building

B 1 LOW CARBON BUILDINGS

- 1-1 Operational Energy Emissions
- 1-2 Operational Water Emissions
- 1-3 Emission Abatement Through Retrofitting
- 1-4 Building Orientation

B 2 COMMUNITY SERVICES

- 2-1 Shared Facilities and Utilities Within Building

The Application of LCCF

The framework will provide the elements on which the approach will be hinged on, whereas the calculator will utilize these elements and convert them into Carbon equivalents. The two should be read in conjunction with each other. The usage of both is sequential starting with the framework.

Application of the overall framework and assessment system is a cyclical process which enables continuous monitoring and improvement to the identified carbon reduction strategies and measures planned. The implementation are undertaken until the ultimate target for zero carbon emission is achieved.

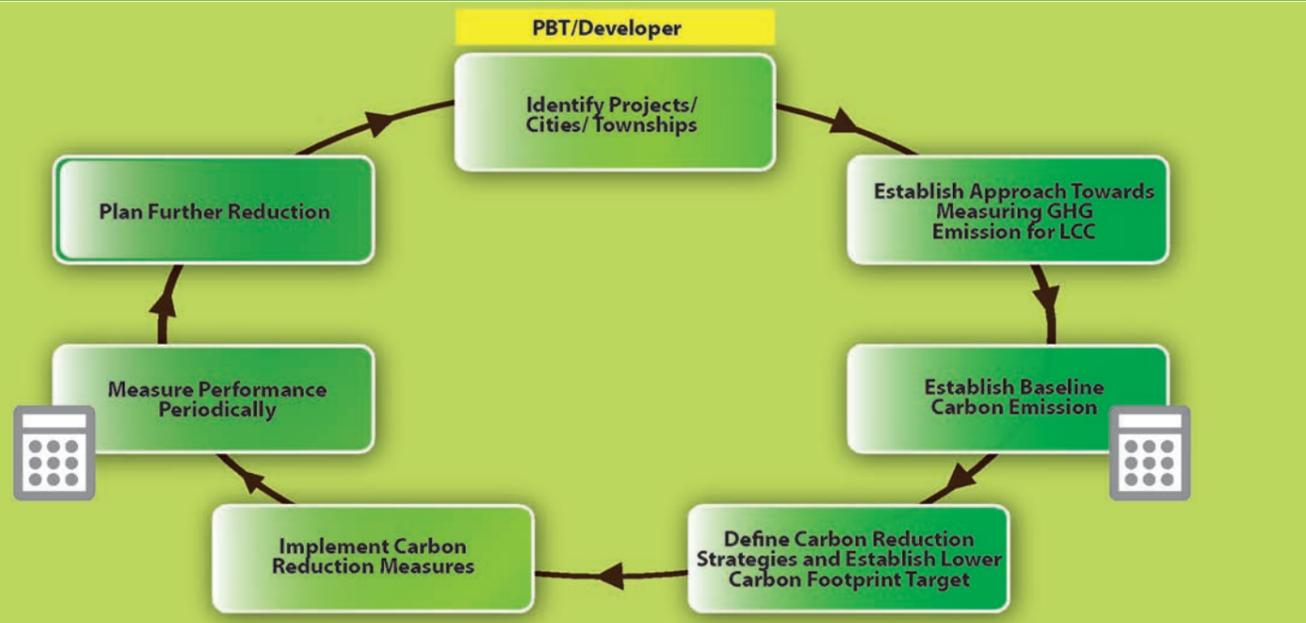
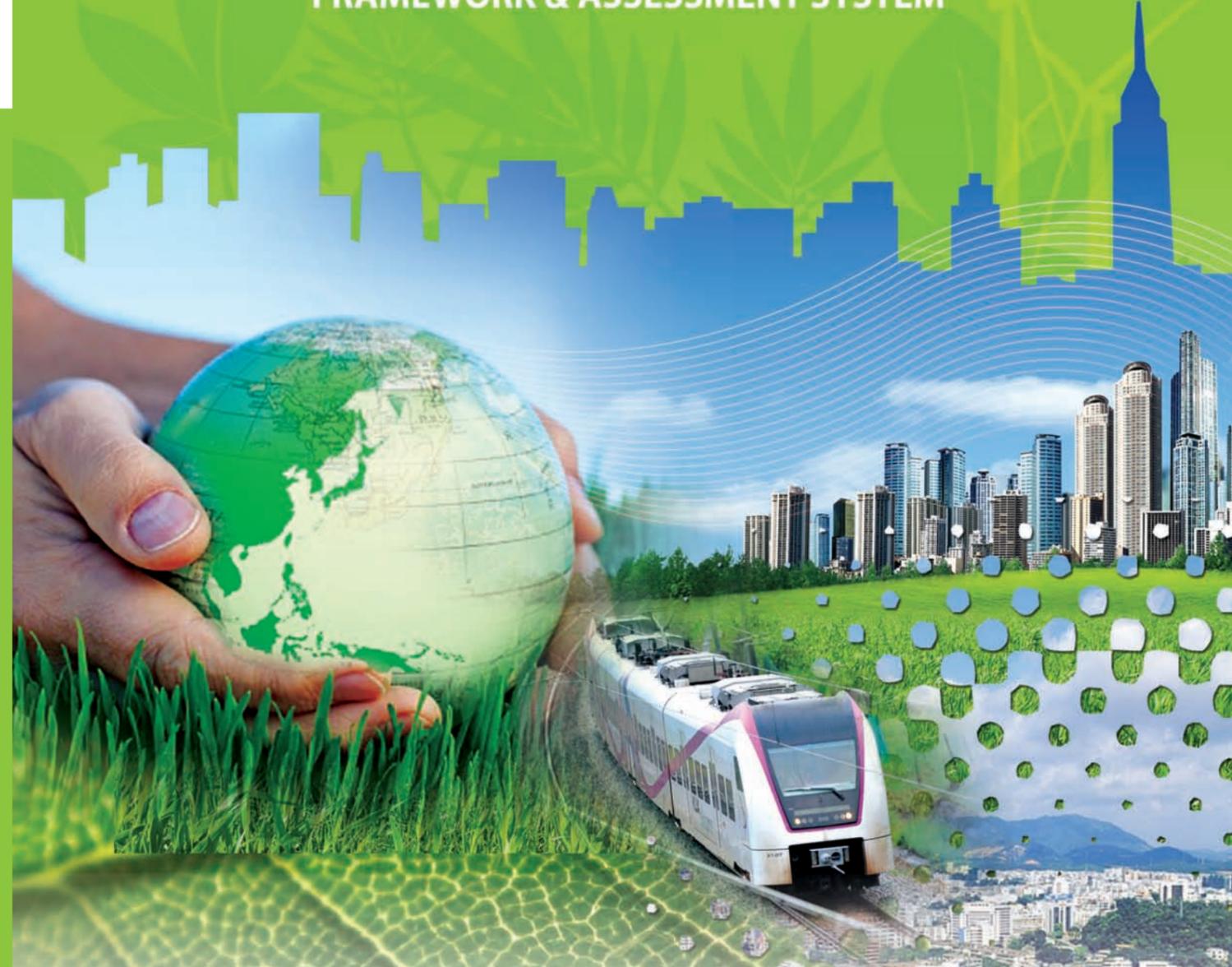


Figure 3: Flow chart for PBT/developer towards zero carbon emission

LOW CARBON CITIES

FRAMEWORK & ASSESSMENT SYSTEM



DEVELOPED BY:



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Foreword from the Prime Minister of Malaysia

It gives me great pleasure to introduce this publication known as the Low Carbon Cities Framework and Assessment System (LCCF). The Government recognizes the need and importance of achieving long term sustainability in providing conducive environment to the people. Malaysia has managed to launch several policies related to environmental protection. These policies reflect the government initiatives on sustainable growth and development that provide direction and motivation for Malaysians towards greener solutions.

Most governments of the world have recognized the need to establish and implement national sustainable development programmes that requires high participatory instruments intended to ensure socially responsible economic development, which protects our natural resources and environment. This document is a stepping stone towards achieving the government vision of seeing Putrajaya and Cyberjaya becoming pioneer green townships in Malaysia as well as towards achieving my pledge made during COP 15.

I hope all stakeholders will find this publication useful and informative as I believe that there has been some extensive research and analysis put into place for the development of this document. It must be noted that the LCCF document is one of the first framework and assessment system produced in the region that highlights exactly how cities can reduce their carbon emission levels. I hope this document will also serve as an important source for overall sustainability towards achieving a better quality of life for our "rakyat".

I would like to record my appreciation to the Ministry of Energy, Green Technology and Water and its partners in producing this beneficial document.

Thank you.

1Malaysia "People First, Performance Now"

DATU' SRI MOHD NAJIB BIN TUN HJ ABDUL RAZAK

Message from the Minister of Energy, Green Technology and Water



The Low Carbon Cities Framework and Assessment System or better known as the LCCF is a system developed by my Ministry. The purpose of this system is to assist our stakeholders such as developers, local councils, town planners, non-governmental organizations (NGO's) and the public to lower the levels of carbon emission in our cities towards achieving sustainable urban developments.

This system serves as a guide that will propel stakeholders for cities, townships and neighbourhoods to re-assess their priorities in the planning and developing of new projects, as well as strategies that can be taken by existing cities, townships and neighborhoods in reducing their carbon emission levels. Besides serving as a comprehensive guide, the LCCF also has an inbuilt carbon calculator with carbon equivalents that would help stakeholders assess their current baseline levels of the cities, townships and neighbourhood and target their intended levels.

I would like to express my deepest appreciation to the Malaysian Green Technology Corporation, Malaysian Institute of Planners (MIP), Institute Sultan Iskandar (ISI, UTM) and C2C Project Managers for their invaluable support in producing this document. I would also like to commend the editorial team involved in this publication for their dedication and hard work.

I hope the publication of this book will further enlighten all relevant stakeholders on the impending need to mitigate climate change, and the importance of responsible urban development strategies.

DATU' SRI PETER CHIN FAH KUI

Objectives

The Ministry of Energy, Green Technology and Water (KeTTHA) has formulated a document that can assist and townships lower their emissions level, which concurrently supports the Government to achieve the target of 40% carbon emission intensity reduction per GDP per capita by the year of 2020.

The objectives of the document are:

- To encourage and promote the concept of low carbon cities and townships in Malaysia;
- To increase the compatibility of cities/township with their local natural system; and
- To guide cities in making choice/decisions towards greener solutions.

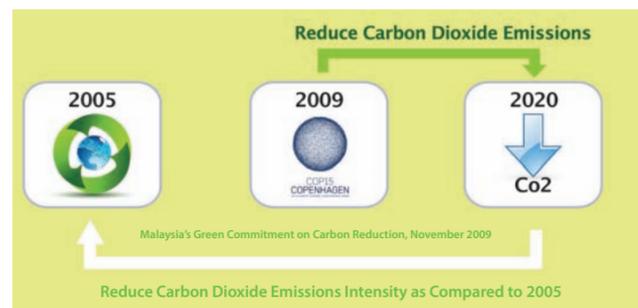


Figure 1: COP 15 Commitment by Malaysia

Definition

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

Why do We Need Low Carbon Cities (LCC)

The population in urban areas has been growing at a rate of 2.2% per annum versus the rural growth rate of 1.6%, over the period of 2000 to 2009. In 2008, the urban population in Peninsular Malaysia reached 67% of the total population, and this is expected to grow to 75% by 2020 as the nation develops.

(Sources: Census Data, 2010 & RFN 2001)



Figure 2: Contributors to Green House Gas Emission
Source: Cities and Climate Change-Global Report on Human Settlements 2011, UN-Habitat

The above numbers indicate that more and more people prefer to live in urban areas. Cities consume energy, and are also centre where environmental degradation and effects of temperature rise can also be most felt. Urban development has been widely identified to be the main contributor to global warming, contributing 50% of total green house gas emissions.

The total greenhouse gas emissions increased by 45% in 2000 when compared with the 1994 levels. Malaysia's emission of CO₂ per capita which is about 7.1 tonne/capita was higher than the average for Asia Pacific of 2.6 tonne/capita based on the National Communications Report submitted by each country to the United Nation Framework Convention on Climate Change (UNFCCC).

What is Low Carbon Cities Framework (LCCF)

A national framework and assessment system to guide and assess the development of low carbon cities and to support holistic sustainable development in Malaysia. The document is divided into two components;

1 Low Carbon Cities Framework- The framework serves as a guide to uses on pertinent areas (elements) that contributes to the reduction of GHG emission. This information would help the user identify areas in which they could target an overall carbon reduction. The framework introduce and discusses the definition of low carbon cities through the four main focus that have carbon impact.

2 Low Carbon Cities Assessment System – An in built carbon calculator will help a user determine their current baseline. The user will then apply the various strategies recommended in the framework to achieve a reduction level. The calculator will be used again to reassess the carbon emission levels to see if the user has obtained a good reduction level.



4 Main Elements of LCCF

This document is designed to contribute towards the Prime Minister's commitment at COP 15 in Copenhagen, December, 2009: conditional voluntary target to reduce carbon emission intensity of up to 40 per cent of Gross Domestic Product (GDP) compared to 2005 levels. A 'GHG reduction' approach is used in this document. The Carbon equivalent of each activity producing GHGs are focused on four elements identified. The elements are; Urban Environment, Urban Transportation, Urban Infrastructure and Building.

Assessment Approach To Encourage Implementation

User can opt to undertake a One-System Approach or a City-based Approach depending on their objective and capacity.

A ONE SYSTEM APPROACH



A One System Approach is mitigating a particular selected sector as described in the main criteria and not all the criteria in the LCCF will be considered and mitigated.

OR

A CITY BASED APPROACH



A City Based Approach is a holistic view where all criteria are considered and mitigated as stated within LCCF.

