

Webinar Normal Baharu **BANDAR RENDAH KARBON** Jadikannya Realiti! SIRI 5

Introduction to Low Carbon Cities

Nov 2020



MALAYSIAN GREEN TECHNOLOGY & CLIMATE CHANGE CENTRE (MGTC)

Sustainable Cities Division

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CHAMPIONING GREEN ECONOMY, MITIGATING CLIMATE CHANGE



www.mgtc.my

MALAYSIAN GREEN TECHNOLOGY & CLIMATE CHANGE CENTRE (MGTC)

MGTC adalah sebuah agensi kerajaan yang ditugaskan untuk menjuarai sektor ekonomi hijau dan perubahan iklim dibawah Kementerian Alam Sekitar dan Air (KASA)

Penstrukturan semula agensi bermula pada 10 Oktober 2019



**BANDAR RENDAH
KARBON**



**PENGANGKUTAN
RENDAH KARBON**



**PEMBANGUNAN
MODAL INSAN**



**KECEKAPAN
TENAGA**



**PEMBANGUNAN
INDUSTRI HIJAU**



**PROMOSI
BUDAYA HIJAU**

WHY CITIES?

ENDING CLIMATE CHANGE BEGINS IN THE CITY

Cities have the ability to change the world.

But cities are as vulnerable as they are impactful.

Climate change causes financial damage too.

Urban growth shows no sign of slowing.



FOSSIL BASED ENERGY

PRIVATE VEHICLE USE

NTUAN
HELPLINE
74947333



THE CAUSE

**WE ARE EMITTING MORE CARBON
INTO THE ATMOSPHERE THAN THE
EARTH'S NATURAL SYSTEM CAN
REGULATE.**



WASTE IN LANDFILLS

MASS DEFORESTATION





Drought in Ayer Hitam, Perlis @ 2016



Floods in Georgetown, Penang @ 2017

IMPACT OF CLIMATE CHANGE TO MALAYSIA

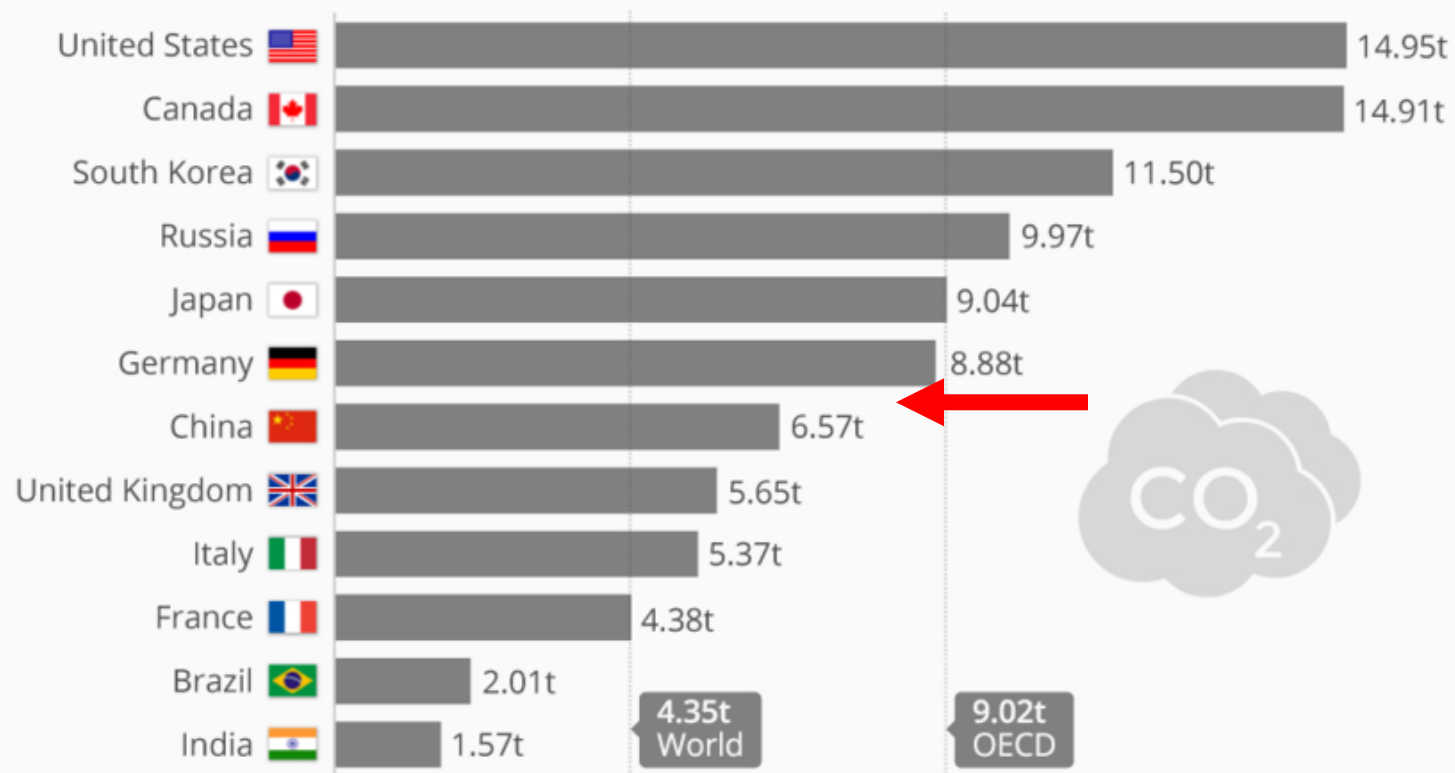
- FOOD SECURITY
- HEALTH IMPACT
- COASTAL SAFETY
- COST OF BUSINESS
- EXTREME WEATHER EVENTS

OUR CONTRIBUTION

Source: [World Bank](#)

The Global Disparity in Carbon Footprints

Per capita CO₂ emissions in the world's largest economies in 2016* (in metric tons)



ASEAN EMISSIONS PER CAPITA 2014 (tCO₂/capita)

BRUNEI	22.12
SINGAPORE	10.31
MALAYSIA	8.03
THAILAND	4.62
INDONESIA	1.82
VIETNAM	1.80
PHILIPPINES	1.06
CAMBODIA	0.44
MYANMAR	0.42
LAOS	0.3

MALAYSIA IS RANKED 44TH IN THE WORLD IN PER CAPITA EMISSIONS.



@StatistaCharts

* countries chosen based on 2017 nominal GDP

Sources: International Energy Agency, International Monetary Fund

statista

OUR CONTRIBUTION

EACH OF US
EMIT

EIGHT (8)

OF THESE 10m
DIAMETER
BALLS OF
CARBON
EMISSIONS
EVERY YEAR.

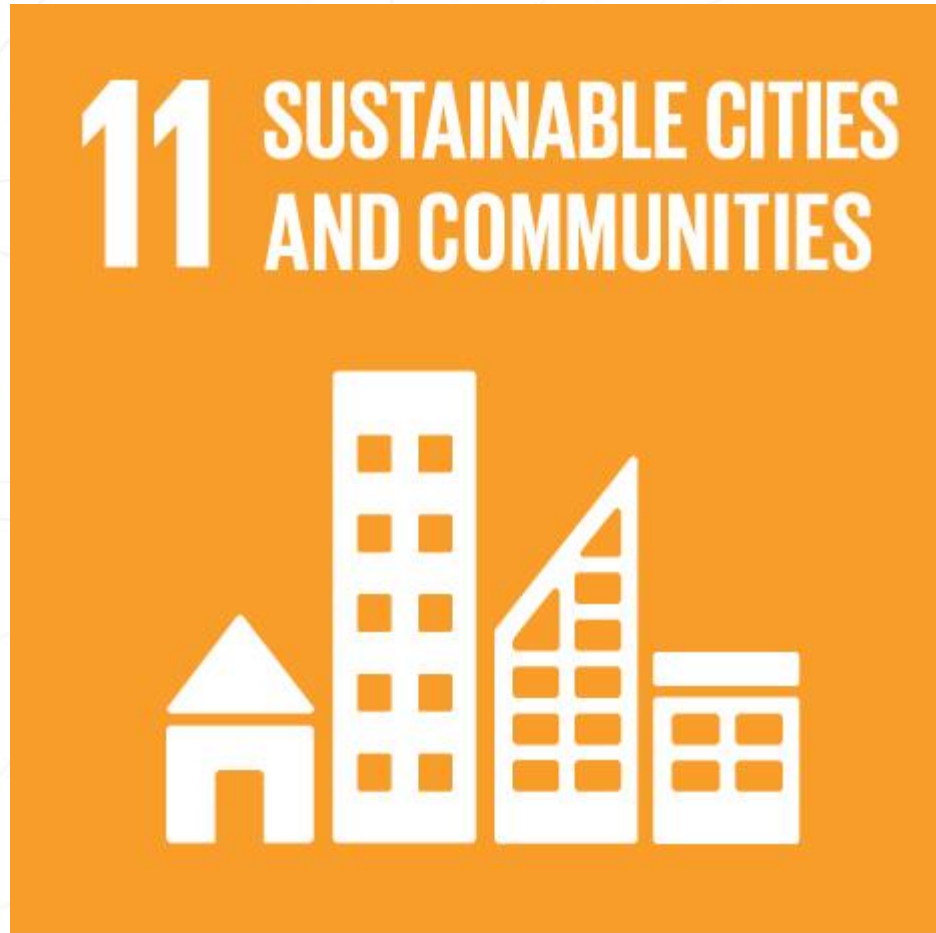




THE DRIVERS OF A LOW CARBON CITY



Goal 11: Sustainable Cities and Communities

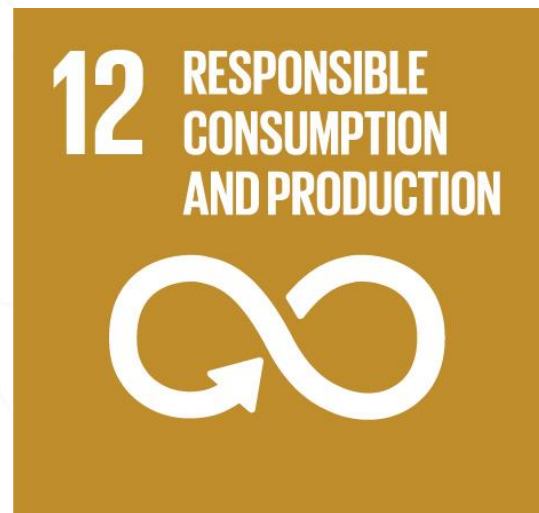


MAKE CITIES AND HUMAN SETTLEMENTS **INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE**

“More than half of the world’s inhabitants live in cities and this migration trend is expected to continue. By 2050 more than two-thirds of the world will be urban dwellers”.

– Kristie Daniel

Other Goals Related



- With the rapid development that Malaysia is undergoing, the need to adopt low carbon cities is becoming increasingly crucial to ensure sustainable economic growth
- Cities are currently projected to contribute 70 percent of the global greenhouse gas emissions.

Goal 13: Climate Action

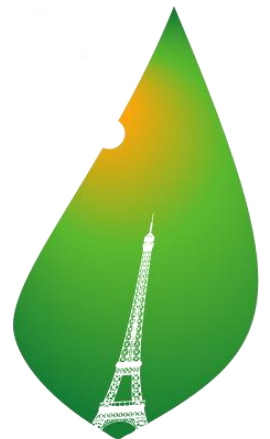
13 CLIMATE ACTION



Take urgent action to combat climate change and its impacts

*Holding the increase in the global average temperature to **well below 2 °C** and as close to **1.5 °C** as possible*

*Currently we are at **1 Degree C** compared to pre-industrial levels*



PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

What we need to do?

Global net emissions of CO2 would need to fall **by 45%** from 2010 levels **by 2030** and reach “**net zero**” around **2050** in order to keep the warming around **1.5 Degree Celcius**



Source: CNN

Climate change report issues dire new warning 01:51

(CNN) — Governments around the world must take "rapid, far-reaching and unprecedented changes in all aspects of society" to avoid disastrous levels of global warming, says a

Technically possible, but need widespread changes in energy, industry, buildings, transportation & cities

Significant **life style** changes is required

GOALS

Year 2030

Global net emission (absolute) of CO2 need to fall by 45% from 2010 levels

Year 2050

Net zero carbon emission must be achieved

Need to act now!

1.5 Degree Celsius Earth

Currently we are at **1 Degree C** compared to pre-industrial levels

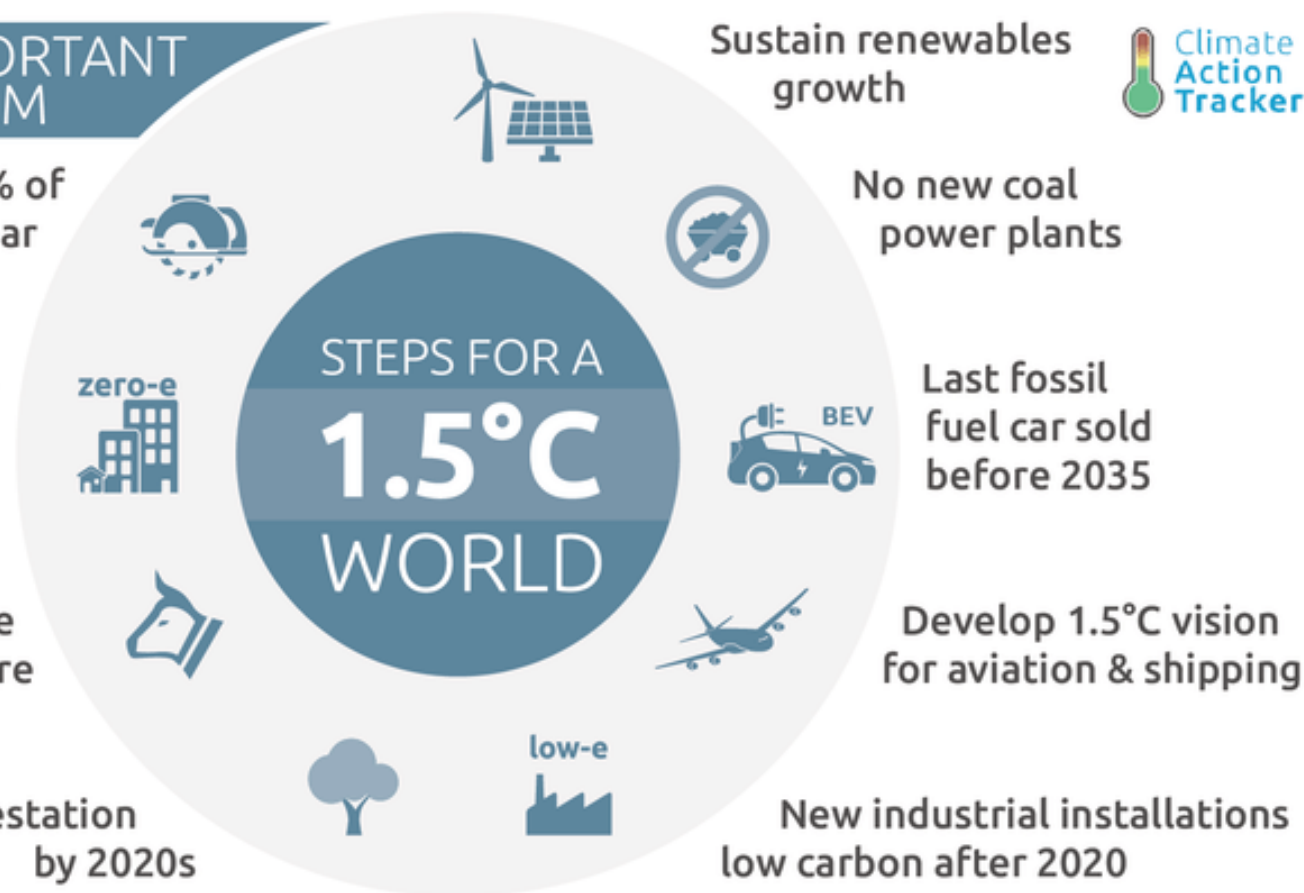
MOST IMPORTANT SHORT TERM

Renovate 3–5% of buildings per year

New buildings zero emissions from 2020

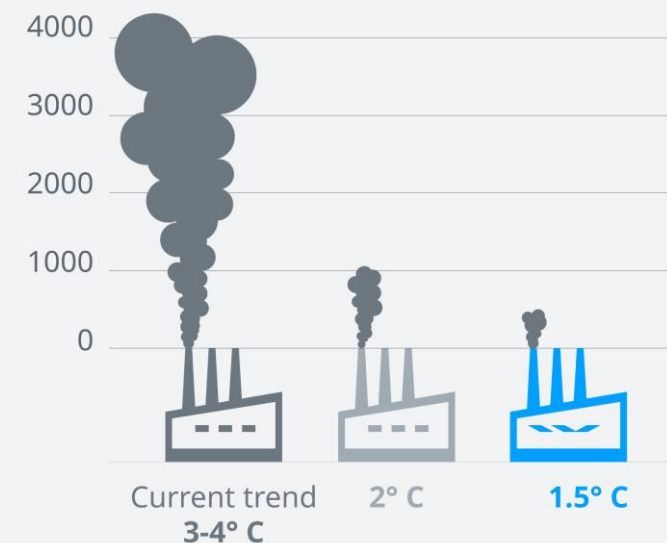
Best practice in agriculture

Zero deforestation by 2020s



1.5 degrees: How much carbon can we emit by 2100?

In gigatons of CO₂ equivalents



Source: PIK | Status at 10/2018

©DW

www.climateactiontracker.org



CLIMATE RISKS: 1.5°C VS 2°C GLOBAL WARMING

EXTREME WEATHER

100% increase in flood risk. vs **170%** increase in flood risk.

SPECIES

6% of insects, **8%** of plants and **4%** of vertebrates will be affected. vs

18% of insects, **16%** of plants and **8%** of vertebrates will be affected.

WATER AVAILABILITY

350 million urban residents exposed to severe drought by 2100. vs

410 million urban residents exposed to severe drought by 2100.

ARCTIC SEA ICE

Ice-free summers in the Arctic at least once **every 100 years.** vs

Ice-free summers in the Arctic at least once **every 10 years.**

PEOPLE

9% of the world's population (700 million people) will be exposed to extreme heat waves at least once every 20 years. vs

28% of the world's population (2 billion people) will be exposed to extreme heat waves at least once every 20 years.

SEA-LEVEL RISE

46 million people impacted by sea-level rise of 48cm by 2100. vs

49 million people impacted by sea-level rise of 56cm by 2100.

OCEANS

Lower risks to marine biodiversity, ecosystems and their ecological functions and services at 1.5°C compared to 2°C.

CORAL BLEACHING

70% of world's coral reefs are lost by 2100. vs

Virtually **all coral reefs are lost** by 2100.

COSTS

Lower economic growth at 2°C than at 1.5°C for many countries, particularly low-income countries.

FOOD

Every half degree warming will consistently lead to lower yields and lower nutritional content in tropical regions.

HOW DOES THE LOW CARBON CITY LOOKS LIKE?



Renewable Energy for
decentralise energy
generation



Solar Township/
Buildings



Energy Efficient/
Low Carbon Buildings



Energy & Water
consumption reduction



Reduction of
Municipal Waste



Transit Oriented
Development – reachable
by walking and cycling



Lesser/ negligible
traffic congestion



Electric Vehicles/
Energy Efficient
Vehicles



Urban Environment



Urban Transportation



Urban Infrastructure



Building



Efficient & Effective
Mass Public
Transport



More Green Spaces &
Green Connectors



Plant more high
sequestration trees



Low carbon
emission



Improve standard
of living



Government effort is visible
& motivates people to
value the Environment



Malaysia's
Inspiration



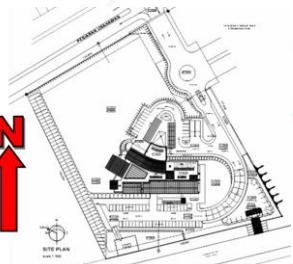
Catalyst of Change and
Inspiration to other
cities and communities

Positioning Malaysia in the forefront of low carbon cities development



ENERGY EFFICIENCY & RENEWABLE ENERGY

5 - 45% Reduction in Consumption



Passive Design

North-South building orientation and carefully designed building envelope (roof, walls, windows and floors) to minimize unwanted heat gain and use of daylight



Energy Efficient Fixtures & Appliances

Energy efficient lighting such as LED paired with sensors can optimise energy use.



Solar PV

Rooftop solar, self consumption



LED Street Lighting



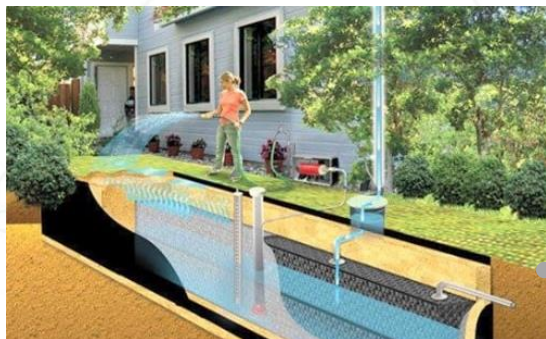
Air Conditioning & Mechanical Ventilation (ACMV)

Optimise, retrofit or overhaul the air conditioning system.



WATER EFFICIENCY

10 - 60% Reduction in Consumption

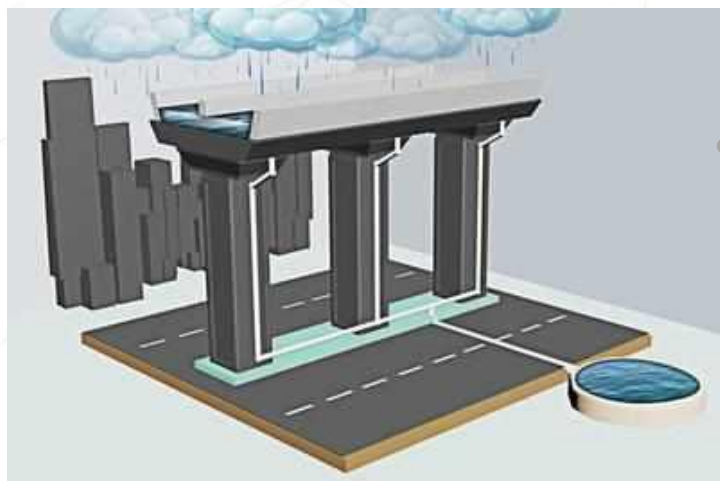


Rainwater Harvesting - Home

Reduce consumption of treated water for outdoor and non-human use.



Greywater Recycling for Industrial Use



Rainwater Harvesting - City

Using existing infrastructure to capture rainwater that can be used by the city for outdoor cleaning or landscape watering.



Water Efficient Fittings for Households & Industry



WASTE AS A RESOURCE

80 - 90% Waste Diverted from Landfill



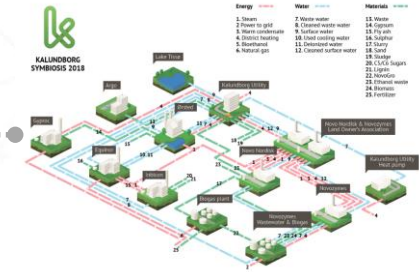
3R

Products that reduce waste generation in the first place and if the product has served its primary purpose, it can be reused for another purpose and if it really needs to be thrown, it can be recycled.



Food Waste for Compost or Biogas

Targeted food waste from specific industry such as F&B or Food Processing industry that can be turned into compost or generate biogas for energy.



Industrial Symbiosis



Micro Waste to Energy

Local solutions for cities or industries



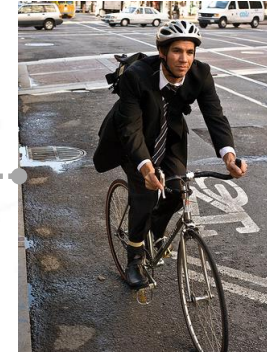
Material Recovery Facility

These MRF Centres can recover valuable resources that can be used as a raw material for industry.



LOW CARBON MOBILITY

30 - 50% Reduced Air Pollution



Cycling Lanes & Facilities
Dedicated cycling lanes in cities and supporting facilities in buildings.



Mobility as a Service (MaaS)
Consumer buys in mobility, instead of investing in transport equipment (private ownership).

EV Bus, Trucks, Vans
Providing first mile and last mile connectivity within the city. Low carbon freight for logistics and goods



EV Fleet
Electric vehicle fleet for company operations and management.



EV Charging Stations
Public and private electric vehicle charging infrastructure.



Bus Rapid Transit (BRT)
Providing comprehensive intracity mobility for the mass.



URBAN GREENERY

25 - 50 % Green Space



Green Roof

Planting of trees and rooftop gardens on top of buildings.



Urban Farming

Creating hyper local farms that can directly serves its immediate community.



Urban Forest

Planting of trees with extensive tree cover in and around the city. Tree cover can also help reduce the urban heat island effect in the city.



Pocket Parks

Pocket parks can be developed within the city on abandoned land or pieces that are too small for development.



LOW CARBON CITIES FRAMEWORK
& ASSESSMENT SYSTEM

LOW CARBON CITIES FRAMEWORK (LCCF)

Since 2011

2011-2015

LCCF :: WHAT IT IS ALL ABOUT?

TO GUIDE STAKEHOLDERS TO LEAD BY EXAMPLE & IMPLEMENT LOW CARBON CITIES EFFORT

All cities in
Malaysia:
Municipalities,
Developers,
Universities

LCCF

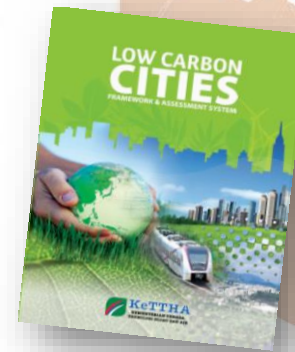


TARGET: To reduce
carbon emission
intensity by **45% per
GDP per capita by
the year of 2030**

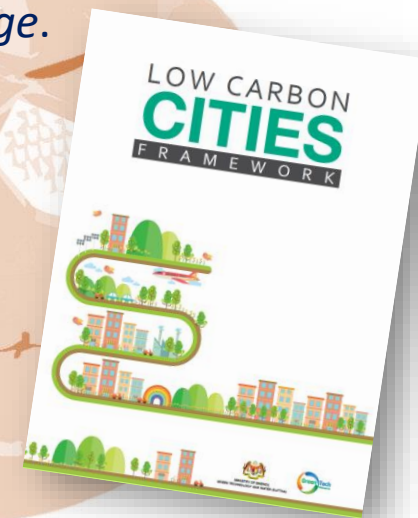
Low Carbon Cities - a city that
comprises of societies
that consume sustainable green
technology, green practices and emit
relatively low carbon or GHG as
compared with present day practice to
avoid the adverse impacts on climate
change.

OBJECTIVE

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



LCCF Version 1 launched :
8 September 2011



LCCF Version 2 released
October 2017

* Performance Criteria are **measurable strategies** to **reduce carbon emission** through:-

Policy control, technological development, better process & product management, change in procurement system, carbon capture, consumption strategies & others.

Urban Environment

UE

- Site Selection
- Urban Form
- Urban Greenery & Environmental Quality



Buildings

B

- Sustainable Energy Management System
- Low Carbon Buildings



LOW CARBON CITIES FRAMEWORK (LCCF)

UI

- Infrastructure Provision
- Waste
- Energy
- Water Management



Urban Infrastructure

UT

- Reduction Use of Private Motorised Transport on Urban Road
- Increase in Public Transport
- Mode Shift from Private to Public Transport and Non-Motorised Transport
- Use of Low Carbon Transport
- Improvement to Level of Service of Road Links and Junctions
- Utilisation of Transit-Oriented-Development (TOD) Approach



Urban Transportation

41 LOW CARBON CITIES PERFORMANCE CRITERIA

URBAN ENVIRONMENT

- Development within defined urban footprint : 1-1
- Infill development : 1-2
- Development projects within transit nodes and corridor : 1-3
- Brownfield and Grey field redevelopment : 1-4
- Hill slope development : 1-5
- Mixed-use development : 2-1
- Compact development : 2-2
- Road and parking : 2-3
- Comprehensive pedestrian network : 2-4
- Comprehensive cycling network : 2-5
- Urban Heat Island (UHI) effects : 2-6
- Preserve natural ecology, water body and bio-diversity : 3-1
- Green open space : 3-2
- Number of trees : 3-3

URBAN INFRASTRUCTURE

- Land take for infrastructure and utility services : 1-1
- Earthworks management : 1-2
- Urban storm water management : 1-3
- Construction waste management : 2-1
- Industrial waste management : 2-2
- Household solid waste management : 2-3
- Energy consumption : 3-1
- Renewable Energy : 3-2
- Site wide district cooling system : 3-3
- Efficient Water Management : 4-1

ENERGY

MOBILITY

WATER

WASTE

GREENERY

5 Direct
Measured
Elements
(Under
LCC2030
Challenge)

URBAN TRANSPORTATION

- 1-1: Classified Traffic Volume Urban Road Network
- 1-2: Vehicle-km of Travel by Modes
- 2-1: Public Transport Ridership
- 2-2: Public Transport System Improvement and Coverage
- 3-1: Modal Share of Private, Public, and Non-Motorised Transport
- 4-1: Use of More Fuel-Efficient Vehicles for Passenger Vehicles and Green Freight Transport
- 4-2: Number of Charging Stations
- 5-1: Performance of Road Links and Junctions
- 5-2: Average Link Speeds and Journey Speeds
- 6-1: New Development and Redevelopment Schemes Incorporating TOD Concept
- 6-2: Walking and Cycling Facilities to Support Access and Mobility to/from Public Transit Nodes

BUILDING

- 1-1: Active and passive designs
- 1-2: Operational energy consumptions
- 1-3: Operational water consumptions
- 1-4: Preserve existing building stock by retrofitting
- 2-1: Energy management system
- 2-2: Facility management



LOW CARBON CITIES 2030 CHALLENGE

An implementation programme under the Low Carbon Cities Framework (LCCF) launched by the Federal Government on 23 July 2019. Using LCCF as the main reference document.

LCC2030 CHALLENGE DRIVING FORCE

DRIVER 1

Malaysia's commitment to reduce GHG emissions intensity by 45% by 2030.



KOMITMEN MALAYSIA TERHADAP THE PARIS AGREEMENT

“Malaysia berhasrat untuk mengurangkan intensiti pelepasan *greenhouse gases* berdasarkan GDP sebanyak 45% berbanding intensiti pelepasan pada tahun 2005 menjelang tahun 2030. Daripada keseluruhan sasaran penurunan ini, 35% akan dilaksanakan tanpa syarat (unconditional) manakala baki 10% lagi adalah bersyarat (conditional), iaitu tertakluk kepada penerimaan peruntukan kewangan, pemindahan teknologi, dan pembangunan kapasiti daripada negara maju.”

YB YEO BEE YIN
Sidang Dewan Rakyat, Mesyuarat Pertama,
Penggai Pertama, Parlimen Keempat Belas
31 Julai 2018

12 Disember 2015
195 negara telah bersetuju Paris Agreement semasa Persidangan ke-21 Konvensyen Rangka Kerja Perubahan Iklim Pertubuhan Bangsa-Bangsa Bersatu (UNFCCC)

22 April 2016
Malaysia menandatangani Paris Agreement

16 November 2016
Malaysia meratifikasi Paris Agreement

KOMITMEN KERAJAAN
1. Malaysia akan **menubuhkan** Majlis Kebangsaan Adaptasi dan Mitigasi Perubahan Iklim
Janji 3R, Buku Harapan

KOMITMEN MESTECC
1. **Membangunkan** Pelan Tindakan Strategik Adaptasi dan Mitigasi Perubahan Iklim Malaysia
2. **Membangunkan** dasar dan insentif bagi **menggalakkan** pembangunan industri hijau

www.mestecc.gov.my | [f](#) | [@mestecc](#) | [@MyMestecc](#)

DRIVER 2

To limit global warming to 1.5°C, we have to reduce GHG emissions by 45% by 2030.



ipcc
INTERGOVERNMENTAL PANEL ON climate change

WMO UNEP

Global Warming of 1.5°C

An IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.

LCC 2030 CHALLENGE MOTIVATION

Low carbon cities have multiple direct and indirect benefits to the residents, businesses and the city.

4 key benefits are:

CLEANER

- Cleaner air from **reduced pollution** from fossil fuel vehicles
- Cleaner environment from the **reduction in waste** that goes to the landfills

COOLER

- Cooler city from **increase in greenery** and tree cover
- Cooler city from **reduced urban heat island effect**
- Cooler buildings and homes from **green buildings**

HEALTHIER

- Healthier environment from **reduced air pollution and contamination**
- Healthier residents from increased **outdoor activity in cycling and walking**

CHEAPER

- Cheaper **operating cost for electricity and water** from efficiency measures
- **Reduced wastage** from more efficient and productive use of resources

GOAL: 200 LOW CARBON ZONES & 1,000 LOW CARBON PARTNERS

ABOUT LCC2030 CHALLENGE



WHAT

Accelerate the Transformation Towards Low Carbon Cities

WHY

Cities are responsible for up to 70% of GHG emissions

HOW

Establish Low Carbon Zones in State Capitals & Major Urban Areas

WHO

Local Authorities, Universities, Economic Zones, Companies

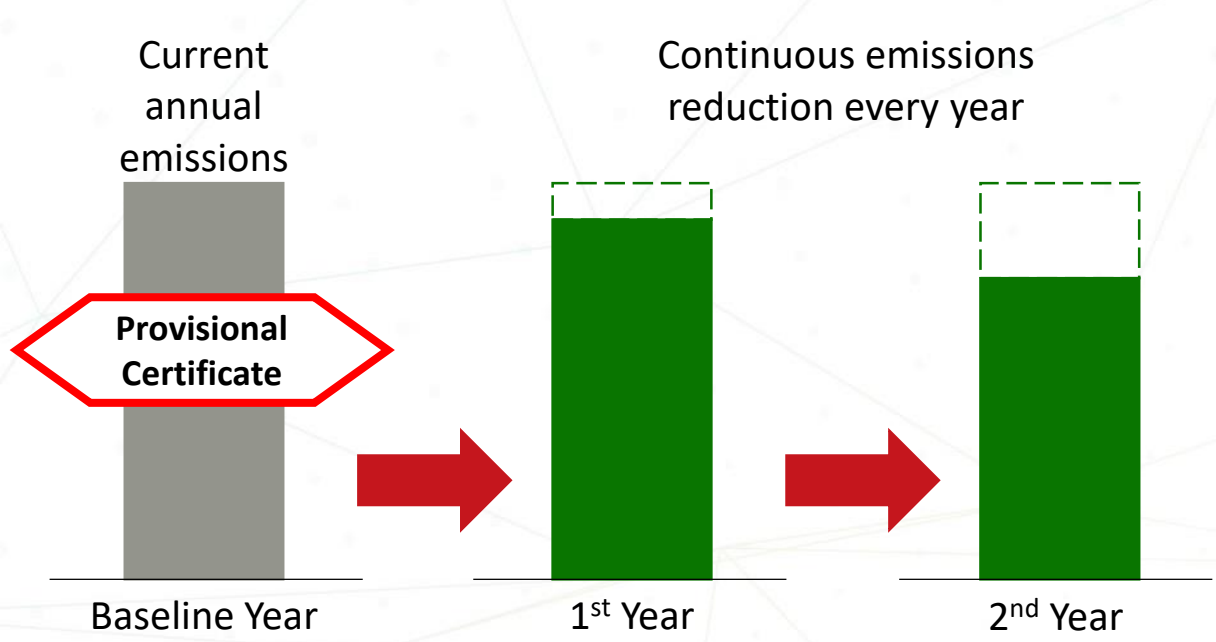
LOW CARBON ZONES

Target: 50 by 2021
100 by 2025
200 by 2030

LOW CARBON PARTNERS

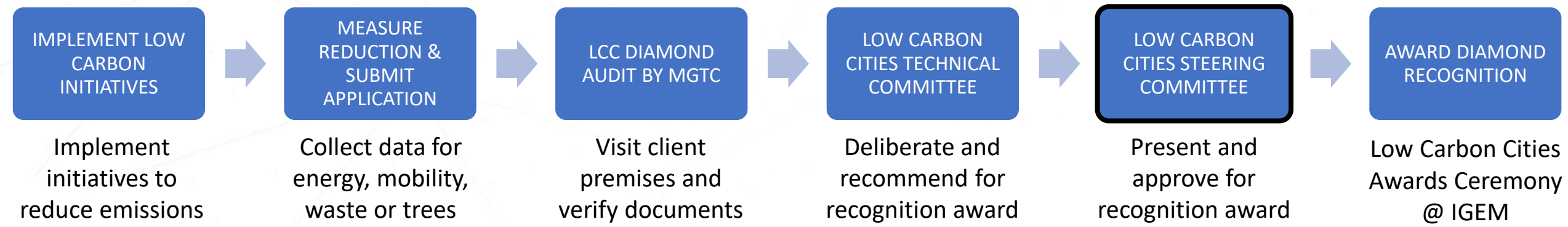
Target: 250 by 2021
500 by 2025
1,000 by 2030

DIAMOND RECOGNITION



Diamond Recognition

Achieve emissions reduction based on the scale below:



REDUCE EMISSIONS & INCREASE CARBON SEQUESTRATIONS

The LCC 2030 Challenge targets a total of **45% CO₂ emissions reduction** by adopting these 5 elements



Maximize building energy efficiency and increasing adoption of renewable energy



Maximize water efficiency and increase adoption of rainwater harvesting



Reduce the amount of waste that goes to the landfills



Increasing the use of public transport (bus), cycling, walking and other low carbon modes



Maintain or increase the number of trees and green spaces in the city

LCC-Z-B100-08-0001 / 2019



DIAMOND

RECOGNITION

This is to verify that
MAJLIS PERBANDARAN SEPANG
 for the
CYBER1, CYBERJAYA
 Low Carbon Zone

has successfully reduced its GHG emissions by **33.69 %**
 since **2016** across **4 elements** which is equivalent to
2,647.56 tCO₂e
 and has **increased** its carbon sequestration potential by
8.30 % to **3,133.51 tCO₂/year**

ELEMENT	REDUCTION ACHIEVED	DIAMOND LEVEL
ENERGY	39.81 %	◆◆◆◆◆
WATER	(60.18 %)	◆◆◆◆◆
WASTE	19.38 %	◆◆◆◆◆
MOBILITY	38.11 %	◆◆◆◆◆
ELEMENT	SEQUESTRATION	DIAMOND LEVEL
GREENERY	INCREASED by 8.30 %	◆◆◆◆◆



YB PUAN YEO BEE YIN

Minister

Ministry of Energy, Science, Technology, Environment and Climate Change

LCC-P-B100-09-0001 / 2019



CERTIFICATE

PROVISIONAL

THIS CERTIFICATE IS PROUDLY PRESENTED TO

Majlis Daerah Hulu Selangor

In recognition of their commitment to reduce their
 carbon emissions under the

LOW CARBON CITIES 2030 CHALLENGE

Location : Ibu Pejabat MDHS
 Baseline Year : 2017
 Baseline tCO₂ : 266.87
 Elements : Energy, Water, Waste, Greeneries



TUAN SYED AHMAD SYED MUSTAFA
 ACEO / COO
 Malaysian Green Technology Corporation

TARGET AND ACHIEVEMENT (cumulative as of 2019)

*20 additional new PBTs in 2020

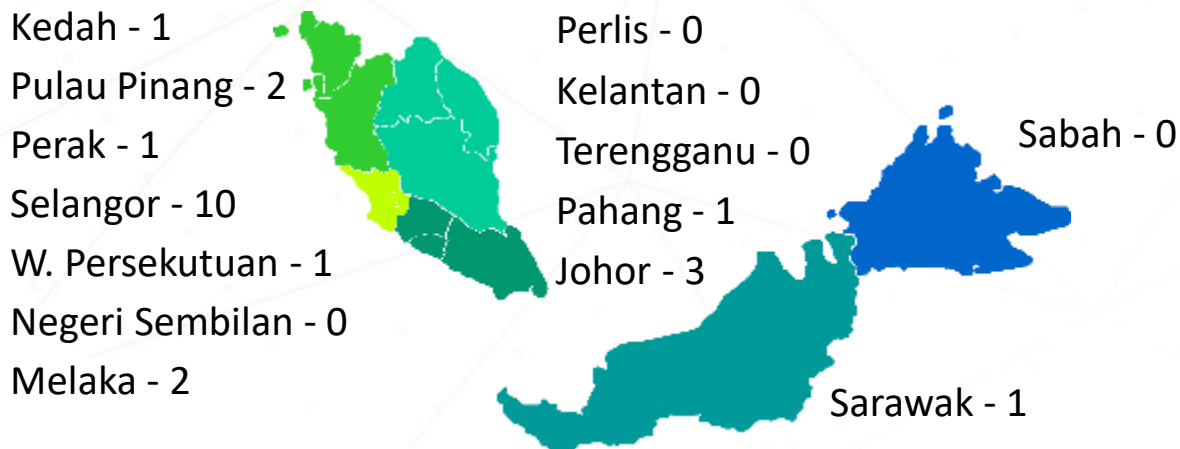
Obtained Diamond Recognition
12 PBT + 2 UNI + 1 SR
PBTs, Universities & Special Region

Cumulative since 2013
61,841.71
Carbon Reduction (tCO₂e)

10 DR + 7 PC
Low Carbon Zone

9 DR + 4 PC
Low Carbon Partners

Nota: DR - Diamond Recognition dan PC - Provisional Certificate



State	No of PBT	TRAINING		IMPLEMENTATION	
		Trained	2020 target	Implemented	2020 target
W.Persekutuan	3	2	3	1	2
Johor	15	8	15	3	5
Kedah	11	2	11	1	2
Kelantan	12	1	12	0	1
Melaka	4	4	4	2	4
N.Sembilan	8	3	8	0	2
Pahang	11	10	11	1	3
Perak	15	4	15	1	3
Perlis	1	1	1	0	1
P.Pinang	2	2	2	2	2
Sabah	24	1	24	0	1
Sarawak	26	3	26	1	2
Selangor	12	10	12	10	12
Terengganu	7	2	7	0	1
Pihak Bukan PBT diberikuasa PBT	3	0	3	0	1
Jumlah	154	53	154	22	42*

Nota: cumulative target

Thank You

Sustainable Cities Division

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