CLIMATE ACTION PLANNING IN URBAN DEVELOPMENT – THE CASE OF MALAYSIAN CITIES

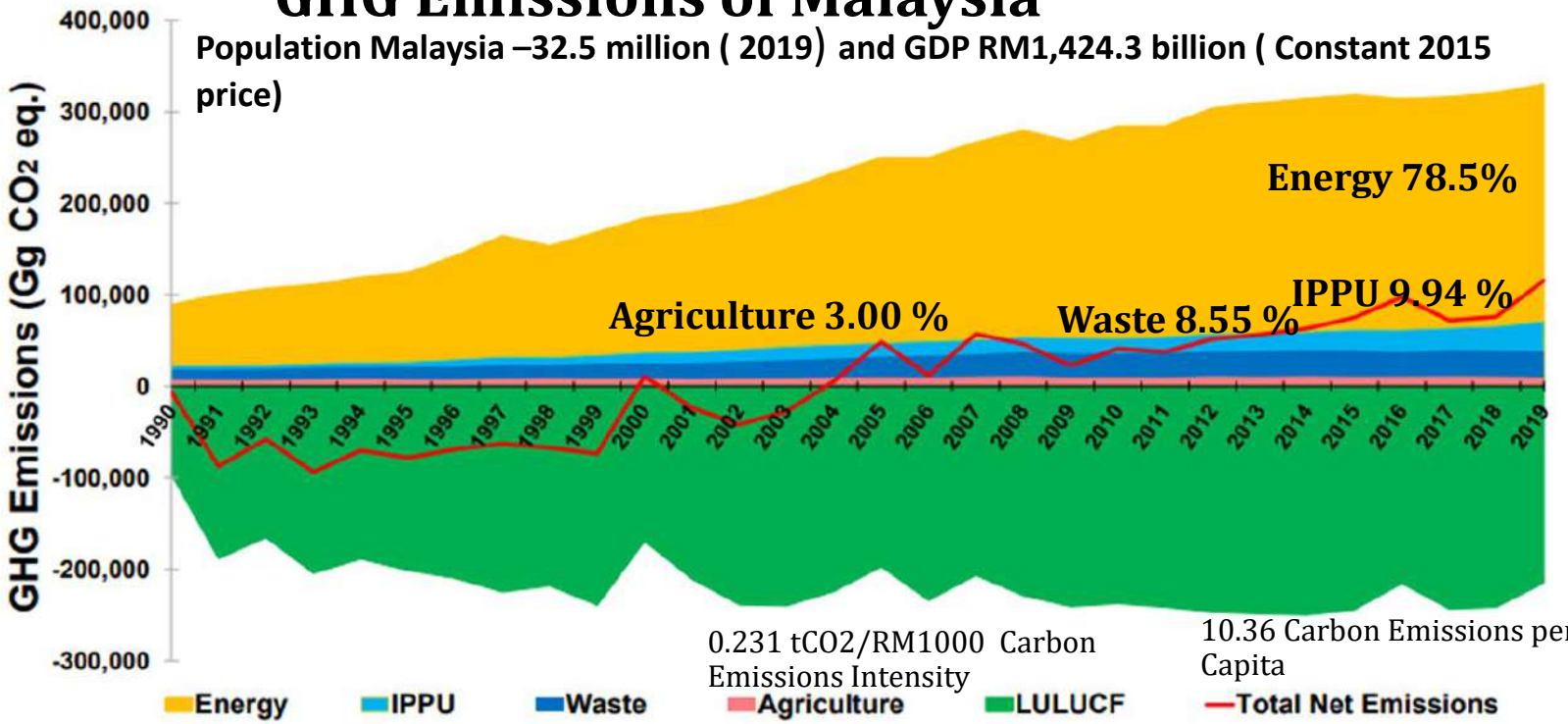
GHG EMISSION IN ASIA 2 – MALAYSIA 1550-1710 pm 15 Sept 2023
OHYAMA HALL NIES TSUKUBA JAPAN

PROF Dr TPr HO CHIN SIONG

UTM-Low Carbon Asia Research Centre
Faculty of Built Environment and Surveying
Universiti Teknologi Malaysia
Johor Bahru, Malaysia

GHG Emissions of Malaysia

Population Malaysia –32.5 million (2019) and GDP RM1,424.3 billion (Constant 2015 price)



0.231 tCO2/RM1000 Carbon Emissions Intensity

kg CO2/GDP Purchasing Power Parity, US Dollars using 2005 Prices

10.36 Carbon Emissions per Capita

tonne CO2/person

Reference:
International Energy Agency (2018) CO2 Emissions from Fuel Combustion – 2018 Highlights

Reference:
Ministry of Environment and Water, Malaysia (2020)

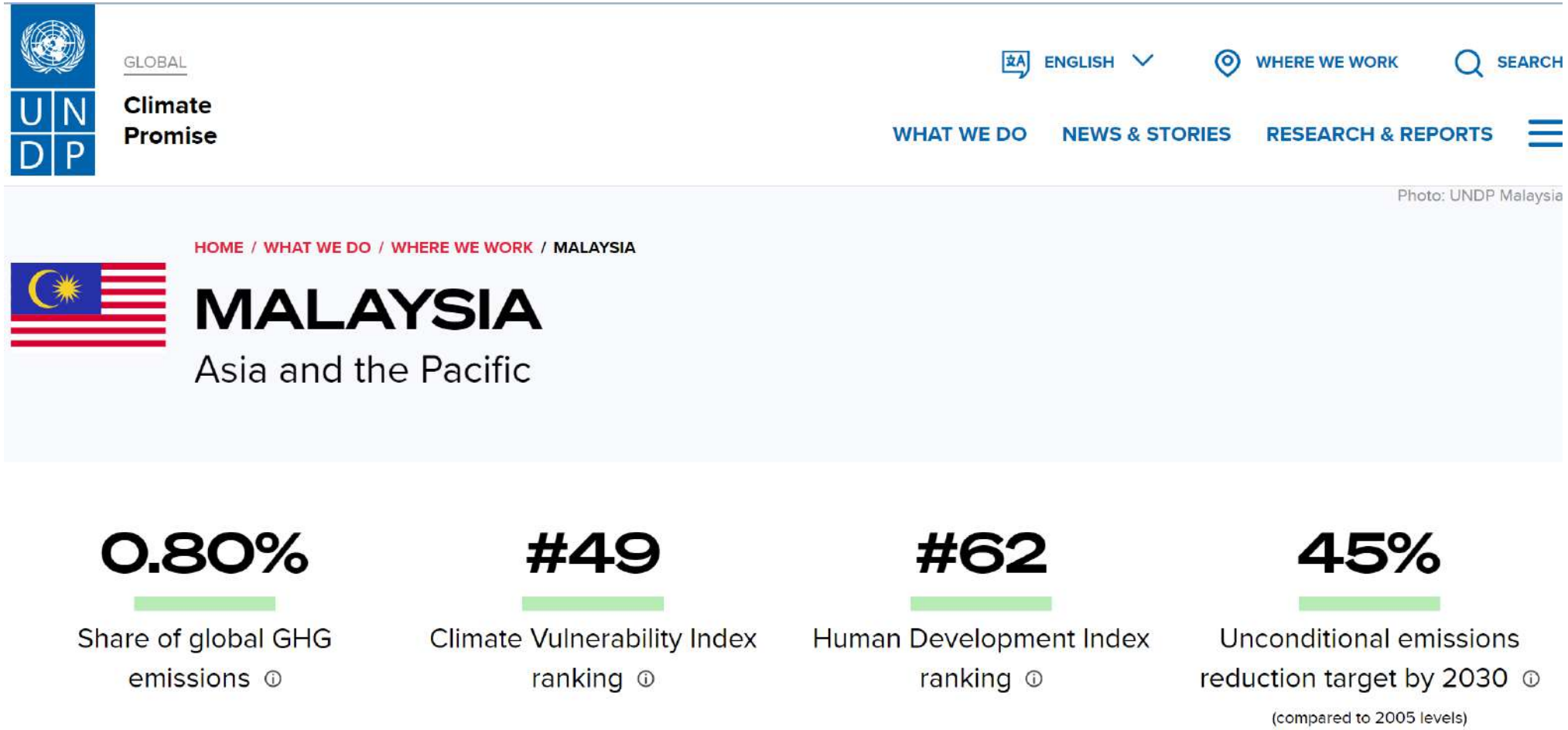
BUR3 Report (2020) Total emission 2016	CO2 emission ('000metri tons	CO2 per capita metric ton (Pop 30.68mil)
without LULUCF	330,358.21	10.16
With LULUCF	115,643.68	3.56

POSITIONING MALAYSIA IN THE GLOBAL CLIMATE SCENE

COUNTRY		TREND	2018 EMISSIONS	AS PERCENT OF GLOBAL	PER CAPITA
Indonesia	**Indonesia** is one of the top GHG emitters. It accounts for 2.17% of global emissions. In 2018, it emitted 1,074.19 million tonnes.		1,074.19 million tonnes of GHG	2.2%	4.03 tonnes of GHG
Thailand	**Thailand** emits more GHG now than it did in 1990. In 2018, it emitted 434.78 million tonnes.		434.78 million tonnes of GHG	0.9%	6.28 tonnes of GHG
Viet Nam	**Viet Nam** has had one of the biggest increases in GHG emissions — 305% since 1990.		418.80 million tonnes of GHG	0.8%	4.34 tonnes of GHG
Malaysia	**Malaysia** has had one of the biggest increases in GHG emissions — 253% since 1990.		324.31 million tonnes of GHG	0.7%	10.12 tonnes of GHG

Source: *UNEP, 2021; https://www.unep.org/explore-topics/climate-action/what-we-do/climate-action-note/state-of-climate.html?gclid=CjwKCAjw1MajBhAcEiwAagW9MVgZeuGSEzb8Kd-kO8Z3vlvf4yTEc6749su-Zl2tbmF_2-h7uJrGBxoC_j0QAvD_BwE*

POSITIONING MALAYSIA IN THE GLOBAL CLIMATE SCENE



Source: https://climatepromise.undp.org/what-we-do/where-we-work/malaysia

NDC Status

Malaysia submitted its revised NDC in July 2021.

Key highlights from the NDC

- Malaysia increased its mitigation ambition with an an unconditional target to cut carbon intensity against GDP by 45% by 2030 compared to 2005 levels.
- In the first NDC, the unconditional emissions reduction target was 35%, with an additional 10% being conditional on external support.
- Moreover, the revised NDC covers seven greenhouse gases, compared to the first NDC which only covered three.
- The country also expanded the adaptation component, with particular focus on protecting biodiversity and mainstreaming climate resilience into urban planning.
- Comprehensive sector-based projections and multi-stakeholder consultations with public sector, private sector, civil society and youth groups were done to provide inputs to the NDC revision process.
- A National Adaptation Plan and NDC Roadmap will be developed to help achieve NDC targets.

Source: *https://climatepromise.undp.org/what-we-do/where-we-work/malaysia*

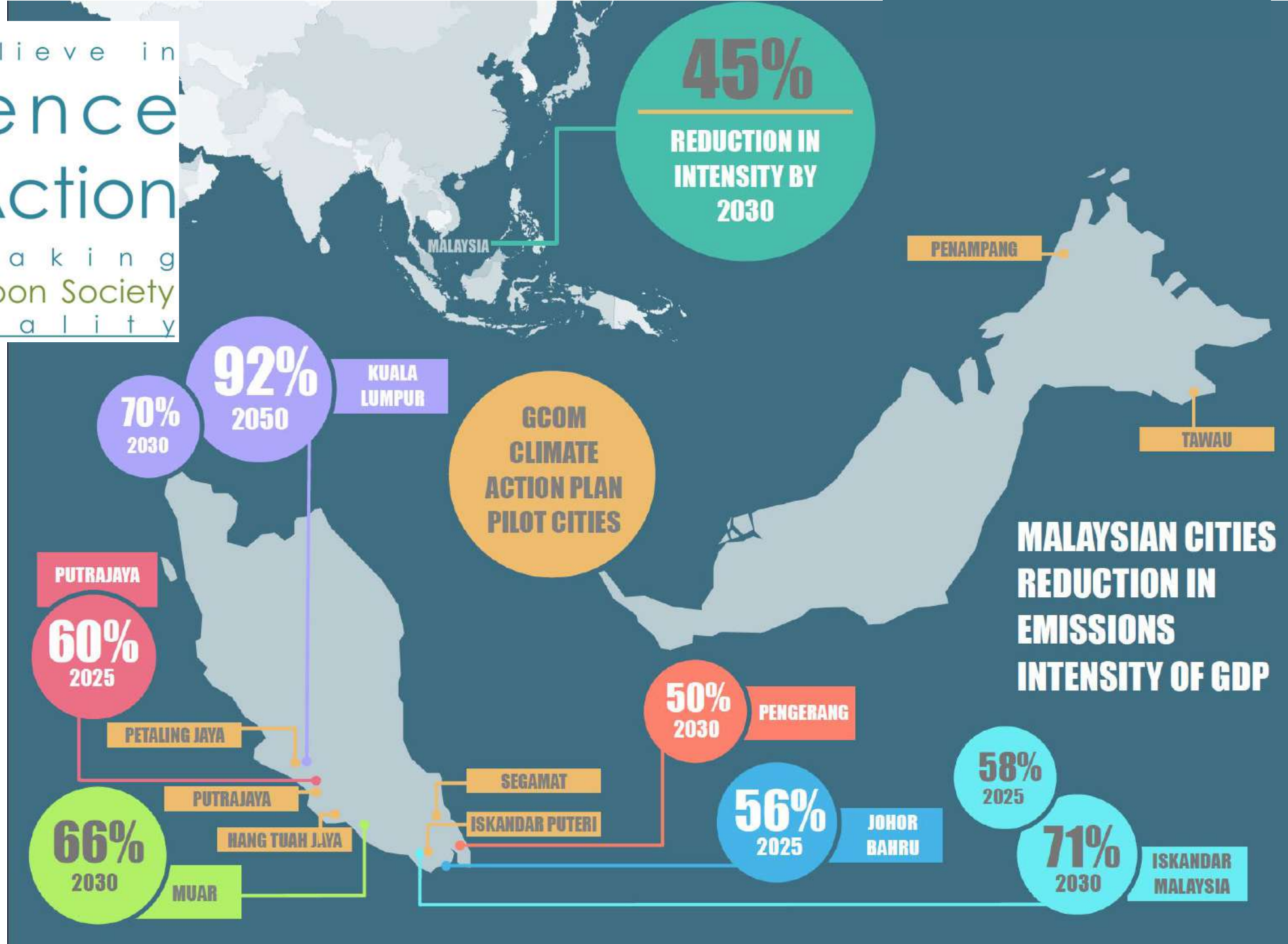
S2A

We believe in Science to Action in making Low Carbon Society a Reality

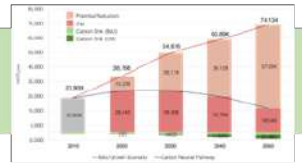
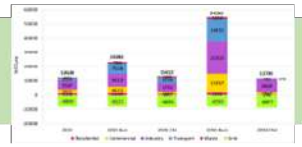
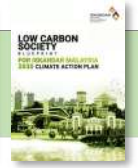
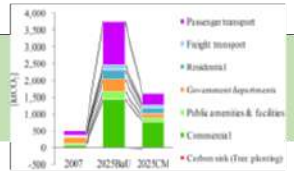
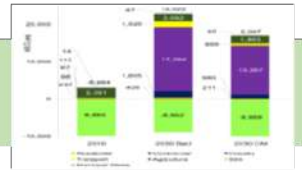
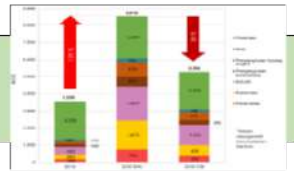
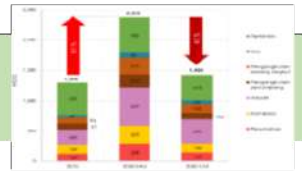
Science

Policy

Action



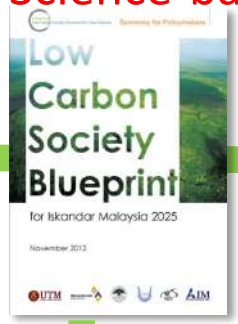
CLIMATE SCIENCE TO ACTION FOR SELECTED MALAYSIAN CITIES

Cities	Asia-Pacific Integrated Model	Blueprints / Action Plans	2030 Low Carbon Society	2040 Carbon Neutral Ready	2050 Net Zero Emission
Kuala Lumpur		 	70%	85%	Net Zero
Iskandar Malaysia		  	70%	--	Net Zero
Putrajaya			60%		
Pengerang			50%		
Muar			66%		
Segamat			57%		

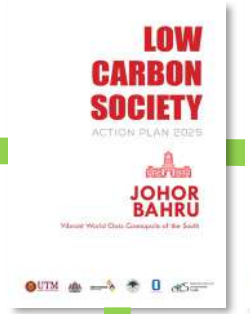
UTM & ISKANDAR MALAYSIA's EPIC LCS JOURNEY

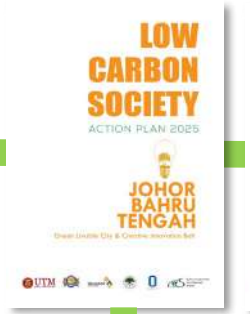
Science-based Climate Policies and Action Plans

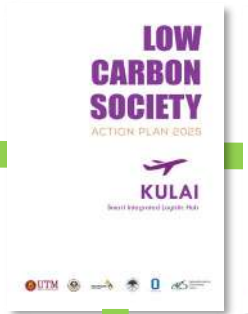
2009

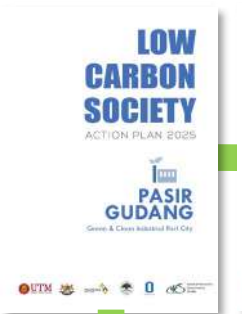


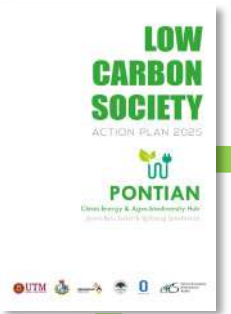
2011-2012



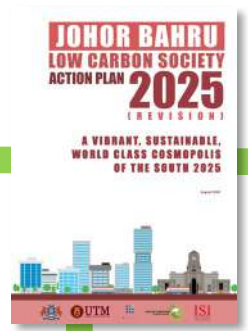




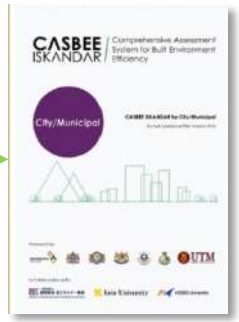




2014-2015

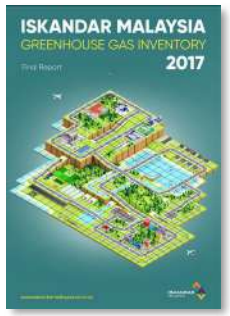


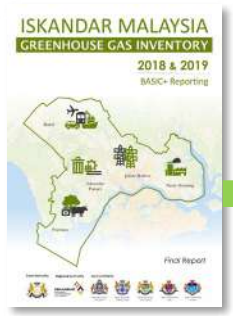
2018



Tools for Action

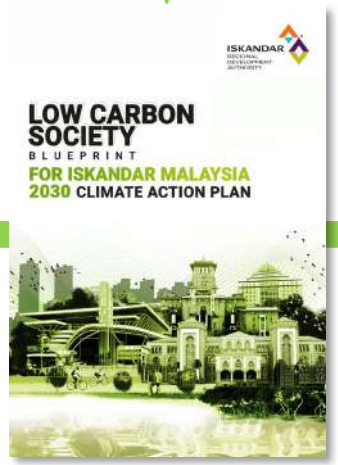
2015-2016





Stocktaking and Monitoring

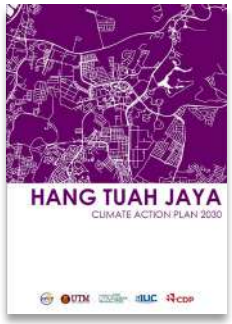
2015-2019

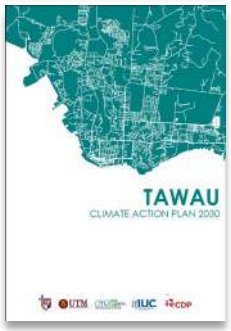


2021-2022

Iskandar Malaysia Net Zero Emission Future (2050)

GCoM MALAYSIAN PILOT CITIES – TAKING CLIMATE ACTIONS





UTM UNIVERSITI TEKNOLOGI MALAYSIA · uniplan consult sdn. bhd. · UTM LOW CARBON ASIA RESEARCH CENTRE

GLOBAL COVENANT of MAYORS for CLIMATE & ENERGY SOUTHEAST ASIA

GCOM MALAYSIAN PILOT CITIES

33% 2030 — Reduction in absolute GHG carbon emission

PETALING JAYA, SELANGORR

Population: 793, 636 (2021)
Main Economy: Manufacturing, Commercial and Services
Administration: Petaling Jaya City Council (MBPJ)
Total GHG Inventory Emission (2018)
5.10 mil tco_2eq
Vulnerabilities:
Drought · Flash flood · Vector-borne disease

PUTRAJAYA

33% 2030 — Reduction in absolute GHG carbon emission

Population: 134, 931 (2021)
Main Economy: Governance, Commercial and Services
Administration: Putrajaya Corporation
Total GHG Inventory Emission (2018):
1.43 mil tco_2eq
Vulnerabilities:
Severe Wind · Heat Wave · Flash flood · Vector-borne disease

HANG TUAH JAYA, MELAKA

45% 2030

Population: 124,000 (2010)
Main Economy: Manufacturing, Commercial and Services
Administration: Hang Tuah Jaya Municipal Council (MPHTJ)
Total GHG Inventory Emission (2017)
1.03 mil tco_2eq
Vulnerabilities:
Monsoon · Drought · Flash flood · Vector-borne disease

SEGAMAT, JOHOR

50% 2030

Population: 213, 900 (2020)
Main Economy: Agriculture, Tourism
Administration: Segamat Municipal Council (MPS)
Total GHG Inventory Emission (2018)
1.29 mil tco_2eq
Vulnerabilities:
Monsoon · River flood · Vector-borne disease

ISKANDAR PUTERI, JOHOR

63% 2030

Population: 921,806 (2020)
Main Economy: Education, Tourism, Commercial and Services
Administration: Iskandar Puteri City Council (MBIP)
Total GHG Inventory Emission (2018)
4.11 mil tco_2eq
Vulnerabilities:
Monsoon · Heat Wave · River flood · Vector-borne disease

PENAMPANG, SABAH

45% 2030

Population: 121,934 (2010)
Main Economy: Agriculture, Commercial and Services
Administration: Penampang Districts Council (MDP)
Total GHG Inventory Emission (2017)
0.45 mil tco_2eq
Vulnerabilities:
Flash Flood River Flood · Rainstorm · Landslide · Tropical Storm

TAWAU, SABAH

45% 2030

Population: 397,673 (2010)
Main Economy: Agriculture
Administration: Tawau Municipal Council (MPT)
Total GHG Inventory Emission (2017)
1.56 mil tco_2eq
Vulnerabilities:
Tropical Storm Storm Surge · Flash Flood River Flood · Vector-borne disease

MUAR, JOHOR

63% 2030

Population: 281,500 (2018)
Main Economy: Agriculture, Industry, Tourism
Administration: Muar Municipal Council (MPM)
Total GHG Inventory Emission (2017)
1.62 mil tco_2eq
Vulnerabilities:
Monsoon · Flash Flood River Flood · Salt water intrusion · Forest fire · Coastal flood · Vector-borne disease

KUALA LUMPUR – LOW CARBON SOCIETY 2030 into Carbon Neutral 2050
- City to city collaboration / upscaling project implementation especially Energy , Mobility and smart technology applications

Project of developing a policy framework for building energy efficiency through city-to-city collaboration between **Kuala Lumpur** City Hall and **Tokyo** Metropolitan Government

T2KLLCS

2019-2021

TOKYO METROPOLITAN GOVERNMENT

Partners:

IGES Institute for Global Environmental Strategies

UTM Universiti Teknologi Malaysia

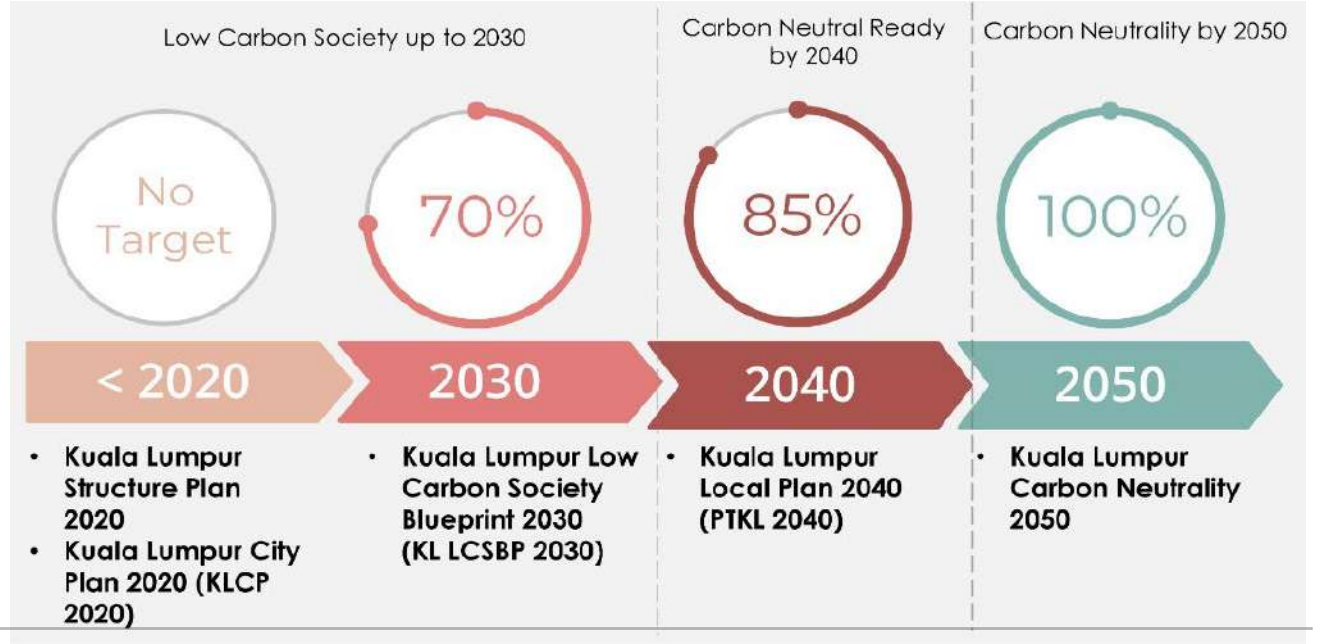
UTM Low Carbon Asia Research Centre

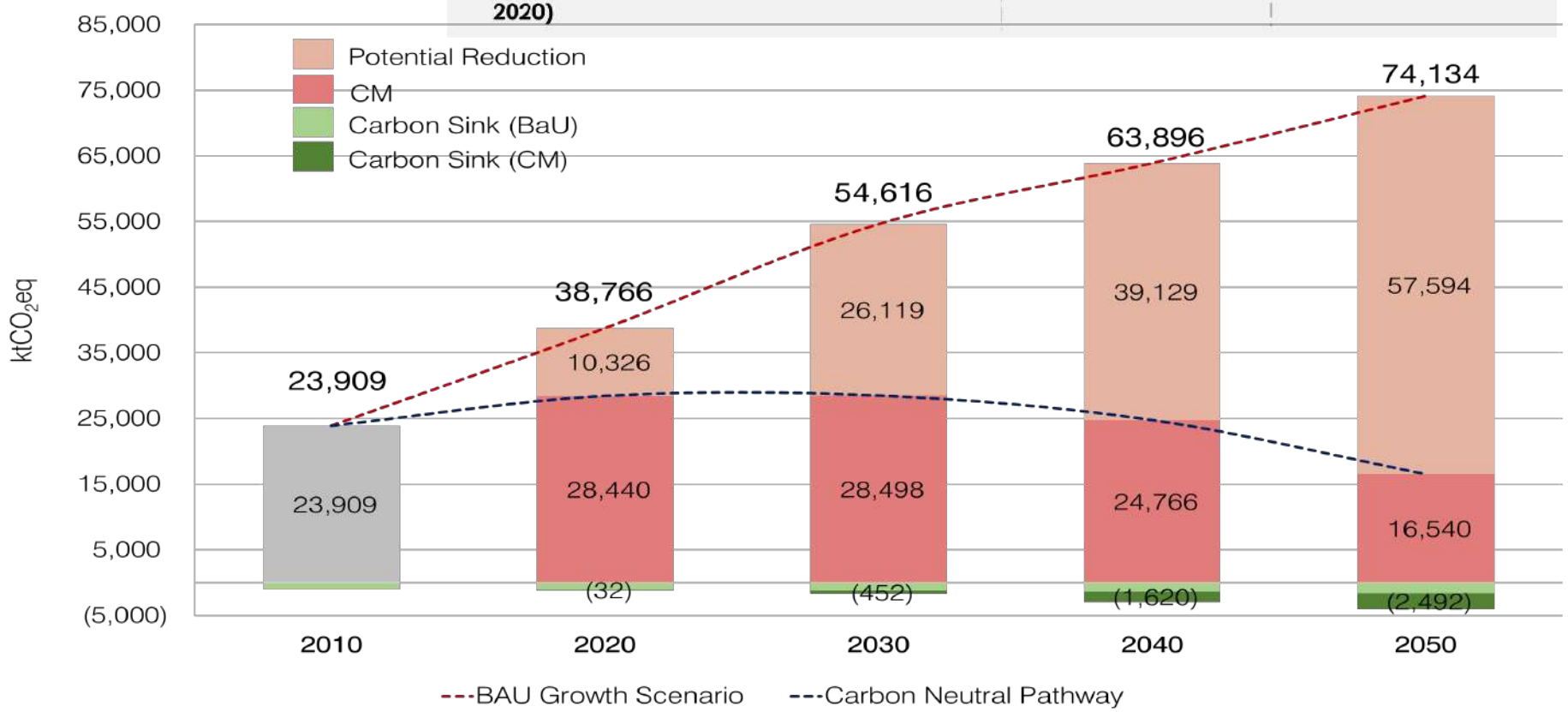
seda Malaysia

Sponsor:

環境省 Ministry of the Environment

KUALA LUMPUR – NET ZERO EMISSION BY 2050 – GUIDED BY SCIENCE (ASIA-PACIFIC INTEGRATED MODEL)





PHASE 2 OUTCOMES- RM 28mil budget for implementation

Tokyo to Kuala Lumpur Low Carbon System (T2KLLCS)
Kuala Lumpur City Hall (KLCH) And Tokyo Metropolitan Government (TMG) Joint Effort To Counter Climate Change :
Carbon Neutral Kuala Lumpur By 2050

PHASE 2 – Air-condition Equipment

Buildings & Equipment
City Hall Tower 1 - AHU **(To Be Replaced in 2021) budget obtained**
City Hall Tower 1 - Auditorium -Chiller, Pump, Cooling Tower & AHU **(To Be Replaced in 2021) budget obtained**
City Hall Training Centre - Academic Tower Variable Refrigerant Flow(VRF) System **(To Be Replaced in 2021) budget obtained**
City Hall Tower 3 -Chiller, Pump, Cooling Tower & AHU **(To Be Replaced in 2022)**

Chillers


Water Pumps


Cooling Tower


AHU

Tokyo to Kuala Lumpur Low Carbon System (T2KLLCS)
Kuala Lumpur City Hall (KLCH) And Tokyo Metropolitan Government (TMG) Joint Effort To Counter Climate Change :
Carbon Neutral Kuala Lumpur By 2050

PHASE 2 – New Potentials Solar PV for KLCH Buildings


Community Centre


Pudu Ulu Park Office

Multipurpose Hall Ampang Hilir

Tokyo to Kuala Lumpur Low Carbon System (T2KLLCS)
Kuala Lumpur City Hall (KLCH) And Tokyo Metropolitan Government (TMG) Joint Effort To Counter Climate Change :
Carbon Neutral Kuala Lumpur By 2050

PHASE 2 – New Potentials Solar PV for KLCH Buildings


Sepak Takraw Stadium


Count Down Clock KL


Kuala Lumpur Library

Tokyo to Kuala Lumpur Low Carbon System (T2KLLCS)
Kuala Lumpur City Hall (KLCH) And Tokyo Metropolitan Government (TMG) Joint Effort To Counter Climate Change :
Carbon Neutral Kuala Lumpur By 2050

PHASE 2 – Kuala Lumpur Solar PV (Private Initiatives)

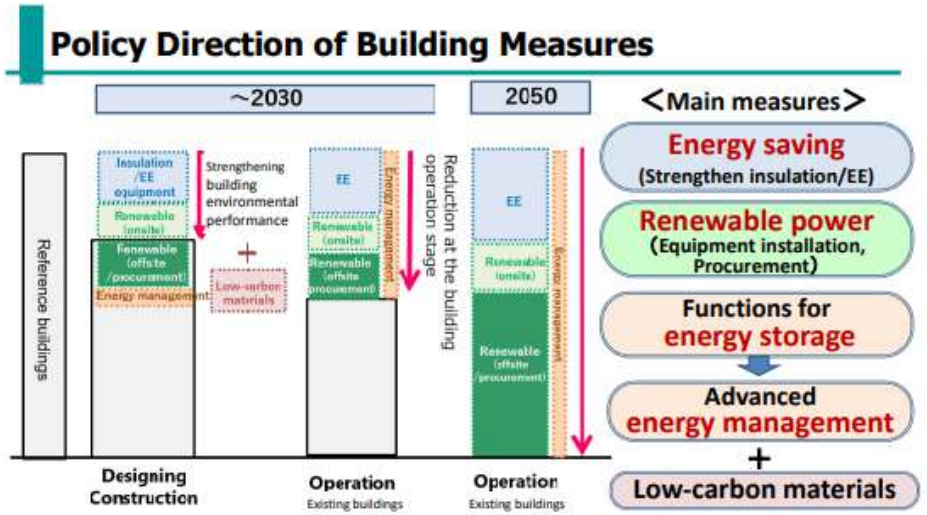

IKEA Cheras

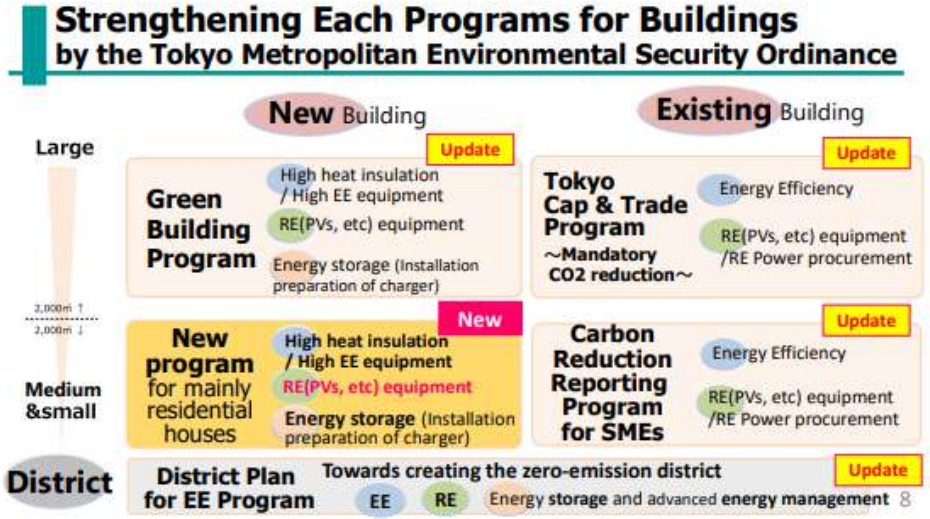

DUKE-Plaza Toll

KEN Tower-TTDI


UTM-Semarak

Lesson from T2KLLCS – TMG -Tokyo Policy initiatives and Measures





Lesson from T2KLLCS – Saitama Policy initiatives and Measures on smart mobility, smart home and Misono district energy planning

Multi Mobility Sharing

Mobility as a Service

Mobility station of the future

Open Street
(Providing the project platfor

ENEOS
(Energy supply & management

Street Scene

Looop

Smart Home Community Project (Phase 3)

エネルギーフリー社会の実現
5

Awards and Recognition

Looop

Awards

Good Design Award 2021

GOOD DESIGN AWARD 2021

FY 2021 Minister of the Environment's Award for Climate Action

FY 2021 Climate Action Minister of the Environment Award

FY 2021 New Energy Award (Community Partnership Category) New Energy Foundation Chair's Award

FY 2021 New Energy Award

(Community Partnership Category)
Organizer: New Energy Foundation

Visit by Environment Minister Tsuyoshi Yamaguchi (Jan 2022)

Environment Minister Visits Advanced "Decarbonized" Area in Saitama City

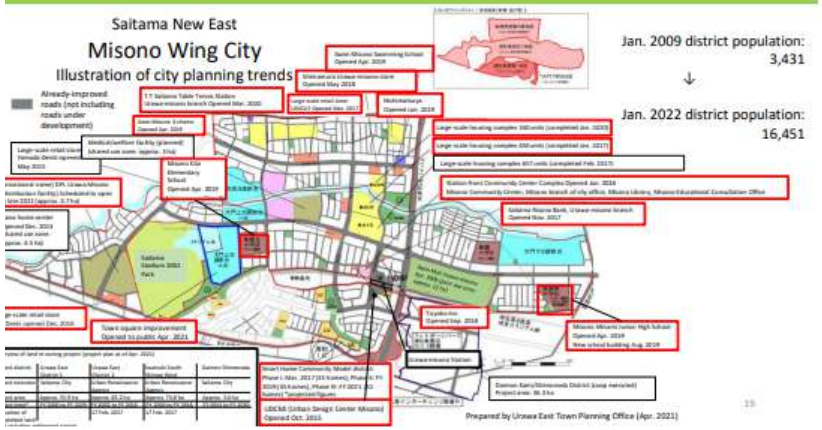
Environment Minister Yamaguchi Tsuyoshi visited the Urawa Misono area in Midori Ward, Saitama City on March 13 to inspect the city's "decarbonization" efforts. Saitama City's initiatives are likely to attract attention as a leader in decarbonization-focused urban development with the Ministry of the Environment planning to invite local authorities that are actively working on decarbonization to take part in a subsidy program to be launched on March 25.

Source: The Nikkei (January 13, 2022)

エネルギーフリー社会の実現
6

ransition of the Misono District

Saitama New East
Misono Wing City
Illustration of city planning trends



Jan. 2009 district population: 3,431

Jan. 2022 district population: 16,451

Prepared by Urawa East Town Planning Office (Apr. 2021)

roject Implementation Structure

Selection of companies based on proposals

- City that guarantees energy security and is low-carbon
- Fostering a face-to-face close-knit local community, and a city that is comfortable to live in

● Partners in town improvements and housing construction

POLUS GROUP

Takasago Construction

AQURAHOME CO., LTD.

+ Saitama City

Dec. 2015
Agreement signed with 3 companies and project launched

KUALA LUMPUR – NET ZERO EMISSION BY 2050

Low Carbon Society up to 2030

Carbon Neutral Ready by 2040

Carbon Neutrality by 2050

No Target

70%

85%

100%

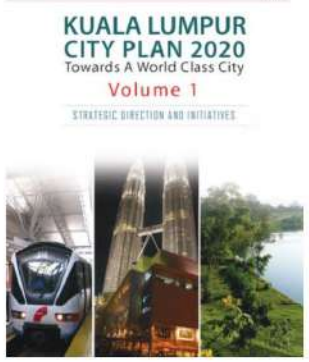
< 2020

2030

2040

2050

Kuala Lumpur Structure Plan 2020



Kuala Lumpur City Plan 2020

Kuala Lumpur Low Carbon Society Blueprint 2030

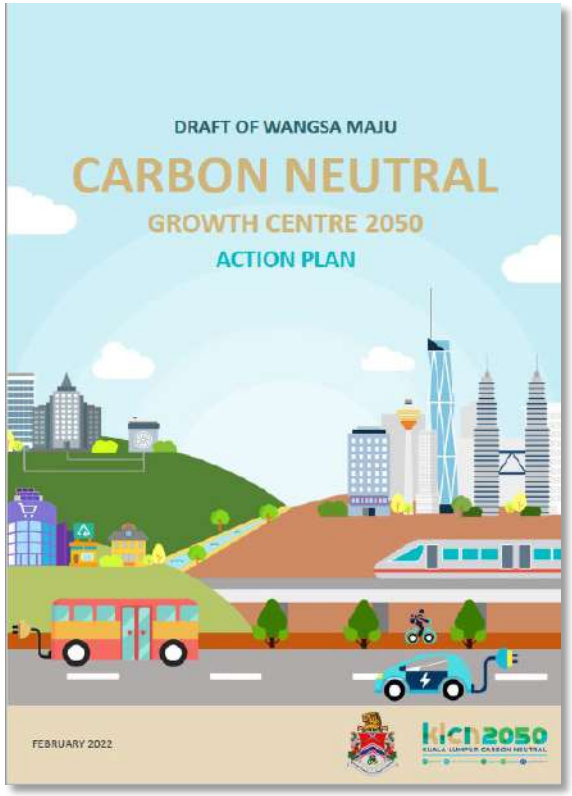
Kuala Lumpur Structure Plan 2040

Kuala Lumpur Local Plan 2040

Kuala Lumpur Carbon Neutrality 2050

klcn2050
KUALA LUMPUR CARBON NEUTRAL

KUALA LUMPUR – ACCELERATING TRANSITION INTO NET ZERO EMISSION



CARBON NEUTRAL KUALA LUMPUR 2050

Kuala Lumpur's Six Carbon Neutral Strategic Zones (2050)

The Other 5 Strategic Zones ← **Wangsa Maju-Maluri Strategic Zone**

Focused Acceleration

Kuala Lumpur Carbon Neutral Ready
85% GHG emissions reduction in terms of intensity of GDP by 2040 (based on 2010 emission level)

PTKL 2040
PSKL 2040

Wangsa Maju Carbon Neutral Growth Centre 2050 Action Plan

KL CAP 2050

KL LCSBP 2030

KLCP 2020
PSKL 2020

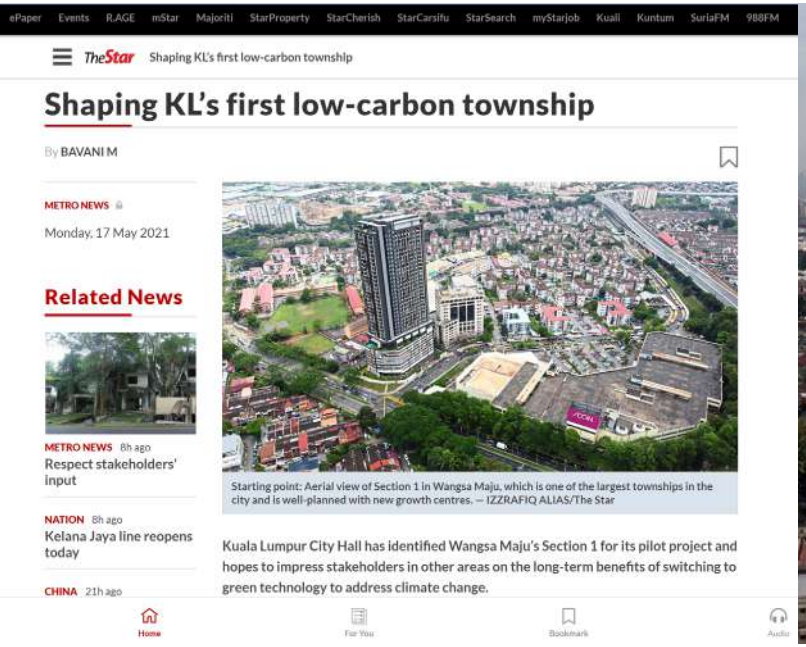
Kuala Lumpur Low Carbon Society
70% GHG emissions reduction in terms of intensity of GDP by 2030 (based on 2010 emission level)

Statutory Development Plans

Climate Policy/Plan/Program

WANGSA MAJU CARBON NEUTRAL GROWTH CENTRE

Develop the Wangsa Maju Growth Centre into a **thriving, prosperous, carbon neutral urban precinct**, serving **as a pioneer showcase** that is **up-scalable** to other Kuala Lumpur Strategic Zones for a progressive transformation of Kuala Lumpur into a **carbon neutral city by 2050**.



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TheStar Shaping KL's first low-carbon township

Shaping KL's first low-carbon township

By BAVANI M

METRO NEWS

Monday, 17 May 2021

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Kelana Jaya line reopens today

CHINA 21h ago

Starting point: Aerial view of Section 1 in Wangsa Maju, which is one of the largest townships in the city and is well-planned with new growth centres. — IZZRAFIQ ALIAS/The Star

Kuala Lumpur City Hall has identified Wangsa Maju's Section 1 for its pilot project and hopes to impress stakeholders in other areas on the long-term benefits of switching to green technology to address climate change.

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WANGSA MAJU CNGC – 20 PROJECTS

(1)Solar on Infrastructure
1a.Rooftop Solar PV
1b. Solar for Pedestrian Mist
(2) Floating Solar PV
(3) District Energy System

Energy

(4) Anaerobic Digester
(5) Waste Composting Plant
(6) Waste Recycling Points

Waste

(7) Open Space and Forest Protection
(8) Vertical/Roof Garden
(9) Linear Urban Parks
(10) River Cleaning

Green & Open Space

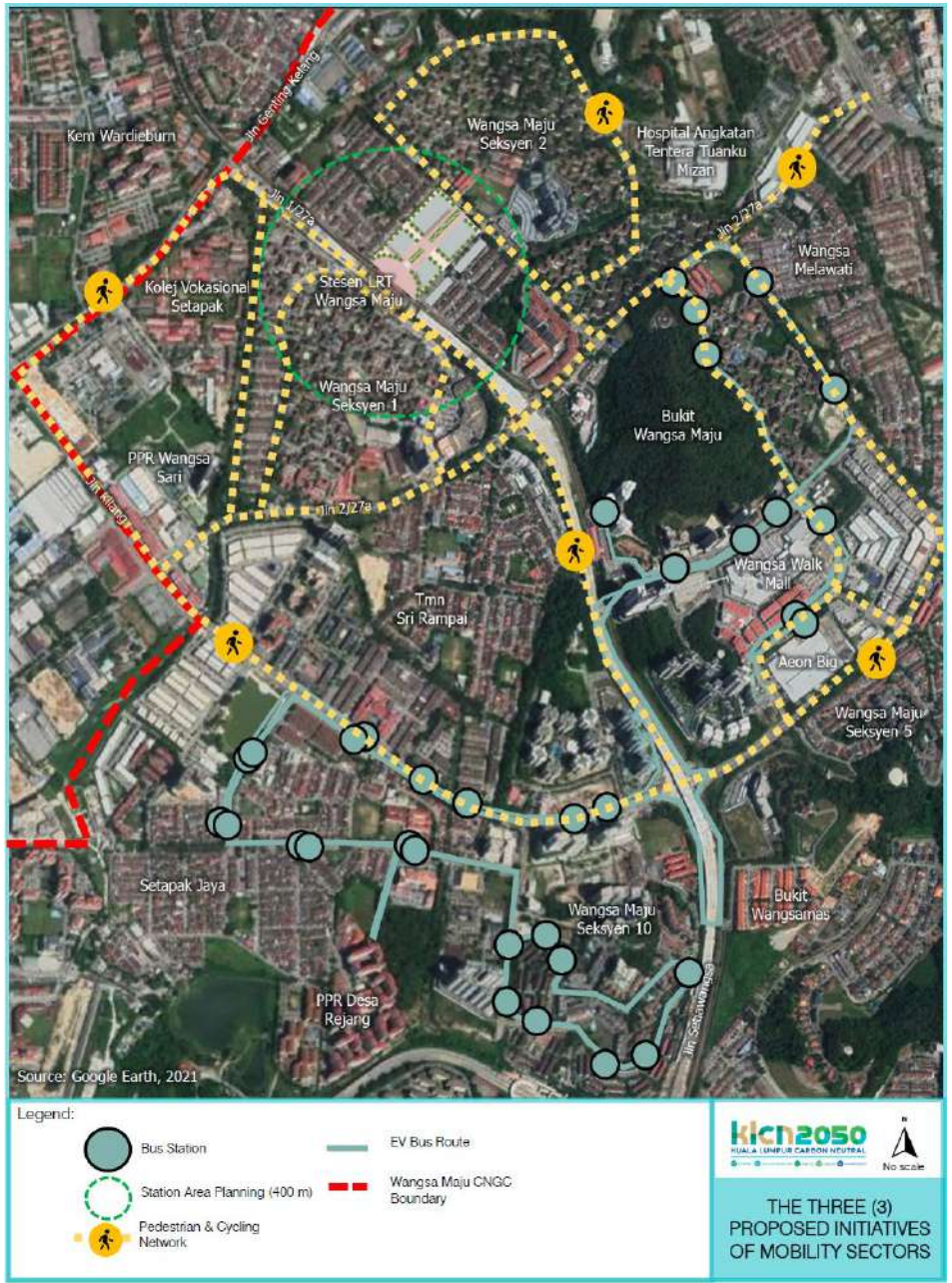
(11) Pedestrian Cycling Network
(12) Public Transportation Improvement
(13) Station Area Planning

Mobility

Community

(14) Eco Park
(15) Community Farming
(16) Introduce Community Water and Energy Saving Program
(17) Transforming the Existing Resident Association into Carbon Neutral Community
(18) Zero Waste Community
(19) Carbon Neutral Challenge Program in Schools
(20) Strengthen School Community through Concentrated Efforts

WANGSA MAJU CNGC – 20 PROJECTS EXAMPLES



WANGSA MAJU CNGC – Accelerating 20 PROJECTS implementation with private sector/ city collaboration with Saitama City/ Tokyo TMG

GoKL City Bus free bus service to go fully electric by early 2023, using 60 Malaysian-made SKS EV buses

WANGSA MAJU CNGC – 20 PROJECTS EXAMPLES

Major international events – COP27 and High Level Talks and Planning for APCW 2023 Johor bahru COP28 Dubai

Japan-Malaysia City to City Carbon Neutral Collaborations – **Celebrating the 40th Anniversary of the Look East Policy (LEP) The year 2022 marks 40 years** since then Prime Minister Mahathir's Look East Policy in 1982. at COP27 Sharm El sheikh 10 Nov 2022 at 1700-1830

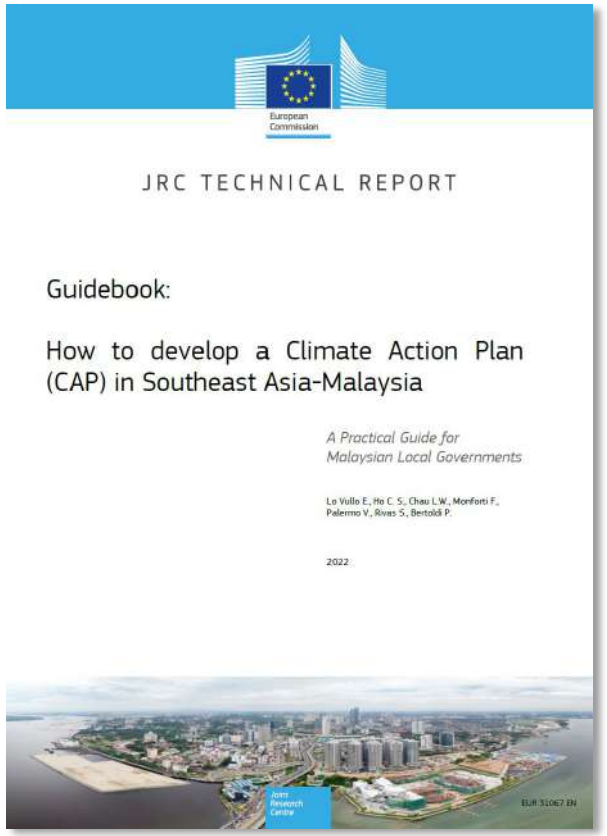
High Level Talks on Zero Carbon City KL on 8 Aug 2022 KL city

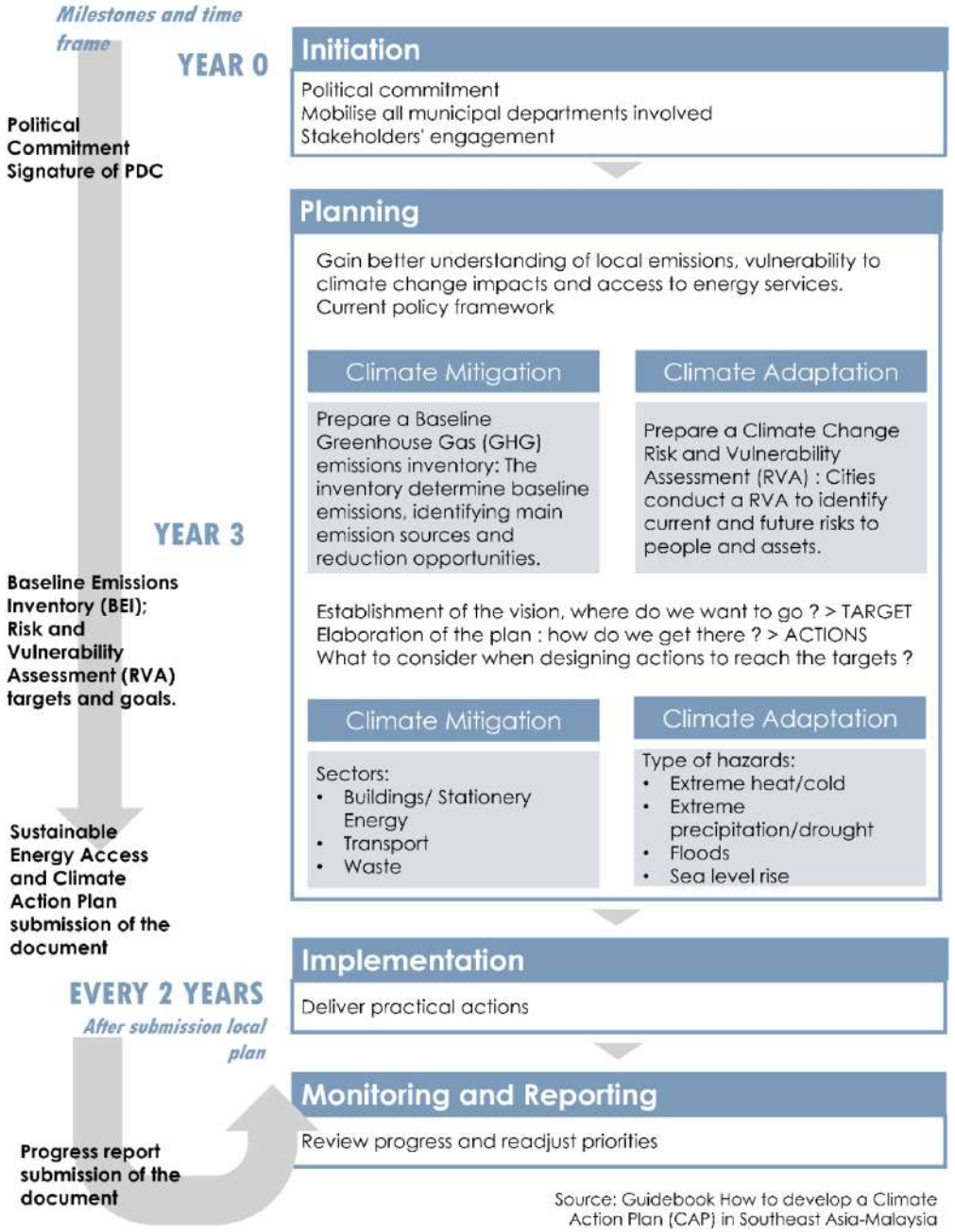
-Discussion focus on decarbonization effort of KL City and knowledge sharing **from TMG Tokyo ordinance revisions for decarbonising buildings and resource recycling initiative**s stated in the 2050 'Zero Emission Tokyo' and 2030 **Carbon Half as well as the City of Saitama - Misono's 'Smart Home Community'** development, a leading example of carbon neutral neighborhoods in Japan

United Nations Climate Change COP 28 DUBAI UAE November 2023

EMPRICAL CASE OF MALAYSIAN CITIES with CLIMATE ACTION PLAN 2030 Prepared in 2022-2023

4 new pilot cities /CASE STUDIES
- Global Covenant of Mayors (GCoM) cities
(Petaling jaya, Putrajaya, Segamat and Iskandar Puteri)





Source: Guidebook How to develop a Climate Action Plan (CAP) in Southeast Asia-Malaysia

Figure 5. CAP Elements

- Strong political support
- Commitment to ambitious targets
- Suitable assessment of the current situation
- Development and prioritization of actions
- Strategies and actions
- Governance
- Engagement of citizens and stakeholders
- Financing
- Document submission
- Monitoring and reporting

https://publications.jrc.ec.europa.eu/repository/bitstream/JRC129159/JRC129159_01.pdf

| COMMON REPORTING FRAMEWORK (CRF) | CLIMATE ACTION PLAN 2030

PETALING JAYA

Function
Major Growth Center of Selangor State (Largest economy)

Area
97.2 km²

Population
793, 636 (2021)

Administration
Petaling Jaya City Council (MBPJ)

PUTRAJAYA

Function
Federal Government Administrative Centre Malaysia

Area
49 km² with Garden City concepts with about 40% open spaces

Population
134,391 (2021)

Administration
Putrajaya Corporation (PJC)

SEGAMAT

Function
Malaysia's Agricultural Powerhouse

Area
1,416 km²

Population
152,458 (2020)

Administration
Segamat Municipal Council (MPS)

ISKANDAR PUTERI

Function
Administrative City, Businesses and Theme Parks – Vision City

Area
402.96 km²

Population
921,806 (2020)

Administration
Iskandar Puteri City Council (MBIP)

CLIMATE ACTION PLAN 2030

Four (4) Malaysian Pilot Cities Segamat, Iskandar Puteri, Petaling Jaya, Putrajaya

VISION

Mitigation Target And Adaptation Goals

GHG EMISSIONS INVENTORY (CIRIS)

- Baseline Emissions
- Reduction Potential

CLIMATE RISK VULNERABILITY ASSESSMENT (CRVA)

- Past and Current Climate Hazards
- Impacts of Climate Hazards And Vulnerable population
- Future Impacts of Climate Hazards

CLIMATE ACTION PLAN 2030

- Development Theme And Planned Actions
- Common Mitigation And Adaptation Measures

| COMMON REPORTING FRAMEWORK (CRF) | CLIMATE ACTION PLAN 2030

Mitigation Goals

SEGAMAT

- **40%** by 2020 — National Target at COP 15
- **45%** by 2030 — National Target at COP 21
- **50%** by 2030 — Segamat Municipal Council

PETALING JAYA

- **40%** by 2020 — National Target at COP15
- **45%** by 2030 — National Target at COP21 *Reduction carbon intensity, base year 2005*
- **33%** by 2030 — Petaling Jaya City Council *Reduction in absolute GHG carbon emission, base year 2021*

ISKANDAR PUTERI

- **40%** by 2020 — National Target at COP 15
- **45%** by 2030 — National Target at COP 21
- **63%** by 2030 — Iskandar Puteri City Council

PUTRAJAYA

- **40%** by 2020 — National Target at COP15
- **45%** by 2030 — National Target at COP26 *Reduction carbon intensity, base year 2005*
- **33%** by 2030 — Putrajaya Corporation *Reduction in absolute GHG carbon emission, base year 2021*

Adaptation Goals

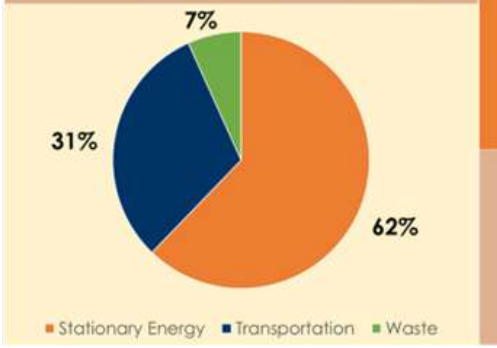
SEGAMAT	Better Protection against Flooding 	Preventing Number of Dengue Cases 	Reducing Downtime of Utilities caused by Tropical Storm 
ISKANDAR PUTERI	Increase Resilience against Flooding 	Reducing Number of Dengue Cases 	Cope with Heat Wave through Landscaping 
PETALING JAYA	Decrease Flooding by Better Protection 	Reduce Number of Dengue Cases 	Increase Resilience against Drought 
PUTRAJAYA	Develop Cooler Putrajaya City 	Preventing Number of Dengue Cases 	Improve landscaping against Severe wind 

Potential Emission Reduction By 2030

CITIES	POPULATION	EMISSION REDUCTION ($ktCO_2eq$)	REDUCTION IN ABSOLUTE GHG EMISSION (%)
SEGAMAT	211,300	531	41
ISKANDAR PUTERI	682,527	2,718	46
PETALING JAYA	771,687	1,650	33
PUTRAJAYA	134,391	474	33
TOTAL	1,799,905	5,373	

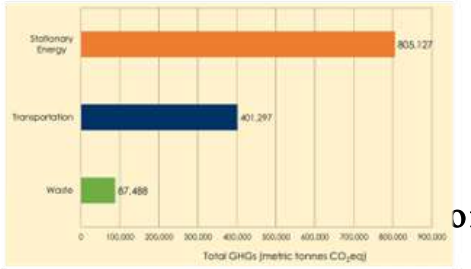
SEGAMAT

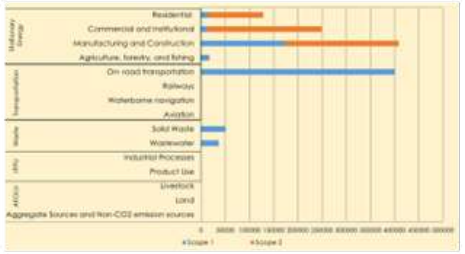
Population of Segamat : 211,300 (2018)



1,293,912 tCO_2eq
Total GHG Emission Segamat

6.1 tCO_2eq
Emission per capita Segamat





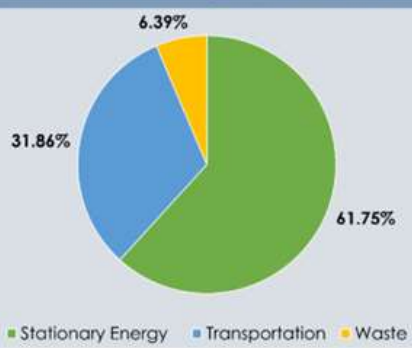
The total GHG emissions of Segamat identified from the year 2018 baseline emissions inventory to be 1.29 mil tCO2eq. Based on the emission profile, the emission per capita for Segamat is 6.1 tCO_2eq.

The proportion of total emissions contributed by each of the three sectors is depicted. Stationary Energy makes up the largest portion of the GHG emissions for Segamat, which is 62% (805 tCO_2eq), followed by Transportation (31%) and Waste (7%).

POTENTIAL EMISSION REDUCTION
531 $ktCO_2eq$

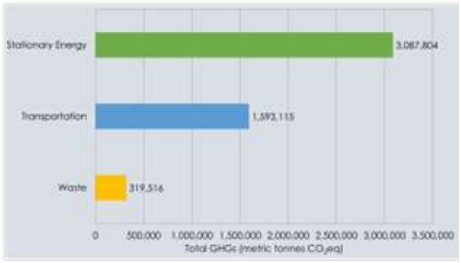
PETALING JAYA

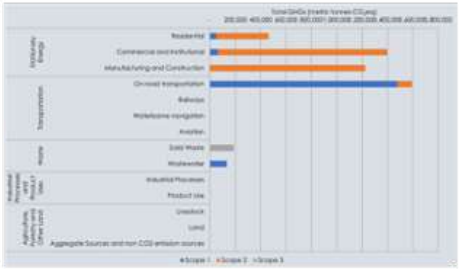
Population of Petaling Jaya : 771,687 (2018)



5,000,436 tCO_2eq
Total GHG Emission Petaling Jaya

6.48 tCO_2eq
Emission Per Capita Petaling Jaya





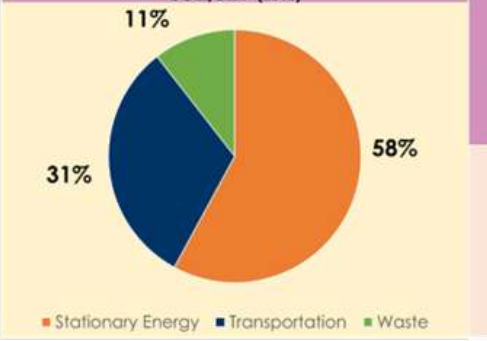
The total GHG emissions of Petaling Jaya identified from the year 2018 baseline emissions inventory to be 5.00 mil tCO_2eq. Based on the emission profile, the emission per capita for Petaling Jaya is 6.48 tCO_2eq.

The proportion of total emissions contributed by each of the three sectors is depicted. Stationary Energy makes up the largest portion of the GHG emissions for Petaling Jaya, which is 61.75% (3,087 tCO_2eq), followed by Transportation (31.86%) and Waste (6.39%).

POTENTIAL EMISSION REDUCTION
1,650 $ktCO_2eq$

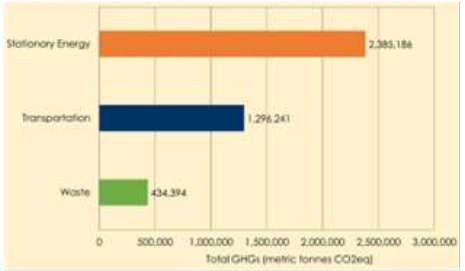
ISKANDAR PUTERI

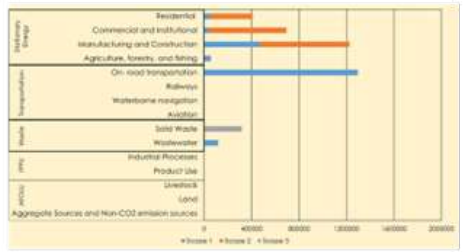
Population of Iskandar Puteri: 682,527 (2018)



4,115,821 tCO_2eq
Total GHG Emission Iskandar Puteri

6.0 tCO_2eq
Emission per capita Iskandar Puteri





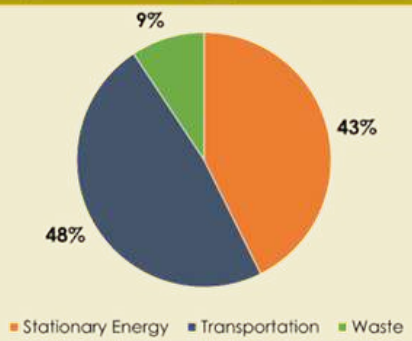
The total GHG emissions of Iskandar Puteri identified from the year 2018 baseline emissions inventory to be 4.11 mil tCO_2eq. Based on the emission profile, the emission per capita for Iskandar Puteri is 6.0 tCO_2eq.

The proportion of total emissions contributed by each of the three sectors is depicted. Stationary Energy makes up the largest portion of the GHG emissions for Iskandar Puteri, which is 58% (2,385 tCO_2eq), followed by Transportation (31%) and Waste (11%).

POTENTIAL EMISSION REDUCTION
2,718 $ktCO_2eq$

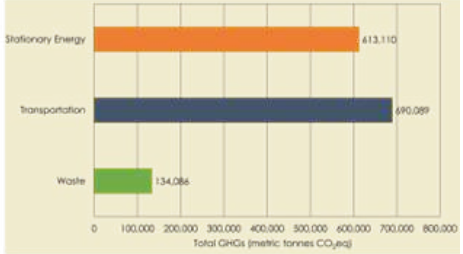
PUTRAJAYA

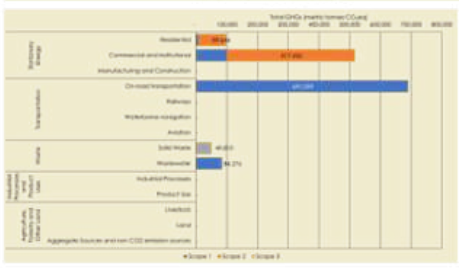
Population of Putrajaya : 134,391 (2021)



1,437,284 tCO_2eq
Total GHG Emission Putrajaya

10.69 tCO_2eq
Emission Per Capita Putrajaya





The total GHG emissions of Putrajaya identified from the year 2021 baseline emissions inventory to be 1.44 mil tCO_2eq. Based on the emission profile, the emission per capita for Putrajaya is 10.69 tCO_2eq.

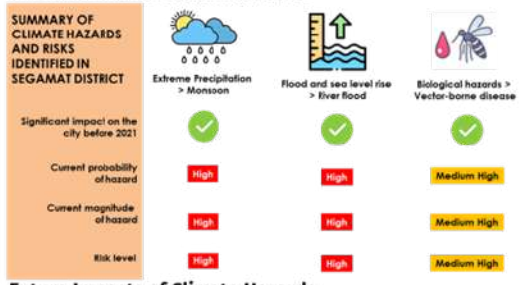
The proportion of total emissions contributed by each of the three sectors is depicted. Transportation makes up the largest portion of the GHG emissions for Putrajaya, which is 48% (690 tCO_2eq), followed by Stationary Energy (43%) and Waste (9%).

POTENTIAL EMISSION REDUCTION
474 $ktCO_2eq$

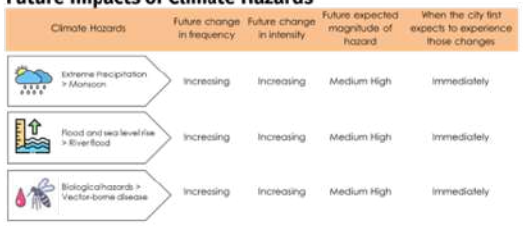
| COMMON REPORTING FRAMEWORK (CRF) | CLIMATE ACTION PLAN 2030

SEGAMAT

Past and Current Climate Hazards



Future Impacts of Climate Hazards

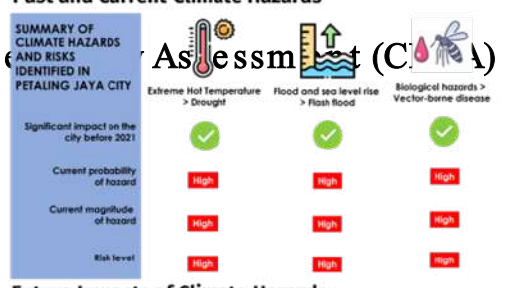


Impacts of Climate Hazards and Vulnerable Population

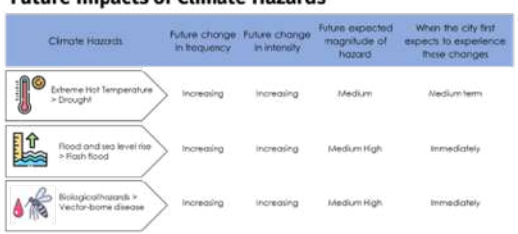
Climate Hazards	Social impact of hazard overall	Most relevant assets / services affected overall	Vulnerable populations affected
Extreme Precipitation > Monsoon	• Fluctuating socio-economic conditions • Increased incidence and prevalence of disease and illness • Increased demand for public services • Increased demand for healthcare services • Increased risk to already vulnerable populations • Increased resource demand	• Food and Agriculture • Tourism • Transportation • Industrial • Commercial • Residential • Emergency services • Land use planning	• Children & youth • Elderly • Indigenous population • Persons with disabilities • Persons with chronic diseases • Low-income households • Unemployed persons • Persons living in sub-standard housing
Flood and sea level rise > River	• Increased demand for public services; • Increased demand for healthcare services; • Increased resource demand (e.g. food); • Others - Damage/loss of property (e.g. car, home); • Inconvenience - closure of road service	• Water supply & sanitation; • Food and agriculture; • Waste management; • Environment, biodiversity, forestry; • Emergency services; • Land use planning	• Women & girls • Children & youth • Elderly • Persons with disabilities; • Low-income households
Biological hazards > Vector-borne dise	• Increased demand for public services (e.g. fogging and prevention measures); • Increased demand for healthcare services; • Increased risk to already vulnerable populations	• Industrial; • Commercial; • Residential; • Public Health	• Children & youth; • Elderly; • Persons with chronic diseases; • Low-income households

PETALING JAYA

Past and Current Climate Hazards



Future Impacts of Climate Hazards



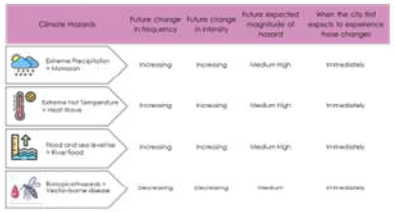
Impacts of Climate Hazards and Vulnerable population

Climate Hazards	Social impact of hazard overall	Most relevant assets / services affected overall	Vulnerable populations affected
Water Scarcity> Drought	• Fluctuating socio-economic conditions • Increased demand for public services • Increased risk to already vulnerable populations • Increased resource demand	• Water supply & sanitation; • Environment, biodiversity, forestry • Industrial • Commercial • Residential • Public Health	• Elderly • Persons with disabilities • Persons with chronic diseases • Low-income households
Flood and sea level rise > Flash / surface flood	• Increased demand for public services; • Increased demand for healthcare services; • Increased resource demand (e.g. food); • Others - Damage/loss of property (e.g. car, home); • Disruptions - closure of road service	• Waste management; • Emergency services; • Land use planning • Industrial • Commercial • Residential • Public Health	• Elderly • Children & youth • Persons with disabilities • Low-income households
Biological hazards > Vector-borne disease	• Increased demand for public services (e.g. fogging and prevention measures); • Increased demand for healthcare services; • Increased risk to already vulnerable populations	• Industrial; • Commercial; • Residential; • Public Health	• Children & youth; • Elderly; • Low-income households; • Persons living in sub-standard housing

ISKANDAR PUTERI

Past and Current Climate Hazards

Future Impacts of Climate Hazards

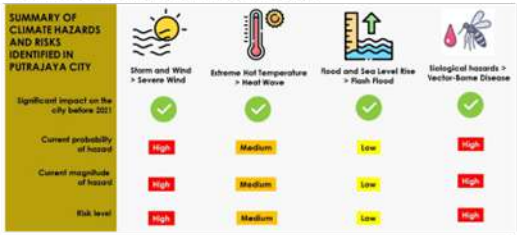


Impacts of Climate Hazards

Climate Hazards	Social impact of hazard overall	Most relevant assets/services affected overall	Vulnerable populations affected
Extreme Precipitation > Monsoon	• Increased demand for public services (e.g. local government assistant to flood victims)/farmers'	• Food and Agriculture • Tourism	• Low-income households
Extreme Hot Temperature > Heat Wave	• Fluctuating socio-economic conditions • Increased incidence and prevalence of disease and illness • Increased demand for public services • Increased demand for healthcare services • Increased risk to already vulnerable populations	• Residential • Tourism;	• Elderly • Persons with dissabilities • Persons with chronic diseases
Flood and sea level rise > River flood	• Increased demand for public services; • Increased demand for healthcare services; • Increased resource demand (e.g. food); • Others - damage/loss of property (e.g. car, home); • Inconvenience - closure of road service	• Water supply & sanitation; • Food and agriculture; • Waste management; • Environment, biodiversity, forestry; • Emergency services; • Land use planning	• Indigenous population • Persons with disabilities; • Low-income households
Biological hazards > Vector-borne disease	• Increased demand for public services (e.g. fogging and prevention measures); • Increased demand for healthcare services; • Increased risk to already vulnerable populations	• Industrial; • Commercial; • Residential; • Public Health	• Children & youth; • Elderly; • Persons with chronic diseases; • Low-income households

PUTRAJAYA

Past and Current Climate Hazards



Future Impacts of Climate Hazards

Impacts of Climate Hazards

Climate Hazards	Social impact of hazard overall	Most relevant assets / services affected overall	Vulnerable populations affected
Storm and Wind> Severe Wind	• Fluctuating socio-economic conditions • Increased risk to already vulnerable populations • Increased resource demand	• Energy • Transportation • Environment, biodiversity, forestry	• Elderly • Persons with disabilities • Persons with chronic diseases
Extreme Hot Temperature > Heat wave	• Fluctuating socio-economic conditions • Increased incidence and prevalence of disease and illness • Increased demand for public services • Increased demand for healthcare services • Increased risk to already vulnerable populations	• Residential • Tourism	• Elderly • Persons with disabilities • Persons with chronic diseases
Flood and sea level rise > Flash flood	• Increased demand for public services; • Increased demand for healthcare services; • Increased resource demand (e.g. food); • Others - Damage/loss of property (e.g. car, home); • Inconvenience - closure	• Water supply & sanitation; • Food and agriculture; • Waste management; • Environment, biodiversity, forestry; • Emergency services; • Land use planning	• Women & girls • Children & youth • Elderly • Persons with disabilities; • Low-income households
Biological hazards > Vector-borne disea	• Increased demand for public services (e.g. fogging and prevention measures); • Increased demand for healthcare services; • Increased risk to already vulnerable	• Industrial; • Commercial; • Residential; • Public Health	• Children & youth; • Elderly; • Low-income households; • Persons living in sub-standard housing

| COMMON REPORTING FRAMEWORK (CRF) | CLIMATE ACTION PLAN 2030

Mitigation And Adaptation Measures

SEGAMAT

5 THEMES
30 PLANNED ACTIONS

1. Sustainable Energy and Green Building
2. Green Commuting and Logistic
3. Conservation of Biodiversity
4. Community based on Climate Response
5. Disaster Management

PETALING JAYA

6 THEMES
56 PLANNED ACTIONS

1. Renewable Sources and Energy Efficiency
2. Sustainable Urban Planning and Building Regulations
3. Pedestrian First and Green Transportation
4. Green Space Planning and Management
5. Social Sustainability and Empowered Communities
6. Disaster Risk Reduction Management

ISKANDAR PUTERI

5 THEMES
41 PLANNED ACTIONS

1. Enhancing Sustainable Buildings and Construction
2. Changing to "Car-lite Future" and Sustainable Logistics Transportation
3. Safeguarding Existing Biodiversity
4. Strengthening Community Participation in Low Carbon Initiatives
5. Climate Resilience

PUTRAJAYA

6 THEMES
38 PLANNED ACTIONS

1. Energy
2. Urban Planning and Building Regulations
3. Mobility
4. Blue and Green
5. Community
6. Climate Resilience

Common Mitigation And Adaptation Measures

CITIES	MITIGATION						ADAPTATION		
	SUSTAINABLE ENERGY		TRANSPORTATION		COMMUNITY ACTION		CLIMATE RISK		
	Renewable Energy	Energy Efficiency	Active Mobility	Public Transport	Community Engagement	Waste and Lifestyle	Flood	Dengue	Drought/ Heat Wave
SEGAMAT	✓	✓	✓	✓	✓	✓	✓	✓	✓
ISKANDAR PUTERI	✓	✓	✓	✓	✓	✓	✓	✓	✓
PETALING JAYA	✓	✓	✓	✓	✓	✓	✓	✓	✓
PUTRAJAYA	✓	✓	✓	✓	✓	✓	✓	✓	✓

CONCLUDING REMARKS

1. ***Asian Cities are experiencing rapid urbanisation*** (UR ~ 85% by 2030) ***and we need to take this opportunity to avoid carbon locked situation.***
2. ***Society are at the core*** of mitigating and adapting to climate change, and enhancing sustainability
3. **TBL holistic development** where Social (quality of life, inclusiveness),economic (growth and prosperity) and environmental (biodiversity, carbon sink/NBS) conservation goals must be sustained as we mitigate and adapt to climate change
4. Smart technologies, AI, IoT, ICT as ***means to ends*** for accelerating the transition into sustainable, climate-smart cities (low carbon 2030, carbon neutral 2050)
5. Science to Action (S2A) – ***evidence-based, action-oriented climate policymaking*** with ***implementation*** in mind – ***MAINSTREAMING CLIMATE ACTIONS INTO STATUTORY PLANS IS KEY!***
6. ***Highest level buy-in*** is essential (highly committed and passionate State Executive Councillors, City Mayors/Presidents)
7. We must ***ACT NOW!*** STOP green washing!

THANK YOU!

UTM-Low Carbon Asia Research Centre
Block B12, 02-04-01
Faculty of Built Environment & Surveying
Universiti Teknologi Malaysia
81310 UTM Johor Bahru
Johor, MALAYSIA

T: +60-7-5557359
M: +60-12-2986302
E: lwchau@utm.my