

Net-Zero and NDCs: Science-based climate policymaking
and implementation in Asia

Science-based climate policymaking and implementation for carbon neutrality – the case of Malaysia cities

Date and Time: Monday, 18 Nov 2024 11000-1130am(90 minutes)
Japan Pavillion UNFCCC COP29 **Baku**



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Prof. TPr. Dr. HO Chin Siong and
TPr Chau Loon Wai

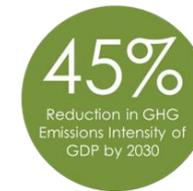


*UTM-Low Carbon Asia Research Centre
Faculty of Built Environment and Surveying
Universiti Teknologi Malaysia
Johor Bahru, Malaysia*

Pledge of Voluntary 40% reduction of CO₂ emission intensity by 2020 to 45% emission intensity by 2030 and now carbon neutral nation by 2050

Government Policy Directions

- National Policy on the Environment
- National Green Technology Policy
- National Policy on Climate Change 2010
- Renewable Energy Act 2010
- SEDA Act 2010
- Green Neighborhood Planning Guidelines
- Low Carbon Cities Framework and Assessment
- Malaysia Smart City Framework 2018
- National Low Carbon Cities Masterplan 2022
- National Energy Policy 2022- 2040
- National Energy Transition Roadmap 2023



Background

Asian and Malaysia cities : Key Challenges



Size: 330,803 km²

Population: 32.7mil. (2021) | 1.32%pa growth rate

GDP: RM1.5 tril. or USD359bil (2021) 5% p.a growth rate

Issues

- Rapid urbanization and industrialization (7%pa)
- Relatively high carbon intensity dependence on fossil fuel (80%^)
- High private car ownership (15% public)
- Low density development and urban sprawl
- Low efficiency appliances and Renewable energy

Collaborative efforts among Federal, state and local governments as well as the private sector and CSOs will be intensified to support the transition to a low-carbon nation

To address climate change across all GHG emitting sectors, namely energy, transport, IPPU, waste management, agriculture, forestry and land use.

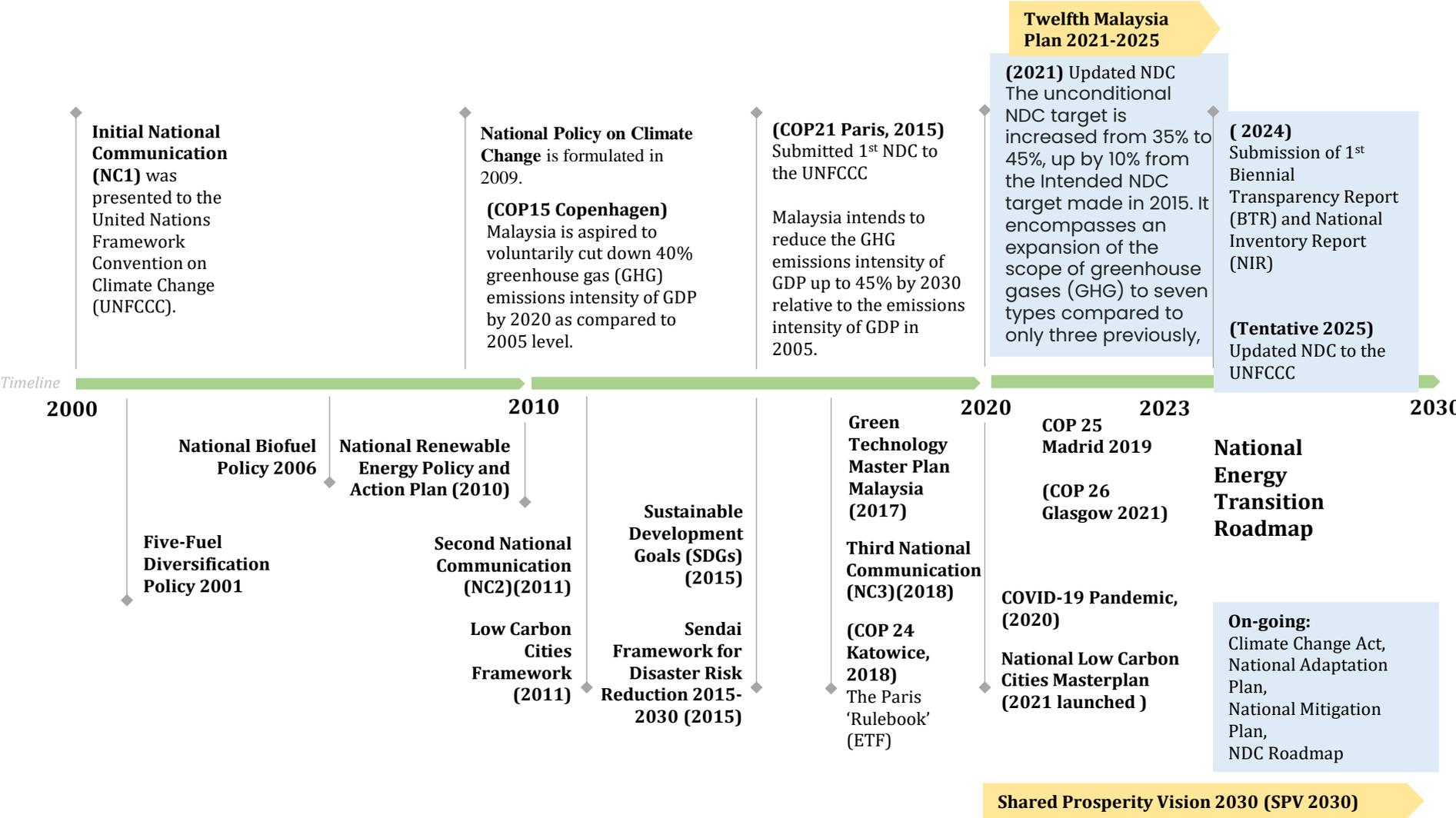
Malaysia's commitment to the Paris Agreement of the UNFCCC to reduce up to 45% GHG emissions intensity to GDP by 2030 based on emissions intensity in 2005, the focus will be on developing enabling instruments for climate action, including carbon pricing.

Promoting green and resilient cities and townships, enhancing green mobility and augmenting the consumption of low carbon energy as well as expanding the green market and GDP.

POSITIONING MALAYSIA IN THE GLOBAL CLIMATE SCENE

COUNTRY	TREND	2018 EMISSIONS	AS PERCENT OF GLOBAL	PER CAPITA
China	<p>China is one of the top GHG emitters. It accounts for 27.79% of global emissions. In 2018, it emitted 13,739.79 million tonnes. It has had one of the biggest increases in GHG emissions – 250% since 1990.</p> 	13,739.79 million tonnes of GHG	27.8%	9.71 tonnes of GHG
United States of America	<p>United States of America is one of the top GHG emitters. It accounts for 12.74% of global emissions. In 2018, it emitted 6,297.62 million tonnes. It is one of the countries with the highest per capita GHG emissions – 19.27 tonnes.</p> 	6,297.62 million tonnes of GHG	12.7%	19.27 tonnes of GHG
India	<p>India is one of the top GHG emitters. It accounts for 7.32% of global emissions. In 2018, it emitted 3,619.80 million tonnes.</p> 	3,619.80 million tonnes of GHG	7.3%	2.67 tonnes of GHG
Japan	<p>Japan is one of the top GHG emitters. It accounts for 2.57% of global emissions. In 2018, it emitted 1,270.21 million tonnes.</p> 	1,270.21 million tonnes of GHG	2.6%	9.99 tonnes of GHG
Malaysia	<p>Malaysia has had one of the biggest increases in GHG emissions – 253% since 1990.</p> 	324.31 million tonnes of GHG	0.7%	10.12 tonnes of GHG

Current Climate Change Efforts of in Malaysia



EXAMPLE 1 ISKANDAR MALAYSIA's – Setting up LCS BP - decarbonization plan with specific target and planned actions follow by detailed Action Plans and sectorial plan + monitoring report (bi annual GHG inventory report)

Science-based Climate Policies and Action Plans



EXAMPLE 2 : Malaysian Pilot cities with Climate Action Plan to promote multilevel governance

GCoM MALAYSIAN PILOT CITIES – TAKING CLIMATE ACTIONS

GCOM MALAYSIAN PILOT CITIES



EXAMPLE : PUTRAJAYA CITY as a case

33% 2030
Reduction in absolute GHG carbon emission

PETALING JAYA, SELANGOR
Population: 793, 636 (2021)
Main Economy: Manufacturing, Commercial and Services
Administration: Petaling Jaya City Council (MBPJ)
Total GHG Inventory Emission (2018): 5.10 mil tCO₂eQ
Vulnerabilities: Drought, Flash flood, Vector-borne disease

45% 2030

PENAMPANG, SABAH
Population: 121,934 (2010)
Main Economy: Agriculture, Commercial and Services
Administration: Penampang Districts Council (MDP)
Total GHG Inventory Emission (2017): 0.45 mil tCO₂eQ
Vulnerabilities: Flash Flood, River Flood, Earthquake, Landslide, Tropical Storm

50% 2030

SEGAMAT, JOHOR
Population: 213, 900 (2020)
Main Economy: Agriculture, Tourism
Administration: Segamat Municipal Council (MPS)
Total GHG Inventory Emission (2018): 1.29 mil tCO₂eQ
Vulnerabilities: Monsoon, River flood, Vector-borne disease

33% 2030
Reduction in absolute GHG carbon emission

PUTRAJAYA
Population: 134, 931 (2021)
Main Economy: Governance, Commercial and Services
Administration: Putrajaya Corporation
Total GHG Inventory Emission (2018): 1.43 mil tCO₂eQ
Vulnerabilities: Severe Wind, Heat Wave, Flash Flood, Vector-borne disease

45% 2030

TAWAU, SABAH
Population: 397,673 (2010)
Main Economy: Agriculture
Administration: Tawau Municipal Council (MP)
Total GHG Inventory Emission (2017): 1.56 mil tCO₂eQ
Vulnerabilities: Tropical Storm Storm Surge, Flash Flood, River Flood, Vector-borne disease

63% 2030

ISKANDAR PUTERI, JOHOR
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 tCO₂eQ
Vulnerabilities: Monsoon, Heat Wave, River Flood, Vector-borne disease

45% 2030

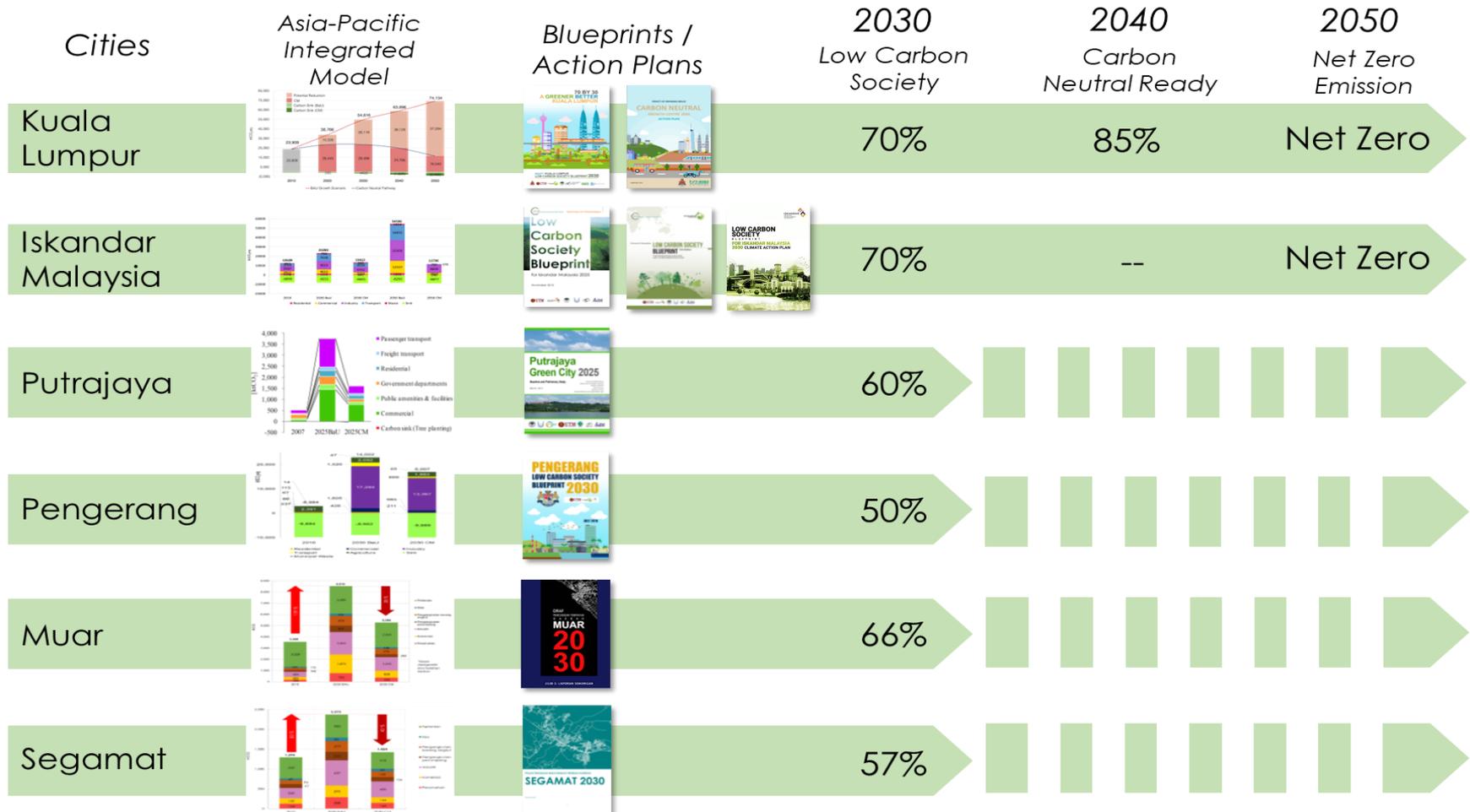
HANG TUAH JAYA, MELAKA
Population: 124,000 (2010)
Main Economy: Manufacturing, Commercial and Services
Administration: Hang Tuah Jaya Municipal Council (MPHJ)
Total GHG Inventory Emission (2017): 1.03 mil tCO₂eQ
Vulnerabilities: Monsoon, Drought, Flash Flood, Vector-borne disease

63% 2030

MUAR, JOHOR
Population: 281,500 (2018)
Main Economy: Agriculture, Industry, Tourism
Administration: Muar Municipal Council (MPM)
Total GHG Inventory Emission (2017): 1.62 mil tCO₂eQ
Vulnerabilities: Monsoon, Flash Flood, River Flood, Salt water intrusion, Forest fire, Coastal Flood, Vector-borne disease



CLIMATE SCIENCE TO ACTION FOR SELECTED MALAYSIAN CITIES With Specific emission reduction target

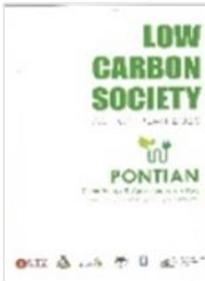
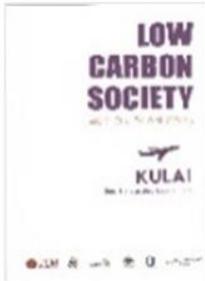
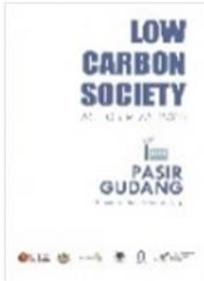
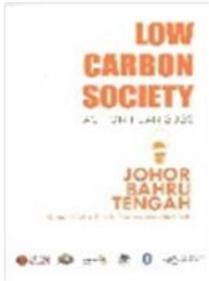
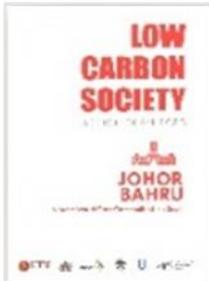
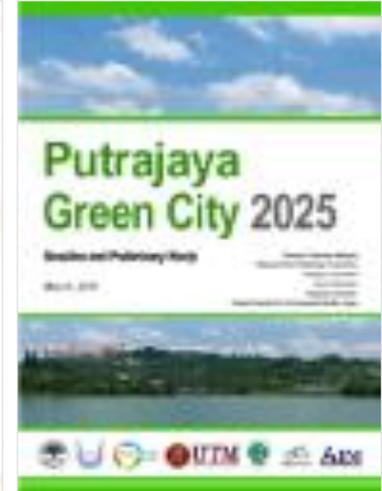
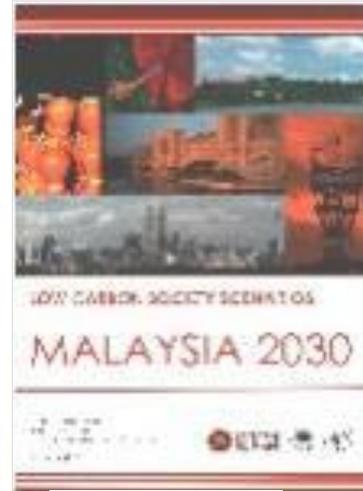
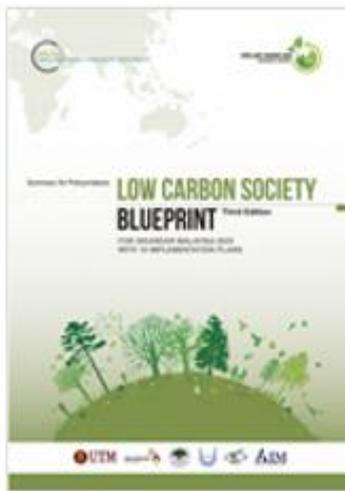
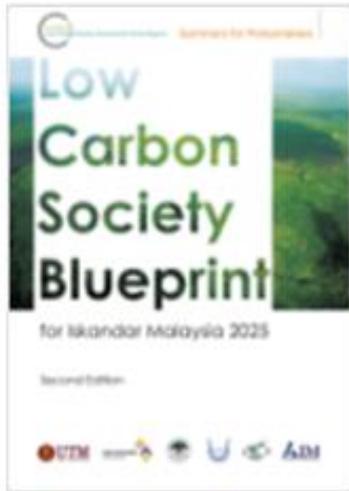


Many big cities in Malaysia have Climate Action Plans

ISKANDAR MALAYSIA GREENHOUSE GAS INVENTORY

2018 & 2019

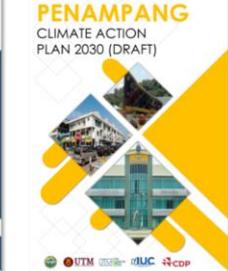
Draft Final Report



**PULAU PINANG
CARBON NEUTRAL
2050**



RESEARCH COLLABORATION



**Additional 20
more cities
with Climate
Action Plan**

2009-2020

Some examples of CLIMATE ACTION PLAN 2030 for Malaysian pilot cities

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

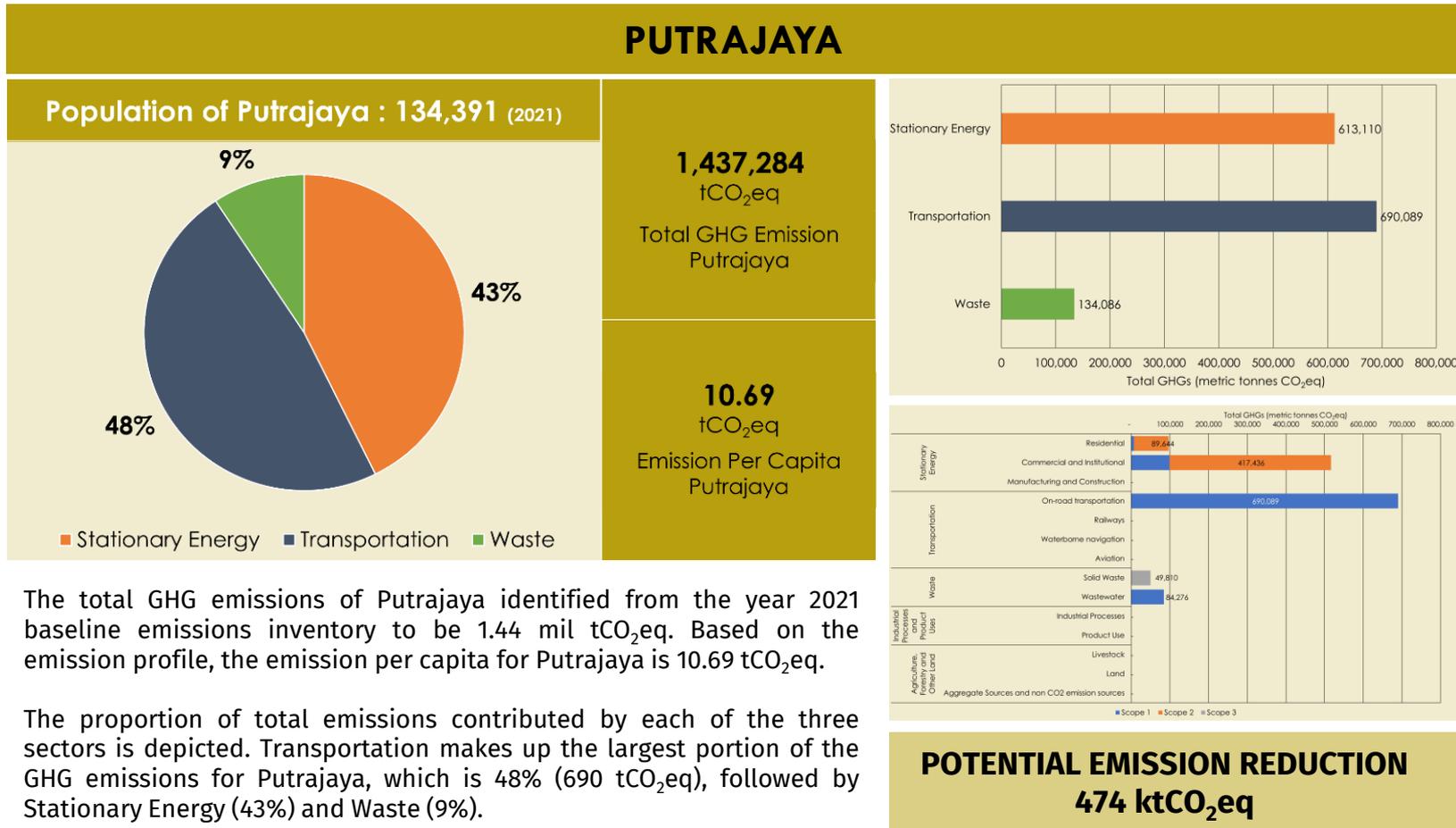
1. Enhancing Sustainable Buildings and Construction
2. Changing to “Car-lite Future” and Sustainable Logistics Transportation
3. Safeguarding Existing Biodiversity
4. Strengthening Community Participation in Low Carbon Initiatives
5. Climate Resilience

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

EXAMPLE : PUTRAJAYA CITY as a case BASELINE EMISSIONS INVENTORY (CIRIS)



EXAMPLE : PUTRAJAYA CITY as a case PLANNED **ACTIONS** for theme **Energy and Urban Planning**

PUTRAJAYA



THEME 1: ENERGY

Renewable Energy

- B1** Collaborate with relevant agencies for promoting solar energy system (PV) and solar thermal system on buildings in Putrajaya
- I1** Carry out a pilot project of floating solar farm on the lake

Energy Efficiency

- I2** Implement an online energy monitoring system
- I3** Adopt Energy Efficiency Infrastructures and Facilities (Energy Saving Street Light, Sensor on Site Facilities, Centralised Electronic Bulletin Board)
- B2** Install energy efficiency (EE) equipment and smart meters for PJC assets and commercial buildings



THEME 2: URBAN PLANNING AND BUILDING REGULATIONS

Urban Design

- I4** Adopt and implement Safe City practices to promote active mobility and use of public transport
Protect cultural identity, precincts character and sense of place through sustainable urban design practices (TOD, compact development)
- B3**

Building

- B4** Incorporate the Latest Green Building Design and Certification in Development Control
- B5** Promote Adoption of Passive Architecture in New Buildings via Natural Ventilation, Shading and Lighting
- I5** Expand the Adoption of Rainwater Harvesting System and Promote Periodical Maintenance of It

EXAMPLE : PUTRAJAYA CITY as a case

PLANNED ACTIONS for Mobility and theme 4 Blue and Green

PUTRAJAYA



THEME 3 : MOBILITY

Active Mobility

- T1** Promote Pedestrian and Cycling as mode choice in home to work's travel in Putrajaya
- T2** Maintain Comfortable & Safe Pedestrian Networks
- T3** Rebrand Existing Car Free Day Event into Monthly Active Mobility Program

Public Transport

- T4** Promote a shift from private vehicles to public transport
- T5** Provide more environmentally friendly public bus services by using clean and green fuel

Mobility Technology

- T6** Install digital display board for real time information on public transport
- T7** Promote sharing green economy and the future of personal mobility (e.g partnering with EV Car Sharing Companies)



THEME 4: BLUE AND GREEN

Planting and Green Spaces

- E1** Promote vertical gardens and green roofs in commercial buildings, schools and government buildings
- E2** Conduct Tree Planting Campaign in Putrajaya in line with 100 Million Tree-Planting Campaign 2020-2025
- E3** Conduct Continuous Monitoring and Updating on Existing Tree Inventory
- E4** Conduct Continuous Enhancement of Urban Biodiversity
- E5** Promote Nature-Based Solution (NBS) to protect, restore and manage natural and semi-natural ecosystems

Water Bodies

- E6** Enhance Putrajaya Lake Awareness Programme
- E7** Monitor and Protect Lake Water Quality

PLANNED ACTIONS for the theme Community and Resilience

PUTRAJAYA



THEME 5: COMMUNITY

Community Engagement

- S1** Transform existing Residents' Association, Local Businesses and Industries into Low Carbon communities
- Strengthen Putrajaya Urban Farming Program (*Program Pertanian Bandar 'PUF'*) by increasing participation and involvement of residents

Waste and Lifestyle

- S3** Expand Food Waste Composting Programme for the purpose of Community Farming
- Further Expand Waste-to-Wealth program (e.g., **I6** CAREton@Putrajaya) by collaborating with other private companies
- S4** Enhance community awareness on 3R, Proper Disposal and Illegal Dumping
- I7** Cultivate Recycling Behaviour of the Public through FIKS (Fasiliti Inovasi Kitar Semula)



THEME 6: CLIMATE RESILIENCE

Dengue

- D1** Improve Enforcement by PJC to inspect potential mosquito breeding sites (constructions sites and residential neighbourhoods)
- D2** Raise community awareness and participation on prevention of dengue by more effective step by step guide such as B-break, L-lift, O-overturn, C-change, K-keep

Severe Wind

- D3** Identify potential spots and frequency of downed trees at housing and commercial areas
- D4** Improve tree selection and landscape design to reduce the impact of wind

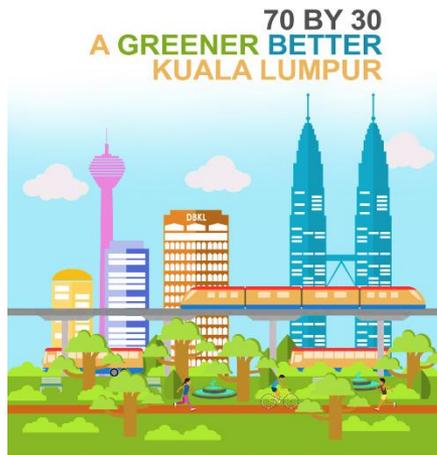
Drought

- D5** Expand and improve monitoring systems through social media or other communication platforms to reduce outdoors activities due to heat wave
- D6** Introduce programs or initiatives to reduce water consumption in commercial and residential areas

Flood

- D7** Improve maintenance of drainage system in Putrajaya
- D8** Improve early warning systems through Multi-Hazard Platforms such as social media, newspaper, public announcement and other applications

EXAMPLE 3 : KL LCSBP 2030- KL to lead other Malaysian



DRAFT KUALA LUMPUR
LOW CARBON SOCIETY BLUEPRINT 2030

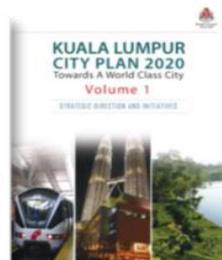


Kuala Lumpur
Structure Plan 2020

Kuala Lumpur Low
Carbon Society
Blueprint 2030

Kuala Lumpur
Structure Plan 2040

Kuala Lumpur
Carbon Neutrality
2050



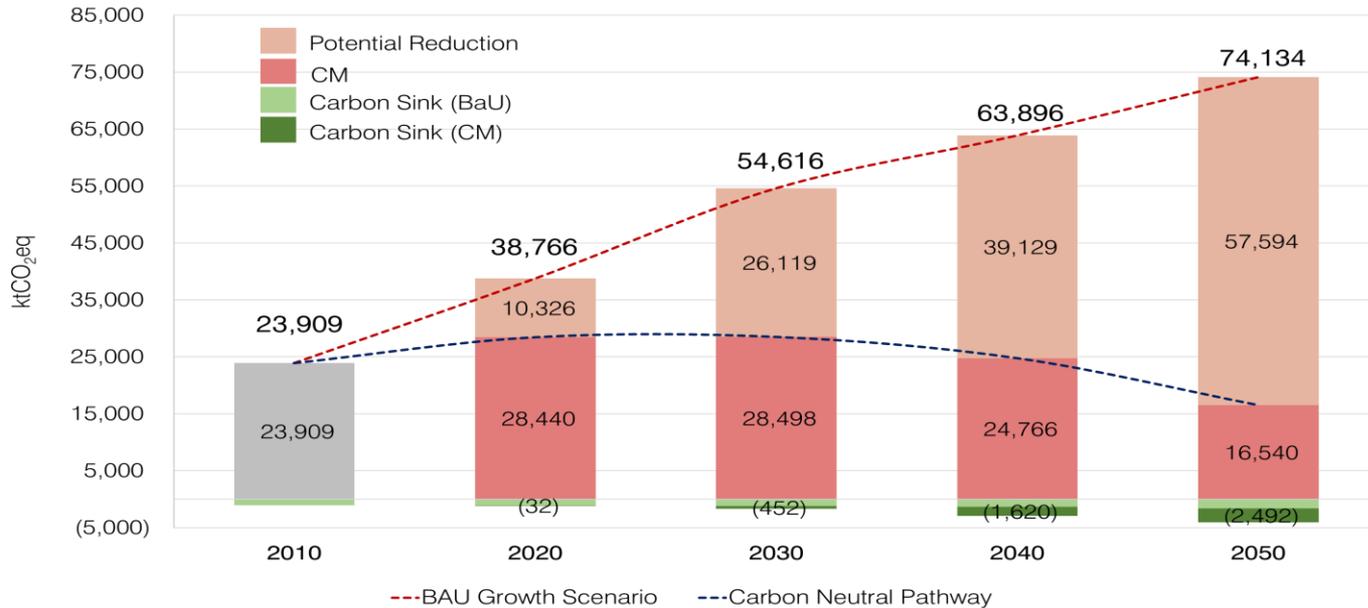
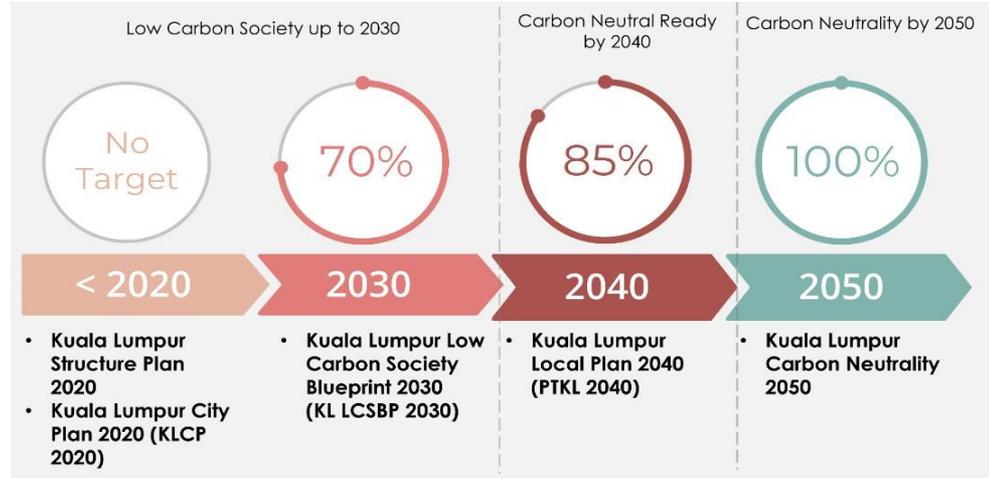
Kuala Lumpur
City Plan 2020



Kuala Lumpur
Local Plan 2040

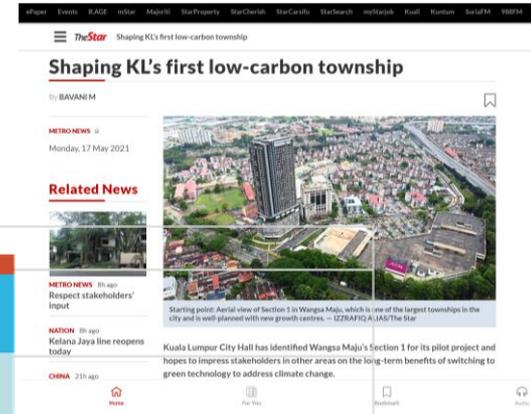
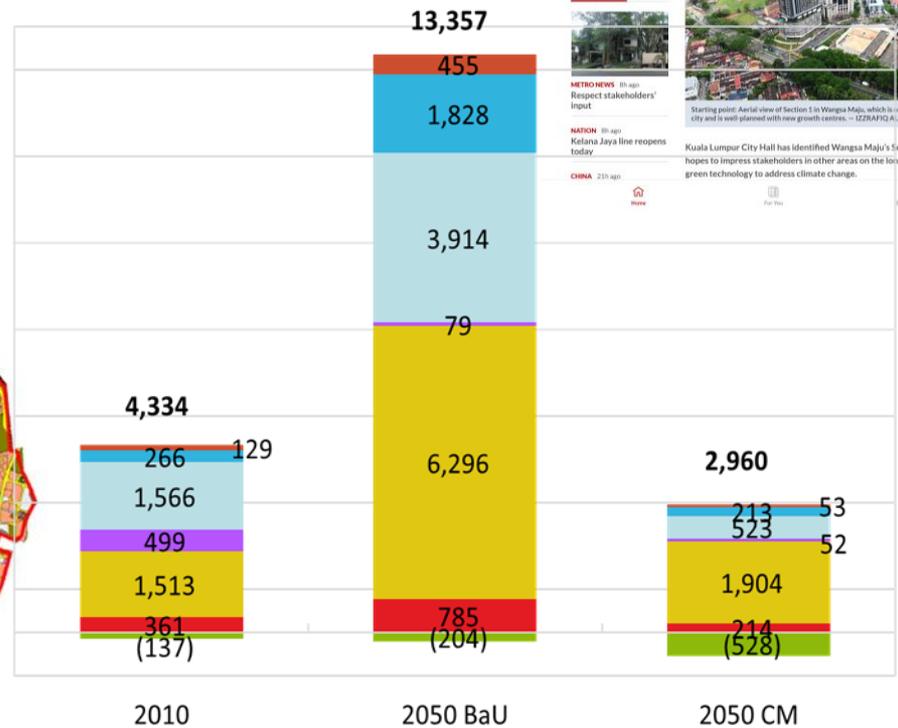
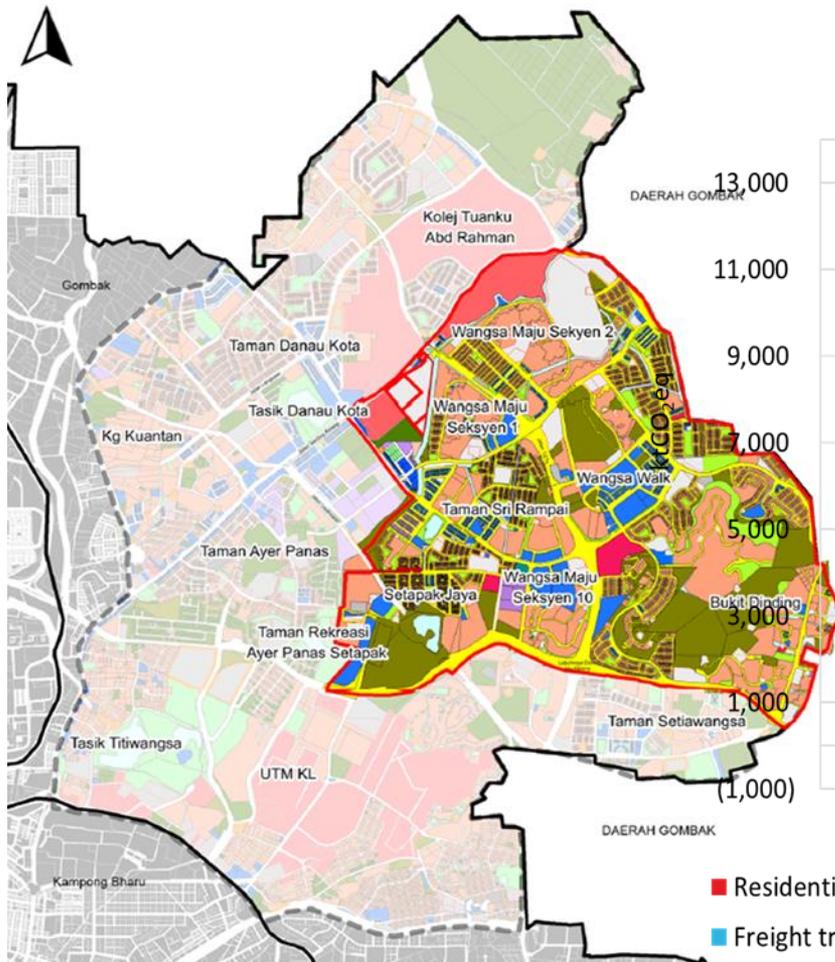


KUALA LUMPUR – NET ZERO EMISSION BY 2050 – GUIDED BY SCIENCE (ASIA-PACIFIC INTEGRATED MODEL)



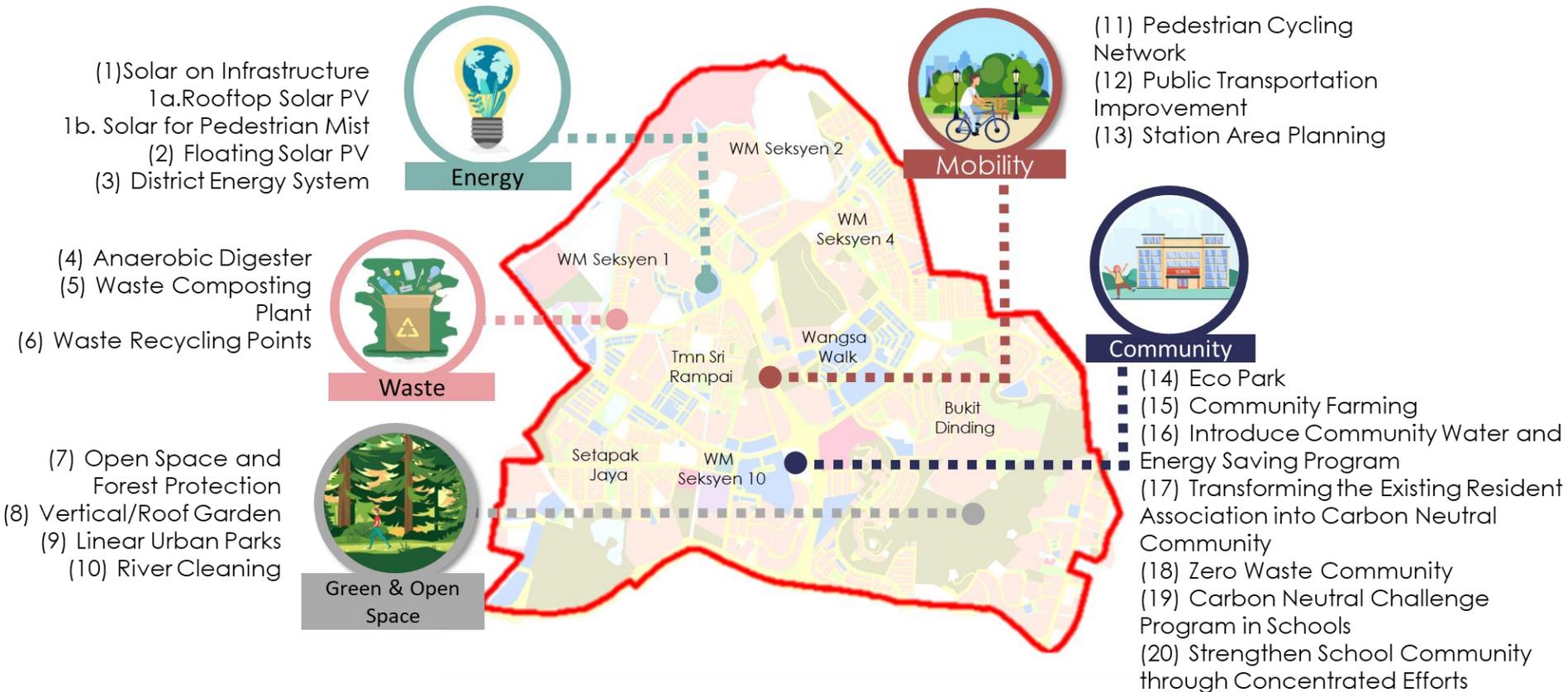
WANGSA MAJU CARBON NEUTRAL GROWTH CENTRE

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**.



- Residential
- Commercial
- Industry
- Passenger transport
- Freight transport
- Municipal waste
- Sink

WANGSA MAJU CARBON NEUTRAL GROWTH CENTRE - 20 PROJECTS LOCATIONS BY SECTOR - (ENERGY, WASTE, GREEN MOBILITY and COMMUNITY SECTORS)



Community and Private sector empowerment are vital to ensure inclusiveness and effective project implementation

COMMONWEALTH ASSOCIATION OF PLANNERS (CAP) AWARD 2023 WANGSA MAJU CNGC PLAN WITH 20 PROPOSED PROJECTS



Key considerations for Malaysian cities to Achieve Net Zero

- 1. Energy Transition in Urban Areas**
- 2. Sustainable and Low-Carbon Mobility**
- 3. Net Zero Buildings and Energy Efficiency Standards**
- 4. Waste Management and Circular Economy Initiatives**
- 5. Leveraging Data and Technology for Science-Based Implementation**
- 6. Building Coalitions and Partnerships to Support Science-Based Climate Action**
- 7. Ensuring a Just and Inclusive Transition**

CONCLUSION

In closing, achieving net zero cities in Malaysia is a **complex but achievable goal**.

Science-based policy-making provides us with a foundation for making informed, effective decisions that can drive urban transformation. By setting measurable targets, leveraging data, building partnerships, and ensuring that our **policies are inclusive, we can create a pathway** for Malaysian cities to lead in climate action.

Let us move forward with both ambition and a commitment to science-based policy-making, creating urban spaces that are **not only net zero but also resilient, equitable, and sustainable**.

Together, we can help ensure that Malaysian cities are key players in the fight against climate change and contribute meaningfully to a net zero future.

.

UTM-LCARC PARTNERS

Sponsors



Clients



Research Partners



Research Alliances



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: +197768823

Email: ho@utm.my

W: www.utm.my/satreps-lcs



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

