

High Level Talks on Zero Carbon City Kuala Lumpur

T2KLLCS

OKYO 2 TO UALA LUMPUR OW ARBON YSTEM

A case for successful city-to-city collaboration towards accelerating net-zero transition

Ho Chin Siong
Chau Loon Wai

08 August 2022



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

3 phases



TOKYO
METROPOLITAN
GOVERNMENT



Partners:



UTM
UNIVERSITI TEKNOLOGI MALAYSIA



Sponsor:



PHASE 1 (FY2019)

25, 27 Mar 2019 Initiation Discussions (via emails)

Apr-May 2019 Outreaching to DBKL, SEDA, TMG

17 May 2019 UTM Official Communications with IGES and MOEJ

27-28 Jun 2019 Kick-off Meeting @ KL

10 Jul 2019 Skype Meeting

29-31 Jul 2019 ISAP @ Tokyo

23 Aug 2019 T2KLLCS Launching @ KL

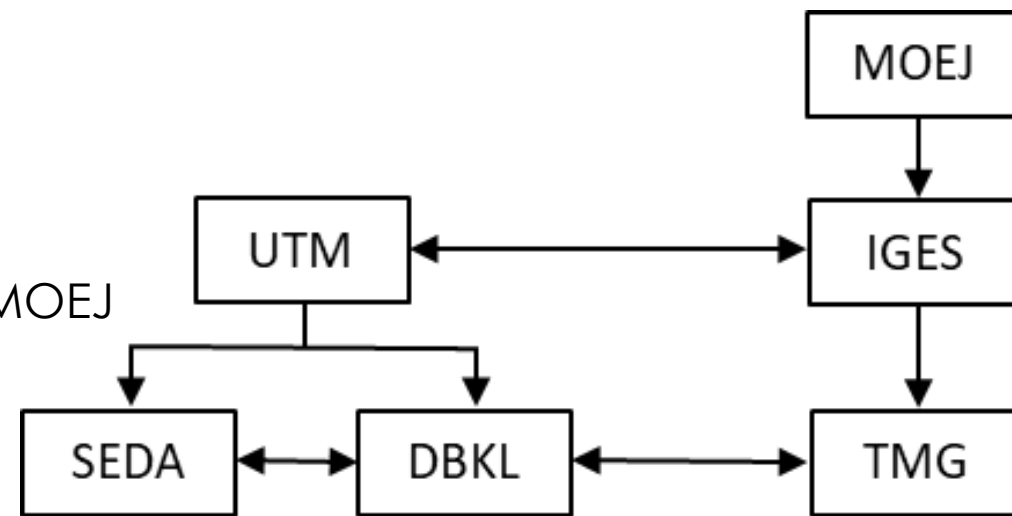
16 Oct 2019 APUF7 IGES Side Event @ Penang

17 Oct 2019 TMG & IGES Visit to DBKL

11 Dec 2019 COP25 Japan Pavilion Side Event @ M

13-18 Jan 2020 Training @ Tokyo

2 Mar 2020 Final Reporting to MOEJ



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 1 – City To City Collaboration



PHASE 1 (FY2019) OUTCOMES



1,955 units



405 units out of 1,955



MYR 60 million/year for electricity bills

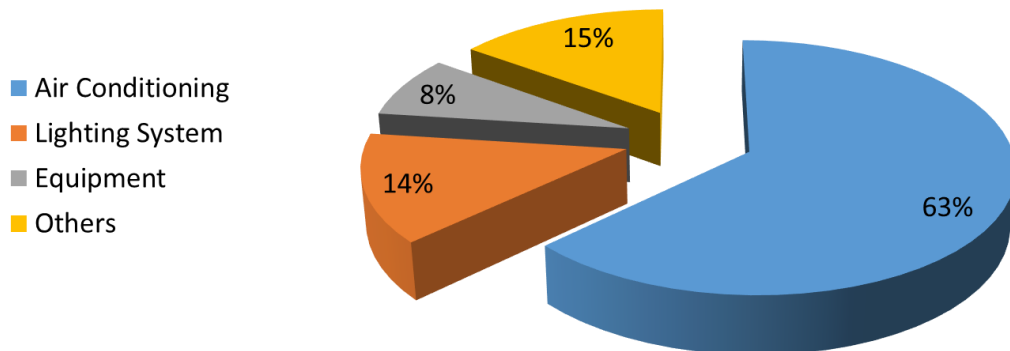


111.8 million kWh energy consumption



77.6 million kg CO₂e/year

T2KLLCS: **63%** OF POWER CONSUMPTION BY KLCH BUILDINGS IS FROM AIR CONDITIONING SYSTEM



Building Envelope	1	Infiltration - Airtight Building Envelope
	2	Reduce Direct Sunlight - Shading, Window Blind
	3	Insulation - Green Roof, Roof Insulation, Wall Insulation, Window Tinted, Window Glass
Air-Conditioning System	4	Outdoor Air Ventilation Control
	5	Zoning & Control of Air Distribution System - VAV, Temperature & Humidity Control, Setback & Shut-off Control, Off-hour control
	6	High Efficiency Fan System
	7	High Efficiency Air Filtration
	8	Effective Piping & Ducting Insulation
	9	High Efficiency Unitary Air Conditioning System - Single Split, Package, Multi Split, VRF
	10	High Efficiency Centralized Air Conditioning System - Chiller, Hydronic System, Cooling Tower
	11	Control of Centralized Air Conditioning System - Automation & Optimization
Lighting	12	Lighting Control - Daylight Control, luminance Control, Zoning Control, Motion Control, Off-hour Control
	13	High Efficiency Lighting System - Indoor & Outdoor
Energy Management Control System	14	Control of Equipment, Monitoring of Equipment, Integration of Equipment and Other Sub-systems, Energy related Data Collection and Analyses
Renewable Energy	15	Solar PV

	Scenario 1	Scenario 2
CO ₂ EMISSION IMPROVEMENT	35%	47%
Approach	Moderate	Aggressive
CO ₂ EMISSION REDUCTION	12.5 million kgCO ₂ e/year	16.9 million kgCO ₂ e/year
Monetary saving	MYR 7 million/year	MYR 9 million/year

PHASE 2 (FY2020)

14 May, 4, 10, 17 Jun 2020 Four (4) Pre-Project ZOOM Meetings

23 Jun 2020 Kick-off Meeting

7, 24 Jul; 5 Aug; 1 Sep 2020 ZOOM Meetings

24 Jul 2020 DBKL Mayor signed the TMG-DBKL MoU

4, 7, 22 Sep 2020 WEBEX Meetings

1 Oct 2020 Datuk Seri Mahadi Che Ngah Appointed 13th Mayor of KL

21 Oct 2020 ICLEI Daring Cities 2020 – Launching of Carbon Neutral KL 2050

27 Oct, 10 Nov 2020 WEBEX Meetings

22 Dec 2020 ZOOM Meeting

6 Jan 2021 ZOOM Meeting

14 Jan 2021 International Forum on SDG for Regional Revitalisation

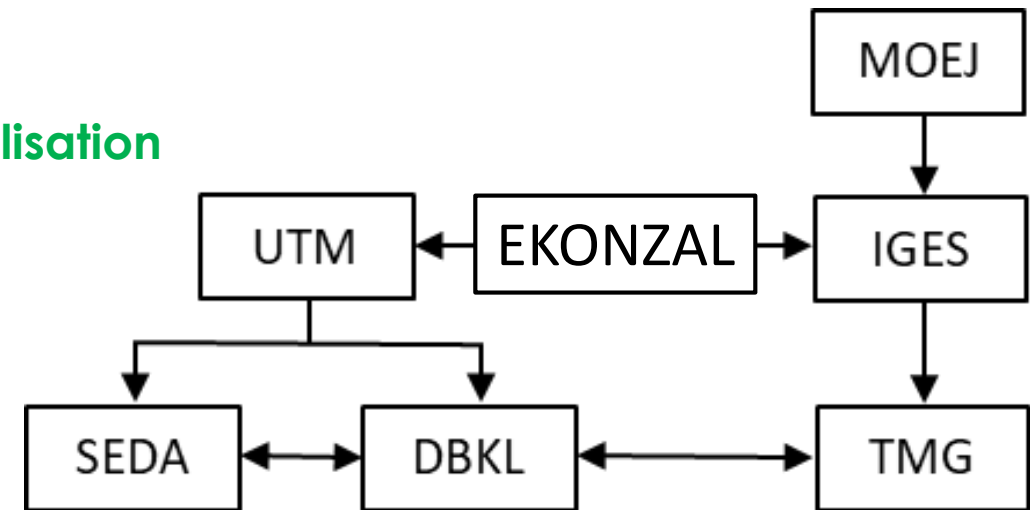
21 Jan 2021 Solar PV Installation Evaluation Discussion @ KL

25, 27 Jan 2021 ZOOM Meetings

5 Feb 2021 T2KLLCS 2021 Webinar

5 March 2021 Final Reporting to MOEJ

17 March 2021 Zero Carbon Cities International Forum



PHASE 2 (FY2020) OUTCOMES- RM 28mil budget

Tokyo to Kuala Lumpur Low Carbon System (T2KLCS)
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 (T2KLCS)
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

Tokyo to Kuala Lumpur Low Carbon System (T2KLCS)
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 (T2KLCS)
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

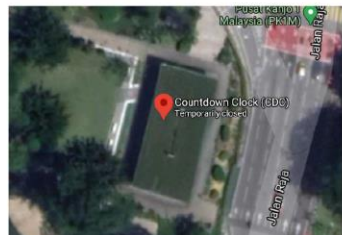
Tokyo to Kuala Lumpur Low Carbon System (T2KLCS)
Kuala Lumpur City Hall (KLCH) And Tokyo Metropolitan Government (TMG) Joint Effort To Counter Climate Change :
Carbon Neutral Kuala Lumpur By 2050



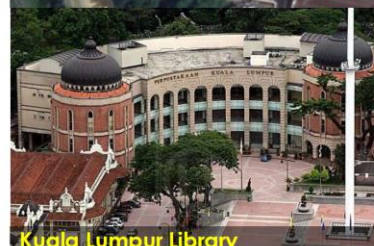
PHASE 2 – Kuala Lumpur Solar PV (Private Initiatives)



Sepak Takraw Stadium



Count Down Clock KL



Kuala Lumpur Library



DUKE-Plaza Toll



KEN Tower-TTDI



UTM-Semarak

PHASE 3 (FY2021)

7 Apr 2021 DBKL-UTM T2KLLCS 2021 Way Forward Discussion

21 Apr, 3, 9 Jun, 1 Jul 2021 Four (4) Pre-Project ZOOM Meetings

7 Jul 2021 TMG-KL extended (Jakarta) Webinar 2021

19 Jul 2021 Kick-off Meeting

29 Jul 2021 ZOOM Technical Meeting

2 Aug 2021 UTM-DBKL Google Meeting (Work Plan and Roadmap)

9 Aug 2021 IGES-UTM ZOOM Meeting

18 Aug 2021 ZOOM 2nd Technical Meeting

6 Sep 2021 DBKL-UTM Technical Meeting (Project Scoping and Data Update)

22 Sep 2021 TMG and IGES Feedback (via email)

5 Oct 2021 IGES-UTM ZOOM Technical Discussion

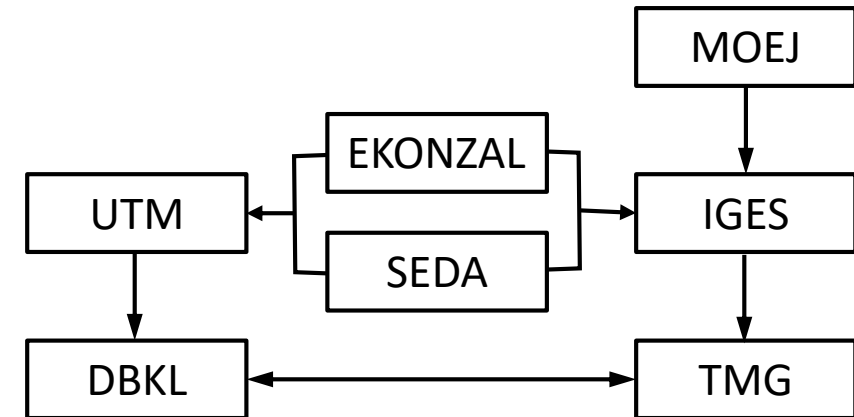
6 Oct 2021 T2KLLCS Action Plan Discussion (Google Meet) – Mayor Chaired

15 Oct 2021 DBKL-AEON-TMG-IGES-UTM-SEDA ZOOM Meeting (Wangsa Maju CNGC Collaboration)

10, 11 Nov 2021 COP26 @ Glasgow UNFCCC Official Side Event, MOEJ SE, LoCAR-Net SE, C40 SE etc.

7 Dec 2021 Menara 1 Reduction Potential Calculation Template (via email)

9 Dec 2021 LCBS for EE Retrofit and O&M (via email)



PHASE 3 (FY2021) OUTCOMES

KL commitment to lead Asian Cities into carbon neutrality- UNFCCC COP26 GLASGOW



PHASE 3 (FY2021) OUTCOMES

FY2021: Complete the ASEAN first comprehensive public building energy efficiency system

	Components	Deliverables	
1	Conduct retrofit in FY2021 to 3 projects identified in FY2020	Implement	Apply to public buildings in Wangsa Maju and others
2	Identify 2 nd round of EE retrofit and RE budgeting in FY2021	Budget	
3	Draft low carbon public building guidance (for retrofits)	Document	
4	Draft low carbon public building guidance (for O&M)	Document	
5	Draft low carbon public building procurement plan for 2030	Document	
6	Present at COP 26	Presentation	

Beyond T2KLLCS...

Smart City *さいたま市*
Saitama Model



TOKYO
METROPOLITAN
GOVERNMENT

Zero Emission Tokyo
Strategy **2050**

Wangsa Maju
Carbon Neutral
Growth Centre



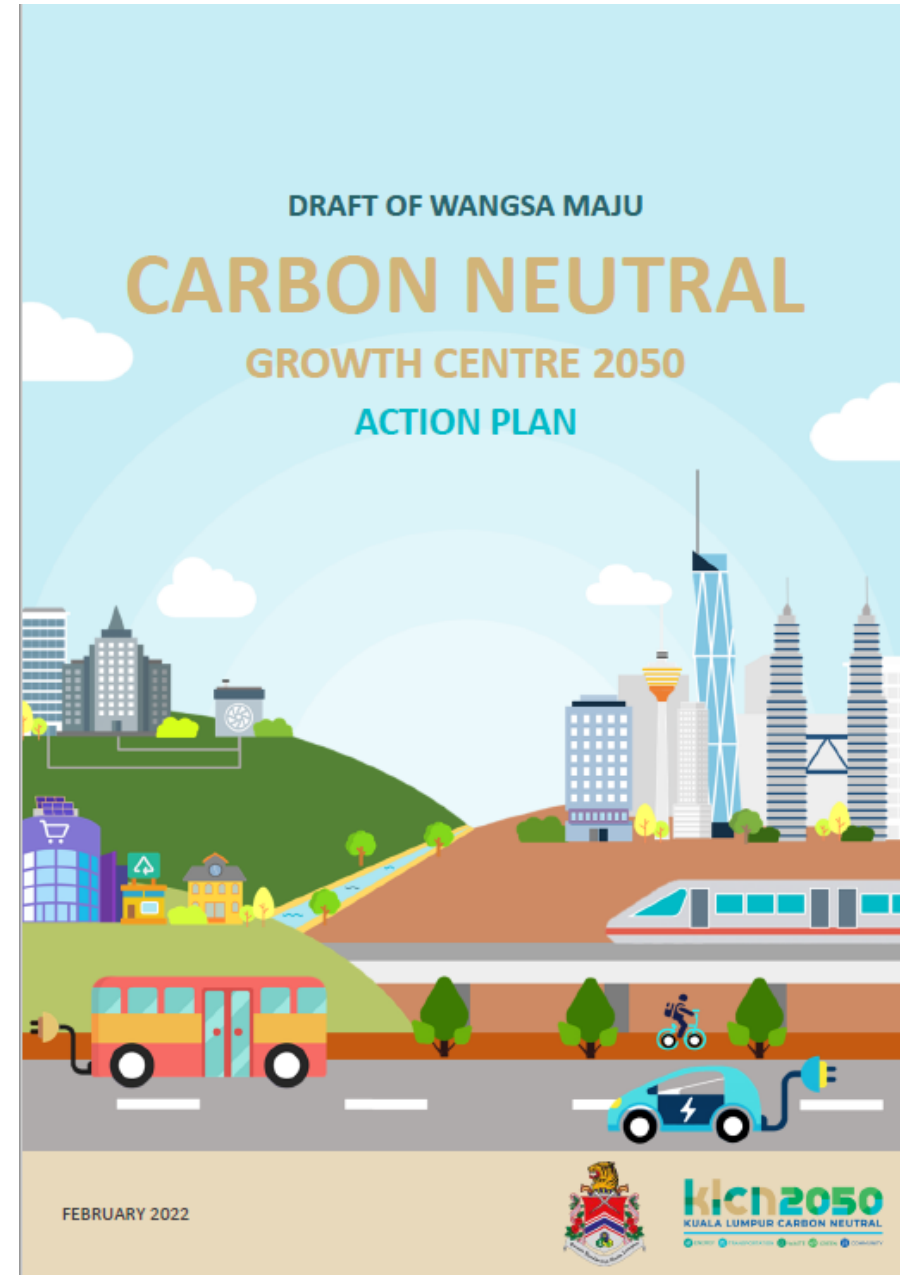
Carbon Neutral
Kuala Lumpur Vision
2050

Beyond T2KLLCS...

Accelerated adoption of EE and RE installation in public buildings, infrastructure and private buildings in Wangsa Maju CNGC – **VISIBILITY IS KEY!**

Low Carbon Building Specification for EE Retrofit & Low Carbon Building Specification for Operation and Maintenance (O&M) as recommended guidelines

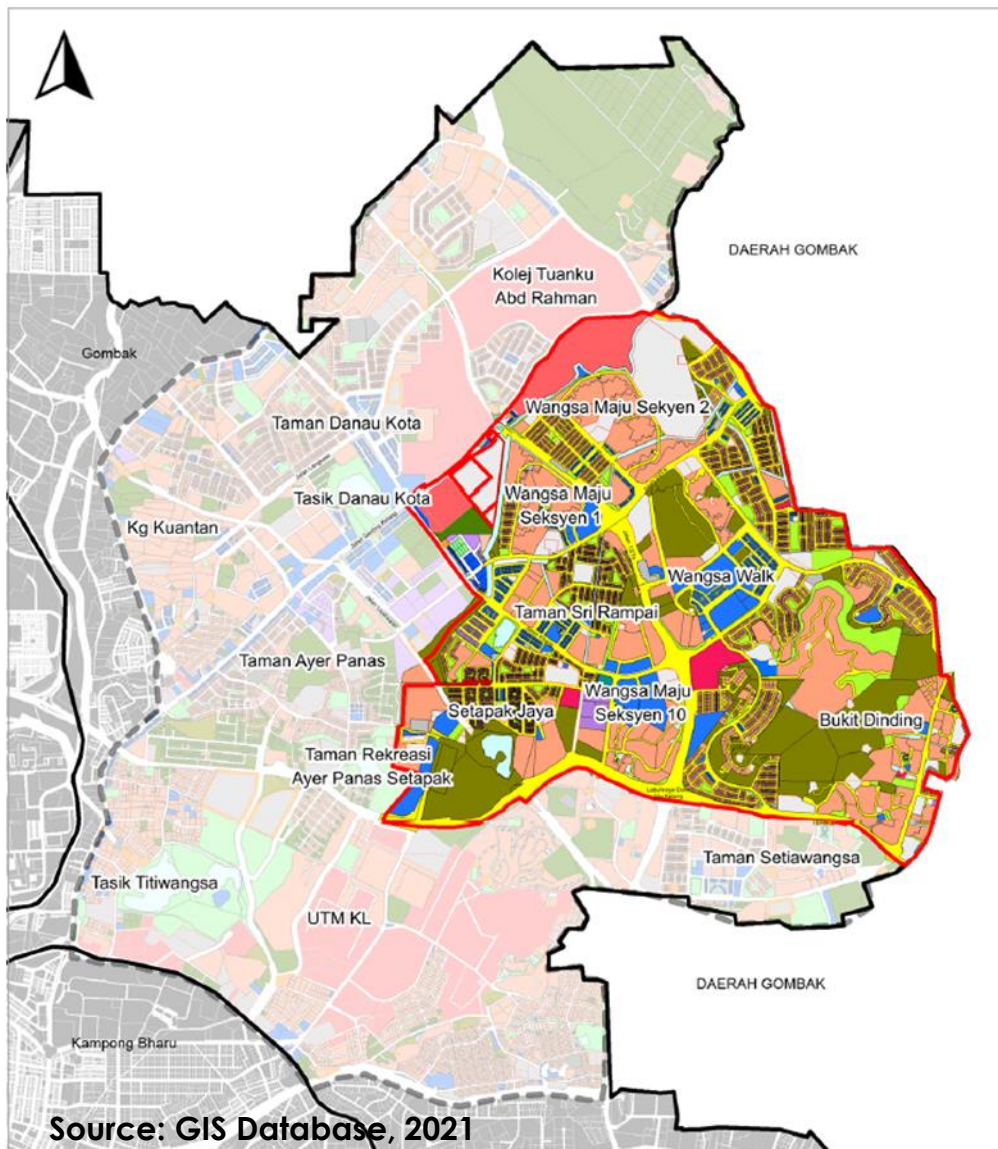
Utilisation of localised GHG emission reduction potential calculation template for EE and RE in buildings





2.0 WANGSA MAJU CNCG ACTION PLAN – A SHOWCASE

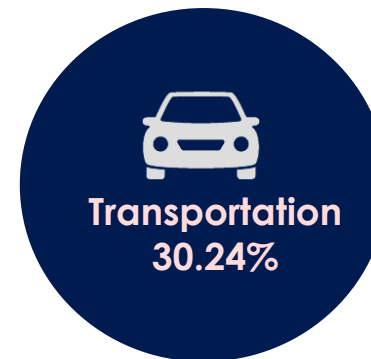
Wangsa Maju Carbon Neutral Growth Centre Profile



Source: GIS Database, 2021



Wangsa Maju Carbon Neutral Growth Centre
2649.2 acres



Source: Data GIS 2021

To 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**.



WANGSA MAJU CNCG 2050 ACTION PLAN

Carbon Neutrality Opportunities in Wangsa Maju Growth Centre

- (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

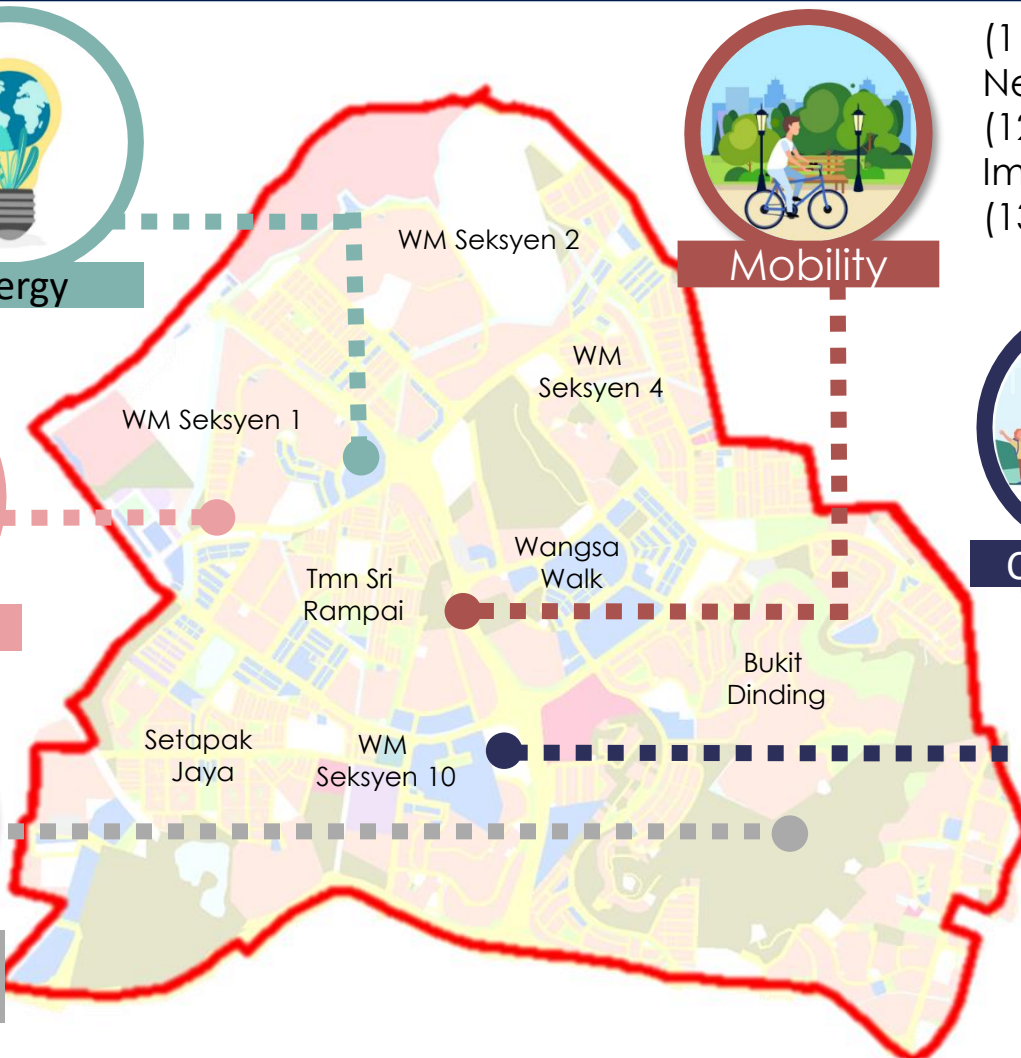


Waste

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



Green & Open Space



Mobility

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



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



UTM
UNIVERSITI TEKNOLOGI MALAYSIA



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

E: ho@utm.my

E: lwchau@utm.my

