EXECUTIVE SUMMARY

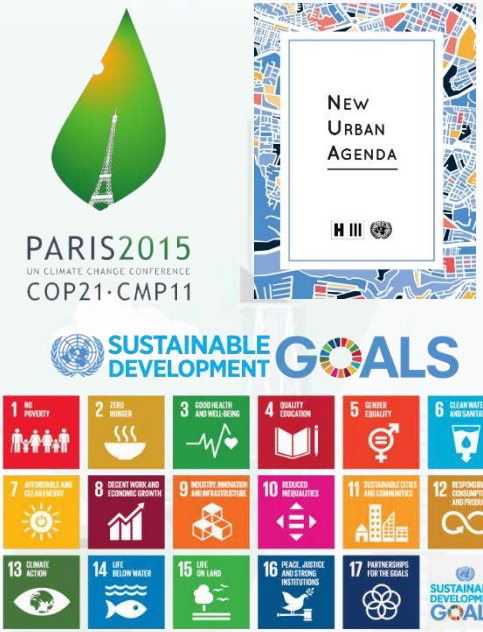
Wangsa Maju
Carbon Neutral Growth Centre

ACTION PLAN

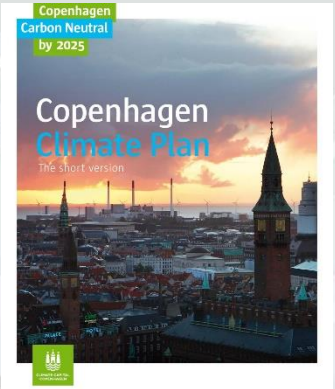
KUALA LUMPUR CARBON NEUTRAL

THE CHALLENGES OF CLIMATE CHANGE

Climate change has been the greatest threat in history to human health, the economy, and the environment. For cities and urban regions that are developing rapidly, initiatives towards decarbonising their development and economic activities are highly essential. Global warming and climate change pose new challenges to nations, cities, and regions to rethink their growth path towards enabling continuous growth while contributing to mitigating greenhouse gas emissions. At the global level, various sustainable development and climate agenda are recognized as centers of converging global frameworks that relate to climate change mitigation, such as the Paris Agreement 2015, the Sustainable Development Goals (SDG) 2030 and the New Urban Agenda (2016)



CONCEPT OF CARBON NEUTRALITY



A city can be regarded as 'climate-neutral' if its greenhouse gas emissions can keep global warming below the dangerous threshold of 1.5°C. Kuala Lumpur aspires to lead the way among rapidly developing cities towards achieving carbon neutrality by 2050. To date, many cities have globally committed to achieving climate neutrality by 2050 or earlier, such as Copenhagen, London, Tokyo, Helsinki and Glasgow and the list is expanding

KUALA LUMPUR TOWARDS CARBON NEUTRALITY BY 2050

In the **12th Malaysia Plan** mention that Malaysia will advance green growth by implementing the clean, green and resilient development (Advancing Green Growth for Sustainability and Resilience) through the whole of-nation approach. Aligned with the shared prosperity initiative, there are three (3) dimensions to be emphasised.

Three Dimensions included in 12th Malaysia Plan 2021-2025:

KLSP 2040 aims to create a holistic, inclusive, equitable, liveable and sustainable city that efficiently manages resources and enhances its competency to drive future green growth. There are six (6) goals and they are:

- **Goal 1** Innovative and Productive City
- **Goal 2** Inclusive and Equitable City
- **Goal 3** Health and Vibrant City
- **Goal 4** Climate Smart and Low Carbon City
- **Goal 5** Efficient Mobility and Environmental Friendly City
- **Goal 6** Integrated and Sustainable Development

The **Kuala Lumpur Low Carbon Society Blueprint 2030 (KL LCSBP 2030)** was officially launched and adopted by the Kuala Lumpur City Hall in December 2018. With a target to reduce the city's carbon emission intensity of GDP by up to 70% by 2030, 3 thrusts, 10 actions, 37 sub-actions, 82 measures and 245 programs have been identified for implementation.

The 3 Thrusts in KL LCSBP 2030:

- Prosperous, Robust and Globally Competitive Economy
- Healthy, Creative, Knowledgeable and Inclusive Community
- Ecologically Friendly, Liveable and Resilient Built Environment

COMMITMENT OF KUALA LUMPUR TOWARDS CLIMATE CHANGE

2006

Local Agenda 21

KLCH established its LA21 unit, responsible for managing community engagement programmes and develop public private partnership

2016

KLCH Carbon Management Plan 2017-2022

KLCH developed its Carbon Management Plan (CMP) to deliver 20% absolute carbon emissions reductions from KLCH owned, managed & operated assets

KL joins C40 City

C40 CITIES

2017

KL Low Carbon Society Blueprint 2030

KLCH and UTM develops the KLLCSBP2030, which contains 245 programmes or actions, to deliver 70% carbon emissions reduction per unit GDP by 2030

2018

KLLCSBP2030 Summary For Policy Makers

KLCH prepared the Summary for Policy Makers (SPM) to guide the delivery of the KLLCSBP2030

KL declares commitment to New Urban Agenda and SDGs

SUSTAINABLE DEVELOPMENT GOALS

2019

KL Joined The C40 Climate Action Planning Programme

In collaboration with C40, KLCH developed a Kuala Lumpur Climate Action Plan to achieve carbon neutrality by 2050 via inclusive planning and multistakeholder collaboration

KL joins GCOM

GLOBAL COVENANT of MAYORS for CLIMATE & ENERGY

2021

KL Climate Action Plan 2050

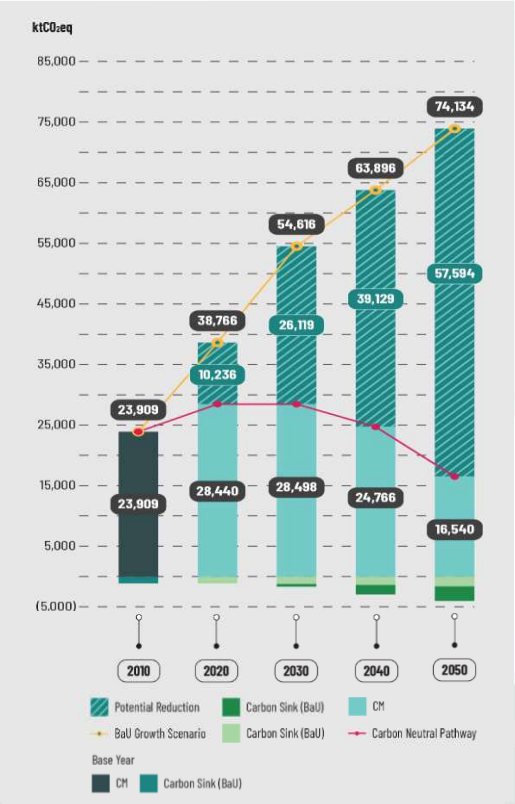
Through KLCH's strong governance and effective collaboration with C40, the Kuala Lumpur Climate Action Plan is formulated

Current Action Plan

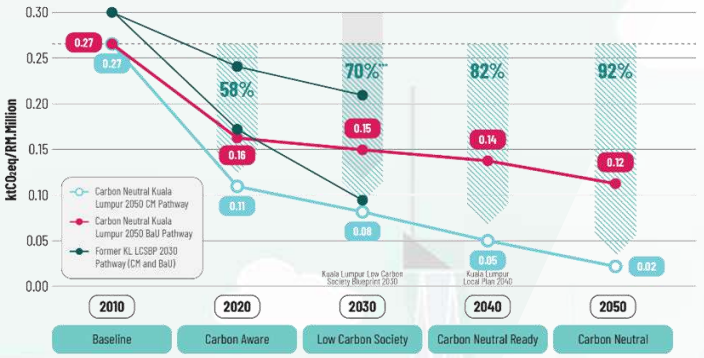
KL Carbon Neutral Climate Action Plan 2050-Wangsa Maju

Aspiring to become a carbon neutral city by 2050, KLCH in collaboration with UTM is formulating KL carbon neutrality action plan 2050-Wangsa Maju

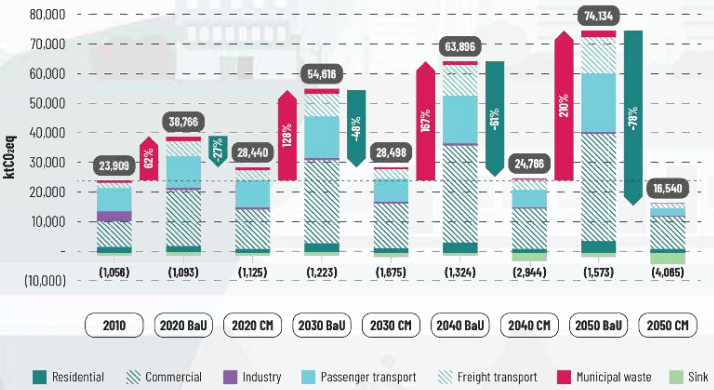
CARBON NEUTRAL KUALA LUMPUR 2050 SCENARIO



This increasing trend of emissions reduction fits well with the carbon neutrality trajectory; to feasibly realise the 2050 target (i.e., becoming a full-fledged carbon-neutral city), Kuala Lumpur has been set to transition into a low carbon city by 2030. These results are derived from the AIM model and based on the recent official data and future trend- gross domestic product (GDP), population and electricity emission factors.



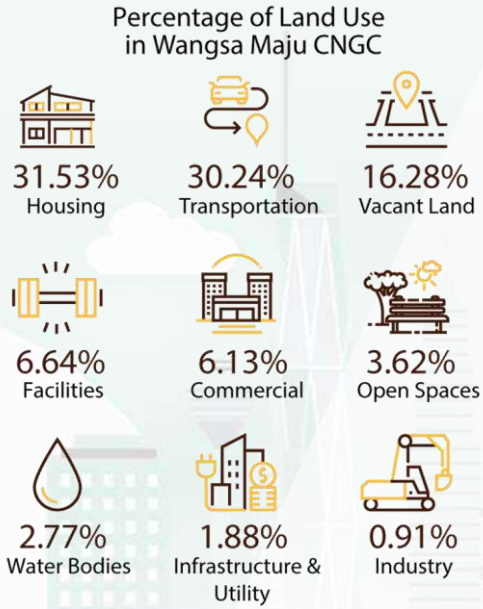
*According to the Kuala Lumpur Low Carbon Society Blueprint 2030 (KL LCSBP 2030), Kuala Lumpur can potentially reduce its GHG emission intensity by up to 70% by 2030 (compared to the 2010 level). However, the target was revised upward to 72% reduction in GHG emission intensity by 2030 in this study (Wangsa Maju Carbon Neutral Growth Centre 2050 Action Plan). These results are derivedbased on the recent official data and future trend-gross domestic product (GDP), population and electricity emission factor (EF) (EF2018 of 0.585 tC/kwH from earlier EF 2015 of 0.694 tC/kwH)

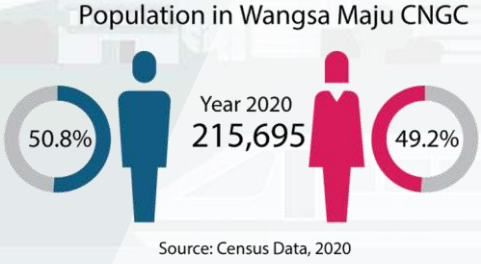


WANGSA MAJU CARBON NEUTRAL GROWTH CENTRE PROFILE

Legend:
Wangsa Maju CNGC Boundary

Kuala Lumpur is a Federal Territory and the economic capital of Malaysia. It is the largest city in Malaysia covering an area of 242.2 km² with an estimated population of 1.98 million as of 2030 (Source: PSKL 2040). The Wangsa Maju CNGC will play a crucial pioneering role to lead the other five strategic zones of Kuala Lumpur, as well as other Malaysian cities, to progressively transition into carbon neutrality by 2050.





AIM, OBJECTIVES AND SCOPE OF WANGSA MAJU CARBON NEUTRAL GROWTH CENTRE 2050 ACTION PLAN

AIM

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.

OBJECTIVES

To identify suitable development concepts and projects for the Wangsa Maju Carbon Neutral Growth Centre that will serve as a best practice reference for upscaling to the other five strategic zones in Kuala Lumpur

To set out a carbon neutral project framework for the Wangsa Maju Carbon Neutral Growth Centre in relation to the Kuala Lumpur Carbon Neutral 2050 modelling and pathway

SCOPE OF EACH SECTOR

ENERGY

- Reduce the energy consumption for selected building and KLCH assets
- Identify existing sources for EE and RE
- Identify potential location for district cooling and RE generation

MOBILITY

- Planning a comprehensive network of bicycles route
- Proposed safe and convenience cycling and pedestrian infrastructure
- Enhance the feeder bus route and promote electric buses

WASTE

- Planning recycling facilities for community neighbourhood
- Propose composting plant for food court or wet market
- Propose anaerobic digester plant

GREEN

- Organising green infrastructure as part of an uninterrupted network of green corridors in the city as well as carbon sink
- Carrying out measures for increasing the greening of the city
- Promoting tree planting

COMMUNITY

- Promoting education and public awareness campaigns
- Promoting involvement of stakeholders in the low carbon development and environmental conservation programs
- Introducing Eco Park concept

ENERGY
3 INITIATIVES

1. Solar on Infrastructure
2. Floating Solar PV
3. District Cooling System

MOBILITY
3 INITIATIVES

1. Pedestrian Cycling Network
2. Public Transportation
3. Station Area Planning

COMMUNITY
7 INITIATIVES

1. Eco Park
2. Community Farming
3. Community Water and Energy Saving Program
4. Carbon Neutral Resident Association
5. Zero Waste Community
6. Strengthen School Community through Concentrated Efforts
7. Carbon Neutrality Challenge Programs in Schools

WASTE
3 INITIATIVES

1. Anaerobic Digester
2. Waste Composting Plant
3. Waste Recycling Point

GREEN
4 INITIATIVES

1. Open Space and Forest Protection
2. Vertical/Roof Garden Urban Parks
3. Linear Urban Parks along River and Waterways Reserve
4. River Cleaning

ENERGY

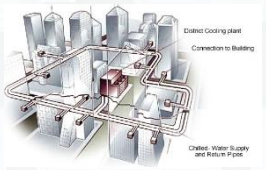
3 INITIATIVES

LIST OF PROPOSED INITIATIVES FOR ENERGY SECTOR

1. INSTALL SOLAR ON INFRASTRUCTURE


2. FLOATING SOLAR PV


3. DISTRICT COOLING SYSTEM

3.1.1 INSTALL SOLAR ON INFRASTRUCTURE

a. Installation of Rooftop Solar

A solar photovoltaic (PV) system, mounted on the roof or integrated into the facade of a building, is an electrical installation that converts solar energy into electricity. A rooftop solar PV system can generate a range from 1200 – 1500 kWh of electricity per year.

PROJECT COMPONENTS :

- Distributed energy systems
- PV modules
- Mounting structure
- Inverter
- Grid operators
- Building owners

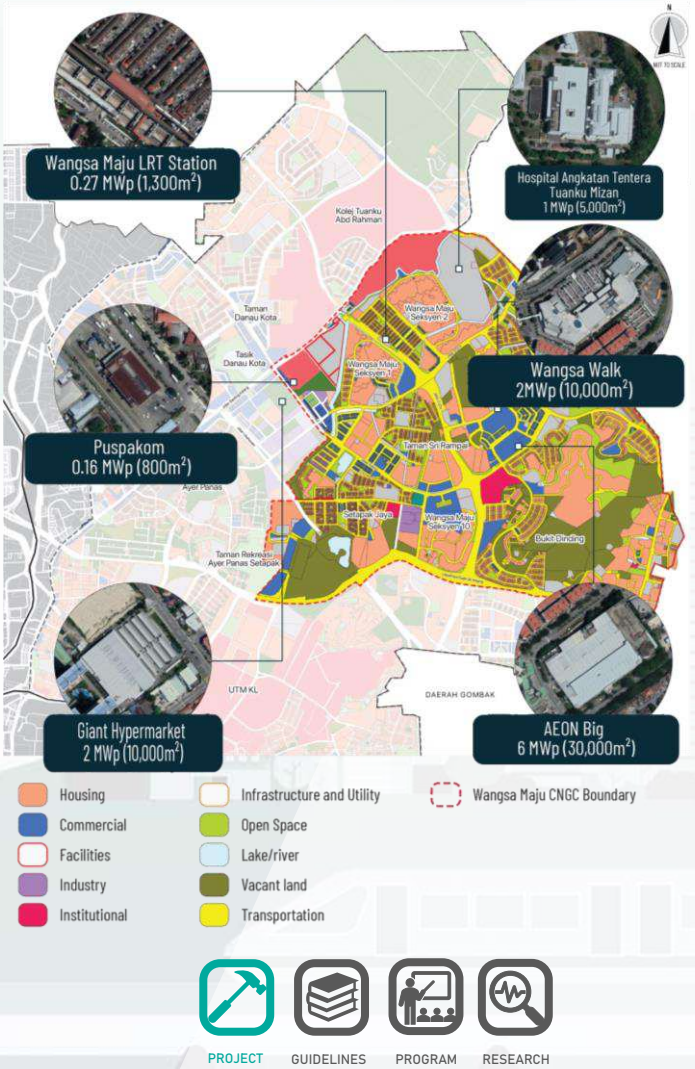
BRIEF INFO :

Carbon reduction: 0.741 kg CO2/ kWh of solar electricity consumed

Potential savings: 36.5 cent/ kWh of solar electricity

BUILDING PARTNERSHIP	
Implementation Approaches	Direct installation on buildings, carparks and walkways
Estimated Cost	RM3000 - 4000/ kWp solar PV system
Timeline	• 2021 - 2025 • 2026 - 2030
Implementers	Building owners, Government agencies (NEM, GoMEn)
Agency	SEDA, ST, MOSTI, MGTC, TNB, MGBC, MAESCO
KLCH Dept.	JKME, JKB, JKAWS, JPLR, JPPH, JPPPB

POTENTIAL LOCATIONS



PROJECT GUIDELINES PROGRAM RESEARCH

POTENTIAL LOCATIONS

PROJECT GUIDELINES PROGRAM RESEARCH

b. Solar for Pedestrian Mist

Cooling mist is suitable to be implemented for pedestrian walkway. Integration with solar PV system will provide green and renewable energy with minimal reliance on power grid. Total energy required to operate the system for 8 hours a day is 27.4976 kWh.

BRIEF INFO :

Energy Consumption: 0.454 kWh/m3

Nozzle Spacing: 0.5 m

Water per nozzle per hour: 0.003785 m3

No. of Nozzle for 1 km distance: 2000 Nozzles

BUILDING PARTNERSHIP	
Implementation Approaches	Direct installation
Estimated Cost	• RM3000 - 4000/ kWp solar PV system • RM6000 - 8000 for battery integrated
Timeline	• 2026 - 2030 • >2030
Implementers	KLCH
Agency	SEDA, ST, MOSTI, MGTC, MGBC, MAESCO, TNB
KLCH Dept.	JPPPB, JKB, JKAWS, JKME, JPPH, JPLR

3.1.2 FLOATING SOLAR PV

Floating solar systems are an innovative, reliable and suitable solar solution for Wangsa Maju CNGC where land and physical spaces are limited resources. Floating solar panels are any kind of solar panels that float on water.

PROJECT COMPONENTS :

- Floating system with either a pontoon or separate floats
- Mooring system to secure the vessel
- Solar panels
- Electrical components such as cables, batteries and inverters

BRIEF INFO :

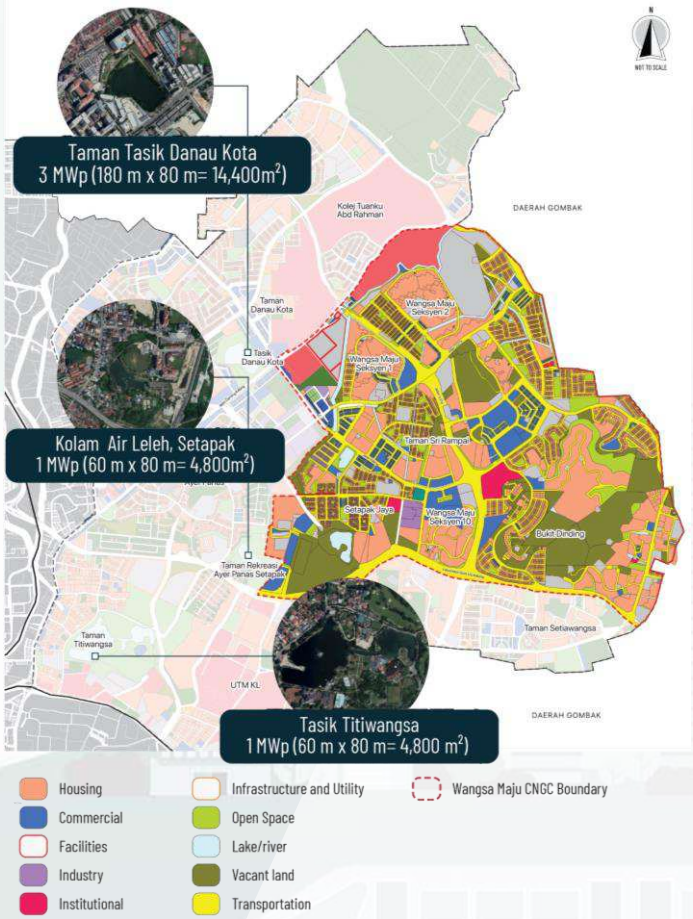
Increased efficiency & higher electricity yield

Conserving valuable land

Less water evaporation

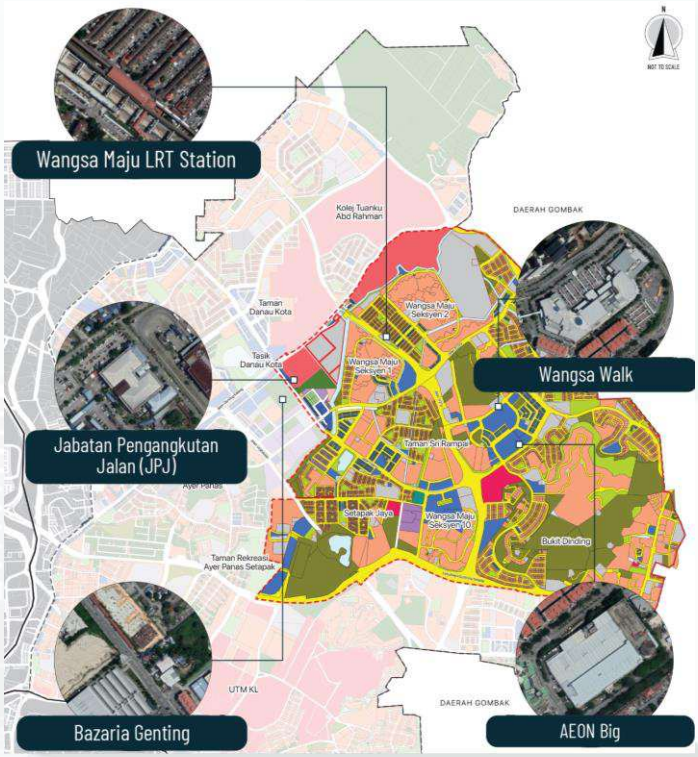
BUILDING PARTNERSHIP	
Implementation Approaches	Direct installation, EPC, leasing
Estimated Cost	RM3000 - 4000/ kWp solar PV system
Timeline	• 2026-2030 • >2030
Implementers	Building owners, Government agencies (NEM, GoMEn)
Agency	SEDA, ST, MOSTI, MGTC, MGBC, MAESCO, TNB
Stakeholder	Building owners, government agencies, KLCH
KLCH Dept.	JPPPB, JKB, JKAWS, JPLR, JPPH, JKME

POTENTIAL LOCATIONS



PROJECT GUIDELINES PROGRAM RESEARCH

POTENTIAL LOCATIONS



3.1.3 DISTRICT COOLING SYSTEM

District cooling system (DCS) concept begins by chilling water at a centralised plant. Chilled water is then pumped to heat exchangers in different buildings. Cold air then is dissipated within the building. Warm water returns to the heat exchangers for a continuous closed loop cooling process again.

PROJECT COMPONENTS :

A typical DCS comprises:

- A Central Chiller Plant
- A Distribution Network
- A Consumer Substation

BRIEF INFO :

- Optimizing resource availability
- Optimized capital expenses
- Low use of energy

BUILDING PARTNERSHIP	
Implementation Approaches	DCS can replace any existing chiller that requires replacement
Estimated Cost	N/A
Timeline	>2030
Implementers	Private organisation, building owners
Agency	ST, SEDA, Petronas (District Cooling Section), Daikin Malaysia Sales Sdn Bhd
Stakeholder	Building owners, government agencies, KLCH
KLCH Dept.	JPPPB, JKB, JKAWS, JPLR, JPPH

LIST OF PROPOSED INITIATIVES FOR WASTE SECTOR

1. ANAEROBIC DIGESTER

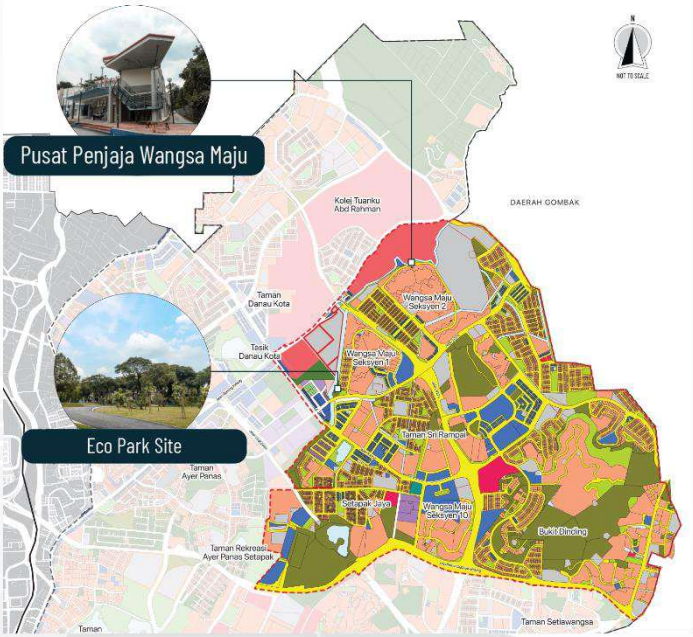

2. DEVELOP WASTE COMPOSTING PLANT


3. PROVIDE WASTE RECYCLING POINTS

WASTE

3 INITIATIVES

POTENTIAL LOCATIONS



PROJECT GUIDELINES PROGRAM RESEARCH

3.2.1 ANAEROBIC DIGESTER

Anaerobic digestion (AD) is the biological process where microbes decompose organic matter without oxygen. The two main products are methane (CH4)-containing biogas and nutrient-rich digestate. Biogas can generate energy through a boiler system and combined heat and power plant (CHP).

PROJECT COMPONENTS :

- Community engagement
- Feasibility study
- Multistakeholder Partnership
- AD plant design
- Implementation and monitoring

BRIEF INFO :

Minimised pollutants

Opportunities for resource and material recycling

Renewable energy is estimated to be 550-700 MWh per annum.

BUILDING PARTNERSHIP	
Implementation Approaches	Private Public Partnership (PPP)/ Built-Operation-Transfer (BOT)
Estimated Cost	RM5-6 M for 5 t/d
Timeline	• 2021-2025 (small scale unit) • >2026 (large scale unit)
Implementers	Consultant/ Technology provider
Agency	JPSPN, SW Corp, Alam Flora Sdn Bhd, SEDA, IWK
Stakeholder	KLCH, JPSPN, SEDA, SWCorp, Waste/ Energy operators, Investors, Communities
KLCH Dept.	JPRB (LA21 KL), JKAS, JPPPK, JPPP

3.2.2 DEVELOP WASTE COMPOSTING PLANT

Composting is a biological process where organic waste is decomposed into humus-like material to be used as a soil conditioner or biofertilizer.

PROJECT COMPONENTS :

- Community engagement
- Feasibility study
- Multistakeholder partnership
- Compost plant design
- Implementation and Monitoring

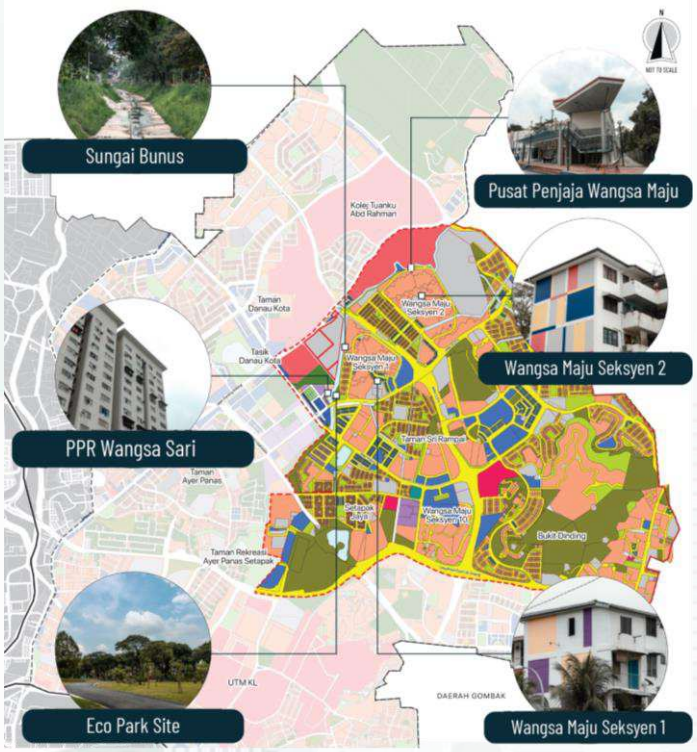
BRIEF INFO :

Alternative for fertiliser

Improving resource conservation

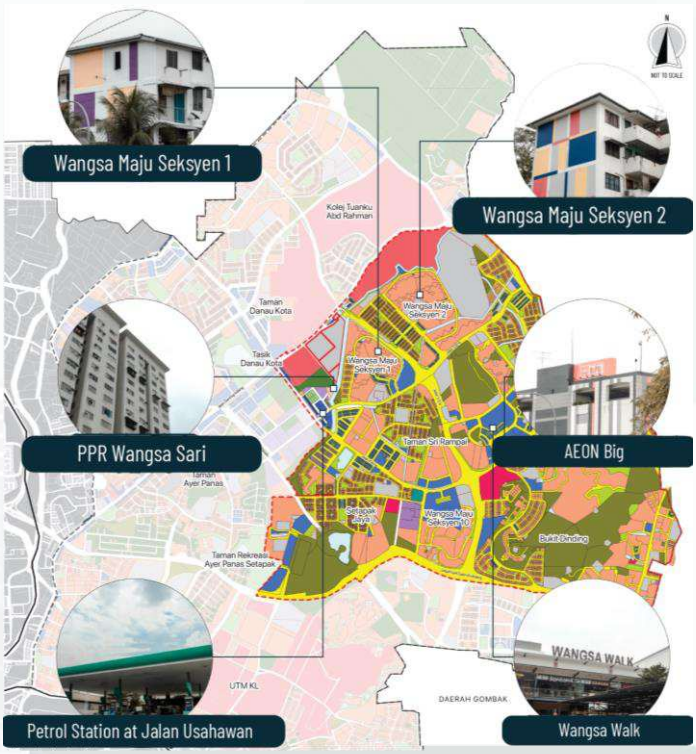
BUILDING PARTNERSHIP	
Implementation Approaches	Private Public Partnership (PPP)/ Built-Operation-Transfer (BOT)
Estimated Cost	• Phase 1: 10 K/ Urban Site • Phase 2: RM4.5 Mil
Timeline	• Short term - Community Farming Area or Wet Market • Long-term - Landscape Waste Areas, Waste Transfer Station
Implementers	Consultant/ Technology provider
Agency	DOE, JPSPN, SW Corp, Alam Flora Sdn. Bhd
Stakeholder	Local community, JPSPN, SEDA, SWCorp, Waste operators, Technology/ Service providers, Investors, NGOs, schools and universities
KLCH Dept.	JPRB (LA21 KL) , JKAS, JPPP, JPPPK

POTENTIAL LOCATIONS



PROJECT GUIDELINES PROGRAM RESEARCH

POTENTIAL LOCATIONS



PROJECT GUIDELINES PROGRAM RESEARCH

3.2.3 PROVIDE WASTE RECYCLING POINTS

Recycling is another approach to recover valuable materials for reuse and reutilisation, which reduces waste production and raw material consumption.

BUILDING PARTNERSHIP	
Implementation Approaches	Private Public Partnership (PPP)/ Built-Operation-Transfer (BOT)
Estimated Cost	N/A
Timeline	• 2021-2025- Public housing (PPR Wangsa Sari, Flat Wangsa Maju Seksyen 1, Flat Wangsa Maju Seksyen 2) • 2026-2030- Commercial area (Wangsa Walk and Aeon Big, petrol station)
Implementers	Consultant/ Technology provider
Agency	DOE, JPSPN, SW Corp, Alam Flora Sdn. Bhd
Stakeholders	Local community, Government agencies (JPSPN, SEDA, SWCorp etc), Waste operators, Technology/service providers, Investors, NGOs, schools and universities.
KLCH Dept.	JPRB (LA21 KL), JKAS, JPPP

LIST OF PROPOSED INITIATIVES FOR MOBILITY SECTOR

1. IMPROVE PEDESTRIAN & CYCLING NETWORK


2. PUBLIC TRANSPORTATION IMPROVEMENT


3. STATION AREA PLANNING (SAP)


MOBILITY

3 INITIATIVES

3.3.1 IMPROVE PEDESTRIAN & CYCLING NETWORK

Kuala Lumpur expected to achieve 70% modal split of public transportation in 2040. Development of physical infrastructures need to be given priority in order to improve active mobility and contribute to carbon reduction.

PROJECT COMPONENTS :

- Enhance First-Mile and Last-Mile Walking and Cycling Experiences
- Improve Existing Pedestrian Walkway
- Develop Walkway and Bicycle Lane Infrastructure at High Potential Demand (HPD) Spots

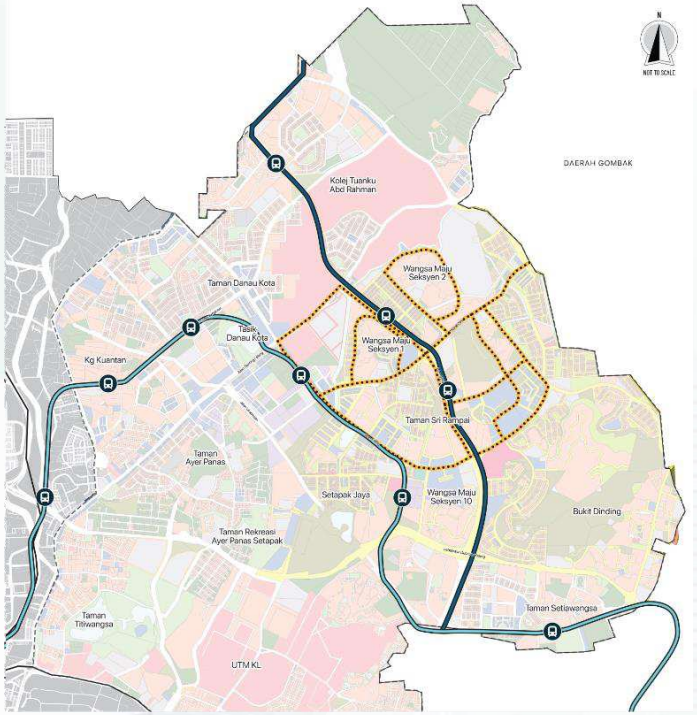
BRIEF INFO :

Lane design as the highest importance

70% modal split of public transportation in 2040 is the target for Kuala Lumpur

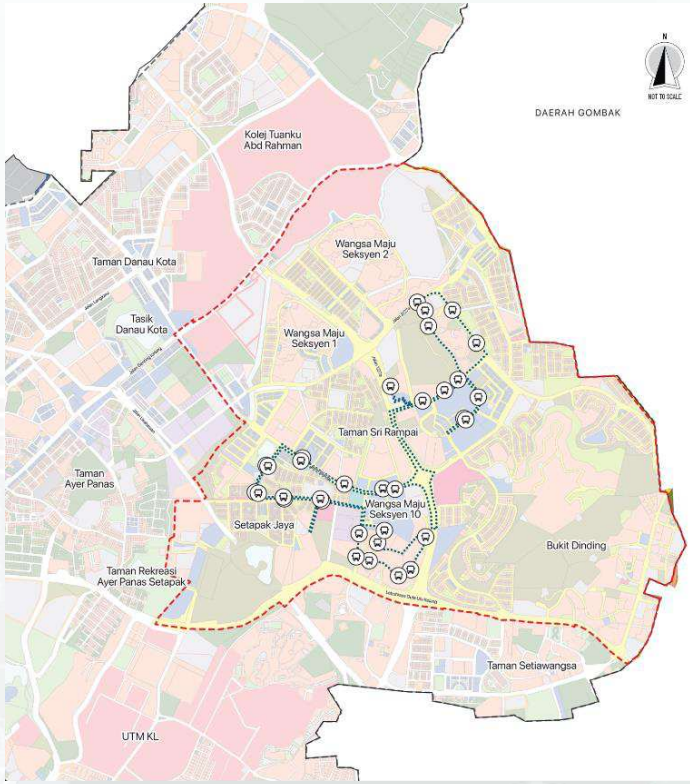
BUILDING PARTNERSHIP	
Implementation Approaches	ROW redesigned, Private Public Partnership, upgrading, maintenance
Estimated Cost	RM15 Mil
Timeline	• 2021-2025 • 2026-2030
Implementers	Private Contractor
Agency	MOT, MIROS, JKR
Stakeholder	Bike clubs
KLCH Dept.	JPIF, JPB, JPLR, JKME, JPRB, JPPH, JPPPB, JPEPP, JPPP, JKAWS

POTENTIAL LOCATIONS



PROJECT GUIDELINES PROGRAM RESEARCH

POTENTIAL LOCATIONS



PROJECT GUIDELINES PROGRAM RESEARCH

3.3.2 PUBLIC TRANSPORTATION IMPROVEMENT

Electric bus is highly adapted to the environment and can be a good alternative to diesel transportation buses to reduce environmental pollutants.

PROJECT COMPONENTS :

- Identify suitable EV bus routes in Wangsa Maju
- Identify suitable location for EV Charging station
- Reliable first mile and last mile buses, easily accessible, good connectivity, safe and comfortable to increase the use of public transport

BRIEF INFO :

Carbon reduction contribution

Range of Electric Bus station are 70 miles

8 hours to fully charge and EV Bus

BUILDING PARTNERSHIP	
Implementation Approaches	Land Acquisition and One EV measuring 9.5 meters will be used as a pilot project around Wangsa Maju Area
Estimated Cost	RM150 Mil
Timeline	• August 2021 • February 2022 • January 2023 - end of project
Implementers	Rapid, GOKL, MRT Feeder Bus
Agency	MRT Corp., MOT, Prasarana Malaysia Berhad
KLCH Dept.	JPIF, JPB, JKME, JPRB, JPPPB, JPEPP, JPPP, JKAWS

3.3.3 STATION AREA PLANNING (SAP)

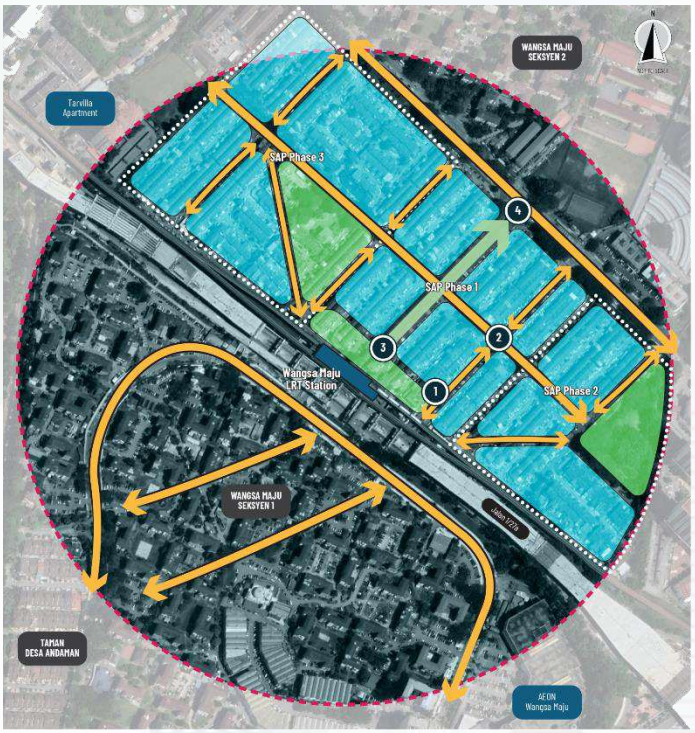
This pilot project aims to transform Wangsa Maju LRT station area from being a station to a destination, creating a well- integrated transit station that is functional, generates new job opportunities and enhance the accessibility.

PROJECT COMPONENTS :

- To improve the ridership of public transport system
- To leverage and maximize the benefits and use of the surrounding lands
- To accelerate and enhance the connectivity and activity of the area
- To create a liveable surrounding area for the communities
- To provide an interactive and sustainable urban design that can be used by all types of users

BUILDING PARTNERSHIP	
Implementation Approaches	Top-down Approach, Land Acquisition, Private Public Partnership (PPP)
Estimated Cost	RM1.5 Billion (Phase 1)
Timeline	• Phase 1: 2022 – 2029 • Phase 2: 2027 – 2034 • Phase 3: 2031 – onwards
Implementers	Building experts (Architects, QS, ID,etc.)
Agency	PPTGWPKL, JKR, TNB, ST, SEDA, PETRONAS
Stakeholder	REHDA, Prasarana Malaysia Berhad
KLCH Dept.	JPRB, JPPPB, JKAWS, JKME, JPPH, JPLR, JPPP, JPIF, JPEP

POTENTIAL LOCATIONS



PROJECT GUIDELINES PROGRAM RESEARCH

LIST OF PROPOSED INITIATIVES FOR COMMUNITY SECTOR

1. DEVELOP AN ECO PARK

2. PROMOTE COMMUNITY FARMING

3. INTRODUCE COMMUNITY WATER AND ENERGY SAVING PROGRAM

4. TRANSFORM THE EXISTING RESIDENT ASSOCIATION INTO CARBON NEUTRALITY COMMUNITY

5. ZERO WASTE COMMUNITY

6. STRENGTHEN SCHOOL COMMUNITY THROUGH CONCENTRATED EFFORTS

7. INTRODUCE CARBON NEUTRALITY CHALLENGE (CNCP) PROGRAMS IN SCHOOLS

COMMUNITY

7 INITIATIVES

POTENTIAL LOCATIONS

PROJECT GUIDELINES PROGRAM RESEARCH

3.4.1 DEVELOP AN ECO PARK

Eco Park refers to a self-sustaining farm that generates its own energy, uses harvested rain water and produces agriculture products for communities.

PROJECT COMPONENTS :

- Fertigation system
- Mini composter
- Solar Systems for Fertigation Pumps and Vertical Farming
- Biological and mechanical filters for aquaculture systems
- Fertilizer Injection System
- Rainwater Harvesting System

BRIEF INFO :

Location is selected for the project because of accessibility, ownership and suitability.

Increasing productivity, minimise emission.

BUILDING PARTNERSHIP	
Implementation Approaches	Private Public Partnership
Estimated Cost	RM25,000 (costing based on size of equipment in project components)
Timeline	• 2021 – 2025 • 2026 – 2030
Implementers	Residents Assoc./ Management Corporation
Agency	UTM, DOA
KLCH Dept.	JPRB (LA21 KL), JPLR, JKAS, JPPPK

3.4.2 PROMOTE COMMUNITY FARMING

Community farming is a shared space where people gather together to grow vegetables, herbs, fruits and/or flowers collectively. It can potentially reduce carbon footprint as urban green spaces are one of the solutions to reduce CO2 emissions.

SIX IMPLEMENTATION STAGES

Form farming group 1	Plan the garden 4
2 Identify suitable site	5 Plant the garden
Sharing session & community engagement 3	Collect harvest 6

BUILDING PARTNERSHIP	
Implementation Approaches	• Bottom-down Approach • Corporate Social Responsibility (CSR) • Private Public Partnership • Six implementation stages
Estimated Cost	Total – from RM3,500
Timeline	• 2021-2025 • 2026-2030 • >2030
Implementers	Community, Resident Association, Management Corporation, Govt. Agencies
Agency	DOA, JPS, PPTGWPKL, JPWPKL
KLCH Dept.	JPRB (LA21), JPLR, JKAS, JPPPK

POTENTIAL LOCATIONS

PROJECT GUIDELINES PROGRAM RESEARCH

3.4.3 INTRODUCE COMMUNITY WATER AND ENERGY SAVING PROGRAM

Community of Wangsa Maju should be aware of the impact of their daily life activities to the environment, especially in terms of water and electrical usage. To motivate the community and obtain active participation the program, competitions will be designed after the awareness campaigns.

PROJECT GUIDELINES PROGRAM RESEARCH

PROJECT COMPONENTS :

- Awareness on carbon neutrality, water and electricity saving
- Competition on water and electricity saving
- Monitoring using calendar
- Development of a database of residential usage and saving of water and electricity

BRIEF INFO :

5 Programs per year

Community involvement: 200-250 people per program

BUILDING PARTNERSHIP	
Implementation Approaches	Private Public Partnership
Estimated Cost	RM80,000 (promotion, coordination, prize and operation)
Timeline	2021-2025 The competition is to run for about 9 months • 7 Months – competition, coordination and promotion • 1-2 Months evaluation and judging based on carbon reduction
Implementers	KLCH, Air Selangor, TNB
Agency	SEDA, SPAN, KPKT, JPWPKL
KLCH Dept.	JPRB (LA21 KL), JPLR, JKAS, JPPPK, JPKKB, Wangsa Maju Branch Offices

3.4.4 TRANSFORM THE EXISTING RESIDENT ASSOCIATION INTO CARBON NEUTRALITY COMMUNITY

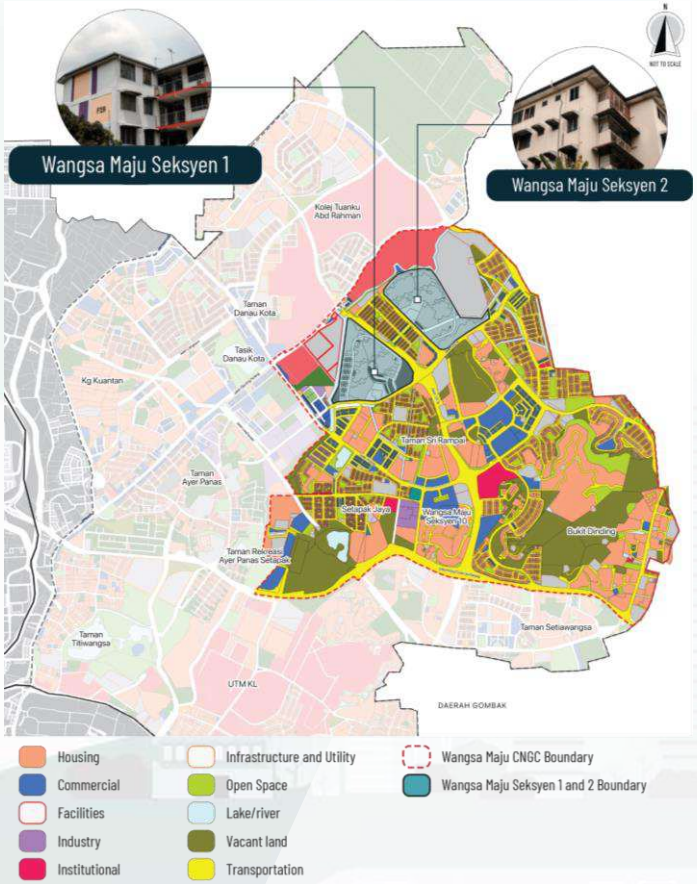
Communities play significant roles in realizing carbon neutrality. Since carbon emission in the world is highly contributed by electric usage, empowering the community from the roots is needed. Creating a carbon-neutral community is important to ensure the sustainable implementation of carbon neutrality programs. With the cooperation of the resident association, it is easier to influence the community to participate in planned activities.

PROJECT COMPONENTS :

- Engage with existing resident associations in Wangsa Maju
- Brief the community on the benefits of joining carbon neutrality projects
- Assist resident association in designing carbon neutrality programs

BUILDING PARTNERSHIP	
Implementation Approaches	The top bottom approach from all communities and the stakeholders
Estimated Cost	N/A
Timeline	2021 – 2025
Implementers	KLCH, Residents Assoc./ Management Corporation
Agency	KPKT
KLCH Dept.	JPRB (LA21 KL), JPLR, JKAS, JPPPK, Wangsa Maju Branch Offices

POTENTIAL LOCATIONS



PROJECT GUIDELINES PROGRAM RESEARCH

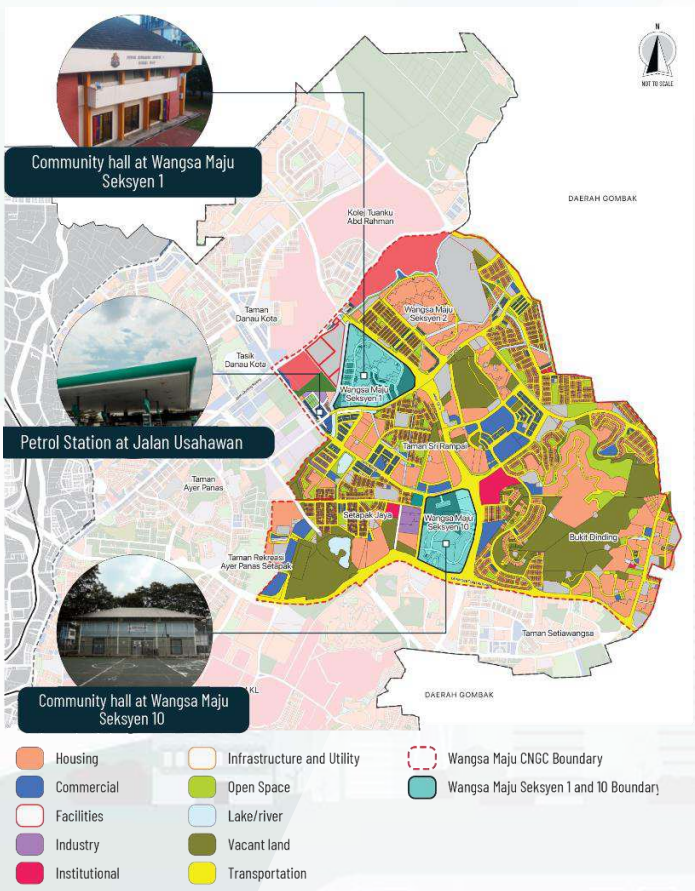
3.4.5 ZERO WASTE COMMUNITY

Dumping large amounts of solid waste to disposal sites (landfills) for a long time creates environmental problems. Reducing, reusing and recycling (3R) is deemed as one of the best practices to abate waste management issues and eventually help cut down carbon emissions.

Preliminary Planning 1	Designing Your Program 2	Operating Your Program 3

BUILDING PARTNERSHIP	
Implementation Approaches	• Private Public Partnership • Corporate Social Responsibility (CSR) • Provide Community Recycling Framework
Estimated Cost	RM 50,000 (awareness, technology, facilities)
Timeline	• 2021-2025: Petrol station, Wangsa Maju Seksyen 1 and 10 as a pilot project • 2026-2030: Wangsa Maju Seksyen 1,2,4,5,10 • >2030: 100% of RA in Wangsa Maju
Implementers	Resident Association, NGOs, Private Org
Agency	SW Corp, DOE
Stakeholder	PETRONAS, Alam Flora Sdn. Bhd, iCycle Malaysia, Kloth Malaysia Sdn Bhd, Residents Assoc./ Management Corporation, NGOs, Private Organisations and other relevant stakeholders
KLCH Dept.	JPRB (LA21 KL), JPLR, JKAS

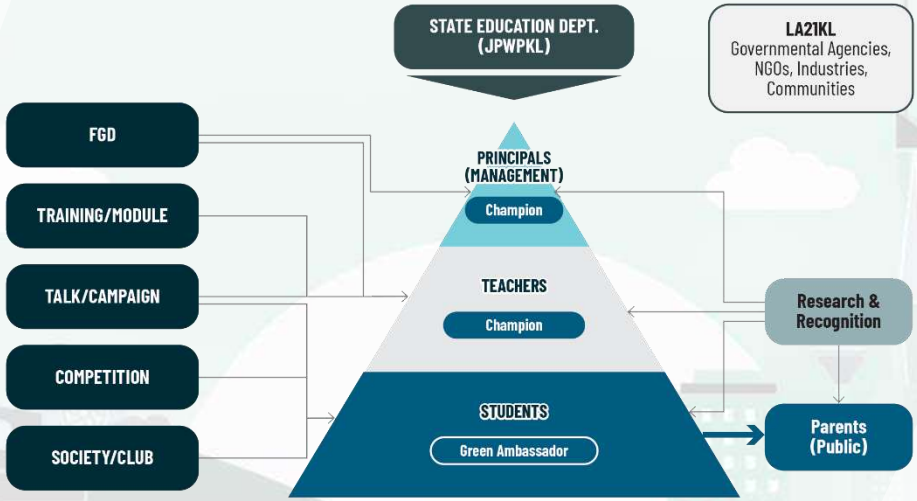
POTENTIAL LOCATIONS



PROJECT GUIDELINES PROGRAM RESEARCH

3.4.6 STRENGTHEN SCHOOL COMMUNITY THROUGH CONCENTRATED EFFORTS

In 2019, JPNJ launched the Pelan Tindakan Pendidikan Kelestarian Johor 2019-2023 (Figure 3.58). This action plan is relevant and practical as it acknowledges the challenges faced by the school community. Through the model proposed, the organized involvement from parents, students, teachers, management and stakeholders can ensure efficient and effective efforts.



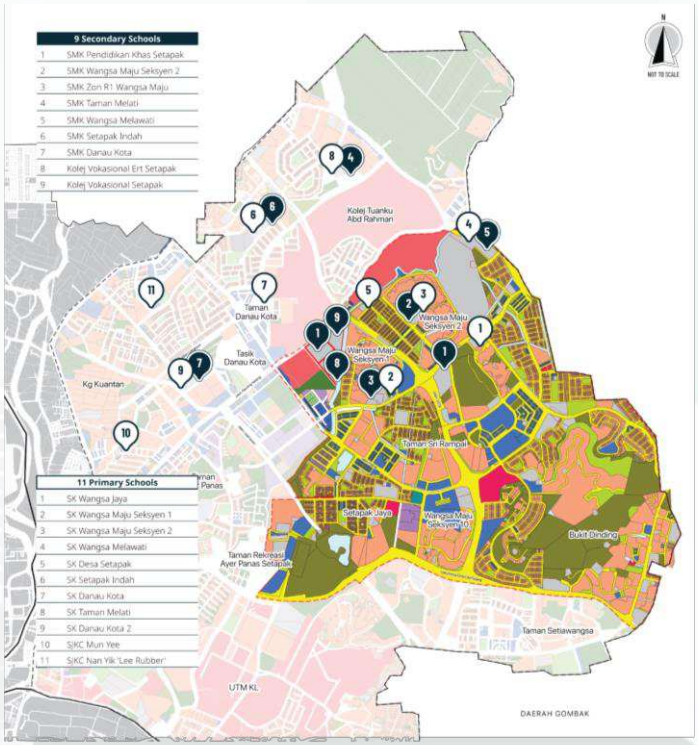
PROJECT COMPONENTS :

- Regular meeting of stakeholders with LA21 KLCH
- All carbon neutrality projects or activities at KL schools to be recommended by LA21 JPWPKL and approved by LA21 KLCH
- A database of all the carbon neutrality projects or activities at KL schools to ensure all schools in KL are involved and carbon calculation can be computed for reporting
- Develop a roadmap for all KL schools to be involved in carbon neutrality programs
- Assess and appoint green schools

BUILDING PARTNERSHIP	
Implementation Approaches	The top bottom approach from all stakeholders
Estimated Cost	N/A
Timeline	2021-2025
Implementers	JPWPKL
Agency	DOE, JPWPKL, SW Corp
Stakeholder	Yayasan Hijau, Ecoknights Malaysia, Alam Flora Sdn Bhd, schools and others
KLCH Dept.	JPRB (LA21 KL), JPLR, JPPPK

PROJECT GUIDELINES PROGRAM RESEARCH

POTENTIAL LOCATIONS



As a pilot case, only 20 potential schools within Wangsa Maju CNGC will be involved. After 2 years, additional 70 schools from Wangsa Maju Maluri will be involved.

PROJECT GUIDELINES PROGRAM RESEARCH

3.4.7 INTRODUCE CARBON NEUTRALITY CHALLENGE (CNCP) PROGRAMS IN SCHOOLS

There are 295 schools in Wilayah Persekutuan Kuala Lumpur (WPKL). These schools are further divided into three Pejabat Pendidikan Daerah (PPD) PPD Keramat, PPD Sentul, and PPD Bangsar Pudu. CNCP aims to educate teachers, students, and school community on carbon neutrality lifestyle.

PROJECT COMPONENTS :

1. Engagement for consensus building
2. Trainings, campaigns and workshops
3. KLCH will provide seed grants
4. Evaluation, monitoring and competition of the carbon neutrality projects annually
5. Showcase of green schools with promising carbon neutrality projects

BUILDING PARTNERSHIP	
Implementation Approaches	FGD with schools management to develop consensus, Private Public Partnership
Estimated Cost	RM 100,000
Timeline	2021-2025
Implementers	Schools
Agency	DOE, JPWPKL, SW Corp
Stakeholders	Yayasan Hijau, Ecoknights Malaysia, Alam Flora Sdn Bhd, schools and other stakeholders
KLCH Dept.	JPRB (LA21 KL), JPLR, JPPPK

LIST OF PROPOSED INITIATIVES FOR GREEN SECTOR

1. PROTECT EXISTING PARKS AND OPEN SPACES


2. INTRODUCE VERTICAL AND ROOF GARDENS

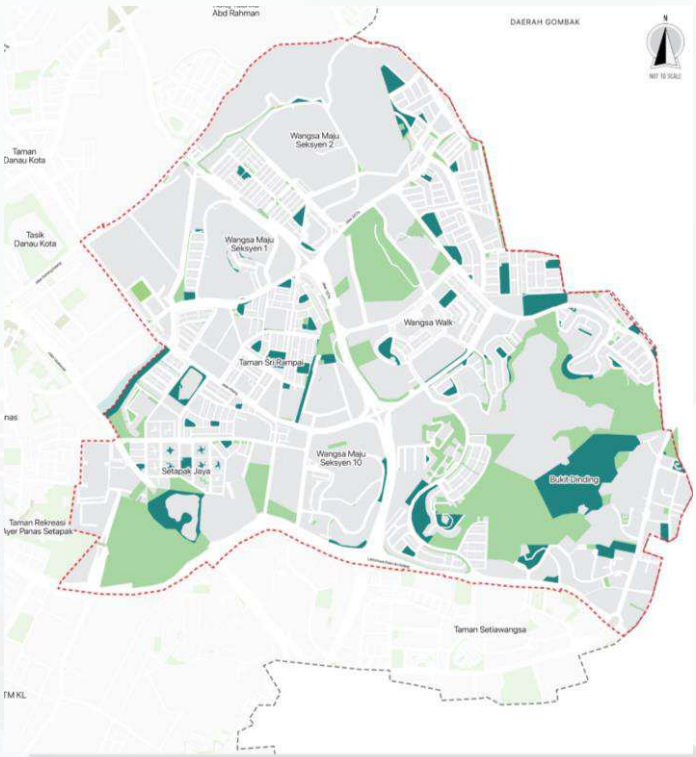

3. CREATE LINEAR URBAN PARKS ALONG RIVER AND WATERWAYS RESERVES


4. ORGANISE "CLEAN UP A RIVER" PROGRAM


GREEN

4 INITIATIVES

POTENTIAL LOCATIONS



PROJECT GUIDELINES PROGRAM RESEARCH

3.5.1 PROTECT EXISTING PARKS AND OPEN SPACES

Tree stands at the parks and open spaces play a significant role in carbon offsetting through sequestration of carbon dioxide emissions produced in the city. Currently, the tree canopy cover of Kuala Lumpur is about 17% (KL LCSBP 2030).

PROJECT COMPONENTS :

- Review of related policies, guidelines, laws and acts
- Tree inventory program
- Tree planting plan through 'One Resident One Tree' program

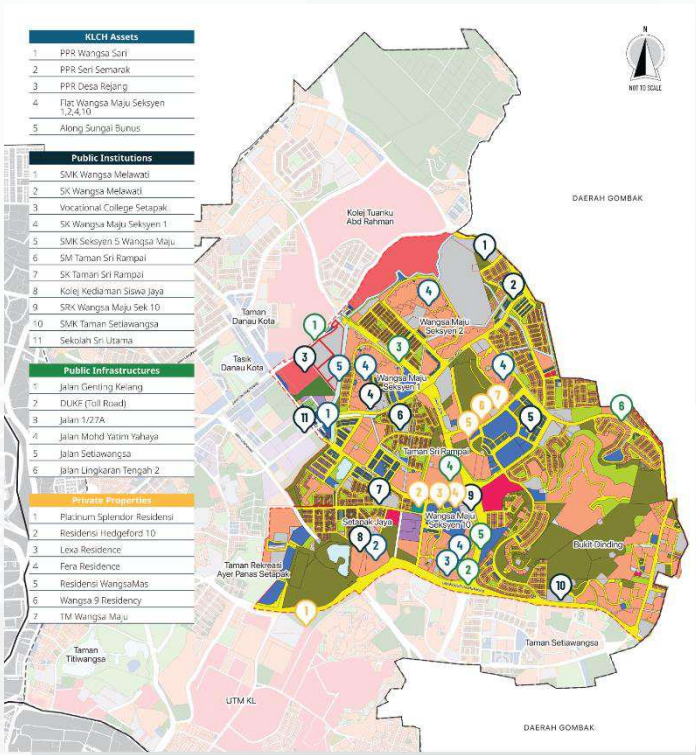
BRIEF INFO :

Trees in urban parks can sequester up to **179.0 tCO2** per hectare.

Co-benefit includes Greenery, shading, noise reduction, air temperature regulation, healthy living environment and aesthetical value

BUILDING PARTNERSHIP	
Implementation Approaches	KLCH to work with MNS, LA21 and Community
Estimated Cost	Tree planting : RM 10-15 mill. (per year) Technology (Tree Inventory) : RM 200,000- RM 2,000,000
Timeline	• 2022-2025: tree planting, site inventory (including developer and private site) • >2030: Use of geospatial technologies for tree inventory
Implementers	KLCH (JPLR), Residents Assoc/ Management Corporation, Private Sectors
Agency	-
KLCH Dept.	JPLR, JPPH, JPRB (LA21 KL), JKAS

POTENTIAL LOCATIONS



The proposed locations for the implementation of vertical green will be based on the type of amenities and property ownerships.

PROJECT GUIDELINES PROGRAM RESEARCH

3.5.2 INTRODUCE VERTICAL AND ROOF GARDENS

Soil, plants, and greenery on building envelopes reduces surface temperature while acting as insulation for the structures below. Green roofs and vertical walls helps to regulate rainwater by catching it as it falls and filtering it to remove pollutants. This proposal aims to reduce greenhouse effect in Wangsa Maju.

PROJECT COMPONENTS :

- The types of the green walls
- The role of green wall
- Carbon Sequestration Calculation (Groundcovers, climbers, creepers)
- Type of Plants
- Manufacturer and Supplier Input

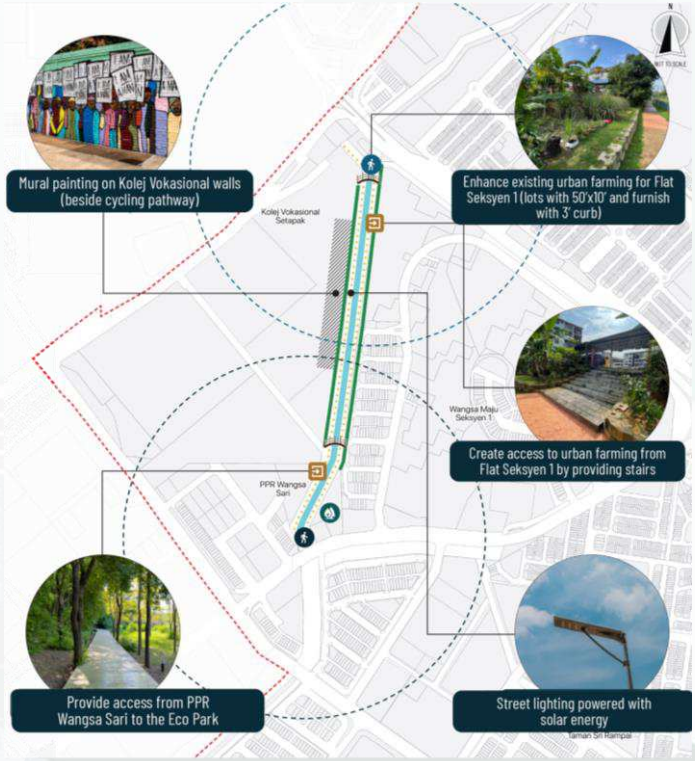
BRIEF INFO :

The greeneries absorb and store carbon dioxide which is the primary greenhouse gas.

Reduces the energy consumption of buildings by creating microclimates within the urban environment that helps regulate temperatures

BUILDING PARTNERSHIP	
Estimated Cost	RM100-RM1500 rm/sqm
Timeline:	• 2021-2025: Upgrading public buildings and Initiative actions • 2026-2030: Private-Partnership & Collaborations • >2031: Implementation of Guidelines
Implementers	Urban green specialist, Landscape specialist for private property
Agency	KeTsa, MGTC, MGBC, Prasarana, JPWPKL
KLCH Dept.	JPRB, JPLR, JKB

POTENTIAL LOCATIONS



SECTION 1: Sungai Bunus - PPR Wangsa Sari - Eco Park.

Origin
Destination
Eco Park
Bridge
Solar Street Lighting
Urban Farming
Access
Mural Painting

PROJECT GUIDELINES PROGRAM RESEARCH

3.5.3 CREATE LINEAR URBAN PARKS ALONG RIVER AND WATERWAYS RESERVES

Urban green space is an important element of land use planning known for its potential to reduce net GHG emissions. Riverfront areas are now popular choices of location for urban green space planning. In many cities, they are being planned as drivers for the regeneration of deprived areas and for residents to be more active.

PROJECT COMPONENTS :

SECTION 1: Sungai Bunus - PPR Wangsa Sari - Eco Park

- Reuse existing space along drainage as a 'Nature Walk Belt'
- Propose sustainable approach
- Beautification of the area

BUILDING PARTNERSHIP	
Implementation Approaches	• Prepare detailed landscape masterplan • Site clearance • Public private partnerships for solar lighting systems along Sungai Bunus • Work with KLCH Transportation Develop a monitoring plan for maintenance • Planned activities (focusing on Section 3) to promote livable and active riverfront
Estimated Cost	RM 1,900,000
Timeline	• Section 1: 2020-2025 • Section 2: 2020-2025 • Section 3: 2025-2030
Implementers	KLCH
Agency	TNB, JPS, DOE, National Landscape Dept.
KLCH Dept.	JPLR, JKAS, JPRB (LA21 KL)

POTENTIAL LOCATIONS

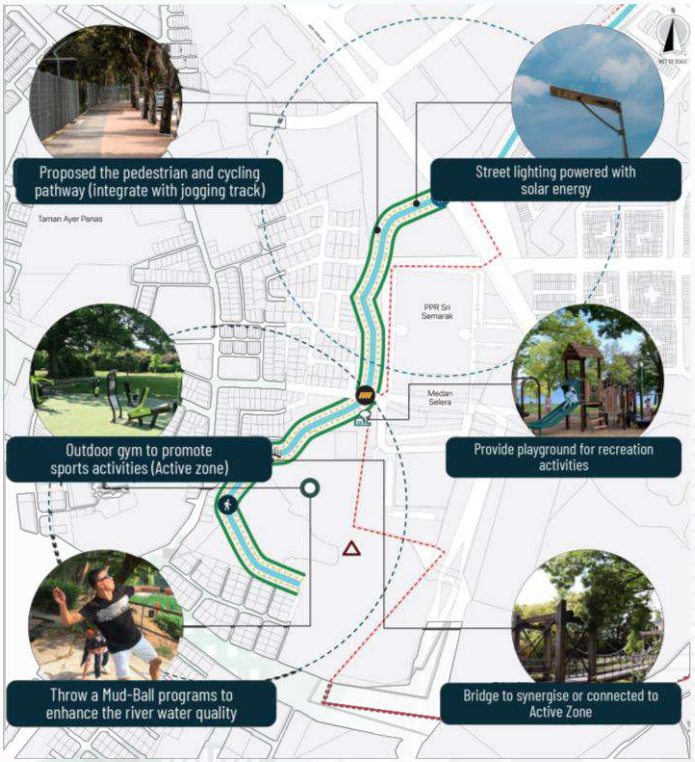
SECTION 2: Eco Park – Sungai Bunus - Tasik Sri Rampai

Origin
Destination
Eco Park
Bridge
Solar Street Lighting
Green Landscape
Walking Route
Pedestrian Crossing
Pocket Park
Existing Pedestrian Pathway

PROJECT COMPONENTS :

- Reuse existing space along drainage as a 'Seamless Connectivity'
- Propose sustainable approach
- Beautification of the area

POTENTIAL LOCATIONS



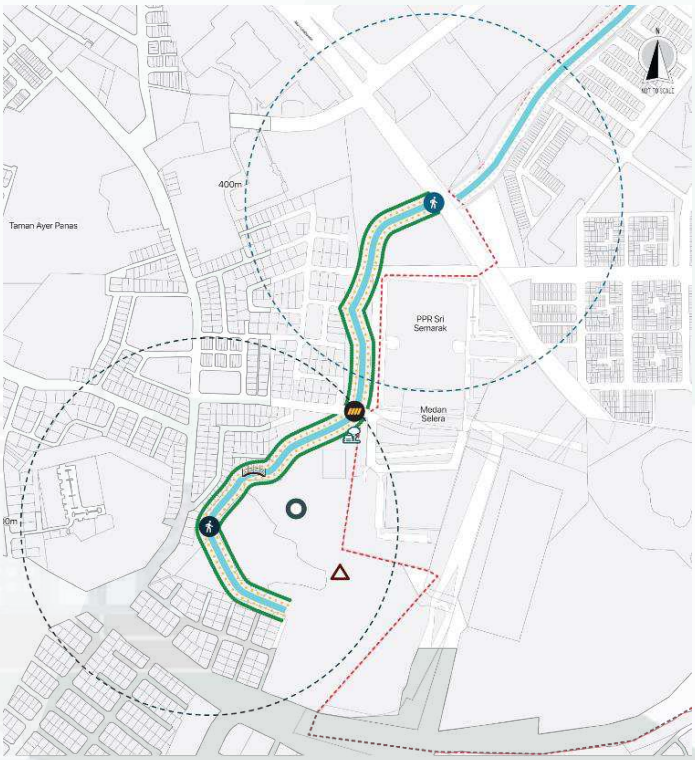
SECTION 3: PPR Sri Semarak - Taman Rekreasi Ayer Panas

Origin
Destination
Bridge
Solar Street Lighting
Green Landscape
Pedestrian Crossing
Playground
Entrance
Active Zone

PROJECT COMPONENTS :

- Reuse existing space along drainage as a 'The Living Waterfront'
- Propose sustainable approach
- Beautification of the area

POTENTIAL LOCATIONS

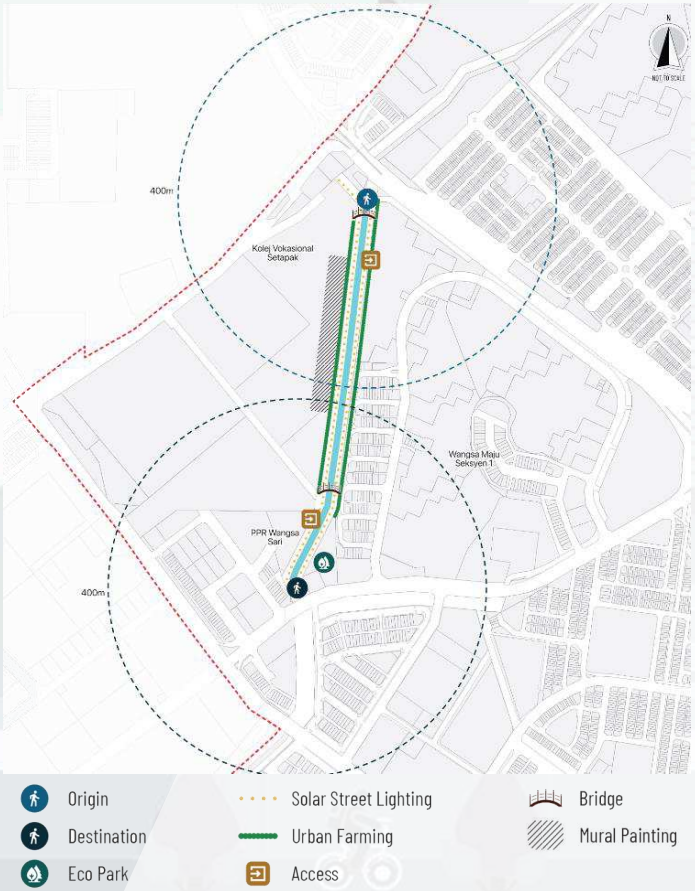


- Potential location at Sungai Bunus
- Divided into 3 sections (part of 16 km):
- Section 1: Sungai Bunus - PPR Wangsa Sari - Eco Park
- Section 2: Eco Park - Sungai Bunus - Tasik Sri Rampai
- Section 3: PPR Sri Semarak - Taman Rekreasi Ayer Panas (refer to Figure 3.95)

3.5.4 ORGANISE "CLEAN UP A RIVER" PROGRAM

The Water Quality Status for Sungai Bunus is categorised as level 4 (polluted). Lack of education and awareness of the public is the factor leading to this issue. This program will focus on promoting community participation and stakeholders involvement in the river protection.

POTENTIAL LOCATIONS



PROJECT COMPONENTS :

- **Stakeholders and Participant**
  Stakeholders and the community from the community farming / eco-park committee are involved in the program. Schools and public or private universities may also participate

- **Mudball Making Knowledge**
  Knowledge sharing on how to make mudball. Stakeholders should supports the necessary items and provide training to the community

- **Mud balls Throwing Events**
  For EM mud balls to work, they have to be continuously tossed into the river. Organising mud ballthrowing events regularly will improve the river water quality

BRIEF INFO :

For Effective Micro-organism mud balls to work, they have to be continuously tossed into the river

Enzymatic mud balls help by decomposing sludge. The decomposition produces nutrition that feeds oxygen-increasing phytoplankton

BUILDING PARTNERSHIP	
Implementation Approaches	• Assign roles for the community garden/ eco park committee and appoints program head to coordinate and organise events to engage the other members of the group and stakeholders • Organize sharing sessions: a) Stakeholders or KLCH may conduct a workshop on how to make a mud balls and the benefits / expected outcome from the programs b) Schools and universities may join together and participate • Plan activities yearly: a) Mud balls preparations (1-10 days) b) Mud balls throwing events (2 time per month) • Monitor the water quality from time to time to ensure the expected outcome is achieve
Estimated Cost	Total: RM 10,640 Financial resources can be obtained through the annual allocation of the local authority
Timeline	2021-2025
Implementers	Residents Association, NGO's, Schools
Agency	JPS, DOE, Public-Private Universities, JPWPKL
KLCH Dept.	JKAS, JPRB (LA21 KL)

4.1 PROGRAM IMPLEMENTATION TIMELINE

The Wangsa Maju CNGC 2050 Action Plan program implementation timeline was divided into three period of target years which are (2021- 2025, 2026-2030 and beyond 2030)

	INITIATIVES	2021 - 2025	2026 - 2030	Beyond 2030
Energy	(1) Install Solar on Infrastructure			
	(a) Install Rooftop Solar PV	●	●	●
	(b) Introduce Pedestrian with Mist System		●	●→
	(2) Floating Solar PV		●	●→
	(3) District Energy System			●→
Waste	(4) Anaerobic Digester	●	●	●
	(5) Develop Waste Composting Pant	●	●	●→
	(6) Provide Waste Recycling Kiosk	●	●	●
Mobility	(7) Improve Pedestrian and Cycling Network	●	●	●
	(8) Improve Public Transportation	●	●	
	(9) Adopt Station Area Planning (SAP)	●	●	●→
Community	(10) Develop an Eco Park	●	●	●
	(11) Promote Community Farming	●	●	●→
	(12) Introduce Community Water and Energy Saving Program	●	●	
	(13) Transform the Existing Resident Association into Carbon Neutral Community	●	●	
	(14) Zero Waste Community	●	●	●→
	(15) Strengthen School Community through Concentrated Efforts	●	●	
	(16) Introduce Carbon Neutrality Challenge Programs in Schools	●	●	
Green	(17) Protect Existing Parks and Open Spaces	●	●	●→
	(18) Introduce Vertical and Roof Gardens	●	●	●→
	(19) Create Linear Urban Parks and along River and Waterways Reserves	●	●	●
	(20) Organise "Clean Up a River" Program	●	●	

This executive summary is a summarization of the ***Wangsa Maju CNGC 2050 Action Plan*** *which discusses the technical details of each initiative to ensure the projects are implementable. Each chapter is interrelated which will justify the list of initiatives outlined. Site visits and engagements with the community and stakeholders also help the study identify the key sector for the proposed initiatives.*