




NATIONAL & LOCAL POLICIES TOWARDS A LOW CARBON BUILT ENVIRONMENT

Presented by:
The Honorable Jagdeep Singh Deo s/o Karpal Singh
Penang State EXCO
For Housing, Local Government and
Town & Country Planning

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INTRODUCTION

An aerial photograph of a city with a mix of urban buildings and green spaces. Overlaid on the image are numerous hexagonal icons in various colors (green, blue, yellow, red) representing different aspects of sustainability and low-carbon living. These icons include symbols for renewable energy (solar panels, wind turbines), water conservation (a water drop), health and well-being (a heart with a pulse line), education (an open book), recycling (a circular arrow), and environmental protection (a hand holding a plant, a globe with a leaf). The text is positioned on the right side of the image, with a white background for the first paragraph and a blue background for the second paragraph.

A **low carbon city** is defined as a city that implements low carbon strategies to meet its environmental, social and economic needs of the city. The city measures, manages and mitigates greenhouse gas emissions to reduce its contribution to climate change.

(National Low Carbon Cities Masterplan, 2021)



POLICIES & ROADMAPS

LOW CARBON CITY ARE ABOUT SUSTAINABILITY AND MOTHER NATURE

The Nation of sustainability calls for mankind not to exploit Mother Nature



SUSTAINABLE ECOSYSTEM

- **BUILT UP AREA**
 - a) Housing
 - b) Road and transportation
 - c) Community Facility
 - d) Open Space and Recreation
 - e) Hill Site Zone
 - f) Infrastructure and Utility
 - g) Heritage Zone
- **NON-BUILT UP AREA**
 - a) Forest
 - b) Agriculture
 - c) Water



ROADMAPS TO 2030

The parameters of sustainability and the resilience need to take on take on the life changing issues of our time

SUSTAINABLE ENVIRONMENT

- **NATURE BASED ADAPTATION**
 - a) Green Space
 - b) National Park/ Botanical Garden
 - c) Trees For Life
- **WASTE REDUCTION**

SUSTAINABLE MOBILITY & CONNECTIVITY

- **GREEN CONNECTORS**
 - a) Cycling City
 - b) Walkable City
 - c) Smart parking
 - d) Electrical Bus Service- CAT
 - e) Transit Oriental Development

GREEN BUILDING

- **GREEN BUILDING CERTIFICATION**
Total Strata Building Scheme in Penang:
MBPP: 1,380 schemes
MBSP: 1,131 schemes

RETROFIT ENERGY MANAGEMENT

- **ENERGY SAVING**
 - a) Solar Panel
 - b) LED Installation

SUSTAINABLE ECOSYSTEM AND ENVIRONMENT

NATURE BASED ADAPTATION

Nature based solutions for climate adaptation programme for the urban areas of Penang is predicted to be an effective strategy to reduce temperatures in the city through shade from trees, enhancing wind flows and a combination of green spaces with water surfaces.

The goal is to introduce more trees and greenery to urban Penang through built projects such as:

- connected canopies;
- tree-lined streets;
- the back lanes transformation project;
- urban farming project;
- the creation of pocket parks;
- introduction of rooftop gardens; and
- infiltration wells to absorb runoff water.

EXPECTED OUTCOMES

Reduction of 1.5°C in temperatures in urban areas and 5-7°C in shaded areas 6 to 8 years after completion of the plan

Reduced number of deaths due to heat stroke

Reduced flooding and GDP losses

Reduced vulnerabilities

Improved community readiness

All impacts will be assessed



CIRCULAR ECONOMY ROADMAP (CER)

- CER for waste sector aim to diversify economy sectors in the city and to provide opportunity for young entrepreneur to explore new ideas through innovative smart solutions.
- Hence, this CER will serve as policy framework for the next ten years to develop integrated solutions and improve the quality of life in Seberang Perai.





BENCHMARKING

BENCHMARKING & REPORTING FOR PENANG ISLAND

- CARBON REDUCTION -

SUSTAINABLE ECOSYSTEM AND ENVIRONMENT	RETROFIT ENERGY MANAGEMENT
Nature Based Adaptation (i) Green Space 35 579.37 acres / 92,506 tonnes Co ² (ii) National Park/ Botanical Garden 20,119,086 kg Co ² / 20,119 tonnes Co ² (iii) Trees for Life 100,000, 000 kg Co ² / 100,000 tonnes Co ² Waste Reduction 105,716,531.61 kg Co ² / 105,716 tonnes Co ²	(i) Energy Saving : Capacity : 55,454,961 kWh 461,828,915.2 kg Co ² / 461,828 tonnes Co ² per year (ii) Solar Panel - Capacity : 1.3075mWp (Building : 5 ; Pillar : 35) 9,879.12 kg Co ² / 9.8 tonnes Co ² per year (iii) LED installation- Saving Capacity: 12,929,151.18 kWh per year (33,101 units) 107,673,963.60 kg Co ² / 107,673 tonnes Co ² per years
GREEN BUILDING	SUSTAINABLE MOBILITY & CONNECTIVITY
48 buildings (Estimated) 47,800,000 kg Co ² / 47,800 tonnes Co ² GBI certification for all new MBPP buildings : 1. sPice 2. Chowrasta market 3. Relau Sport Complex	(i) Bicycle Lane 427 050 kg Co ² / 427 tonnes Co ²



CHALLENGES ON BECOMING LOW CARBON

CHALLENGES FACED IN IMPLEMENTING LOW CARBON CITY

Policies and Direction

- Inconsistent Implementation
- Gap in transition from top to bottom
- No specific reference to low carbon agenda
- Intensity versus absolute targets

Implementation and Execution

- Inconsistent implementation
- Not mandatory
- Absence of dedicated unit/entity at all levels

Source of Funding and Financing

- Insufficient and still lacking
- No dedicated fund
- Legal barriers for local government to generate additional income
- Lack of incentives

Community Participation

- Weak in public appreciation and understanding
- Lack of opportunities to participate

Low Carbon Development in Urban Planning

- Weak integration between low carbon reduction strategies and existing development's document
- Conflicting and competing development priorities



DEVELOPMENT OF LOW CARBON INITIATIVES IN PENANG

MOBILITY & CONNECTIVITY

Green Connectors Project such as public realm improvement and conservation project create a network for the benefit of biodiversity and society.

Example of Green Connectors Project in Penang:

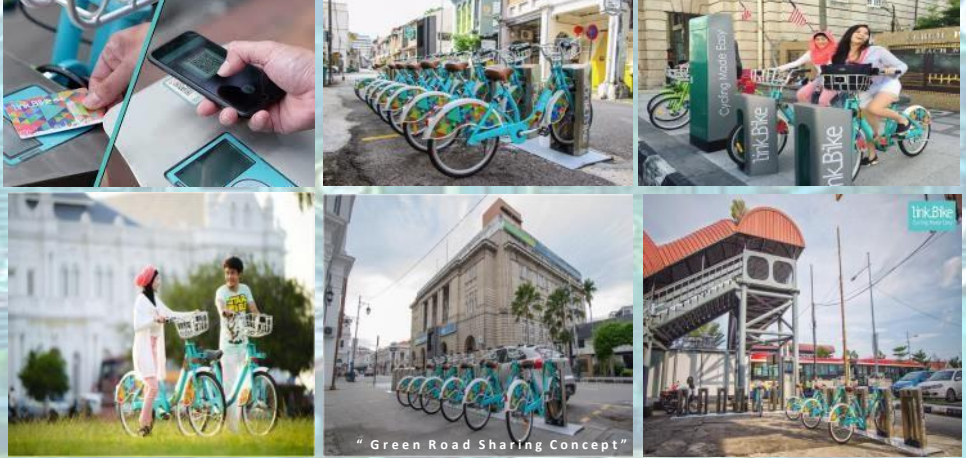
Penang Bicycle Lane Master Plan



Bicycle and pedestrian bridges “Spiral Bidge”



Bike Sharing Systems “Link Bike”



Green Road Sharing Concept



LED INSTALLATION IN PENANG



17,542 UNITS



2,435 UNITS



40,640 UNITS

60,617 UNITS



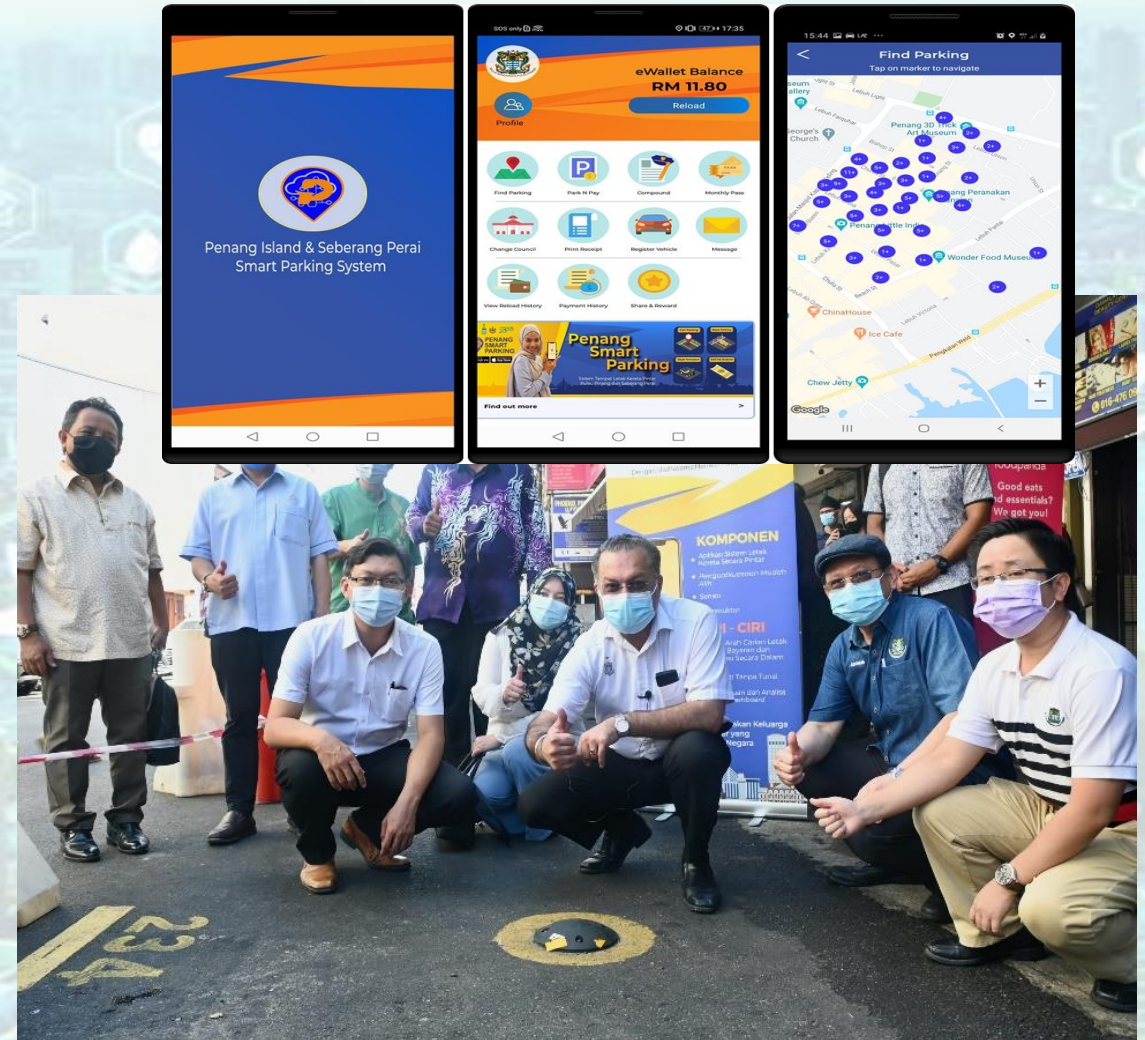
The Local Councils Public Lighting Guidelines require all housing developers to install LED streetlights for all types of new developments in Penang.

IMPLEMENTATION OF PENANG SMART PARKING (PSP)

PSP was introduced to Penang on 19 August 2019 and cover 36,000 public parking lots owned by the Local Councils.

It replaces the use of physical parking coupons in the whole state.

The use of IOT in navigating user to the available parking lot also help to reduce travelling time, traffic jam, air pollution and carbon footprint.



IMPLEMENTATION OF SOLAR PANEL IN GOVERNMENT BUILDING

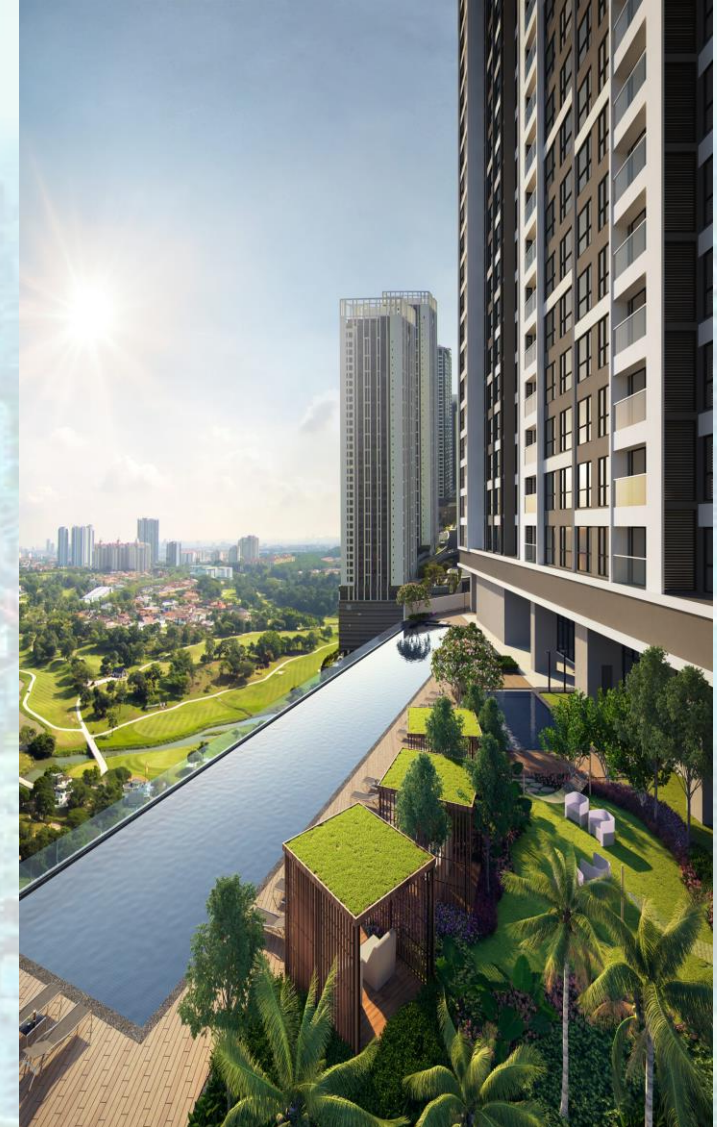
NO OF BUILDING	SYSTEM SIZE	ENERGY SAVING	ELECTRICAL COST SAVING	CO2 REDUCTION
4	299.07 kWp	Currently in installation phase		
4	812.5 kWp	1,070,496 kWh per year	RM328,972.47 per year	758,642kg CO2 per year
4	837.88 kWp	1,360,297 kWh per year	RM360,422.00 per year	800,223kg CO2 per year



GREEN BUILDING CERTIFICATION

Penang recorded as having the **third highest** number of Green Building Index (GBI) certified buildings in Malaysia with a total of **62 GBI certified buildings** comprising a gross floor area of 24 million square feet which will reduce CO2 emission by approximately 73.2 kilo tons per year.

Penang has increased the number of green building certification accepted by the Local Authorities effective June 2022 with additional certification from GreenRE, MyCREST and CASBEE Iskandar.





AWARDS & RECOGNITION

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An aerial photograph of a dense urban landscape, likely Tokyo, featuring numerous skyscrapers and green spaces. Overlaid on the image are several hexagonal icons connected by thin white lines, symbolizing interconnected smart city technologies. The icons include: a solar panel with a sun, a heart with a pulse line, a graduation cap, a water drop, a recycling symbol, a hand holding a plant seedling, a globe with leaves, a person in a wheelchair, a factory, a bar chart, a fork and knife, a leaf, a gear, a lightbulb, a book, a wind turbine, a car, a building, and a person. The overall color palette is dominated by blues and greens, with a soft blue gradient at the top.

An aerial view of a city with various icons representing smart city concepts like renewable energy, healthcare, education, and sustainability. The image shows a dense urban landscape with numerous buildings and green spaces. Overlaid on the city are several hexagonal icons containing symbols for solar energy, a heart with a pulse line, a graduation cap, a water drop, a recycling symbol, a hand holding a plant, a globe with a leaf, and a fork and knife. These icons are connected by lines, suggesting a networked smart city environment.

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THANK YOU