

PUTRAJAYA GREEN CITY 2025 (PGC2025)



by: Azhar Othman, Wang Tze Wee. Putrajaya Corporation, Malaysia



Outline of presentation

◎ Background of Putrajaya

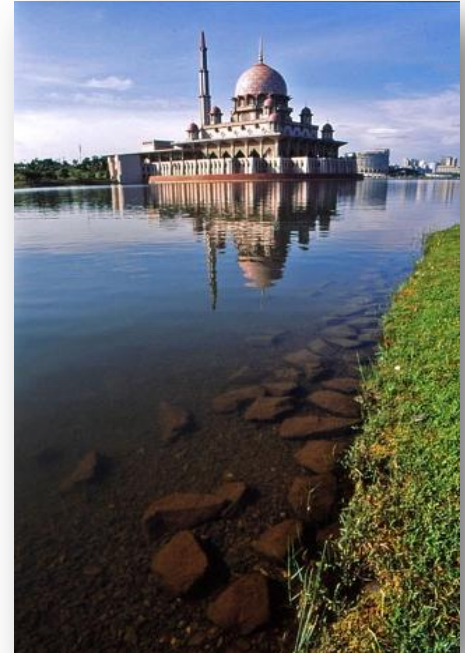
◎ PGC2025 Study

- Introduction
- Current Status
- Expectation To AIM Team

BACKGROUND OF PUTRAJAYA

Introduction

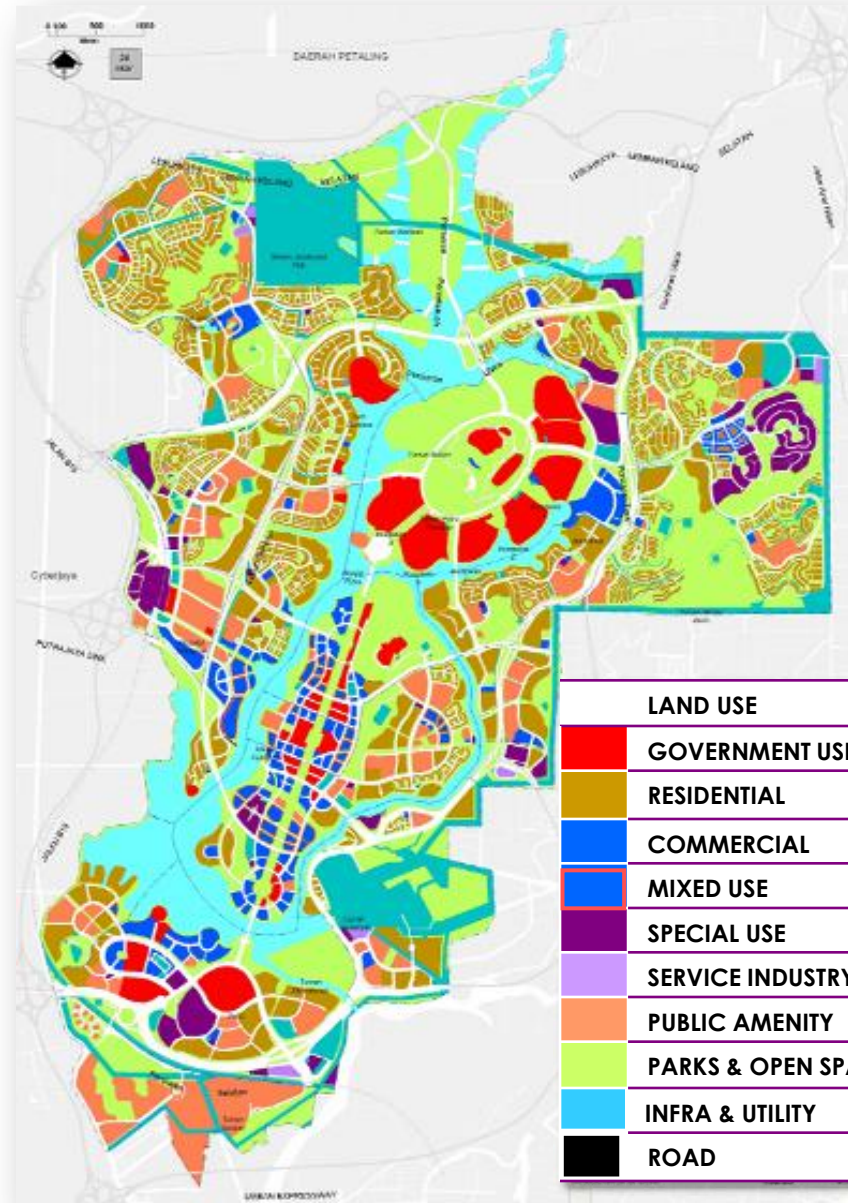
- ◎ Putrajaya is the new Federal Government Administrative Centre of Malaysia
 - ◎ Its development strategy were originally based on 2 underlying concepts:
 - Putrajaya as a garden city - **sustainable development**
 - Putrajaya as an intelligent city
- Based on those concepts, a master plan was drawn up and approved for implementation in 1995
- ◎ The Putrajaya master plan:
 - an integrated land use plan supported by various guidelines & subject plans covering sectors such as transportation, environment, utilities, landscape, urban design, lake use and navigation etc.



The Putrajaya Master Plan

Main features of the Putrajaya Master Plan :

- ① Almost 40 % of the city area designated as open space
- ① Includes 400 hectares of a man-made lake and 200 hectares of wetlands, created to bring in nature and bio diversity into the city fabric
- ① Road and transportation network are planned based on a policy of modal split of 70:30 between public transport: private transport usage. A rail base transport system is also planned for and to be supported by park and ride facilities at the peripheral area.
- ① City divided into 20 precincts; with main employment and commercial precincts (CBD area), located at the 'core island'
- ① Residential precincts at the peripheral are planned on a neighbourhood planning concept.



Basic facts and figures



City area	4,931 ha.
Planned Population	347,700
Daytime Population	500,000
Office space	Government: (3.8 million sq. meters) Commercial 4.2 million sq. meters)
Residential	65,000 units (55% government owned units) (45% sold to the public)
1 st construction	1996

Progress of development

COMPONENT	PLANNED	CURRENT	(%)
Government Institution	21 Ministries	17 Ministries	81.0
Commercial	4,200,000 sq.m.	355,859 sq.m.	10.5
Housing	65,124 units	19,184 units	29.5
Public Facilities	446.4 ha	148.8 ha	33.3
Infrastructure & Utility	859.2 ha	677.9 ha	78.9
Open Space	1,721.6 ha	1,494.3 ha	86.8

Resident Population : 70,000*
Govt. Office Workers : 45,000

*(Note: Update until Dec 2010, *estimation)*

Putrajaya Green City 2025 (PGC2025)

3R Putrajaya

Final disposal
& GHG emission
– 50%



Low-carbon Putrajaya

CO₂ emission
–60%



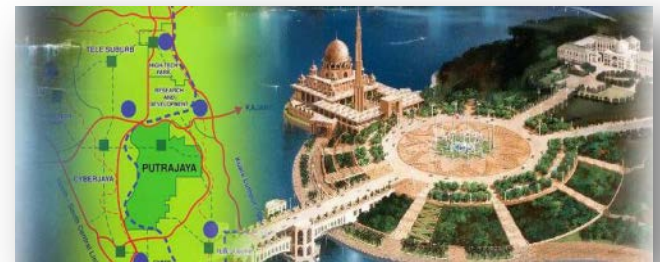
Cooler Putrajaya

–2°C



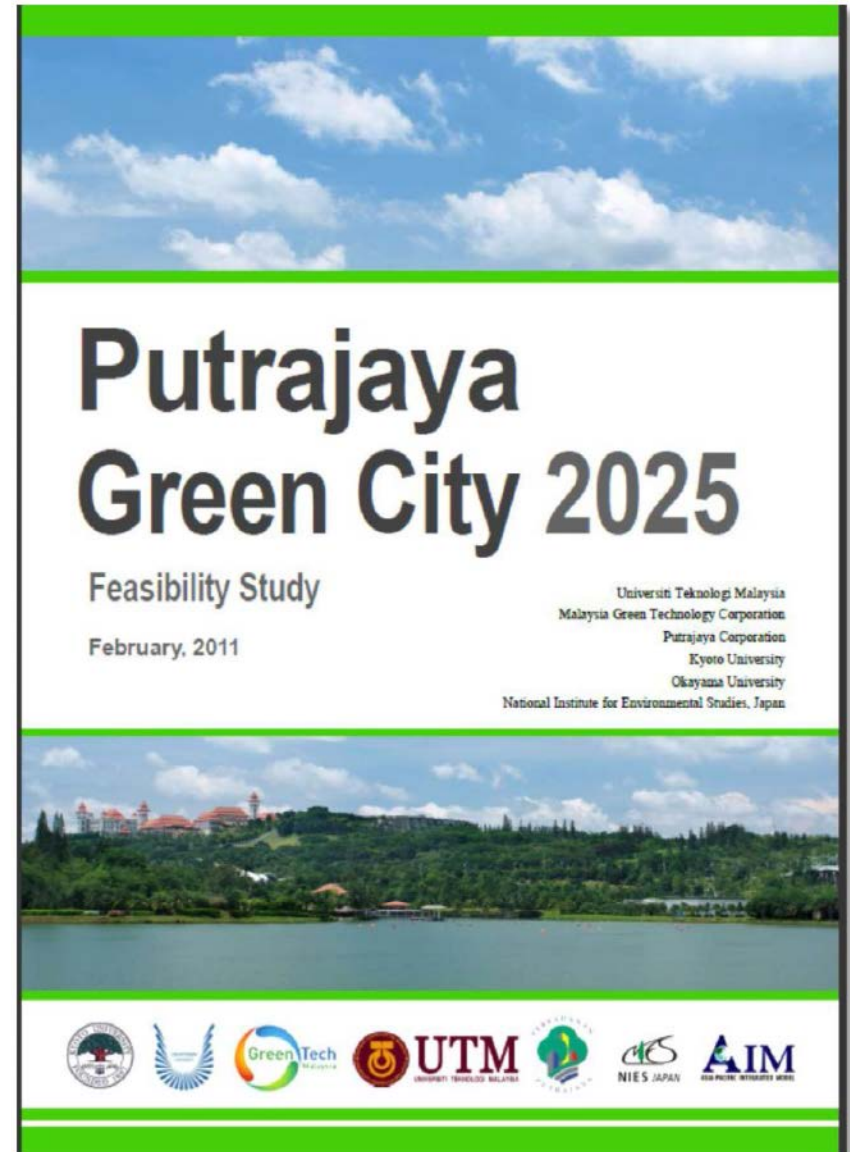
Introduction

- At the Copenhagen COP15, Malaysia has made a conditional commitment of a reduction of carbon emission intensity of Malaysian GDP, of up to 40% by 2020 from a 2005 baseline
- In tabling the 2010 Malaysian Budget, the Prime Minister announced to “develop Putrajaya and Cyberjaya as pioneer township in Green Technology as a showcase for the development of other townships”

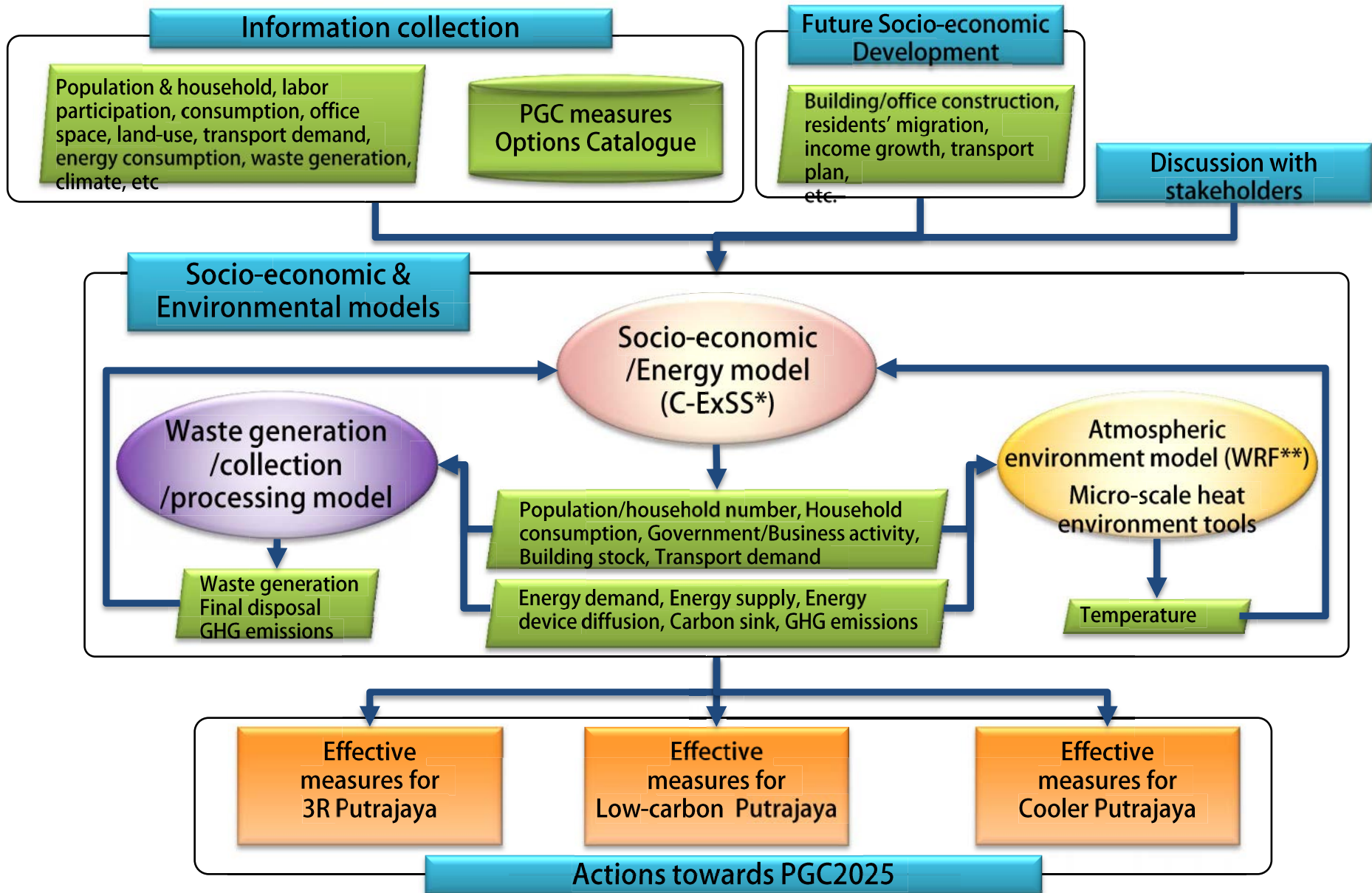


- ◎ A collaborative study between:
 - i. Putrajaya Corporation;
 - ii. University Technology of Malaysia;
 - iii. Kyoto University ;
 - iv. Okayama University;
 - v. National Institute of Environmental Studies
 - vi. Malaysia Green Technology Corporation

- ◎ Three main components & quantitative environmental targets in PGC2025:
 - **Low Carbon Putrajaya:**
reduce GHG emission intensity by 60%.
 - **Cooler Putrajaya:**
reduce peak temperature by 2 degree Celsius.
 - **3R Putrajaya:**
reduce final disposal of solid waste & GHG emission per waste generation by 50%.



Methodology – Integrated Modeling Approach



Current Status of PGC2025

- ◎ Draft report has been produced by task force members and still in the progress of updating and reviewing. 12 (dozen) main actions and more than 50 sub actions have been identified at the initial stage.

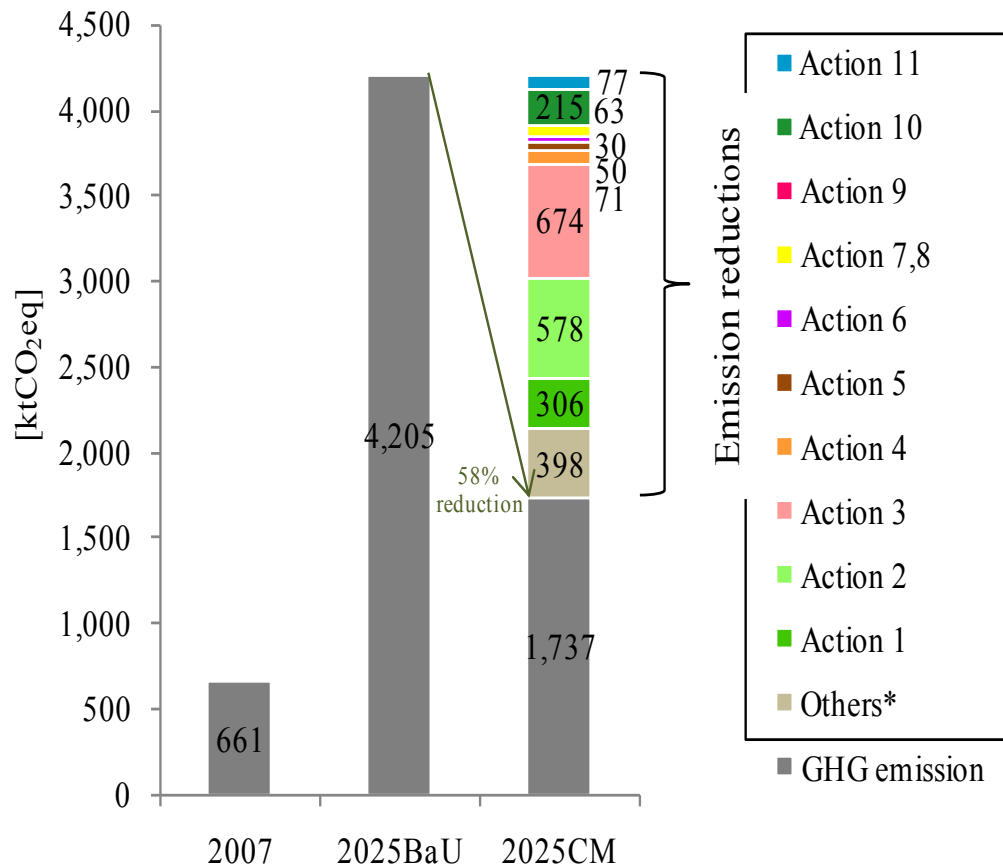
Low Carbon Putrajaya	1. Integrated City Planning & management
	2. Low Carbon Transportation
	3. Cutting-Edge Sustainable Buildings
	4. Low Carbon Lifestyle
	5. More and More Renewable Energy
	6. The Green Lung of Putrajaya
Cooler Putrajaya	7. Cooler Urban Structure & Building
	8. Community and Individual Actions to Reduce Urban Temperature
3R Putrajaya	9. Use Less Consume Less
	10. Think Before You Throw
	11. Integrated Waste Treatment
General	12. Green Incentives and Capacity Building

- From the dozen action, 11 actions can be measured for the quantitative contribution in CO₂ emission reduction.

Action No.	Name of actions	CO ₂ emission reduction [tCO ₂]	Contribution in total reduction [%]
1	Integrated City Planning & Management	305,901	14.8%
2	Low-carbon Transportation	578,270	27.9%
3	Cutting-Edge Sustainable Buildings	673,597	32.5%
4	Low Carbon Lifestyle	71,195	3.4%
5	More & More Renewable energy	50,334	2.4%
6	The Green Lung of Putrajaya	30,396	1.5%
7	Cooler Urban Structure and Building	63,495	3.1%
8	Community and Individual Actions to Reduce Urban Temperature		
9	Use Less Consume Less	5,475	0.3%
10	Think Before You Throw	214,766	10.4%
11	Integrated Waste Treatment	76,833	3.7%
12	Green Incentives and Capacity Building	-	-
Others*	-	397,700	16.3%
Total		2,441,299	100%

*It includes contribution from freight transport (2.7 %) and central power generation (13.5 %).

◎ Total targeted CO₂ reduction by 11 actions will be 60% from BaU scenario.



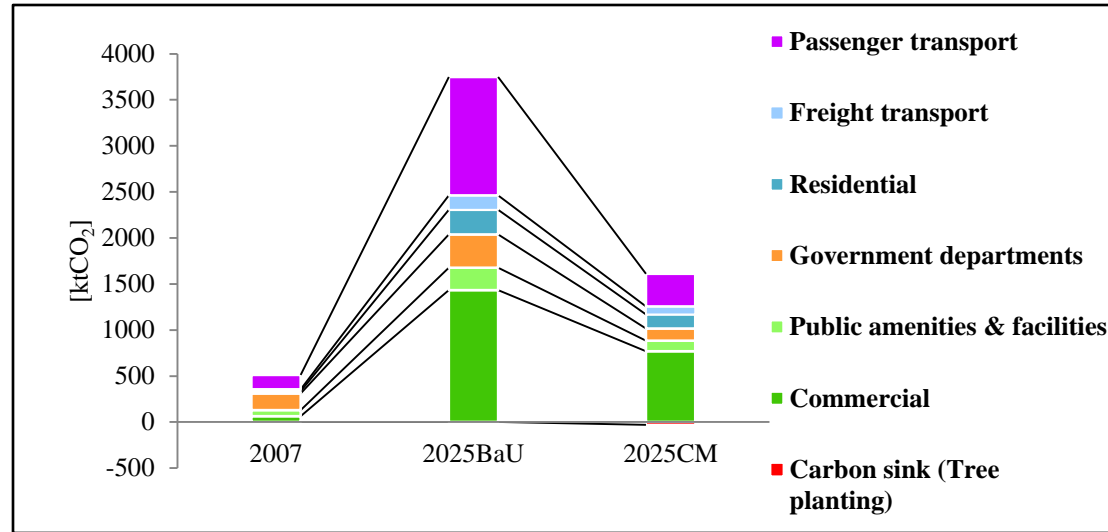
*It includes contribution from freight transport (2.7 %) and central power generation (13.5 %).

**Action 12 does not have its emission reduction.

Emission Result

CO₂ emission result in C-Exss for year 2025 shows that, **commercial** sector will have the **highest** emission follow by **passenger transport** sector.

CO₂ Emission By Sector



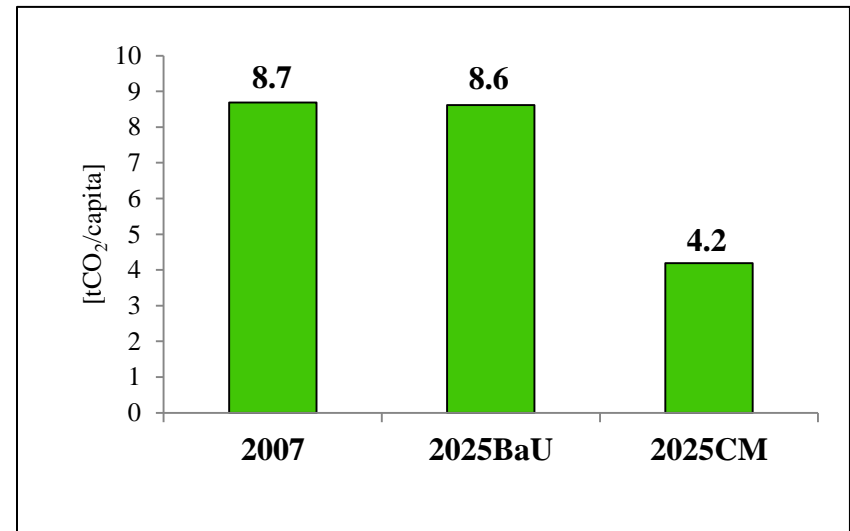
Sector	2007	2025BaU	2025CM	2025BaU /2007	2025CM/ 2007	2025CM/ 2025BaU
Commercial	65	1435	768	22.23	11.90	0.54
Passenger transport	158	1288	355	8.17	2.25	0.28
Government departments	180	362	134	2.00	0.74	0.37
Residential	23	266	149	11.40	6.41	0.56
Public amenities & facilities	67	243	114	3.66	1.71	0.47
Freight transport	20	156	89	7.80	4.45	0.57
Carbon sink (Tree planting)	-	-	-30	-	-	-
Total	513	3749	1579	7.32	3.08	0.42

Low Carbon Putrajaya

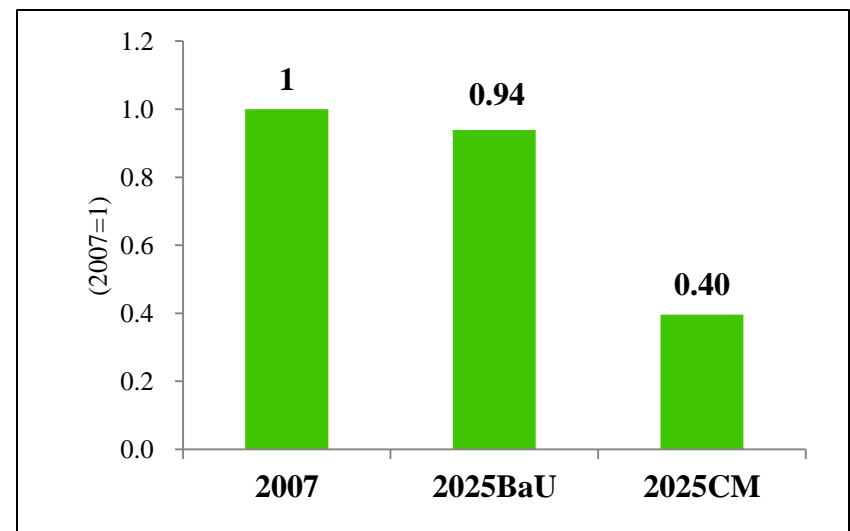
Emission Result

- The per capita emission in 2025BaU will be **8.64tCO₂**. This figures is targeted to be reduced to **4.2tCO₂**.
- CO₂ Emission Intensity in 2025 will be **reduced by 60%** from 2007.
- Economic activity is used as an alternative input data for CO₂ Emission Intensity calculation.

CO₂ Emission Per Capita



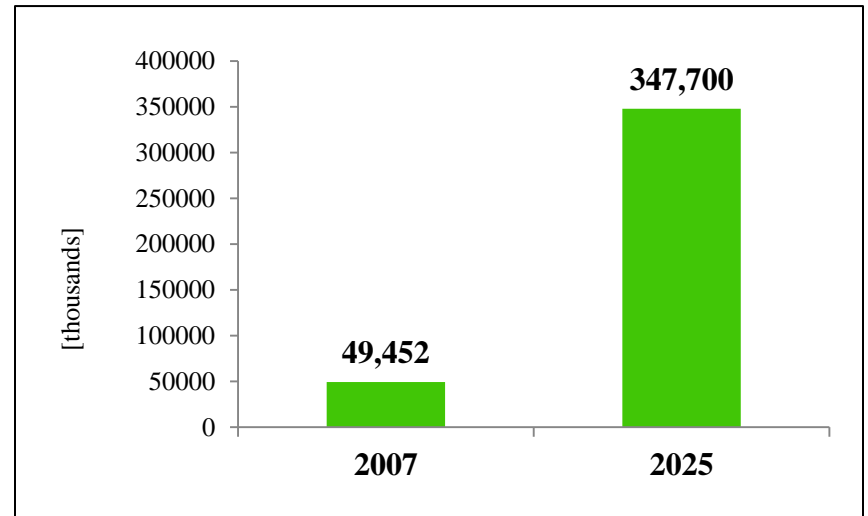
CO₂ Emission Per Economic Activity



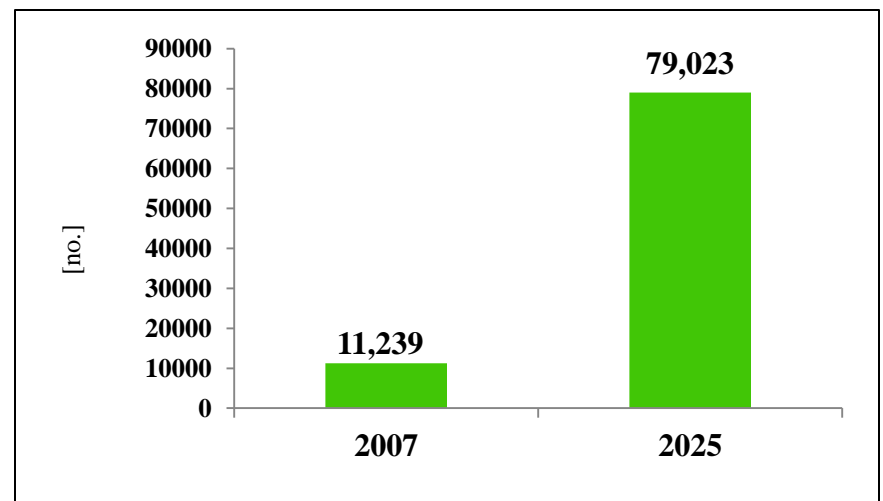
Driving Force

- Population in year 2025 is expected to increase 7 times from year 2007.
- Household no. will increase to 79,023 in year 2025.
- Household size is set as 4.4.

Population in Putrajaya



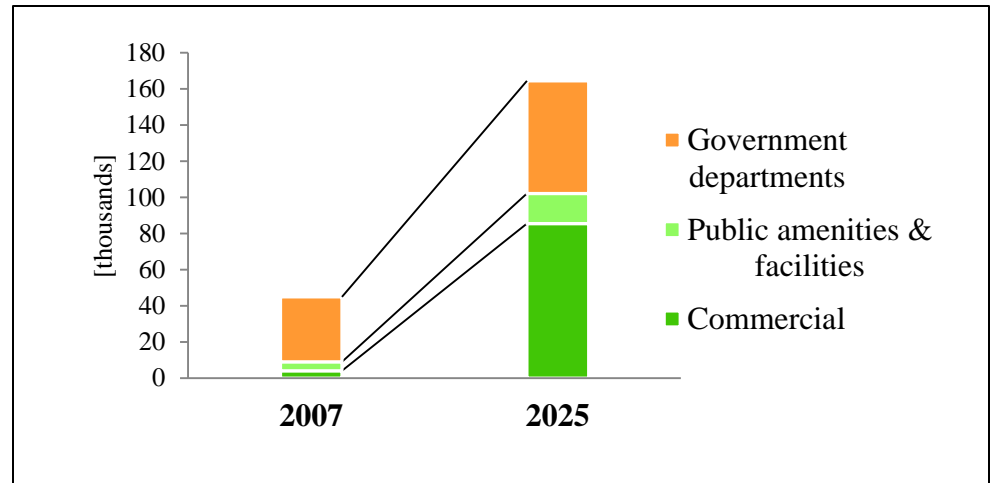
Household Number



Driving Force

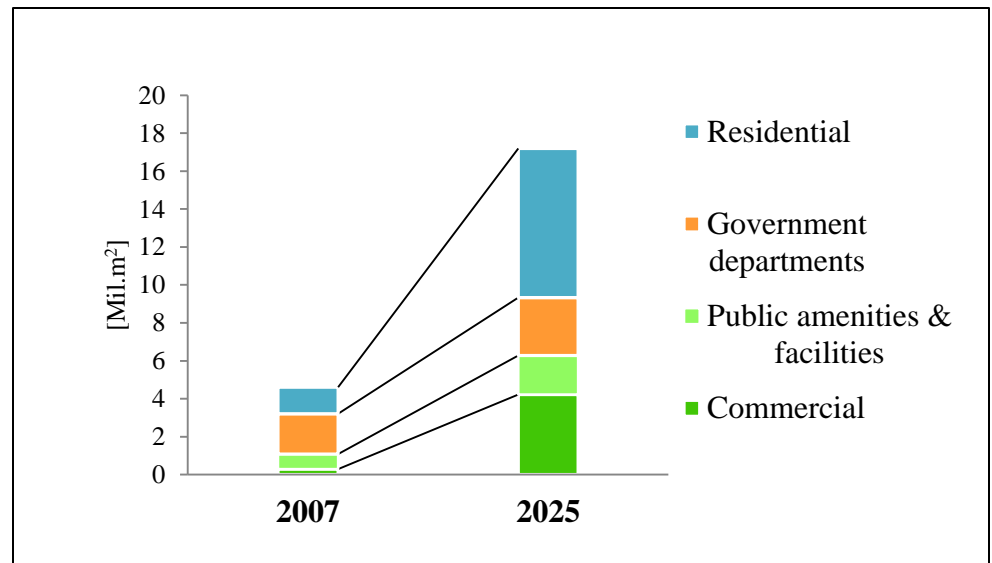
● In year 2007, government sector have the highest no. of employment, but in year 2025 commercial sector will have highest number.

Employment By Sector



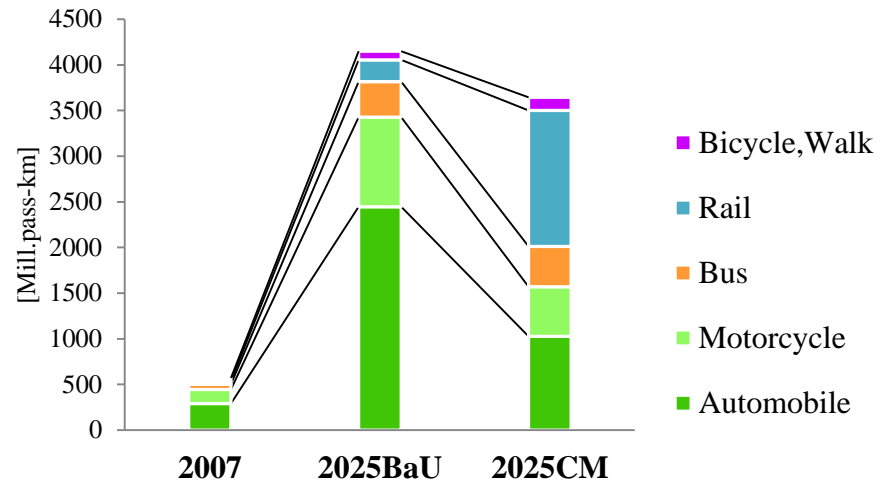
● In year 2007, government sector have the highest floor space area, but in year 2025 residential sector will have highest floor area.

Floor Area By Sector



Passenger Transport Demand

- In year 2007, automobile was highly used and is expected to be the same in 2025 BaU scenario.
- Rail base transportation is targeted to be used as the main transport mode in 2025 CM.



	2007	2025BaU	2025CM	2025BaU /2007	2025CM/ 2007	2025CM/ 2025BaU
Bicycle,Walk	6%	2%	4%	2.81	4.25	1.52
Motorcycle	27%	24%	15%	6.35	3.50	0.55
Automobile	51%	59%	28%	8.43	3.54	0.42
Bus	10%	9%	12%	6.74	7.68	1.14
Rail	6%	6%	41%	6.74	42.31	6.27
Total	100%	100%	100%	7.26	6.38	0.88

Cooler Putrajaya

- ◎ Daily maximum temperature in Putrajaya is **over 30 degree Celsius**.
- ◎ This topic will target to reduce peak temperature by **2 degree Celsius**.
- ◎ By reducing the peak temperature outdoor, it is expected to reduce the cooling demand inside the buildings and encourage people to cycle/walk within the city.
- ◎ To support our CO₂ emission reduction target.



3R Putrajaya

- ⦿ At present, Putrajaya has been utilizing a landfill waste disposal facility approximately 30km away outside the city boundary.
- ⦿ This topic will target to reduce:
 - **50%** of final disposal of solid waste
 - **50%** of GHG emission per waste
- ⦿ This By reducing amount of waste collected and introducing appropriate treatment facilities, this will have direct implication on the amount of GHG emission from waste collection and transportation made to landfill site.



Implication and Expectation to AIM Team

⊙ **Continous Transfer of Knowledge to Putrajaya**

Continuous assistance from AIM in terms of knowledge transfer is highly appreciated. E.g: training for LCS related modeling.

This is to ensure a new planned city like Putrajaya will continue to develop in a balanced and sustainable manner in line with the aspiration for Putrajaya to become the pioneer green city in Malaysia.

⊙ **A Further Study on Carbon Sink Calculation**

A further study on carbon sink calculation needs to be incorporated into C-ExSS to take into consideration tropical tree species. E.g: the average annual carbon accumulation by tree (of tropical species).

Thank you



www.ppj.gov.my