Development of Low Carbon Society Scenarios for Iskandar Malaysia and Putrajaya.

LCS RESEARCH WORKSHOP
July 5, 2011 FAB, UTM, Johor

HO CHIN SIONG

JST-JICA 2011
Technical Cooperation Project
UTM, IRDA, MGTC and JPBD Malaysia
Kyoto U, Okayama U and NiES Japan

Content of Presentation

- How to approach LCS sustainable future ?
  - Political will and Institutional commitment
  - Modeling experts – External and internal

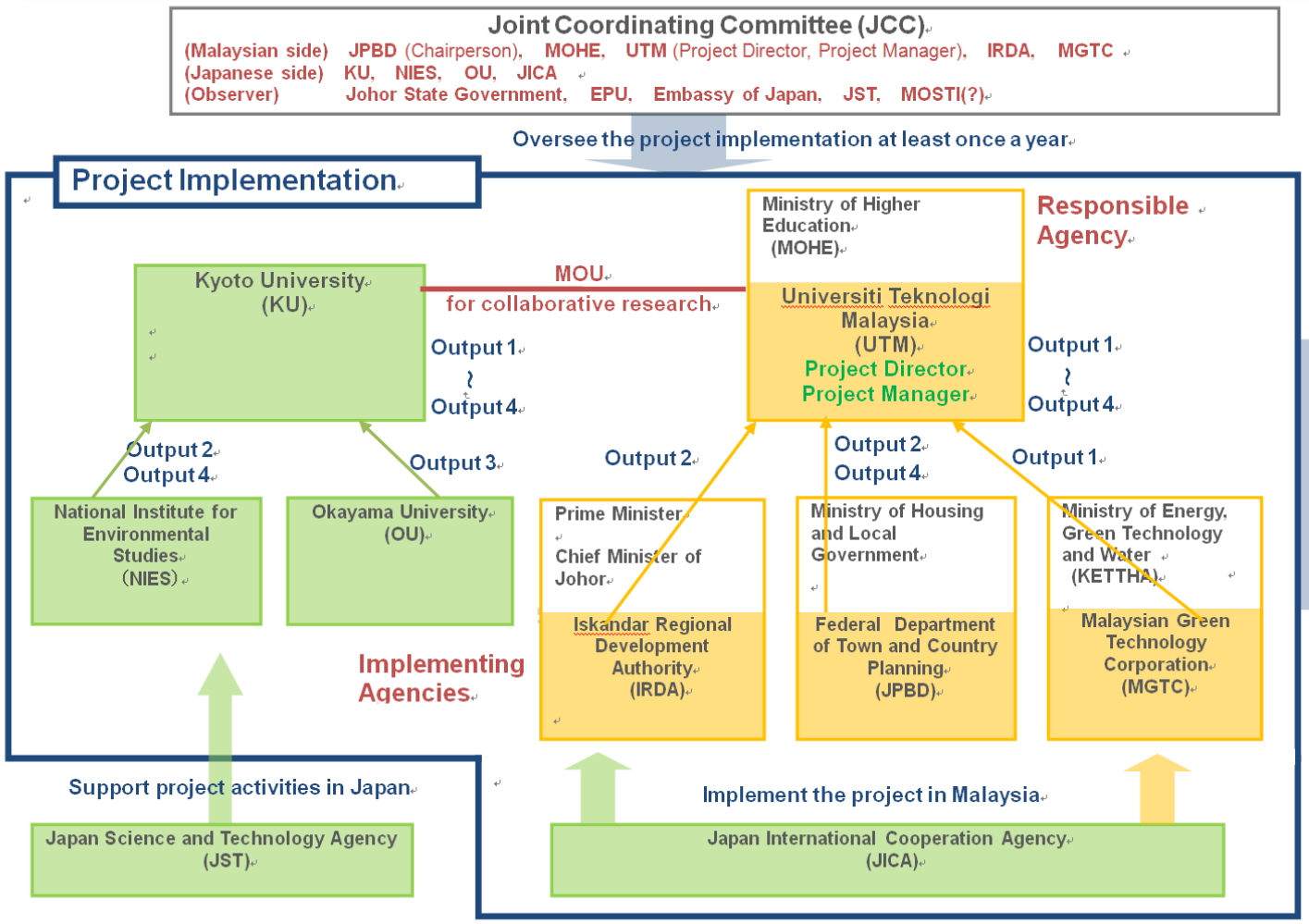
- Who are the Stakeholders to implement Development of Low Carbon Society Scenarios

  - to obtain view points from policy makers and implementing related with LCS.

. What are sustainable issues ?

- National issues / Putrajaya and iskandar Malaysia

IMPLEMENTATION ARRANGEMENT AND OUTPUT



Output 1
Methodology to create LCS scenarios which is appropriate for Malaysia is developed.

Output 2
LCS scenarios are created and utilized for policy development in IM.

Output 3
Co-benefit of LCS policies on air pollution and on recycling-based society is quantified in IM.

Output 4
Organizational arrangement of UTM to conduct trainings on LCS scenarios for Malaysia and Asian counties is consolidated, and a network for LCS in Asia is established.

JICA Detailed Planning Survey
(Nov 2010)

RESEARCH PROJECT TIMELINE 2011-2015

- Need substantial input to blueprints etc.
- Compiling the the first draft of LCS roadmap

Interim project Evaluation

Final project Evaluation

	2011	2012	2013	2014	2015
ACTIVITY 1: METHODOLOGY	Apply the whole methodology and tools		Revising and Improvement		
ACTIVITY 2: IMPLEMENTATION	Design the scenarios and roadmaps	Details for Implementation	Implementation	Revising and Improvement	Wrap up the project
ACTIVITY3: AIR & SWM	Detailed basic survey	System integration	Manual development		
ACTIVITY 4: DISSEMINATION	International Expert Workshop once per year International Training Workshop once per year				

Stage 1

Stage 2

Stage 3

Stage 4

LCS Study in Malaysia: Chronology of events

Beginning of the LCS Study for Iskandar Malaysia (2008)

The outcome of Low Carbon City 2025, Sustainable Iskandar Malaysia Brochure (01/2009)

LCS IM Brochure and idea presented to IRDA (01/2009)

- Visited Iskandar Malaysia Study area. Collaboration & discussions with UTM (Prof Charles Ho) starting a LCS group at UTM.

Research Delegation to Malaysia (08/2009)

- IRDA & IMREC
- UTM
- JPBD-KL
- JICA – KL
- PTHM
- KeTTHA)

Research Delegation to Malaysia. Success in getting the JICA-JST fund for IM (05/2010)

- IRDA , UTM, JPBD-KL, JICA–KL, PTHM
- JICA KL site visit to IM
- Visit to Putrajaya Corporation. Japan came to Malaysia to invite our Malaysian Counterparts to come to Japan for a Technical visit in line with the JICA- JST Project. (26-30 Sept 2010)

The continuation of the Malaysian LCS research (2010- 2011)

- Preparation of LCS study brochures for Malaysia –
- To outline LCS road map for Iskandar Malaysia.
- The Putrajaya Green City Study and Brochure.
- Signing of MM 12 Nov 2010
- Signing of ROD on 2 Jun 2011
- Launching of LCS research on 4 July 2011 by MB Johor

COP 15 – Malaysia's target

- Prime Minster of Malaysia, Y.A.B Dato' Sri Mohd Najib bin Tun Abdul Razak, in **COP15** last year at Copenhagen, Denmark, proposed **to reduce CO_2 emission intensity in Malaysia to 40 per cent by the year 2020 compared with its 2005** levels, subject to assistance from developed countries.
-

COP15 on Dec 17, 2009 at Copenhagen, Denmark

Main points of Research project background

ISKANDAR MALAYSIA

1. Research approach based on view point of **Regional development of Iskandar Malaysia**
2. “Development of Low Carbon Society Scenarios for Asian Regions” (main target region: **Iskandar Development Region, Malaysia**)

PUTRAJAYA

Research approach based on view point of **community /city development of Putrajaya**

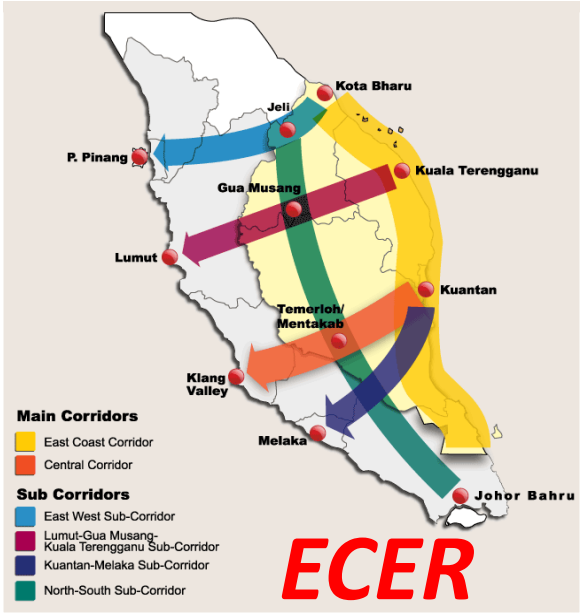
Focus on LCS Putrajaya. Cooler Putrajaya and 3 R Putrajaya

BACKGROUND

MALAYSIA: KEY ECONOMIC DEVELOPMENT CORRIDORS

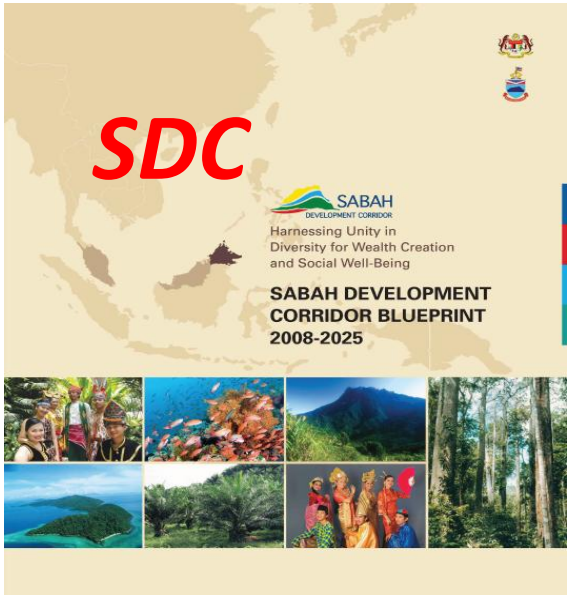
IM

NCER



ECER

SCORE



1 MALAYSIA CHARTING DEVELOPMENT TOWARDS A HIGH INCOME NATION

- The 2011 Budget, with the aim to position Malaysia as a **developed and high-income economy** with inclusive and sustainable development, will continue to ensure that the **most conducive socio-economic environment** is created through the **Government Transformation Programme (GTP)** to underpin growth.

The 10th Malaysia Plan

- Building an environment that **enhances Quality of Life**
- New urbanism and **compact city**
- Growth concentrated in **urban conurbation**
- **Safe city** initiatives
- **Developing climate resilient growth** policy
- Adaptation measures
- Mitigation measures
- Incentives for **RE and EE**
- Improving **Solid waste management**
- Conserving forest
- Reducing **emission to improve air quality**

CURRENT GREEN POLICIES IN MALAYSIA

National Green Technology Policy 2009

- Energy, Building , Water and waste management and Transportation

Malaysia Budget 2010-2011

- Developing Putrajaya and Cyberjaya as pioneer township in green technology

National policy on Climate Change

- Roadmap for Malaysia to achieve 40% reduction of GHG emission by 2020

Green Neighborhood Guidelines – JPBD 2010

-Smart location, Neighbourhood pattern and design, Green Infrastructure.

Green Township Framework –Guide Towards LC Cities 2010- MIP

CURRENT SPATIAL PLANNING IN MALAYSIA AND ENERGY CONSIDERATION

National Physical Planning(NPP2005)

National Urbanization Policy

Development plans

- State Structure Plans
- Local Plans

Development Control/ Planning approval

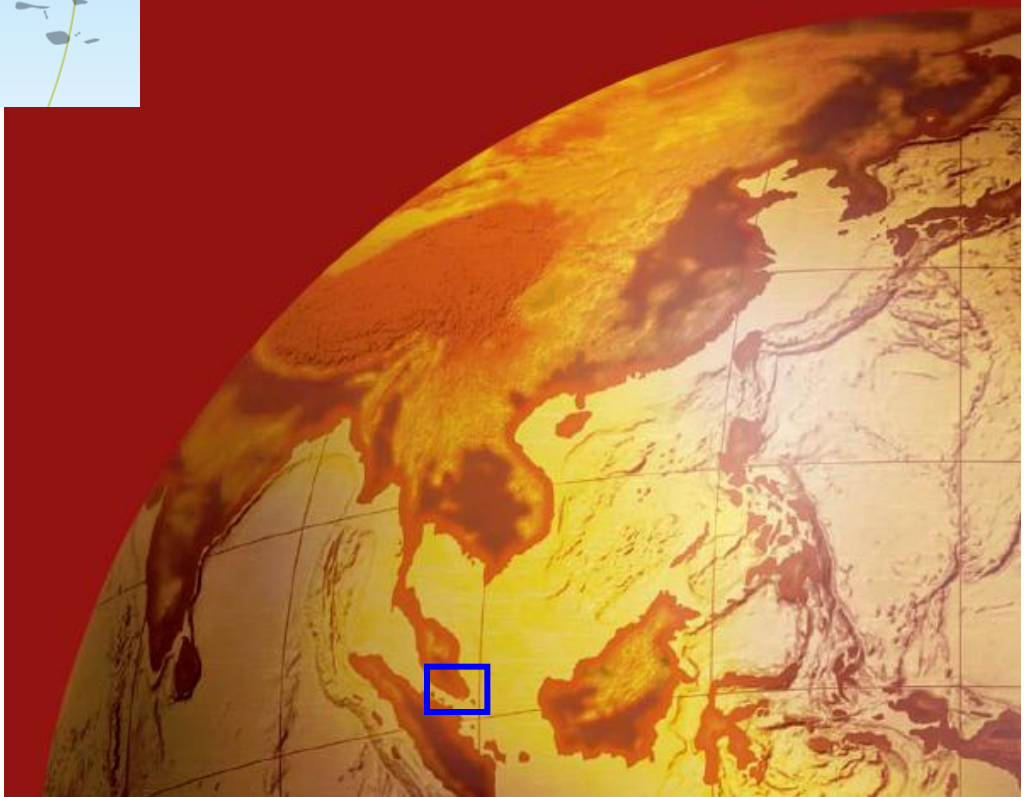
Green Neighborhood Guidelines – JPBD 2010

Case study

Iskandar Development Region

2,216 km^2

Population 1,353,200



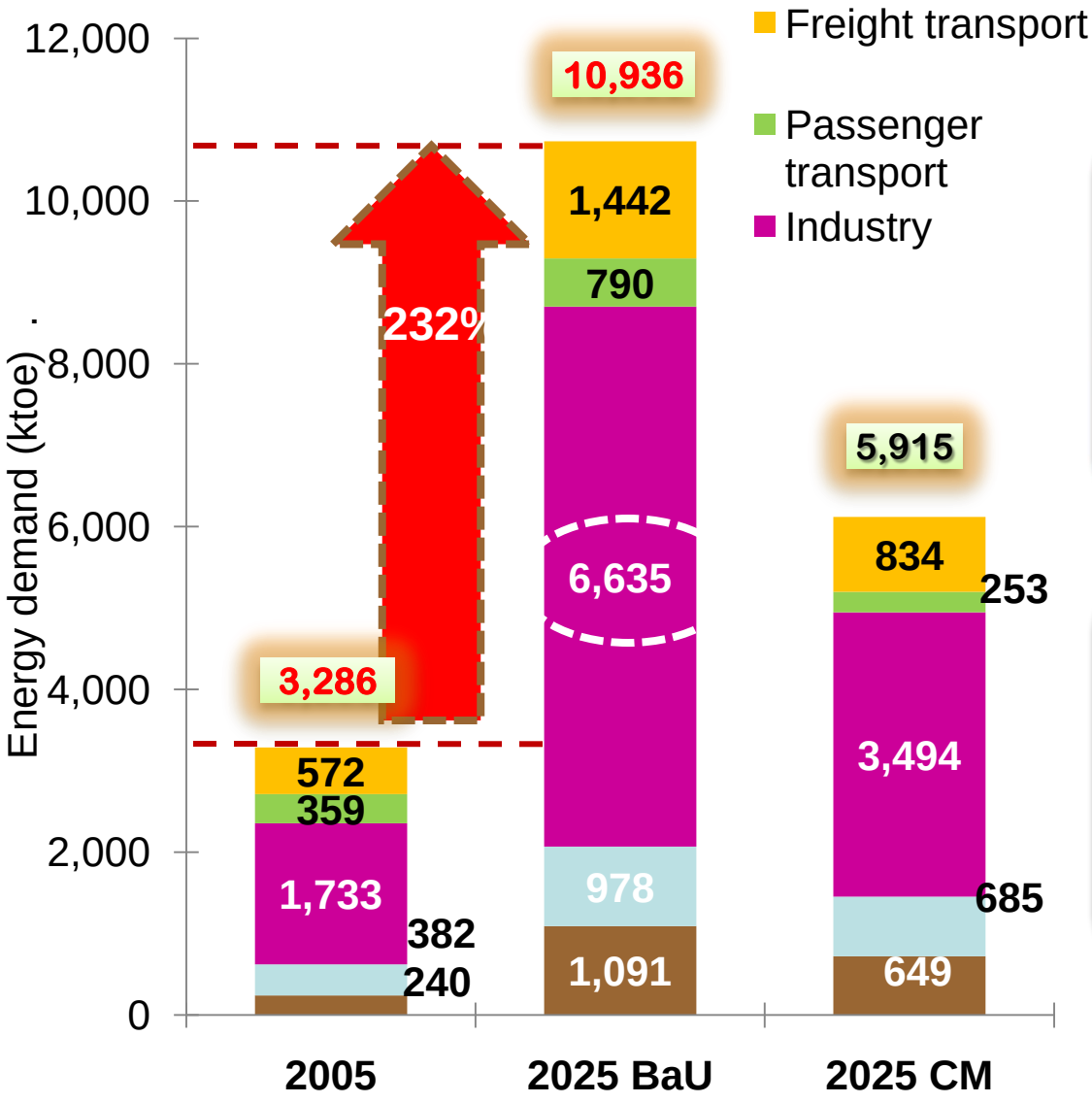
The Iskandar Malaysia Vision
Economic Growth

ISKANDAR REGIONAL DEVELOPMENT AUTHORITY

"To develop Iskandar Malaysia into a strong and sustainable metropolis of international standing"

	Year 2005	Projected (2025)
GDP (RM)	70 billion	325.5 billion
Per capita GDP (RM)	51,765	108,850
Employment	0.610 million	1.428 million
Population	1.4 million	3.1 million

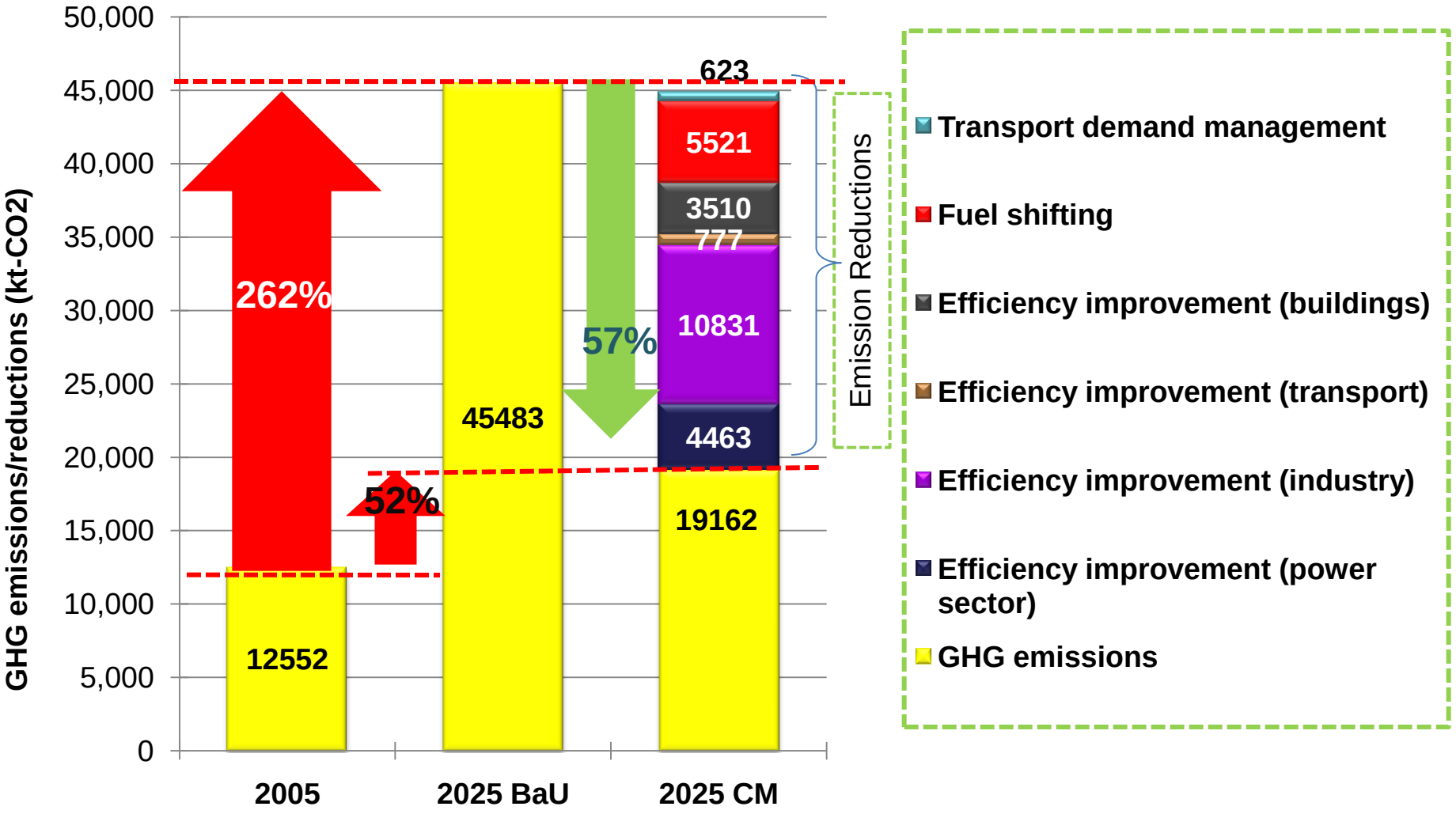
Energy Demand By Sector



Energy demand in IM is projected to increase from **3,286 ktoe** (toe: tonne oil equivalent) in 2005 to **10,936 ktoe** in 2025 for the BaU case (BaU: business as usual)

Industry is expected to be 6,635 ktoe and will maintain the largest share of 61%.

Potential Mitigation in IM



Low Carbon Cities Policy Package

Buildings

- •Environmental performance standard and evaluation of buildings
- •Adjustment of tax rate of fixed asset tax
- •Low interest loans to investment to energy efficient buildings

- •Environmental performance standard of equipments
- •Environmental labeling
- •Education and information service
- •Green purchasing policy

- •Subsidy to introduce photovoltaic power generation system

Transport & Land use

- •Urban planning
- •Transport planning
- •Tax rate adjustment to fixed asset
- •Investment to public transport

- •Environmental performance standard of vehicles
- •Tax rate adjustment to energy efficient vehicles
- •Promotion of bio fuel

Industry

- •Subsidy to investment to energy efficient equipments
- •Promotion of technology transfer

- •Incentive to introduce energy efficient equipments & buildings
- •Incentive to introduce renewable energy

- •Controlling urban growth & choice of transport mode

Energy efficiency improvement

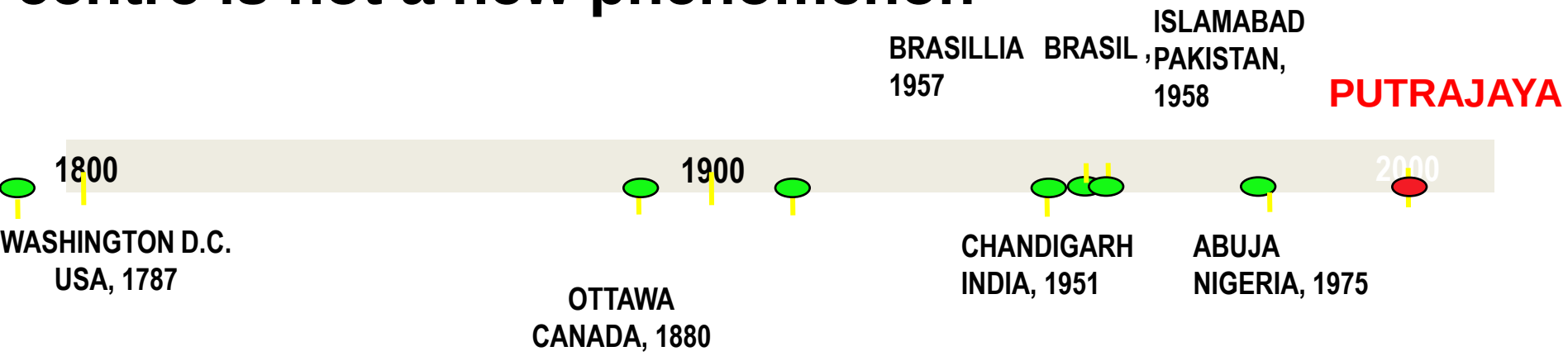
Lowering CO_2 intensity

Transport demand control

Mitigation of GHG emissions from Iskandar Malaysia

Creation of a new Federal Government Administrative Centre

Planning for a new Governmental administrative centre is not a new phenomenon



Recent cases -

- Pinmana, Myanmar which is located about 320km north of Yangon

- Proposed South Korea's new capital 150km south west of Seoul in Yeongi Gongju region.

LOCATION OF PUTRAJAYA

Green City -Main Focus

- This research will be one that supports the current National Initiative towards promoting Putrajaya as a Green City. Elements of "Green" consist of many factors and the integration of them could realize the "Green" City.

- Among them, however, we focus on the following three main sectors which we will be studying, namely; the
- (1) Mitigation of thermal environment of Putrajaya, in order to realize a Cooler Putrajaya,
- (2) Reduction of CO_2 emission to create a Low Carbon Putrajaya, and
- (3) Sound Solid Waste Management of Putrajaya to realize a 3R Putrajaya

PUTRAJAYA GREEN CITY 2025

PGC 2025 Results Output

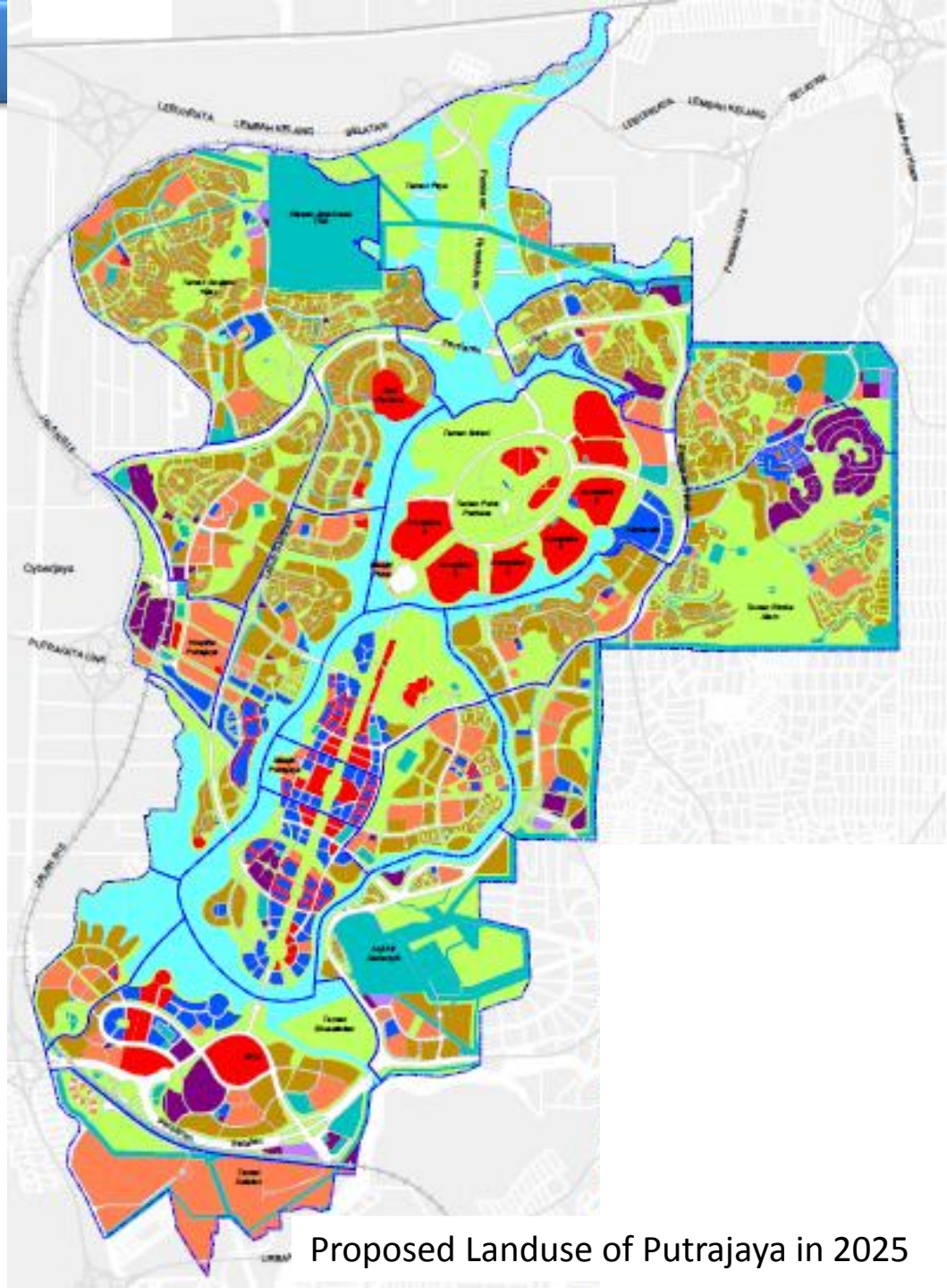
11th January 2011

Topics of Discussion

1. • A Dozen Actions towards PGC 2025
2. • Results for Low Carbon Putrajaya
3. • Input from stakeholders in the workshop

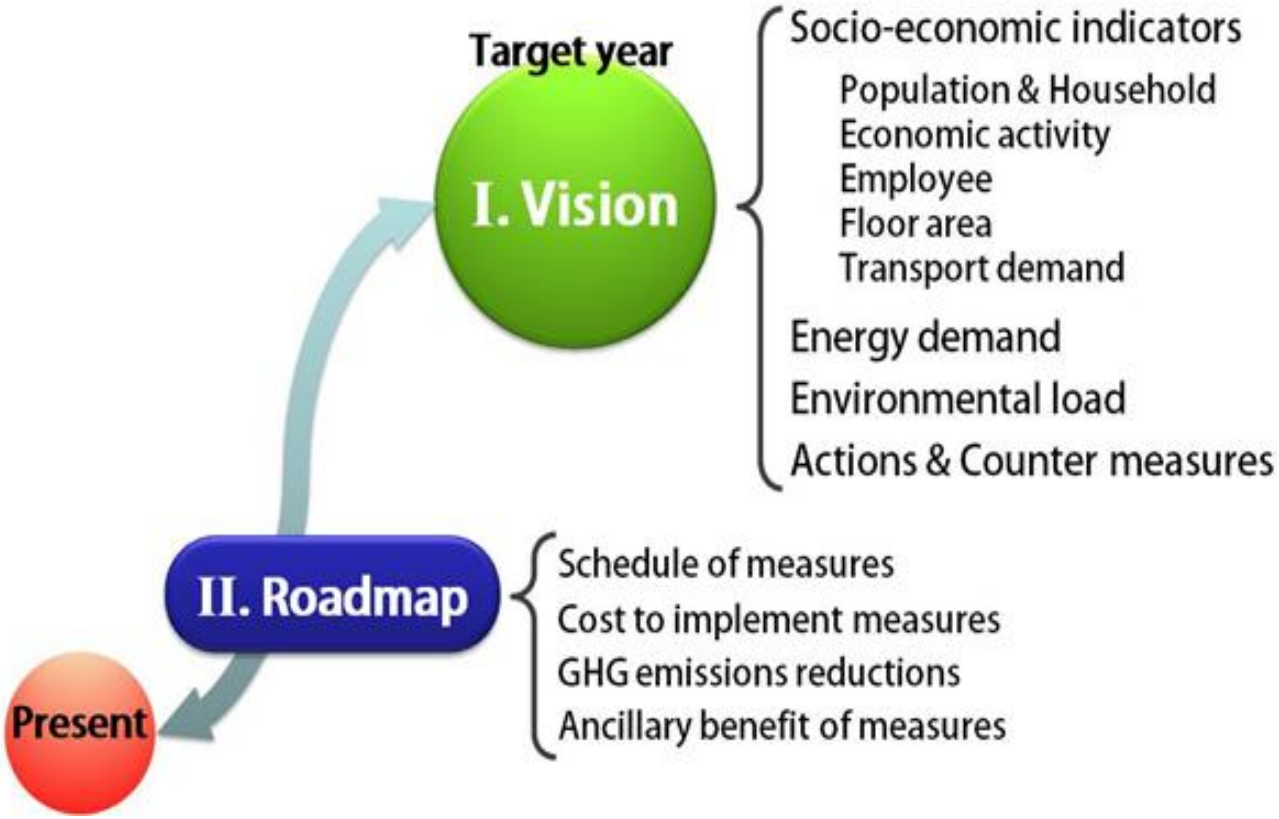
About Putrajaya

- Population =**49,380** (2007)
  347,700 (2025)
- Land Area=**12,184.77 Acres**
  (**49.39 km²**)
- Primary function of Putrajaya is:
  - **Federal Government Administrative Center**.
- Secondary functions:
  - **Business and Finance Center and**
  - **Multimedia Super Corridor (MSC) with Government Incentives as an E-Government (Electronic Government)**

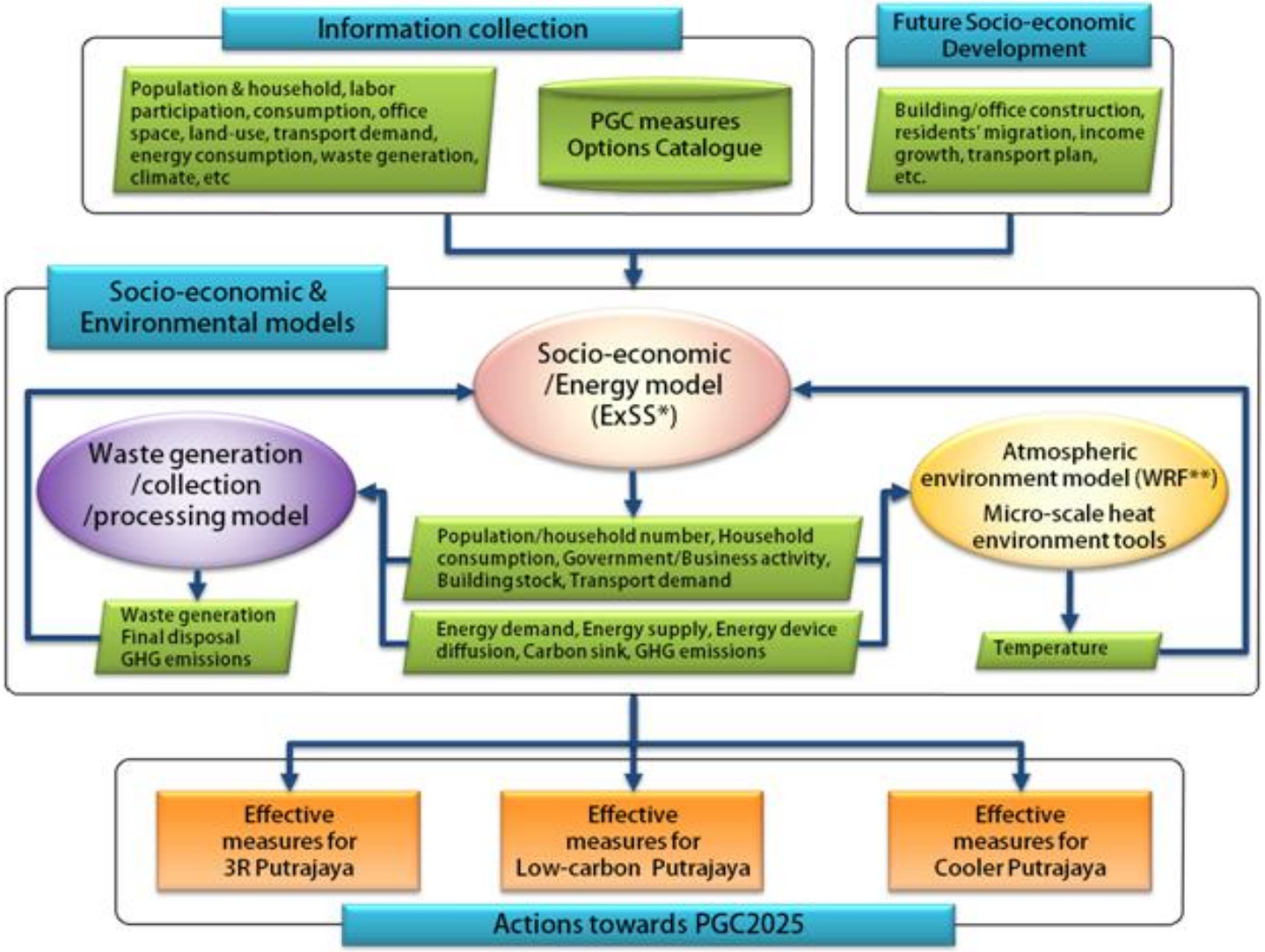


Proposed Landuse of Putrajaya in 2025

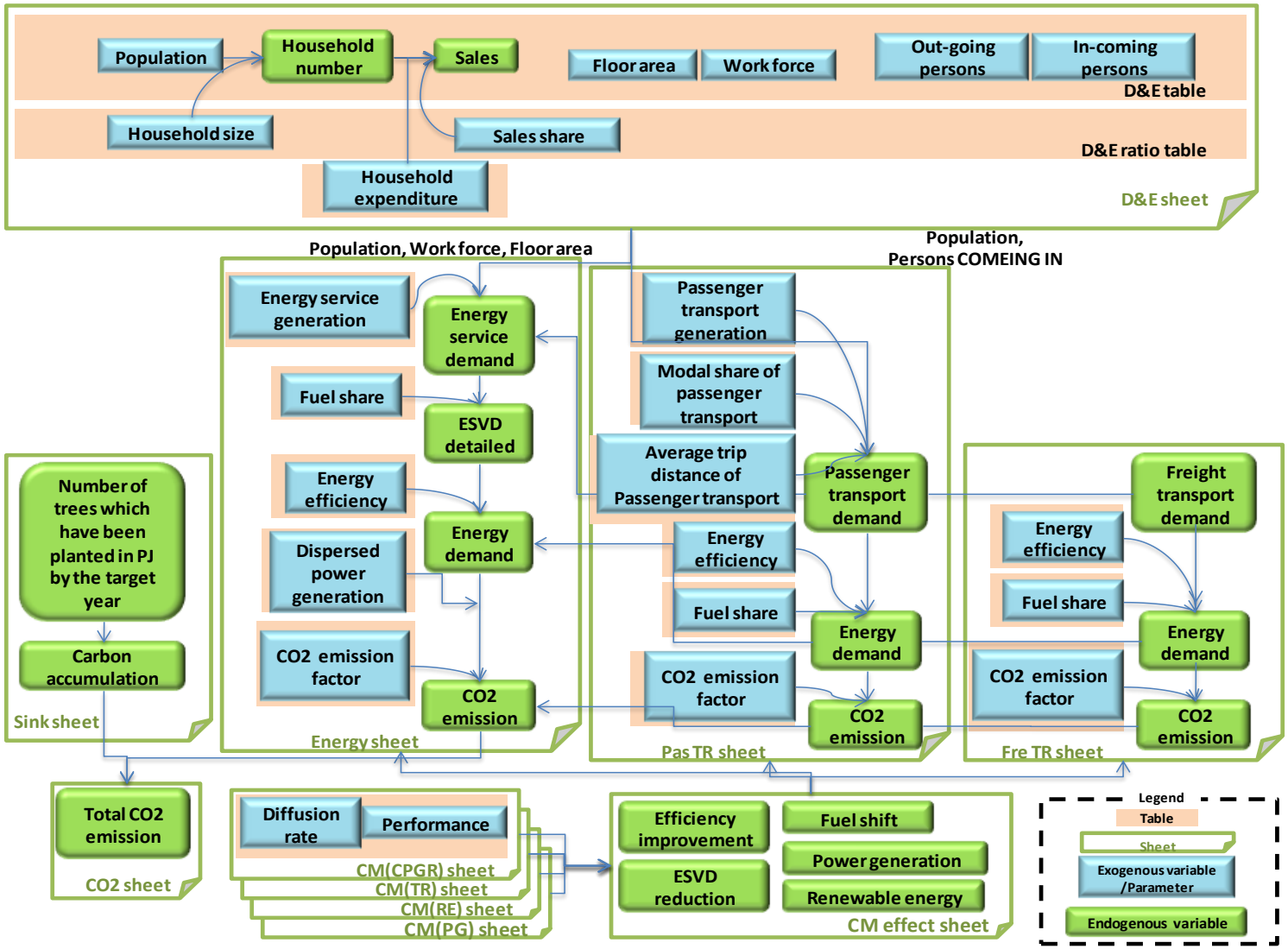
Methodology



Integrated modeling



Community ExSS model



Three Environmental Targets

The goal for PGC2025 in terms of **quantitative environmental targets** are outlined in three themes.

The three themes are

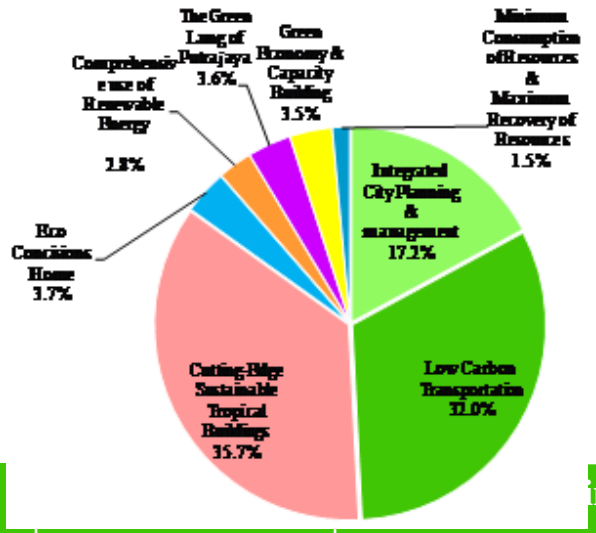
- "Low-carbon Putrajaya" for climate change mitigation
- "3R Putrajaya" for recycle-based society and
- "Cooler Putrajaya" for mitigating urban heat environment.

1. A Dozen Actions Towards PGC 2025

A DOZEN ACTIONS TOWARDS PGC 2025

Name of actions
1.Integrated City Planning & management
2.Low Carbon Transportation
3.Cutting-Edge Sustainable Tropical Buildings
4.Eco Concisions Home
5.Comprehensive use of Renewable Energy
6.The Green Lung of Putrajaya
7. Thermal comfort
8 Cooler urban environment
9. Minimum Consumption of Resources
10 Repossession waste products
11 Maximum Recovery of Resources
12 Green Incentives and capacity Building

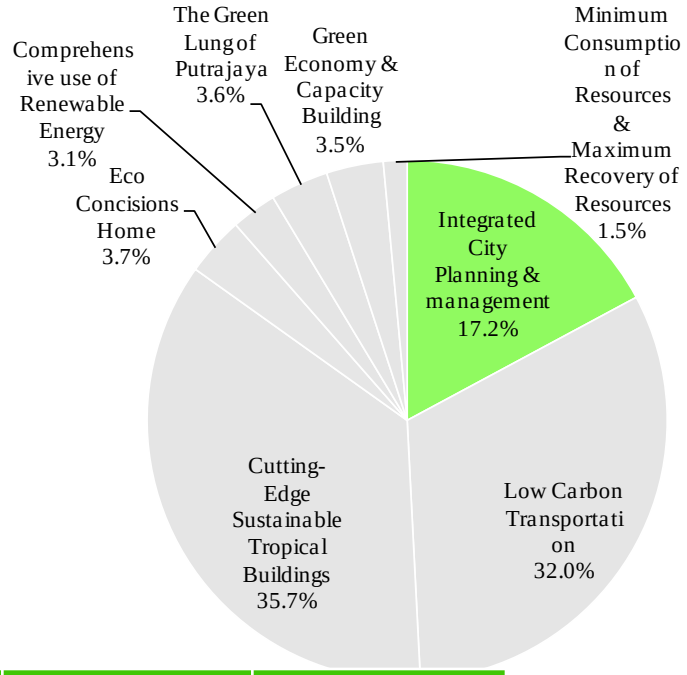
Overall Six Low-carbon actions, three “3R” Actions, two “Cooler” Action



Co2 reduction actions	reduction [tCO_2]	total reduction [%]
1.Integrated City Planning & management	305,546	17%
2.Low Carbon Transportation	570,319	32%
3.Cutting-Edge Sustainable Tropical Buildings	635,192	36%
4.Eco Concisions Home	65,555	4%
5.Comprehensive use of Renewable Energy	50,384	3%
6.The Green Lung of Putrajaya	64,394	4%
7/8 Thermal comfort and cooler urban envtm	63,058	4%
9. Minimum Consumption of Resources		
10/11 Repossession waste products and Maximum Recovery of Resources	26,182	1%

Action 1 Integrated Urban Planning & Management

Major actions are
1.Extensive Pedestrian and Cycling Networks
2.Mixed development and compact development



% Contribution

Low carbon countermeasure	CO_2 emission reduction [tCO_2]	Contribution in the Action [%]	Contribution in total reduction [%]
Mixed use development (Trip distance is shorten by reallocation of residential and work place.)	253,674	83%	14.2%
Pedestrian-friendly city development (Modal shift from automobile to bicycle & walk)	51,872	17%	2.9%
Total	**305,546**	**100%**	**17.2%**

Action 2 Low Carbon Transportation

Major actions are

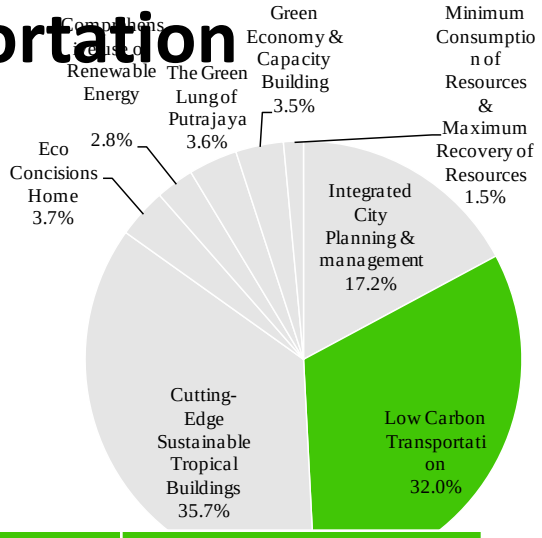
1.Low emission vehicles

2.Intelligent Transportation system

3.Putralink

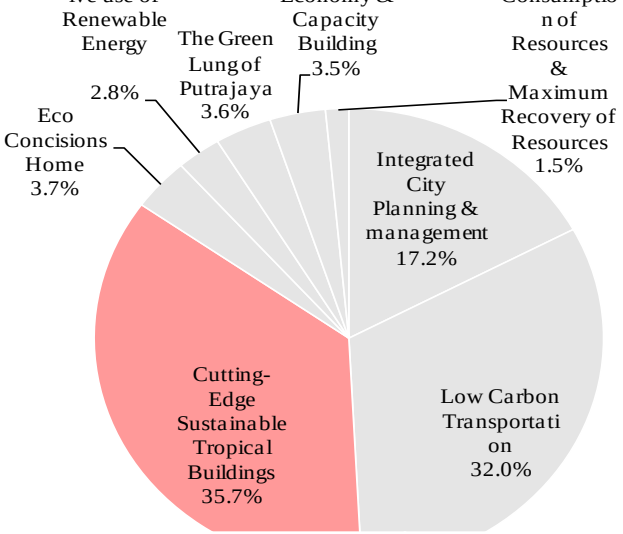
4.Enhancement bus system

5.



Low carbon countermeasure	CO_2 emission reduction [tCO_2]	Contribution in the Action [%]	Contribution in total reduction [%]
Introduction of low-emission vehicles****	354,516	62%	19.9%
Intelligent transport system (Supply chain management, Traffic signal control, Low carbon navigation system, Restriction of automobile)	60,187	11%	3.4%
Introduction of new rail system (Modal shift from motorcycle & automobile to PutraLink)	103,744	18%	5.8%
Enhancement of bus system	51,872	9%	2.9%
Total	**570,319**	**100%**	**32.0%**

Action 3 Cutting-Edge Sustainable Tropical Building



Major actions are

1.Energy efficient appliances

2.BEMS

3.Insulation

4.Energy saving behavour

5.

Low carbon countermeasure	CO_2 emission reduction [tCO_2]	Contribution in the Action [%]	total reduction [%]
Intro. energy-efficient appliances			
Space cooling	98,055	15%	5.5%
Hot water	50,549	8%	2.8%
Cooking	11,816	2%	0.7%
Lighting	88,580	14%	5.0%
Other electric appliances***	214,549	34%	12.0%
BEMS** (Building Energy Mgmt Sys)	68,671	11%	3.9%
Building insulation	52,842	8%	3.0%
Energy saving behavior**	50,130	8%	2.8%

Action 4 Eco Concisions Lifestyle

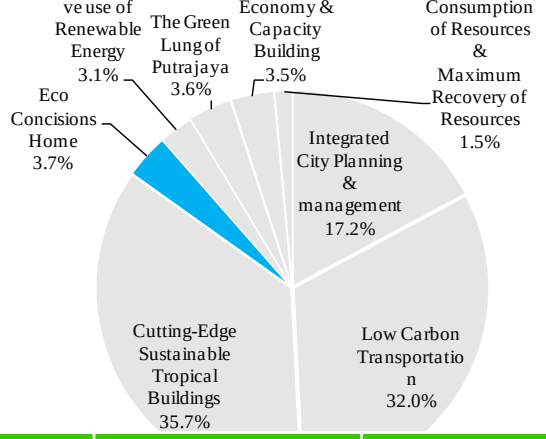
Major actions are

1.Efficiency improvement of appliance

2.HEMS

3.Energy saving behaviour

4.



Low carbon countermeasure	CO_2 emission reduction [tCO_2]	Contribution in the Action [%]	Contribution in total reduction [%]
Efficiency improvement of appliances			
Space cooling	3,669	6%	0.2%
Hot water	2,279	3%	0.1%
Cooking	2,167	3%	0.1%
Lighting	5,692	9%	0.3%
Other electric appliances***	35,627	54%	2.0%
HEMS** (House Management System)	6,404	10%	0.4%
House insulation	3,314	5%	0.2%
Energy saving behavior**	6,404	10%	0.4%

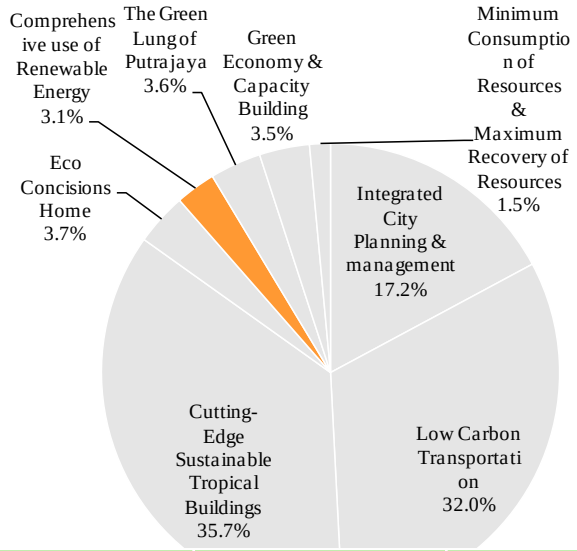
Action 5 :Comprehensive Renewable Energy

Major actions are

1.Use of solar energy – PV

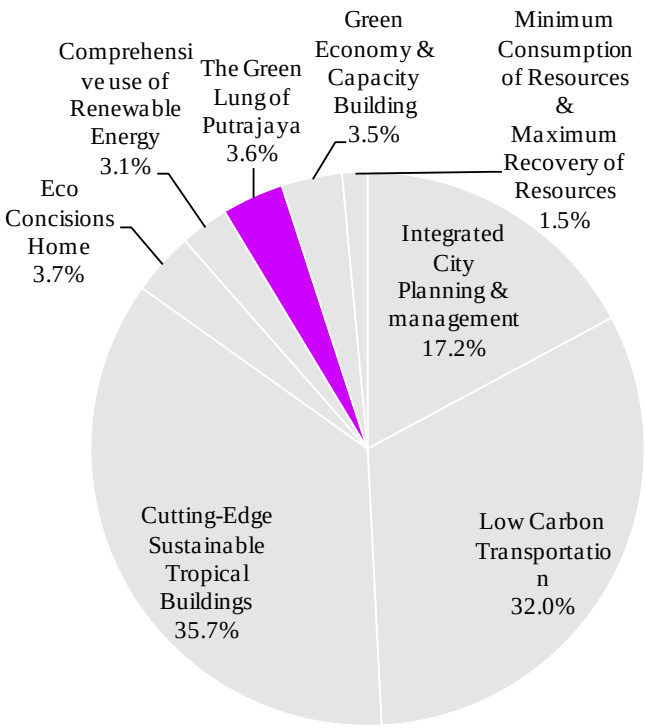
- **Commercial**
- **Public amenities**
- **Government**
- **Residential**

2.



Low carbon countermeasure	CO_2 emission reduction [tCO_2]	Contribution in the Action [%]	Contribution in total reduction [%]
Photovoltaic power generation			
Commercial	5,164	10%	0.3%
Public amenities & facilities	2,491	5%	0.1%
Government departments	37,028	73%	2.1%
Residential	5,701	11%	0.3%
Total	**50,384**	**100%**	**2.8%**

Action 6 The Green Lung of Putrajaya

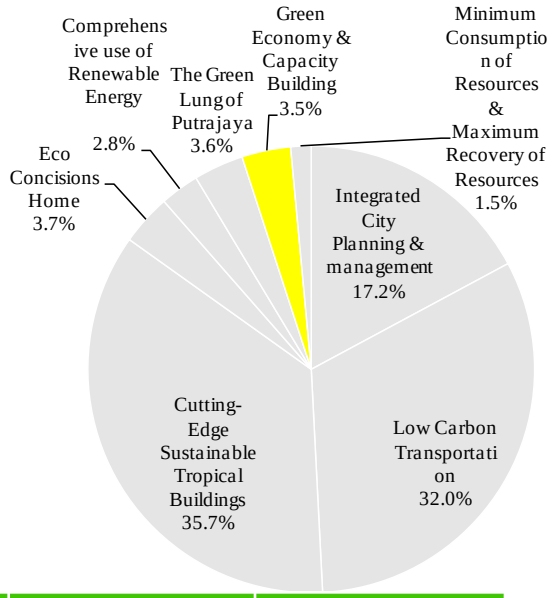


Major actions are
1.Carbon absorption resources – Carbon sink

Low carbon countermeasure	CO_2 emission reduction [tCO_2]	Contribution in the Action [%]	Contribution in total reduction [%]
Carbon sink (Tree planting)	64,394	100%	3.6%

Action 7: Increasing thermal comfort
Action 8: Cooler Urban environment

Major actions are
1.Use of high reflectance paint on roof, wall, pavement
2.Cool air from water surface/ green
3.Mist spray and shade pavement



Low carbon countermeasure	CO_2 emission reduction [tCO_2]	Contribution in the Action [%]	Contribution in total reduction [%]
Reduction of cooling demand (by UHI mitigation)	19,255	31%	1.1%
Modal shift from automobile to bicycle & walk (by UHI mitigation)	43,803	69%	2.5%
Total	**63,058**	**100%**	**3.5%**

Action 9: Minimum Consumption of resource

Action 10: Repossession of waste products

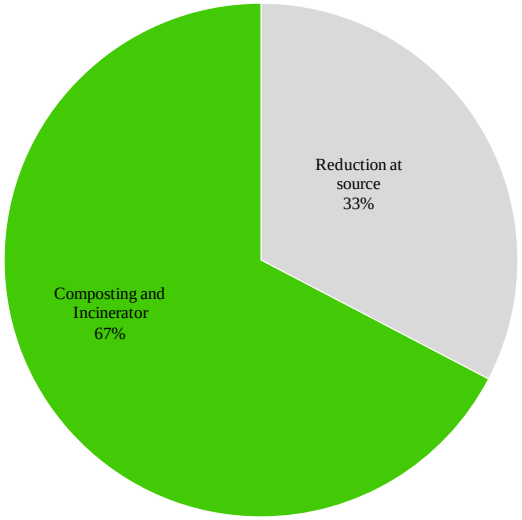
Action 11: Maximum recovery of resources

Major actions are

1.Waste reduction measures (3Rs)

2.Campaigns

3.Separate/group collection and incinerator



3R Putrajaya Countermeasure	Waste Reduction [ton/year]	Contribution in the action [%]
Group collection	1,433	3
Separate collection	27,767	53
Composting	23,394	44
Total	**52,595**	**100**

Action 12: Green Incentives and capacity building

Major actions are

- Business Derivative by Economic Incentive
- Demand Pull by “Low-Carbon” Value
- Education Framework in Cooperation with Green Experts
- Capacity Building and Environment Education

1.

Conclusion

1. LCS Scenario development needs national vision and political/ society commitment and input.
2. The use of model to quantify this vision into quantifiable variables – AIM model from NIES and Kyoto University
3. Data collection and Support of experts in modelling exercise – Capacity building
4. To realize a LCS, IM has to have new and bold policies to encourage and promote businesses and citizens have to take countermeasures to lower the emissions levels.

THANK YOU FOR THE ATTENTION.

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