Development of Low Carbon Society Scenarios for Asian Regions

SYMPOSIUM LCS Research Project

HO CHIN SIONG

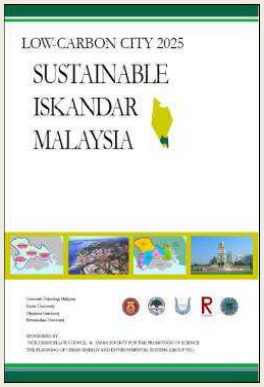
July 4, 2011 Puteri Pacific Hotel, Johor bahru

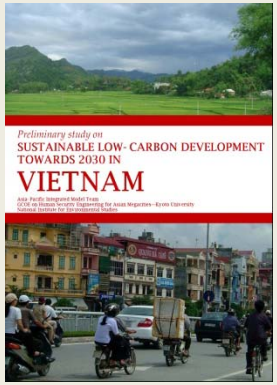
JST-JICA 2010 Technical Cooperation Project

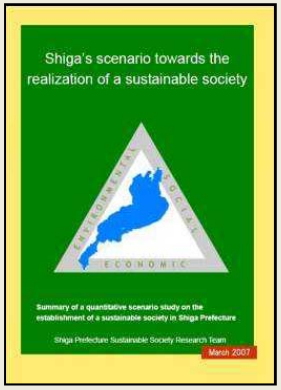
UTM, IRDA, MGTC and JPBD Semanjung Malaysia

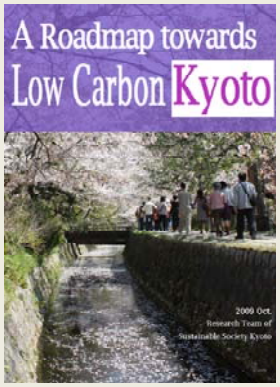
Kyoto U, Okayama U, NiES and AIM team Japan

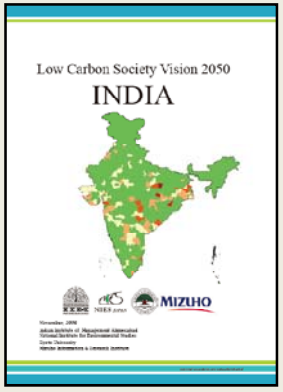
On going Region specific studies
Communication and feedbacks of LCS study to real world

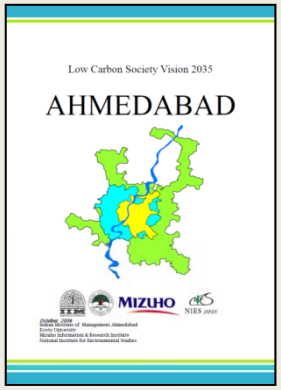


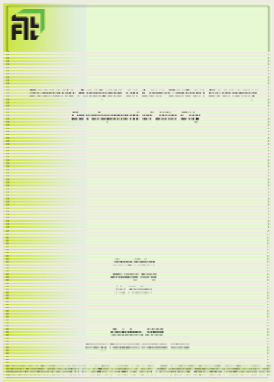


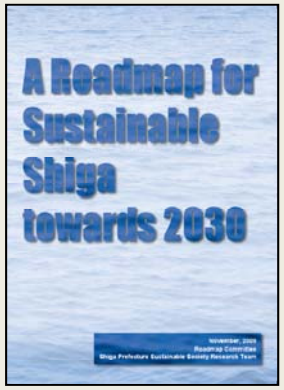










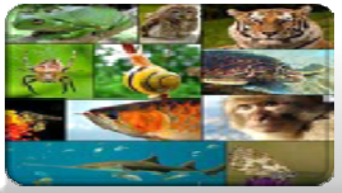


ISSUES AND CHALLENGES

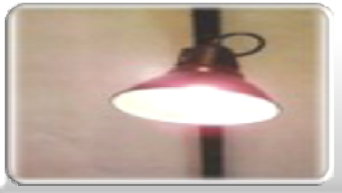
Rapid urbanization and affluent lifestyle

Relatively high carbon intensity dependence on fossil fuel

High Private car ownership



Low density development and urban sprawl



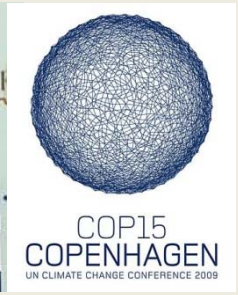
Low efficiency appliances

Contents

1. • Background Issues and Challenges
2. • Current Sustainable Policies in Malaysia
3. • Case Study – Iskandar Malaysia (Quantitative modelling)
4. • Conclusion – Scenarios towards Low Carbon society

1 Introduction

The Need to Develop Low Carbon Societies



Malaysia Commitment
Speech by Datuk Seri Najib Tun Razak, Prime Minister

"… Malaysia proposed a voluntary reduction up to 40% in terms of emission intensity of GDP by the year 2020 compared to 2005 levels."
17th December 2009

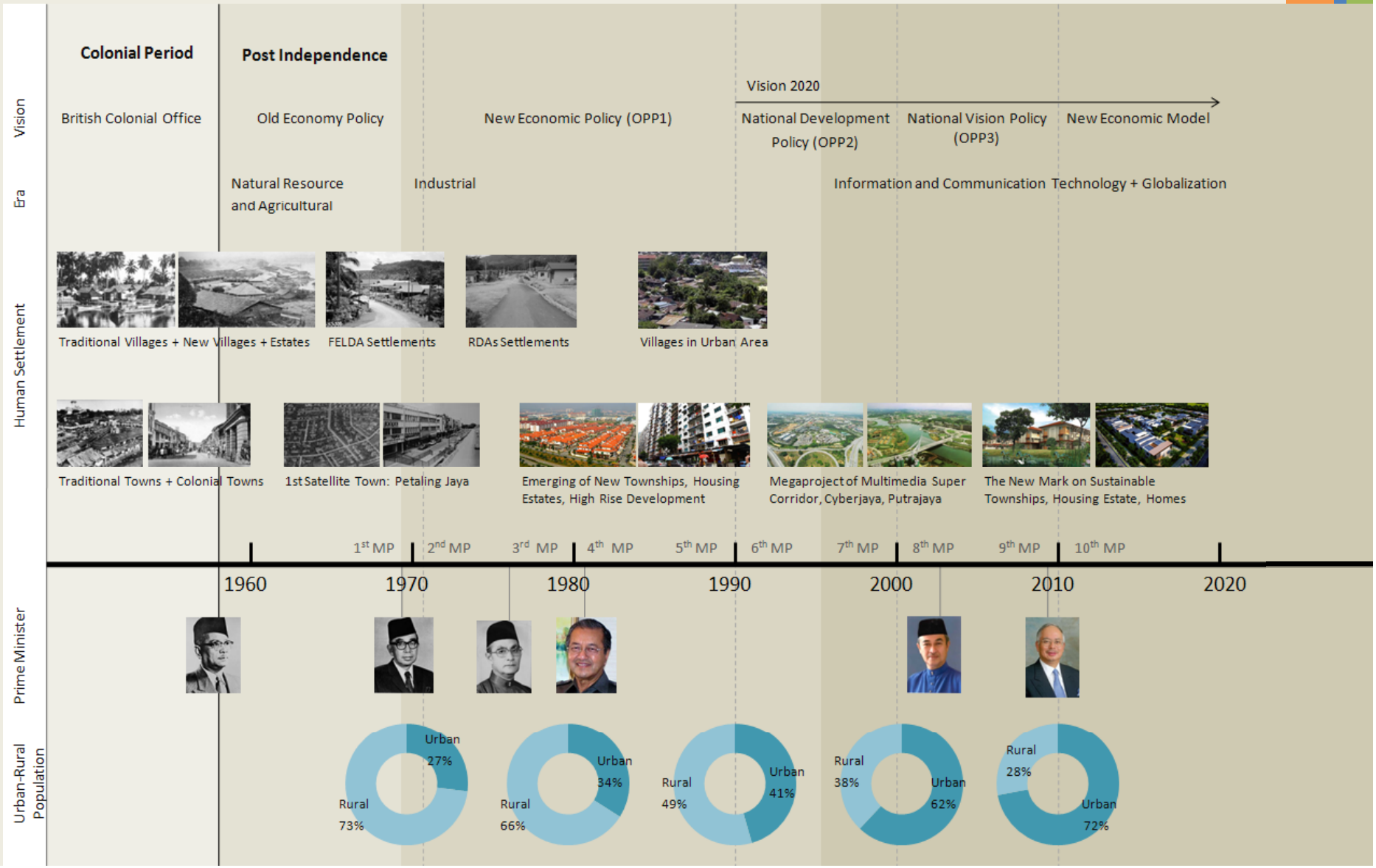
Global Citizens + Responsibilities
For the Earth, for our future generation

Green as New Consumer Culture, New Market, New Growth

Money Saving
Energy conservation and renewable energy

2 Sustainable Development - chronology

Moving Towards Sustainable and Low Carbon Human Settlement



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

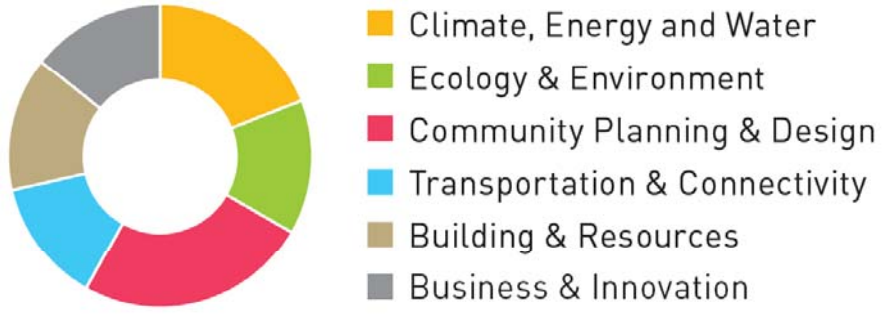
- State Structure Plans
- Local Plans

Development Control/ Planning approval

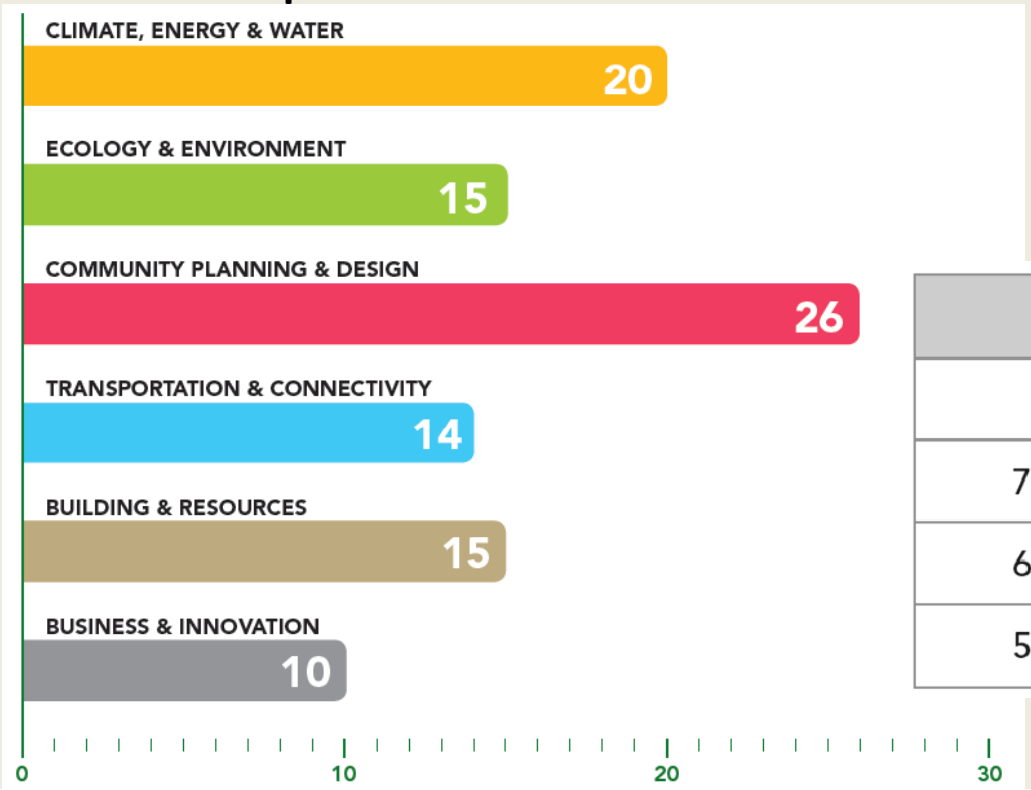
Green Neighborhood Guidelines – JPBD 2010

2 Sustainable Development

Low Carbon Framework: GBI Township Tool – Point allocation



GBI Township Tool Points Allocation Chart + GBI Township Classification



POINTS	GBI RATING
86+ points	Platinum
76 to 85 points	Gold
66 to 75 points	Silver
50 to 65 points	Certified

(Source: Greenbuildingindex Sdn Bhd)

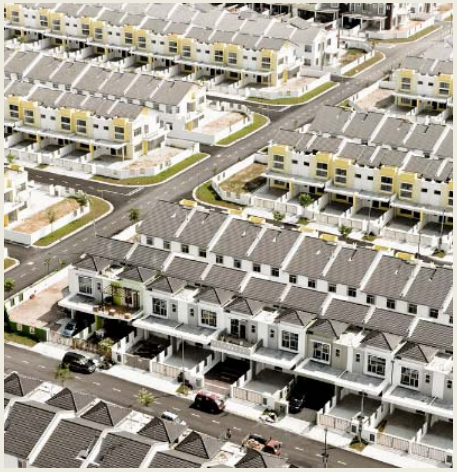
2 Sustainable Development – JPBD guidelines

Low Carbon Framework: Green Neighbourhood Planning Guidelines

About Green Neighbourhood Planning Guidelines

Introduced by **Federal Department of Town and Country Planning** (JPBD)

Planning guideline for the state and local **government to formulate policies , strategies and regulations to promote green neighbourhood**;
To provide design guidance for **industries** to develop green neighbourhood.



Green Neighbourhood

Neighbourhood planned and designed in an integrated manner with the priority given to the **protection and consumption of natural resources, application of green technology and recycling**. It seeks to preserve the environment, reduce the **ecology footprint**, reduce the production of **carbon emission, improving public health, safety as well as general welfare o**f city dwellers.

(Source: Federal Department of Town and Country Planning)

2 Sustainable Development- Policy guidelines

Low Carbon Framework: Green Neighbourhood Planning Guidelines

8 Planning Principles

i. Priority given to **sustainability and environment** of aspect;
ii. **Creating sustainable communities** living in harmony, healthy and interact with each other;
iii. Create high **accessibility environment**;
iv. Comfortable **human scale neighbourhood** design;
vi. Containing the features **of affordable housing**;
vii. **Provide Green Infrastructure**/ "green infrastructure";
viii. Energy efficiency **(EE**) and renewable energy **(RE).**

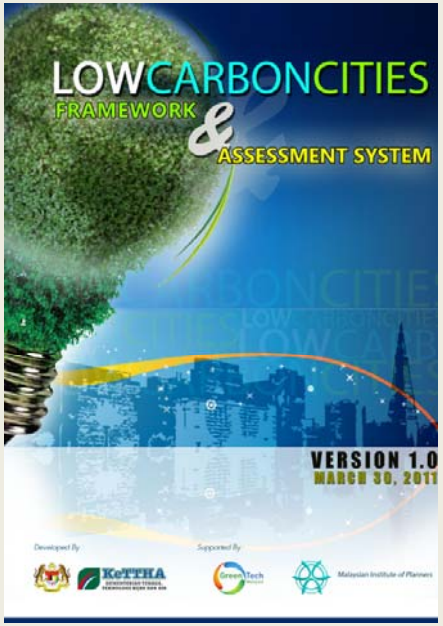
10 General Guidelines

i. Site selection and **site planning**
ii. Application **of green te**chnology in building development
iii. **Walkability** and connectivity
iv. **Green network**
v. **Safe** neighbourhood
vi. Short distance to transit
vii. **Green infrastructure**
viii.**Mixed-use** development
ix. **High density**
x. **Green community** network

(Source: Federal Department of Town and Country Planning)

2 Sustainable Development – Kettha & MIP

Low Carbon Cities Framework and Assessment System



About Low Carbon Cities Framework and Assessment System

Developed by **Ministry of Energy, Green Technology and Water** (keTTHa) with supported from Malaysia Green Technology Corporation and Malaysian Institute of Planners.

A **assessment tool to assist local authorities, developers and designers in assessing whether development** carried out within the city contributes towards reduction or decrease in GHG.

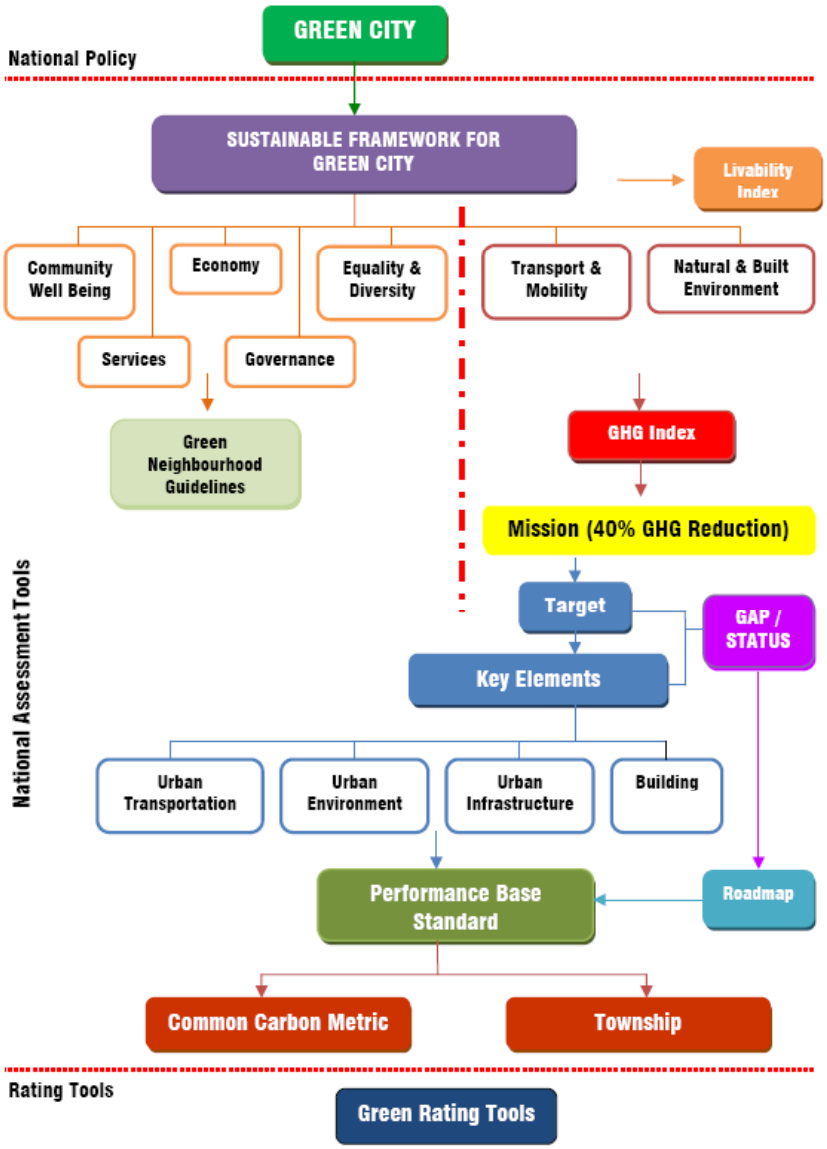
Low Carbon City

A city that comprises of societies that consume sustainable **green technology and relatively low carbon energy** as compared with present day practice to avoid adverse climate change

(Source: Low Carbon Cities Framework and Assessment System)

2 Sustainable Development

Low Carbon Framework: Low Carbon Cities Framework and Assessment System



4 Elements Contribute to GHG emission

15 Performance Criteria

42 Sub Criteria

Urban Environment	• Urban Environment (5)	• Urban Environment (20)
Urban Transportation	• Urban Transportation (4)	• Urban Transportation (8)
Urban Infrastructure	• Urban Infrastructure (4)	• Urban Infrastructure (7)
Building	• Building (2)	• Building (7)

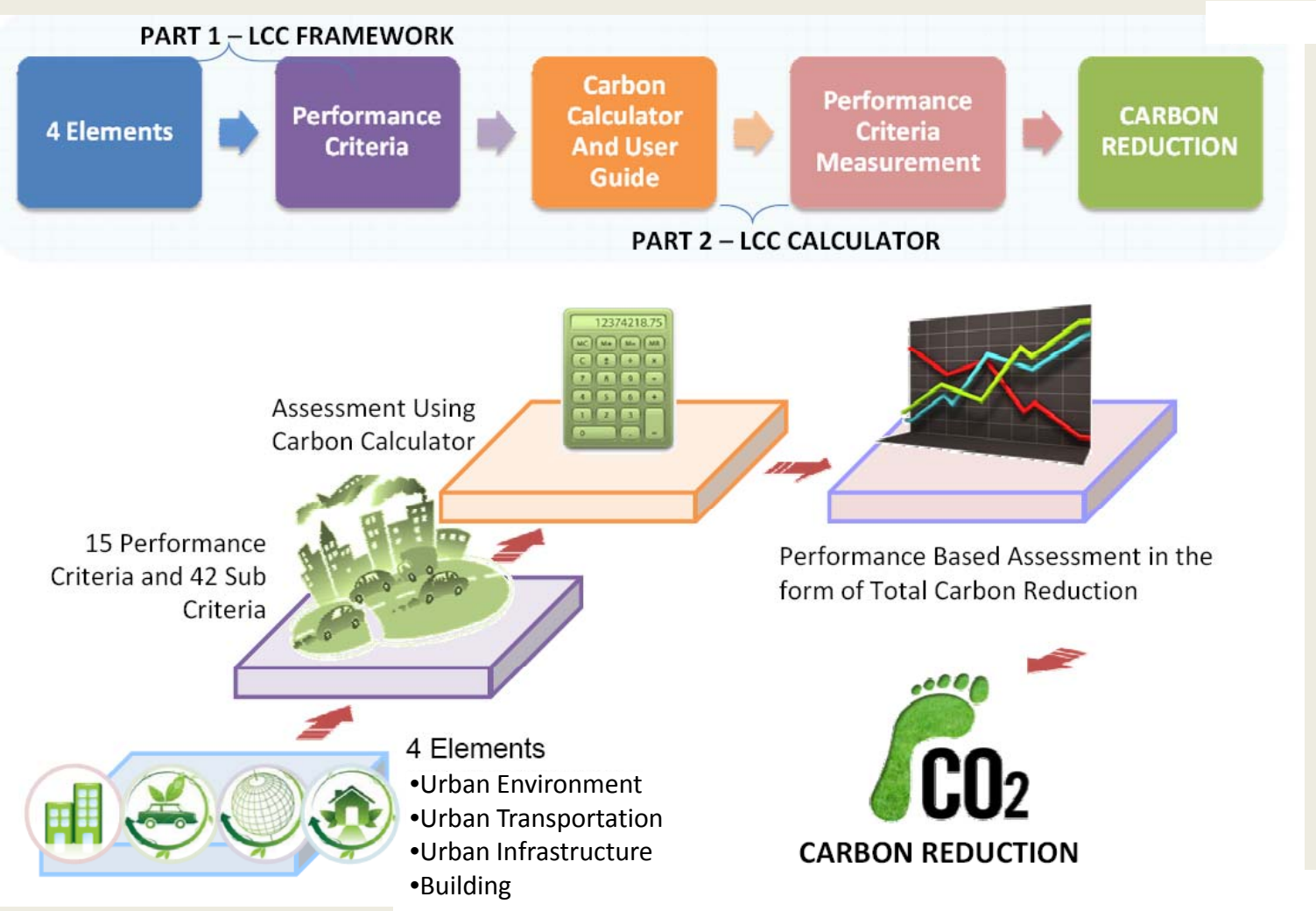
Performance Criteria are measurable strategies to reduce carbon emission through:

- Policy control, Technological development, better process & product management, change in procurement system, carbon capture, consumption strategies & others.

(Source: Low Carbon Cities Framework and Assessment System)

2 The Rise of Sustainable Development

Low Carbon Framework and Assessment System



(Source: Low Carbon Cities Framework and Assessment System)

Green City or/and Low Carbon Cities?

Take actions that are compatible with the **principles of sustainable development**, ensuring that the development needs of all groups within society are met. SUSTAINABLE DEVELOPMENT

Make an **equitable contribution** towards the global effort to stabilize the atmospheric concentration of GHG at a level that will avoid dangerous climate change. EQUITABLE

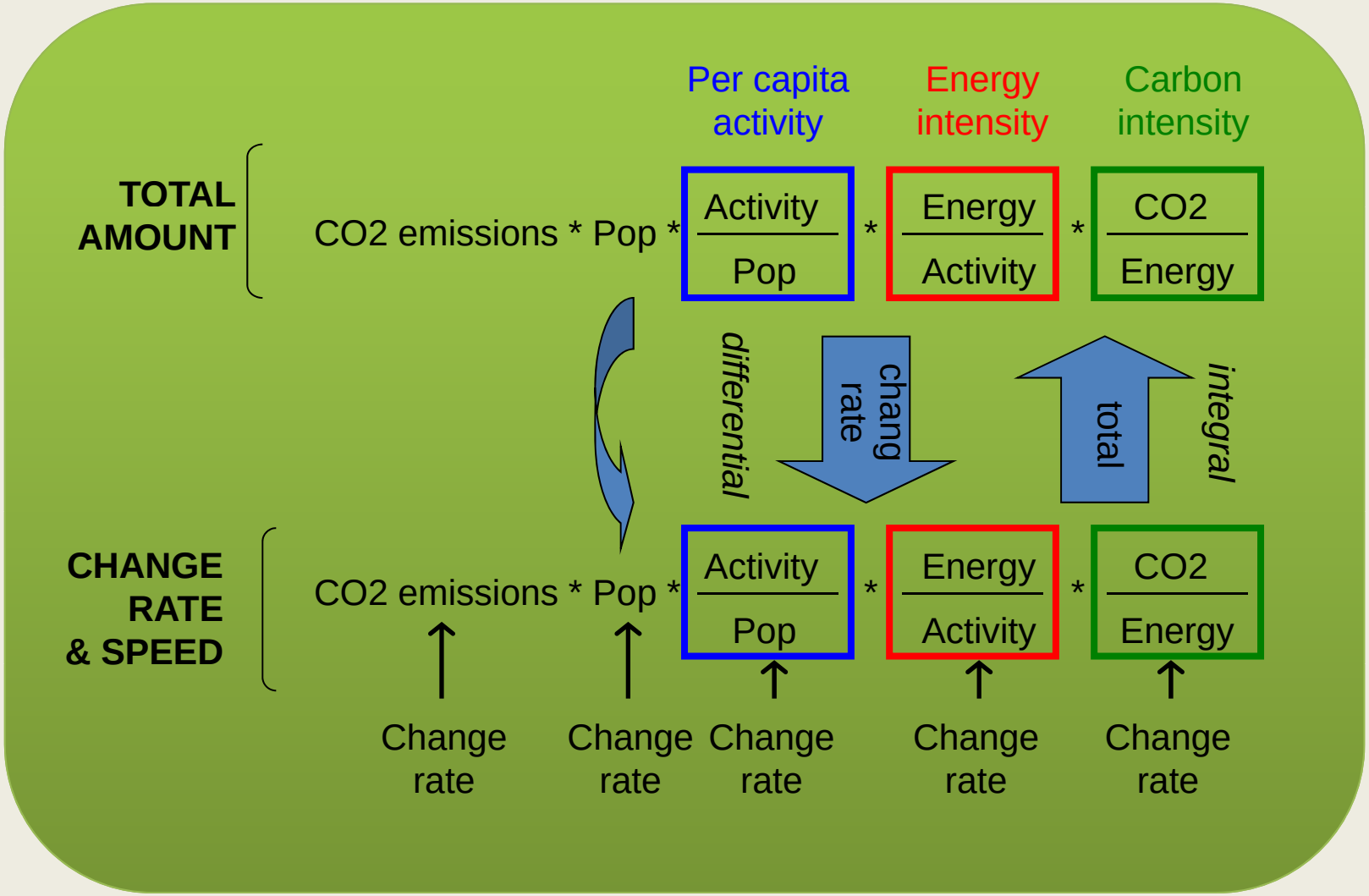
Demonstrate a high level of **energy efficiency** and use low-carbon energy sources and production technologies

EE and RE (TECHNOLOGY)

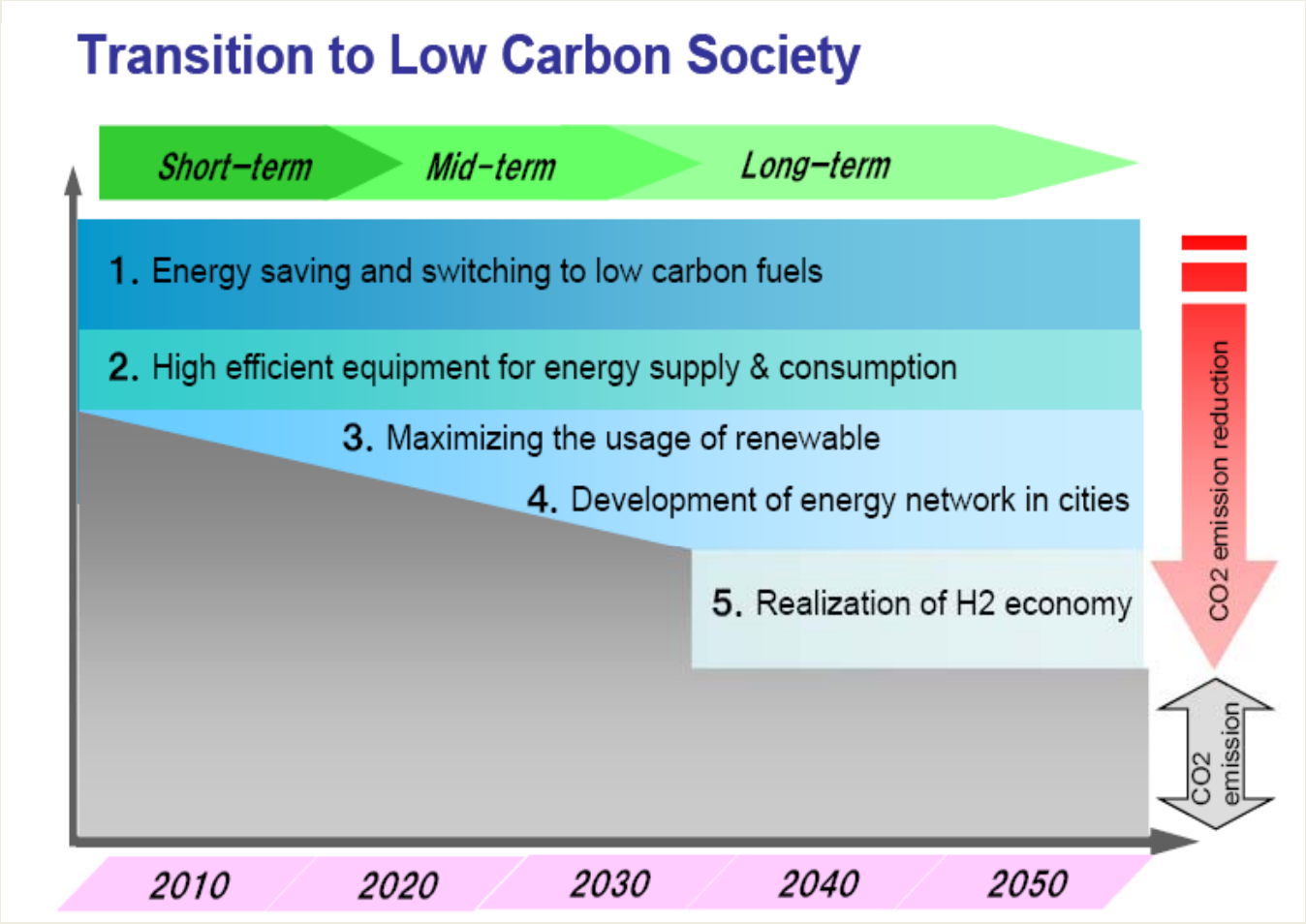
Adopt patterns of **consumption and behavior** that are consistent with low levels of greenhouse gas emissions. SOCIETY/ LIFESTYLE

15

Kaya Identity : CO2 emission and related variables

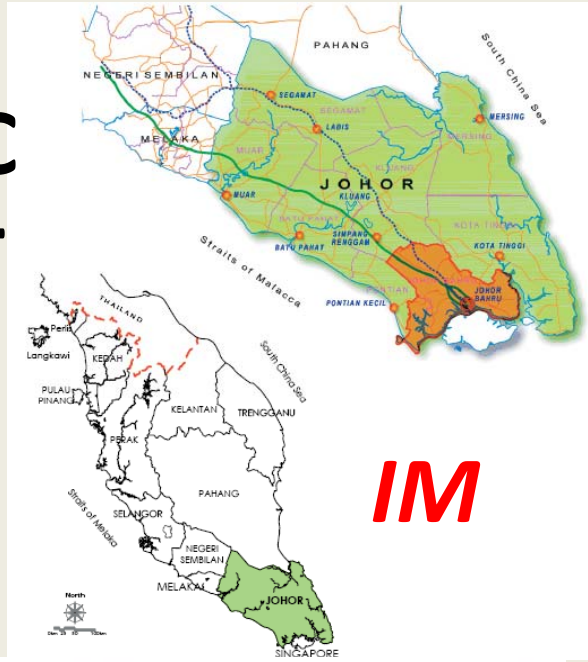


Transition LCS - Malaysia



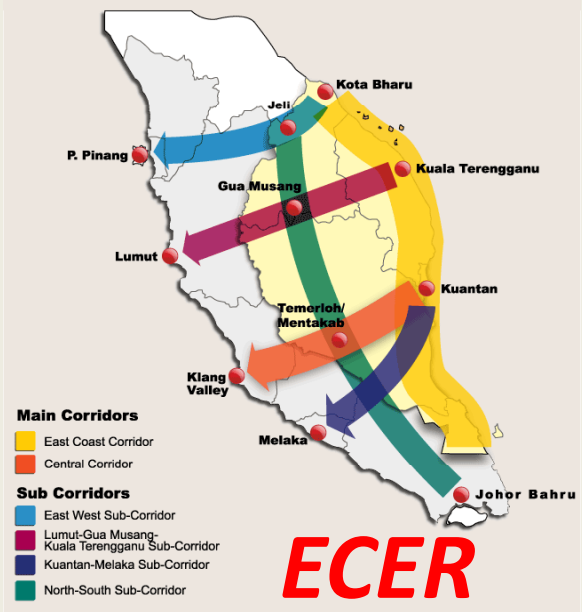
BACKGROUND

MALAYSIA: KEY ECONOMIC DEVELOPMENT CORRIDORS



IM

NCER



ECER

SCORE

SDC

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

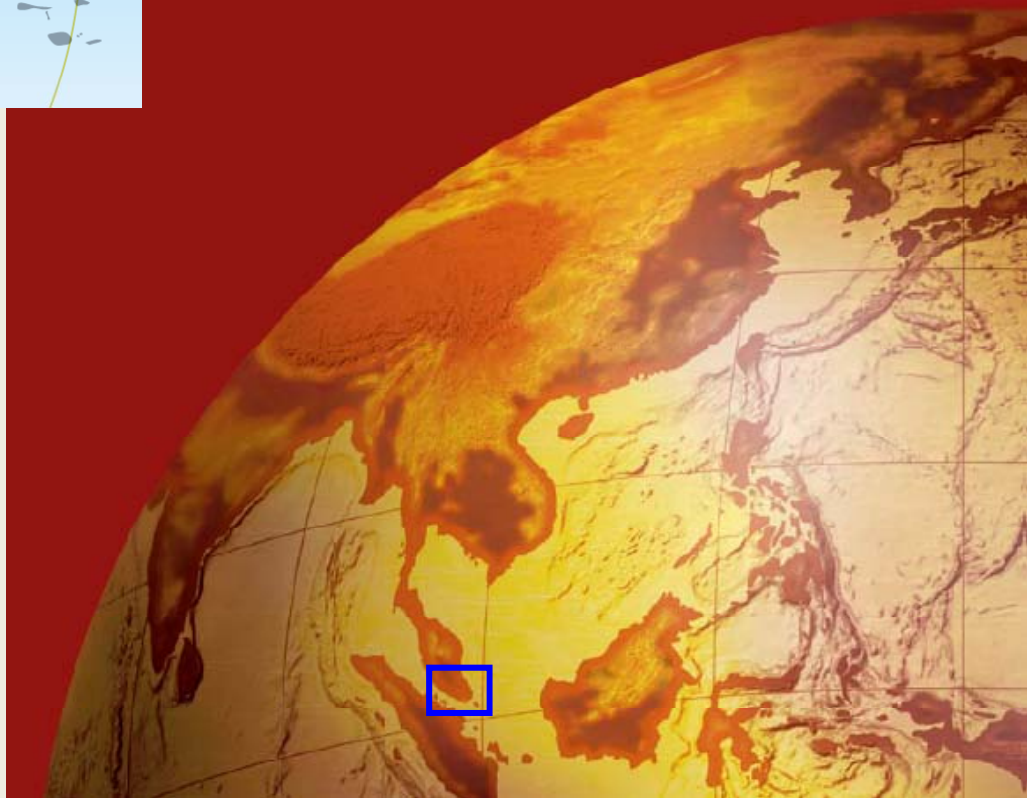
- Building an environment that **enhances Quality of Life**
- New urbanism and **compact city**
- Growth concentrated in **urban conurbation**
- **Safe city** initiatives
- **Developing climate resilient growth** policy
- Adaptation measures
- Mitigation measures
- Incentives for **RE and EE**
- Improving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

Case study

Iskandar Development Region

2,216 km^2

Population 1,353,200



The Iskandar Malaysia Vision
Economic Growth

ISKANDAR REGIONAL DEVELOPMENT AUTHORITY

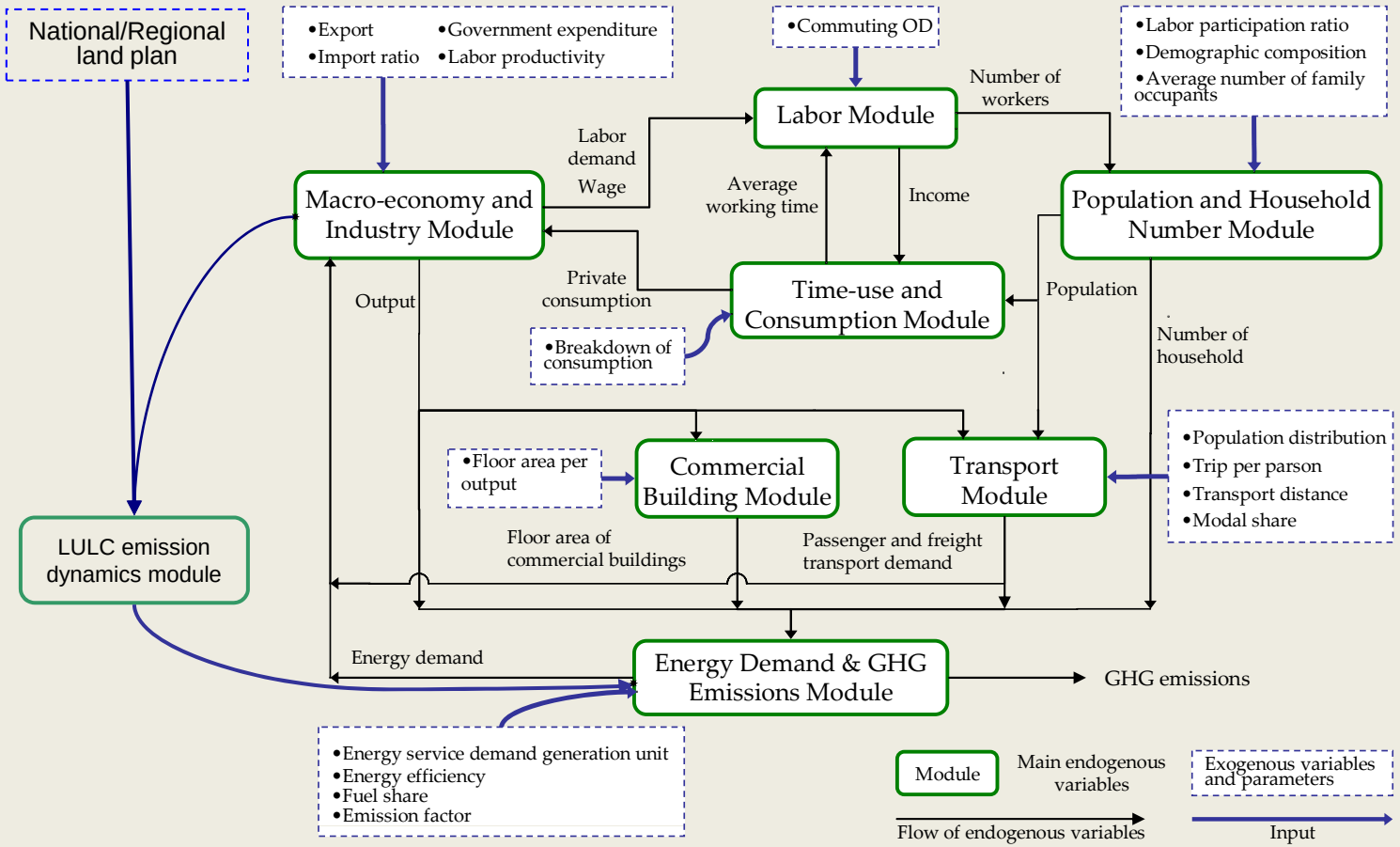
"To develop Iskandar Malaysia into a strong and sustainable metropolis of international standing"

	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

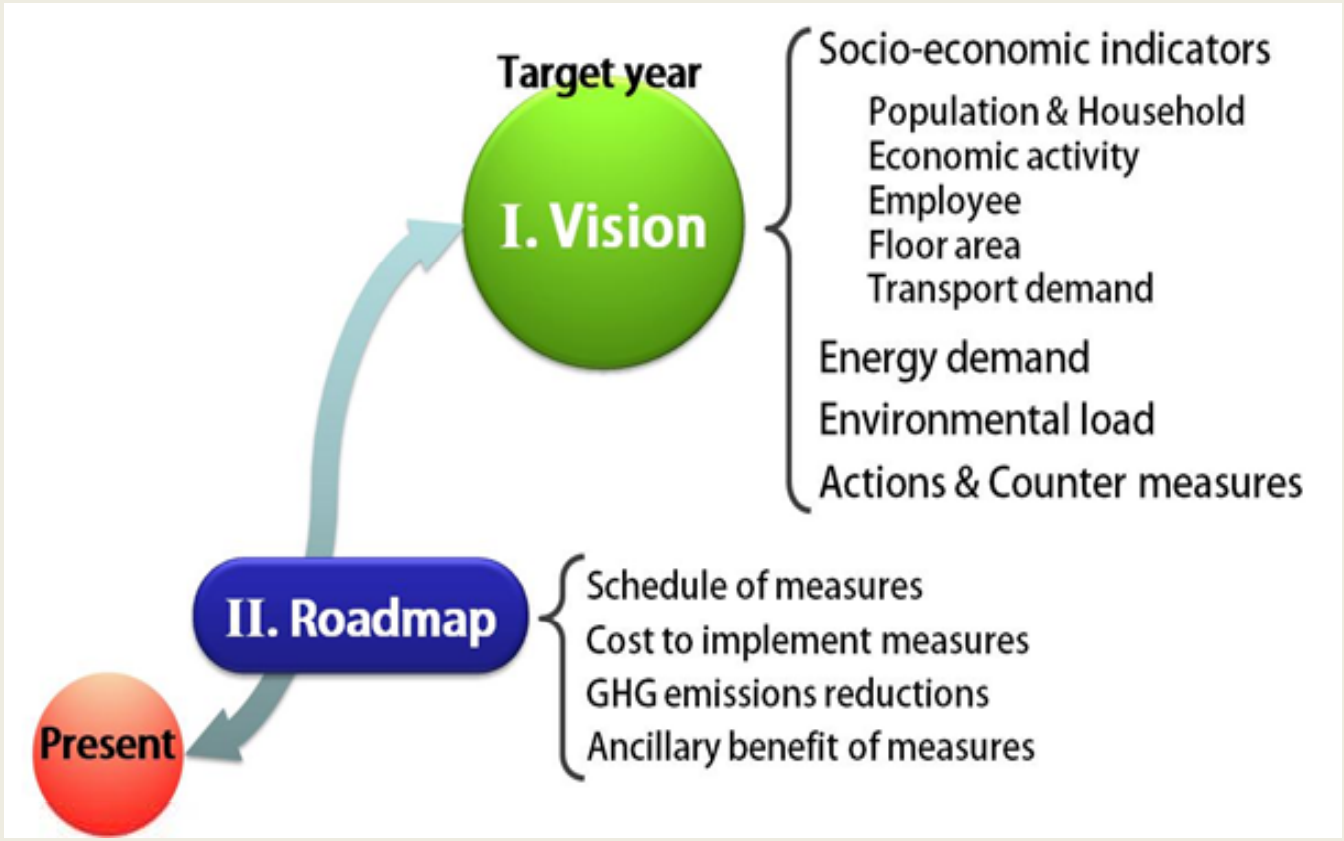
4. Modeling

Extended Snapshot Tool (ExSS)

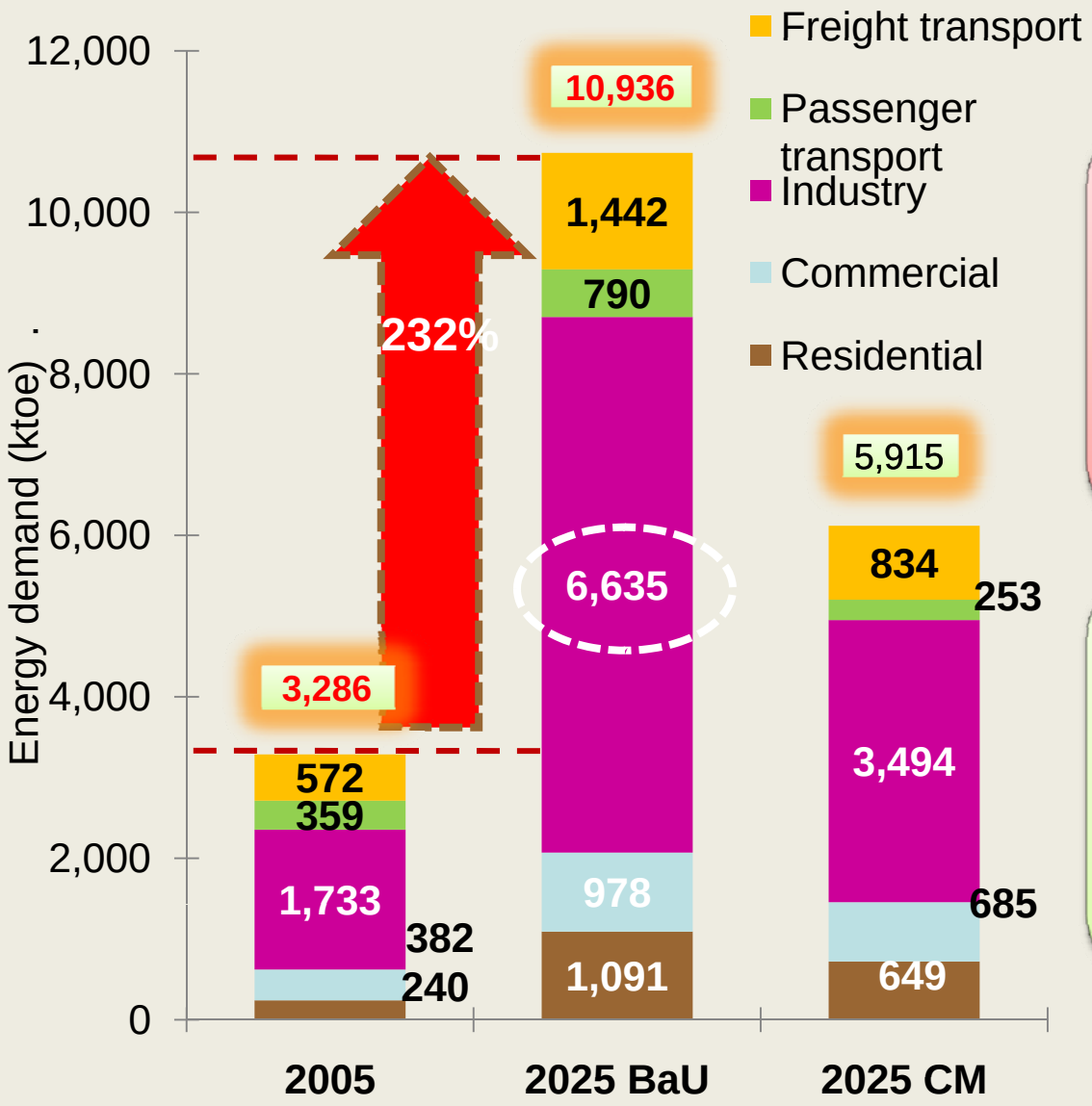
- A tool to designing social accounting matrices, energy balance tables, GHG emission and reduction tables of the target societies -



Methodology



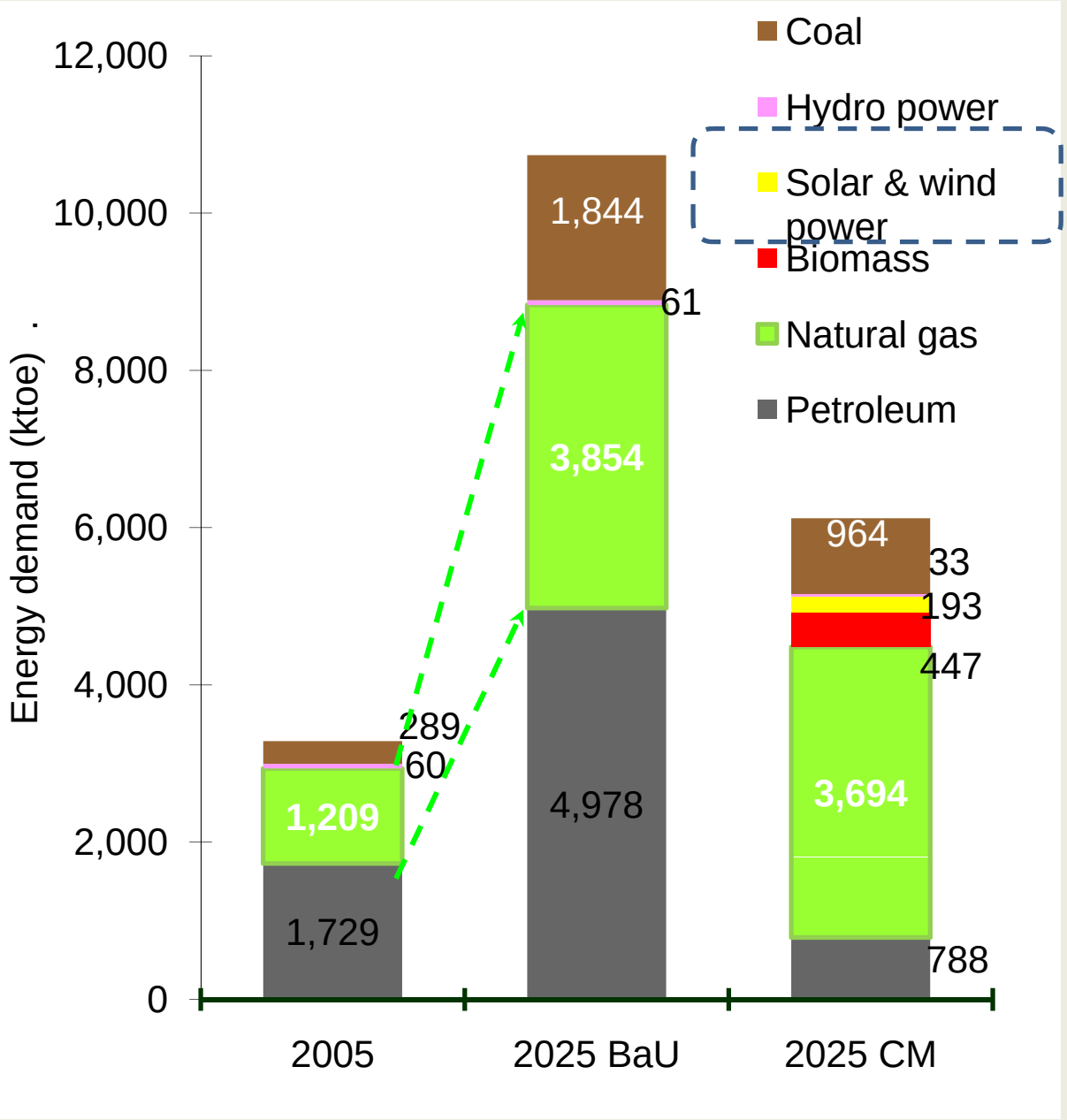
4. Energy Demand By Sector



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%.

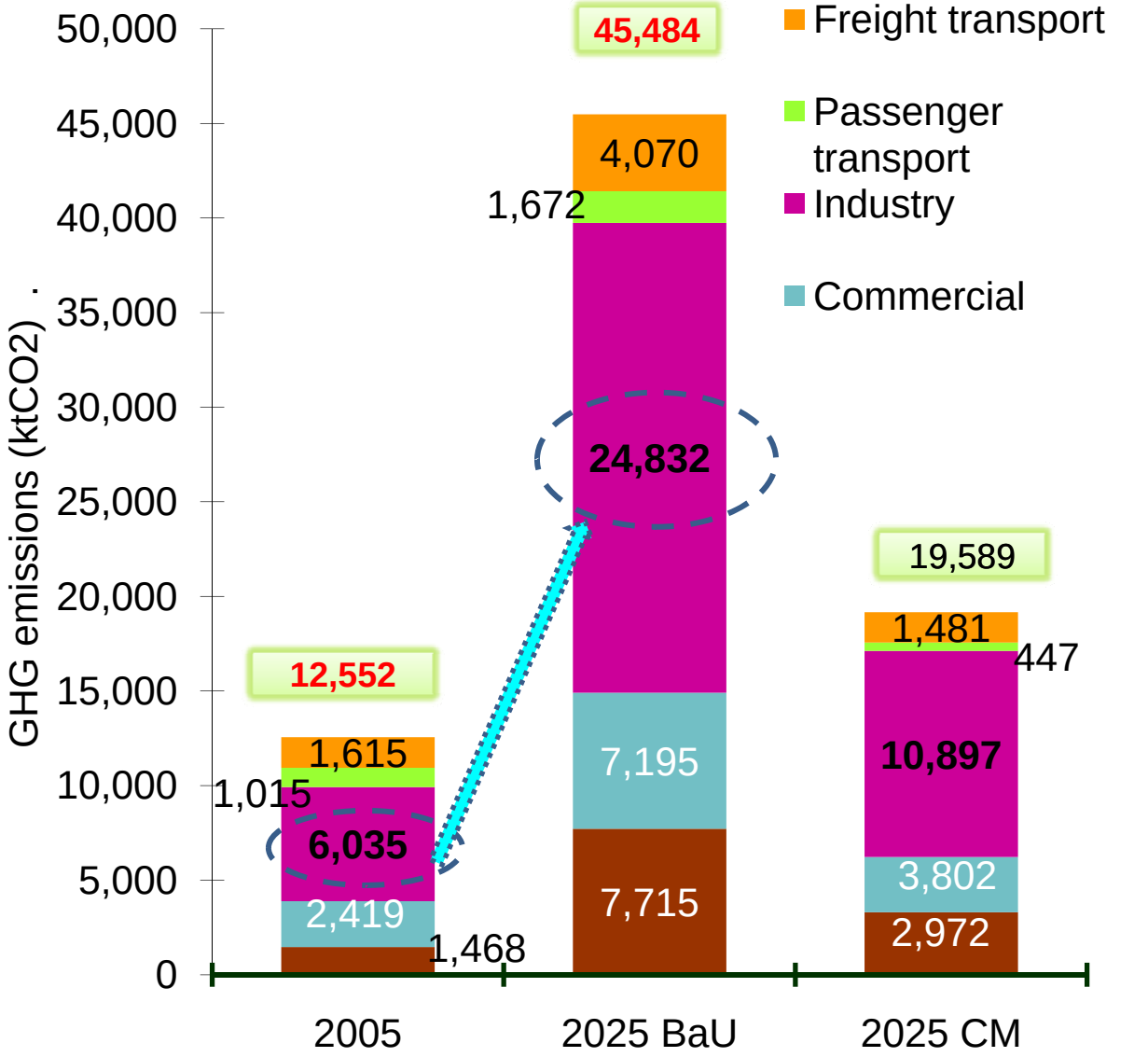
4. Energy Demand by Energy Sources



Increase in demand for **natural gas (3.2 times)** the consumption in 2005.

Energy sources such as **biomass, solar** and **wind power** will be newly introduced for primary energy in 2025 **CM case.**

4. GHG Emission By Sector

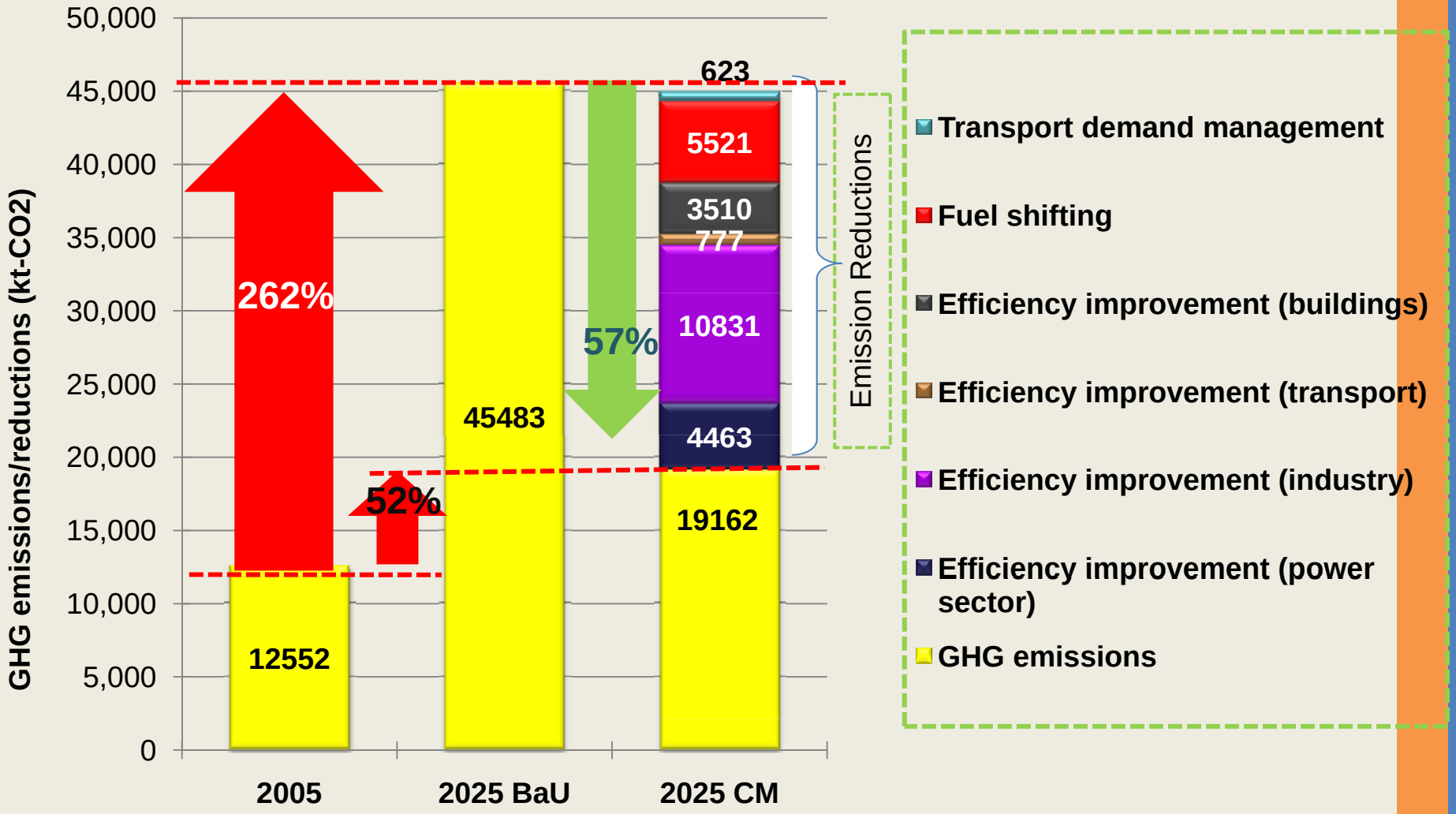


GHG Emissions in IM are projected to increase from 12,552 ktoe CO2 (2005) to 45,484 ktoe CO2 (2025 BaU)

Industry Sector will increase 4.1 times in total as compared to 2004 in GHG emission . (54%of total GHG emission in 2025 BaU)

GHG emissions per capital : 9.3 tonnes of CO_2 /capita (2005) to 15.1 tonnes /capita (2025 BaU), with CM will be reduced to 6.5 tonnes of CO_2/capita.

5. 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

Mitigation Measures

RESIDENTIAL & COMMERCIAL SECTOR

- Energy Efficiency (EE) Improvement (Buildings & equipments)
- Lowering CO_2 Intensity (Renewable Energy – Photovoltaic power generation system)

TRANSPORTATION (FREIGHT & PASSENGER)

- Transport Demand Management (Improvement of Public Transportation Sector)
- EE Improvement (Hybrid Vehicles)
- Lowering CO_2 Intensity (Renewable Energy- Bio fuel)

INDUSTRY & POWER SECTOR

- EE Improvement – (Improvement in Operations & Equipment, Promotion of Technology Transfer)
- Lowering CO_2 Intensity (Increase share of Natural Gas Usage)


Implement
Comply . Enforce
Monitor . Review
Green-focused Agenda
Env'l Planning & Mngt
Social & Cultural Dev
Integrated Transport
SWM
Land Use Planning
RE & Resources
Economic Dev
Com & Industry Planning & Dev
Fed Policy
CDP
IRDA's BPs
LCS
DPs
NPP
Talent Workforce; Low carbon lifestyle
TODs
Modes Infrastructure Corridors Movements
Reuse Recycle Reduce Compost
Decarbonising development/ Development Process
UD Phased Dev & DC
FIT
EE blgs & areas
Rainwater harvesting
Green Economy
Value-added products & services

Synergy of LCS research and application in Iskandar Malaysia

IRDA Blueprints that promote Low Carbon Society

IM Vision: “A Strong, Sustainable Metropolis of International Standing”

IRDA's expectations from the LCS Project

- **How will the LCS Scenarios help to reduce IM's CO_2 emissions between 30-50% by 2025?**
- **How do we translate the results from the research into policies and proposals that can be implemented? REAL SOLUTIONS**
- **How will the results enhance our blueprints? Identify GAPS**
- **CDP Review 2015**

Immediate Things to do

- A Dozen Actions towards IM 2020

2

- Reviewing Details IM blueprints

3

- Input from stakeholders in the workshop

Concluding remarks

- **Quantification from LCS modeling** assist better understanding on **impact of proposed actions**, sub actions and programs.
- Enable planners/ Local authorities to **incorporate stakeholders input** into town making exercise hence commitment from them.
- Green cities or Local carbon cities need to have a **LOW CARBON SOCIETIES mindset**/ behaviour.

Thank you For your Kind Attention