IGES Institute for Global Environmental Strategies

Fifth LOCARNET MEETING AND WORKSHOP
MOFA's "Capacity Building Seminar – How to strengthen transparency in the field of climate change"
Sheraton Bandung Hotel Oct 25-26, 2016

Role of research communities towards NDC development and implementation

AIMS contribution to science based policy making and implementation

Project for Development of Low Carbon Society Scenarios for Asia Regions

SCIENCE TO ACTION (S2A)

(engaging between academia and decision-makers for low carbon design)

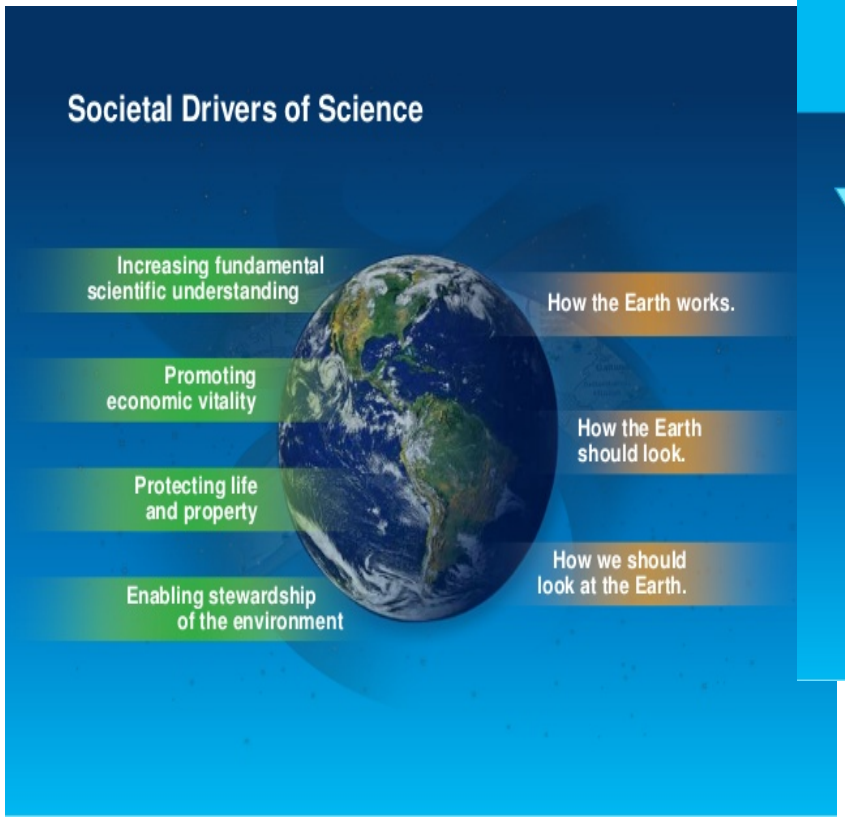
HO CHIN SIONG, Universiti Teknologi Malaysia

SATREPS
Science and Technology Research Partnership for Sustainable Development Program

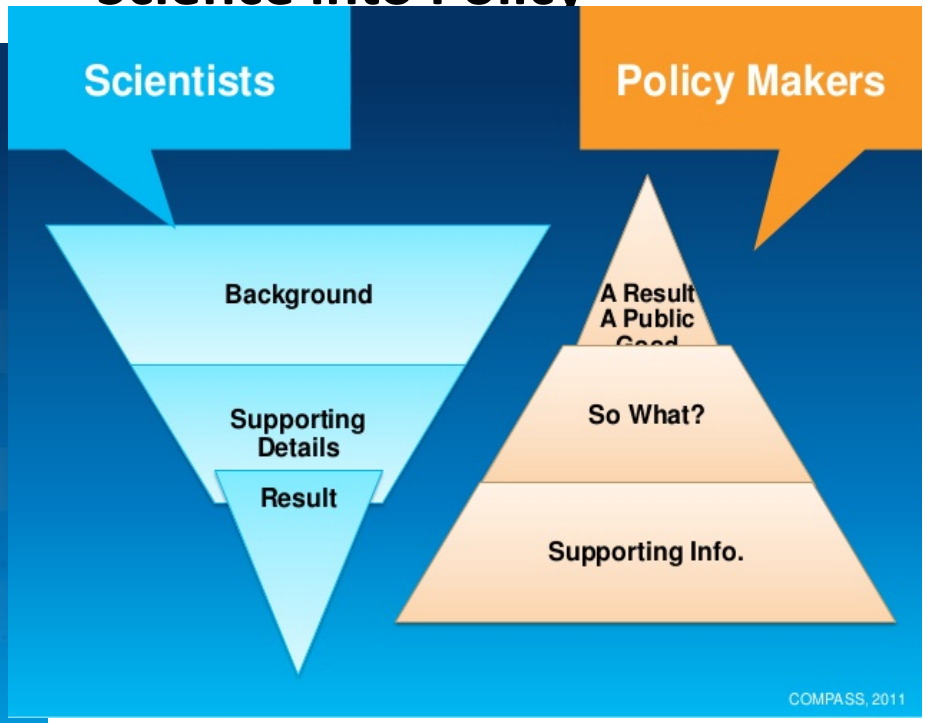
Development of Low Carbon Scenarios for Asia Regions

Bridging the Gap Between Scientists and Policy

Climate change science - Drivers



Science into Policy



a) Not every policy maker is going to be concerned with science and not every scientist is going to be concerned with policy; and

b) The role of science in policy should be that of informing policy, not making policy.

National Determined Contribution

MESSAGE TO PARTIES

United Nations
Climate Change Secretariat

Communication of first Nationally Determined Contributions under the Paris Agreement

Article 4

1. In order to achieve the long-term temperature goal set out in Article 2, Parties aim to reach global peaking of greenhouse gas emissions as soon as possible, recognizing that peaking will take longer for developing country Parties, and to undertake rapid reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty.

2. Each Party shall prepare, communicate and maintain successive nationally determined contributions that it intends to achieve. Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.

3. Each Party's successive nationally determined contribution will represent a progression beyond the Party's then current nationally determined contribution and reflect its highest possible ambition, reflecting its common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.

4. Developed country Parties should continue taking the lead by undertaking economy-wide absolute emission reduction targets. Developing country Parties should continue enhancing their mitigation efforts, and are encouraged to move over time towards economy-wide emission reduction or limitation targets in the light of different national circumstances.

POLICY MAKERS concern
URBAN PROBLEMS Vs PUBLIC GOODS

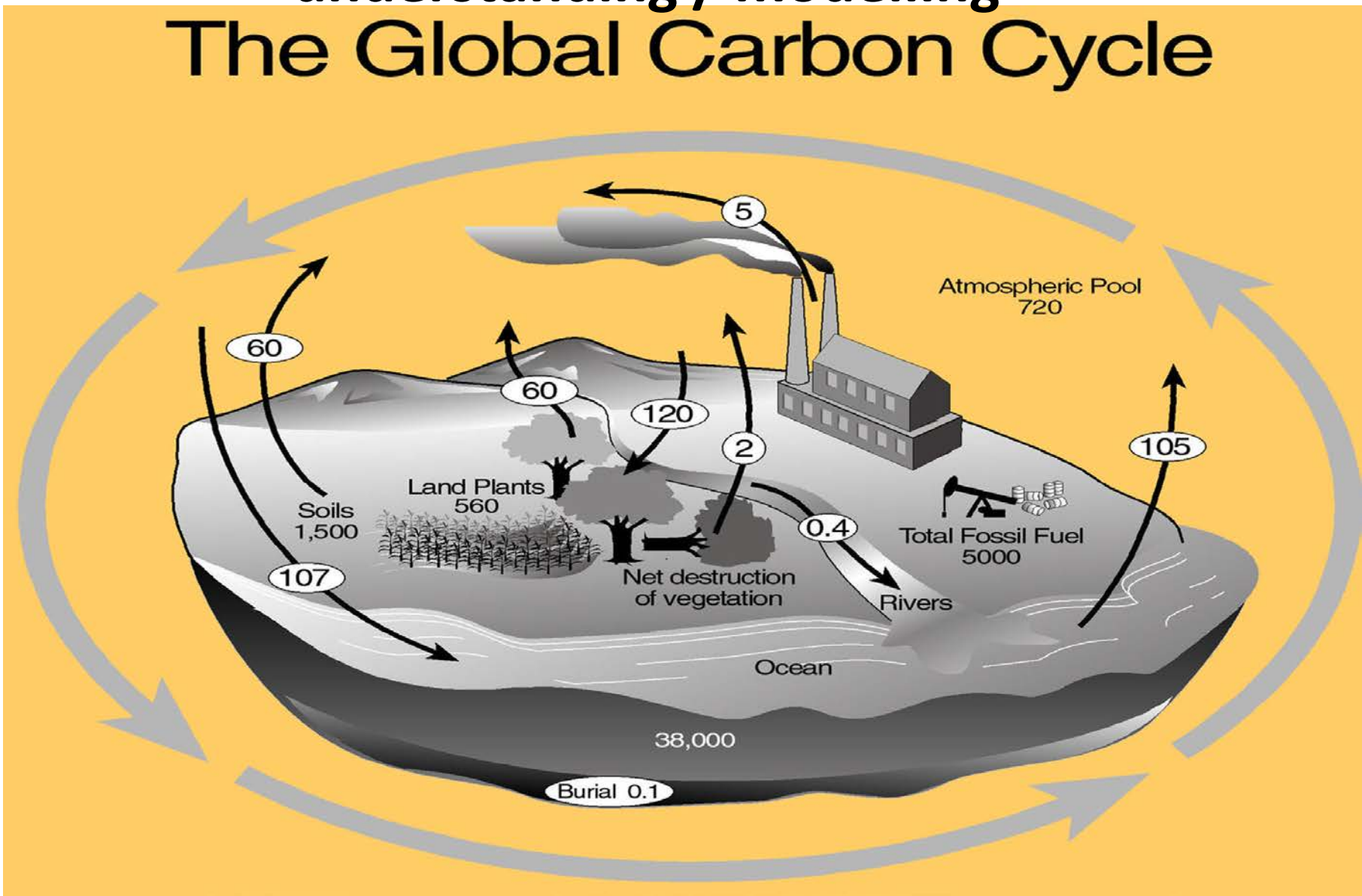
Material and Energy

Mobility and Green

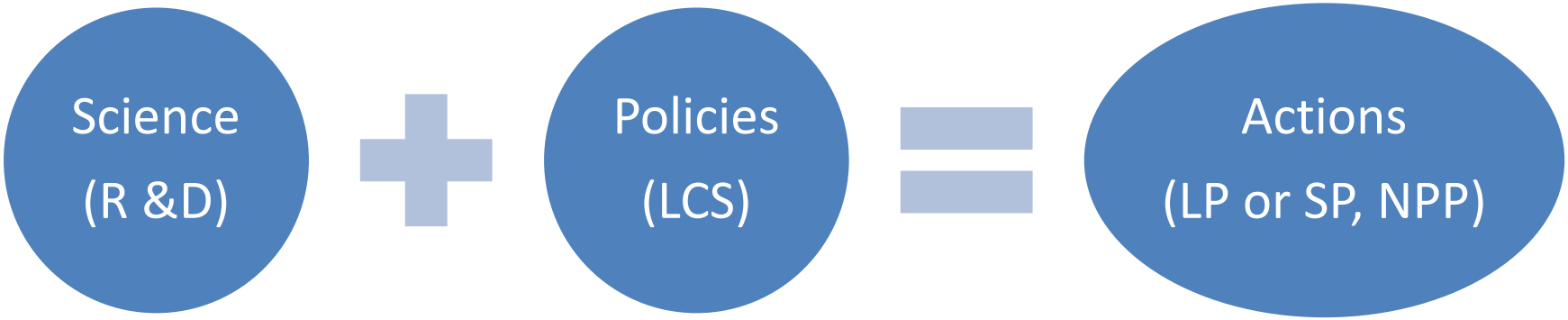
Economy/ Engine of Growth

Social/ People

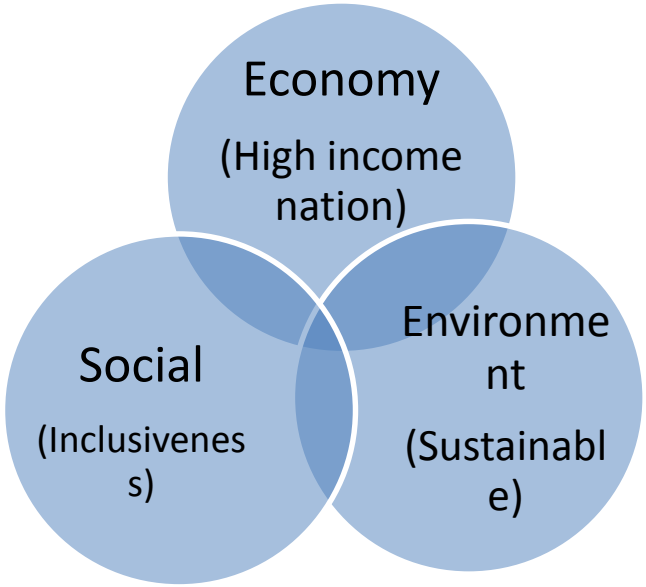
Science based policy needs scienfic understanding / modelling

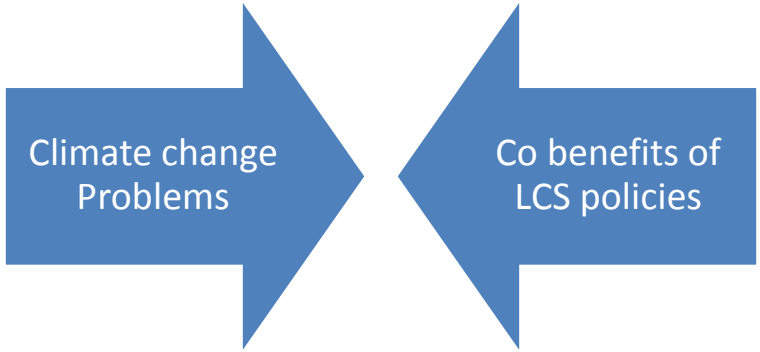


Low carbon sustainable development approach

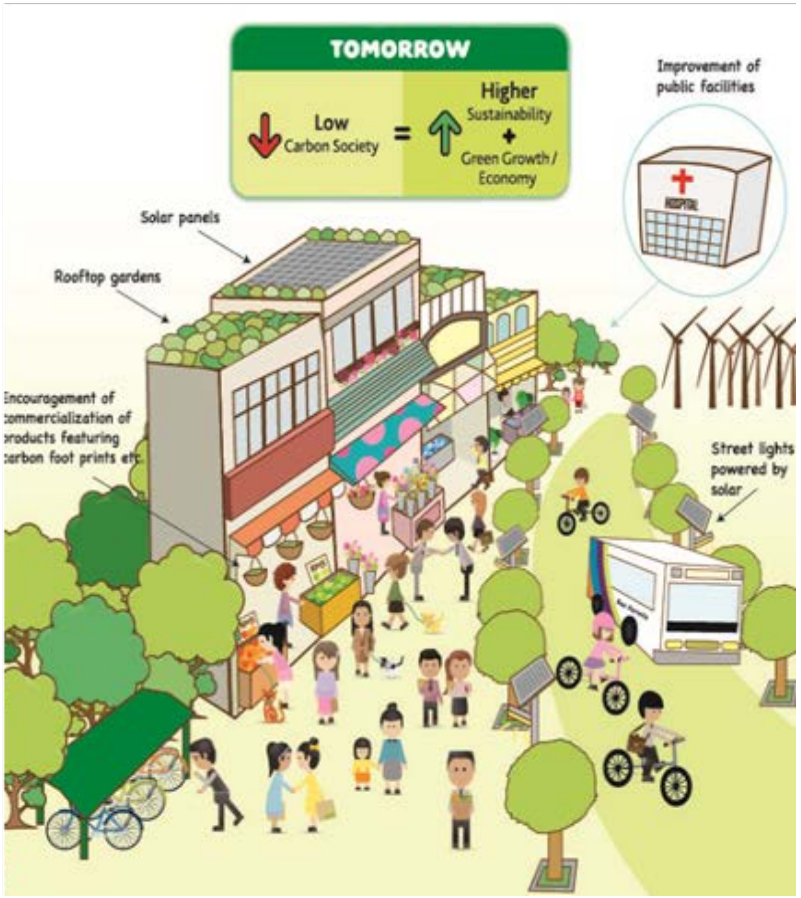


Key element Sustainable development = PRO GROWTH, PRO JOB , PRO POOR and PRO ENVIRONMENT

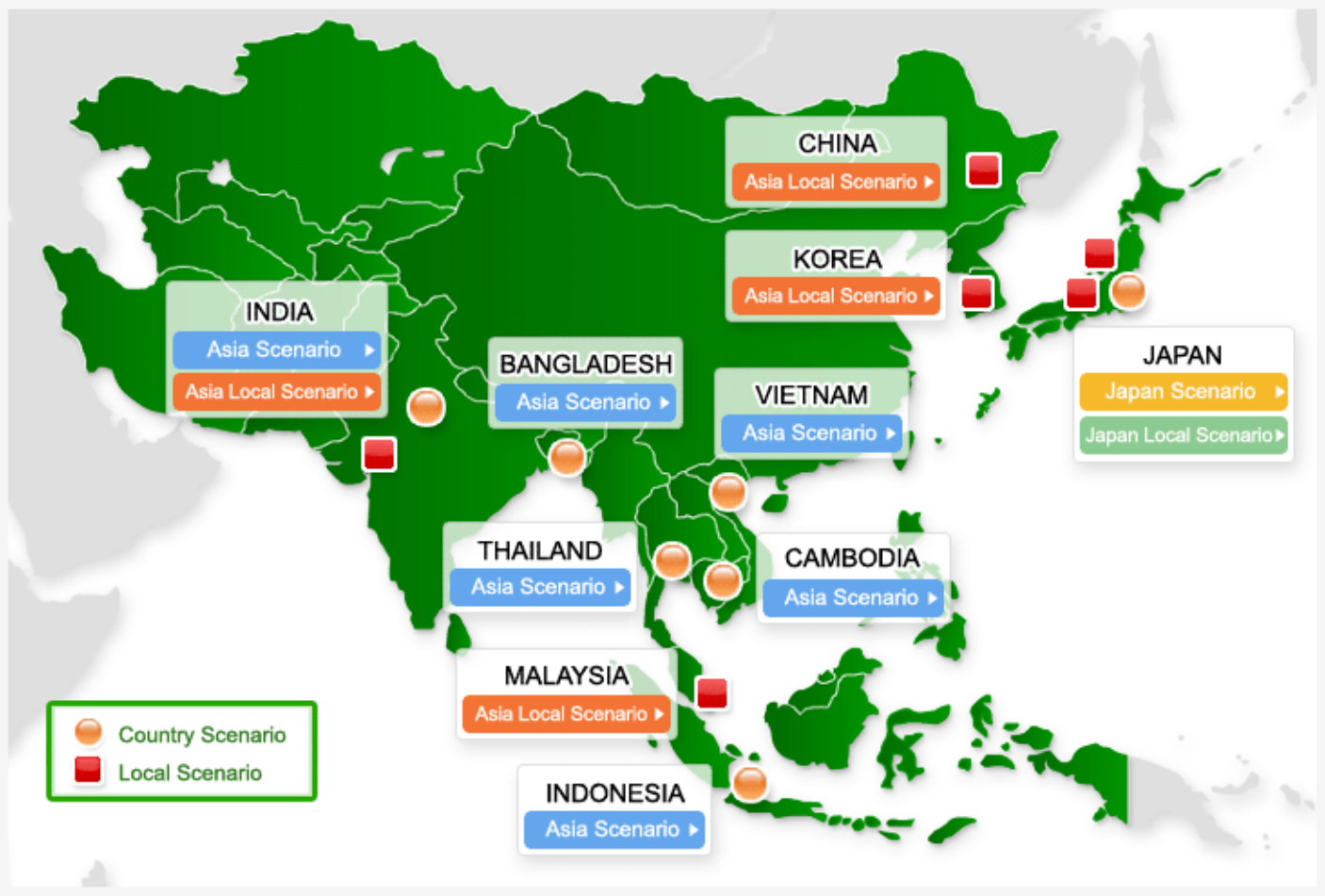




Low carbon society



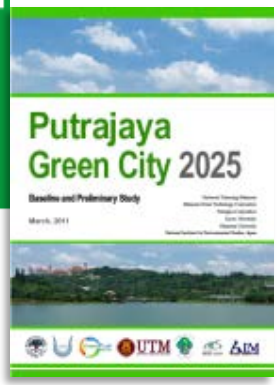
Collaboration partners with LCS Asia Network for benchmarking and Best practices

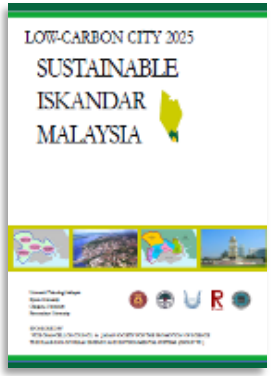


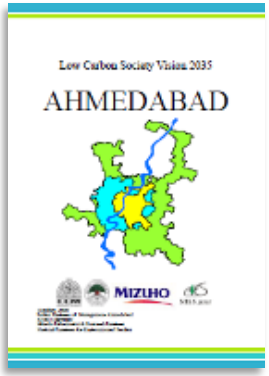
Establishing Low Carbon Society Scenario

- Regional Cooperation with Japan – NIES and IGES

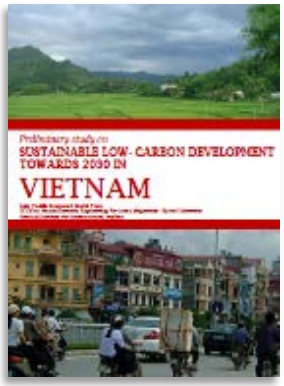
City and Region

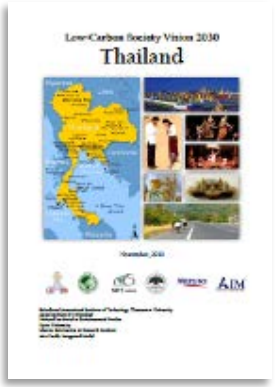






National





(Source: National Institute of Environment Studies, Japan)

Understanding and Knowledge sharing Regional LCS approach

10 Actions toward Low Carbon Asia

- NIES and other collaborating universities and institutes have proposed the 10 Actions to half global greenhouse gas emission in 2050 compared to 1990 level.
  - narrative storyline/roadmap by 2050 and model simulations

Action 1 **Urban Transport**
Hierarchically Connected Compact Cities

Action 2 **Interregional Transport**
Mainstreaming Rail and Water in Interregional Transport

Action 3 **Resources & Materials**
Smart Ways to Use Materials that Realize the Full Potential of Resources

Action 4 **Buildings**
Energy-Saving Spaces Utilizing Sunlight and Wind

Action 5 **Biomass**
Local Production and Local Consumption of Biomass

Action 6 **Energy System**
Low Carbon Energy System Using Local Resources

Action 7 **Agriculture & Livestock**
Low Emission Agricultural Technologies

Action 8 **Forestry & Land Use**
Sustainable Forestry Management

Action 9 **Technology & Finance**
Technology and Finance to Facilitate Achievement of LCS

Action 10 **Governance**
Transparent and Fair Governance that Supports Low Carbon Asia

Basic Understanding Energy Related Co2 Emissio

Development of Low Carbon Society Scenarios for Asian Region

Carbon Emission Reduction = Economic Structural Change + Lifestyle Change + Energy Efficiency Improvement + Renewable Energy, Cleaner Fuel

Activity

$$CO_2 = \frac{GDP}{Person} \times Population \times \frac{Energy}{GDP} \times \frac{CO_2}{Energy}$$

Energy Intensity

Fuel Mix

Malaysia pledges to voluntarily reduce the country's ***carbon emission intensity*** by 40% by 2020 based on the 2005 emission level

Carbon Intensity

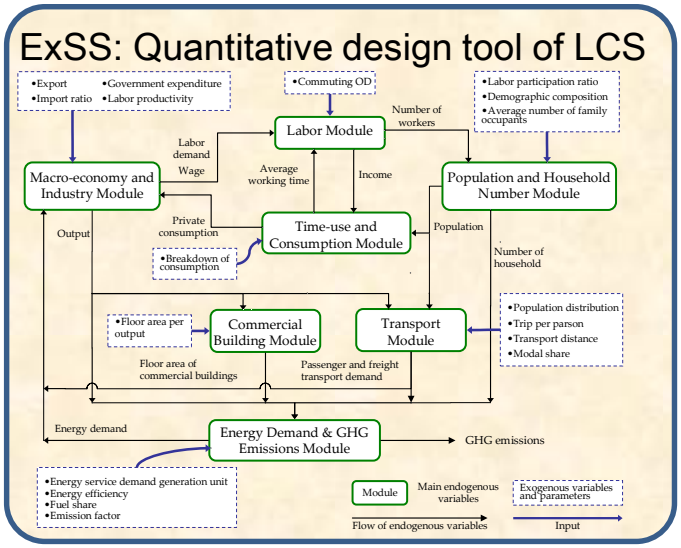
Energy Intensity

Fuel Mix

$$\frac{CO_2}{GDP} = \frac{Energy}{GDP} \times \frac{CO_2}{Energy}$$

RESEARCH LOOKS INTO Methodology

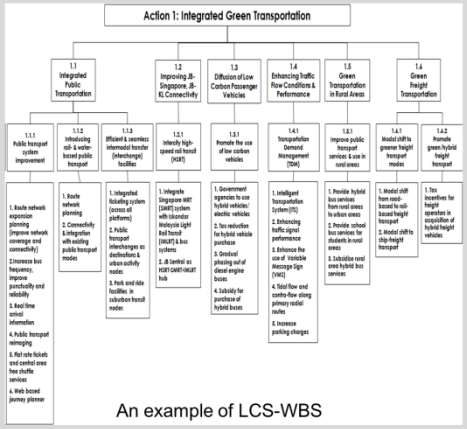
Development of supporting tools for designing and managing LCS scenarios



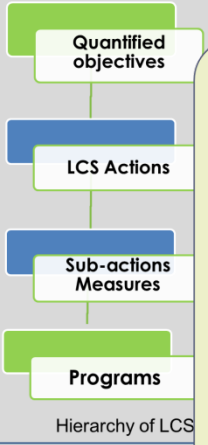
- Extended SnapShot model (ExSS)
- LCS Action Reference Database
- LCS Action Work Breakdown Structures(LCS-WBS)
- LCS Action Specification Cards(LCS-ASC)
- LCS Action Design Structure Matrix (LCS-DSM)
- Tool for attributing the Efforts towards Quantified targets to each Action/program (ARIPPLE)
- LCS Action Backcasting tool (LCS-BCT)

LCS-WBS: Overall structure diagram of LCS actions

Graphical diagram of hierarchically displaying deliverable measures and projects, which are further broken down into more detailed deliverables.



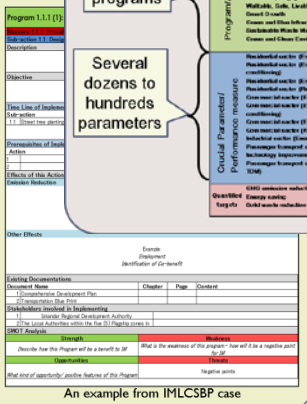
An example of LCS-WBS



Hierarchy of LCS

LCS Action Specification C

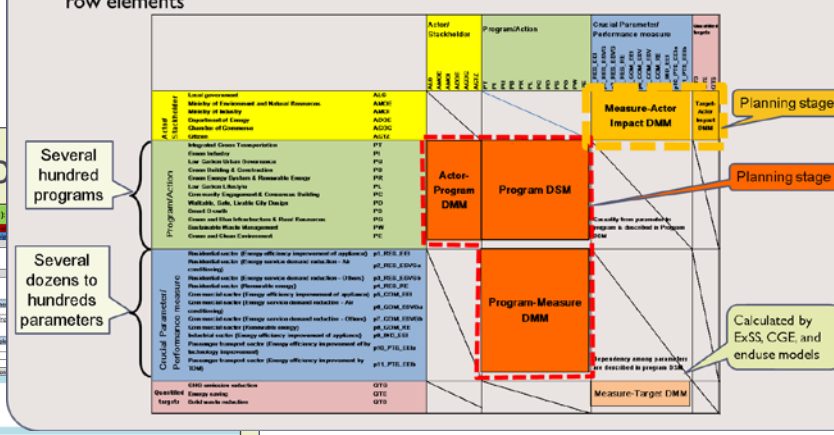
- Describes the Scope statement, Workflow, Timeline of implementation, Required resource, Costing, Implementation organization, Stakeholders, SWOT*, Current status (where you are / how much is done /not done) of the Actions/Projects
- In order to discuss/analyze the Detailed design, Progress management, Sharing and communicating of the relevant information among research groups, implementation agencies and stockholders

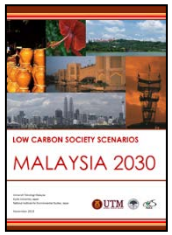


An example from IMLCSBP case

LCS Action Design Structure Matrix (LCS-DSM)

- Direction of information is from column to row
- Elements of matrix denote functional types of relation between column elements and row elements





RESEARCHERS PREPARE
LCS scenarios for policy development
National backgrounds of Low Carbon Policies and GHG Reduction Potential in Malaysia

National mitigation target :
Maintain 40% reduction emission intensity by year 2020, under the condition of technology transfer from developed countries

Policy and GHG reduction trend:

- Now proposing "Low Carbon Roadmap of Malaysia Economy 2030", pending for Cabinet approval Jan / Feb 2015
- Currently achieved 33% (2014) reduction as compared with 40% target in 2020, considering mitigation option (big financial implication), such as FIT – solar and rain harvesting, hybrid car policy, MRT ,etc.

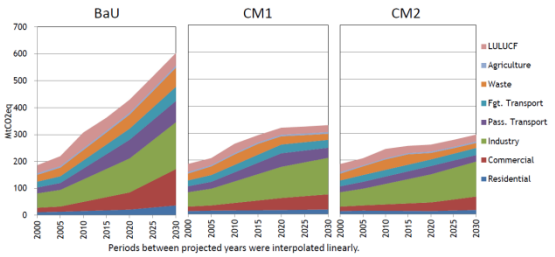
Low Carbon Society Scenarios in Malaysia

Summary of mitigation options

	2020		2030	
	CM1	CM2	CM1	CM2
Diffusion of energy efficient devices	40%	60%	75%	85%
EEI rate from BaU of thermal power plants	10%	20%	20%	30%
Modal shift from passenger cars	10%	22%	20%	40%
Share of bio diesel in transport	2%	6%	3%	8%
Capacity of RE power plant (MW)	2080	4160	4160	10400
Recycling rate of solid waste	40%	55%	50%	60%
Incineration rate of solid waste	10%	15%	20%	20%
Recovery rate of CH4 from waste management	25%	35%	40%	40%
Mitigations in AFOLU sectors*	<10USD/ktCO2eq			

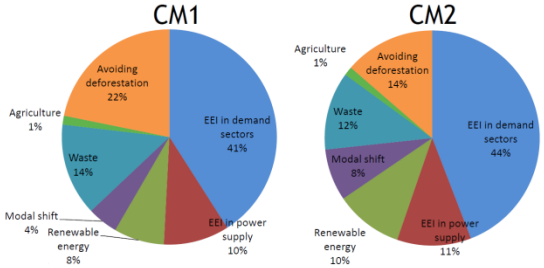
GHG emissions (Energy, Waste and AFOLU)

- Energy has the largest contribution in both scenarios in all years.
- In BaU scenario, GHG emission increased by 96% (2020) and 175% (2030) from 2005
- In CM1 scenario, it was reduced by 26% (2020) and 45% (2030) from BaU, in CM2, 40% (2020) and 51% (2030).

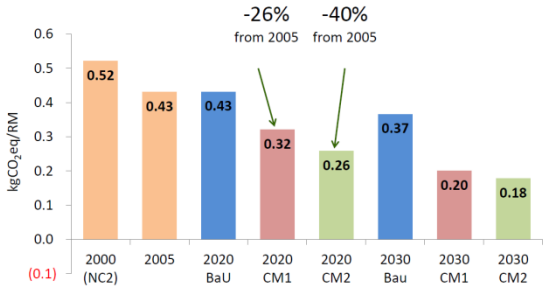


Contribution to emission reduction in 2020

- In order to achieve -40% target in 2020, more contribution of EEI, renewable energy and modal shift is required.



Emission intensity (GHG emission per GDP)



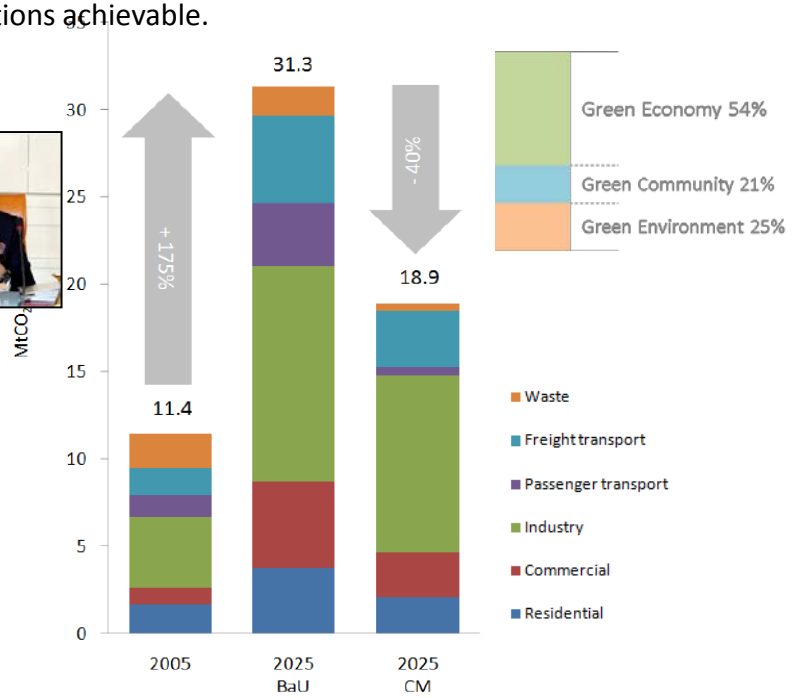
RESEARCHERS needs to prepare baseline study and develop LCS scenarios for policy development .

The *Low Carbon Society Blueprint for Iskandar Malaysia 2025*

- ✓ Document that presents comprehensive climate change mitigation policies and detailed strategies to guide development of Iskandar Malaysia
- ✓ Stress on the **holistic and integrated approach to decouple economy and environment development**
  Comprise of two principal components:

  I) Narrative on growth scenarios, policies, measures and programs to achieve a minimum targeted 40**% reduction in carbon emission by 2025** based on the 2005 level and;

  II) **scenario-based modelling** and projection of carbon emission reductions achievable.

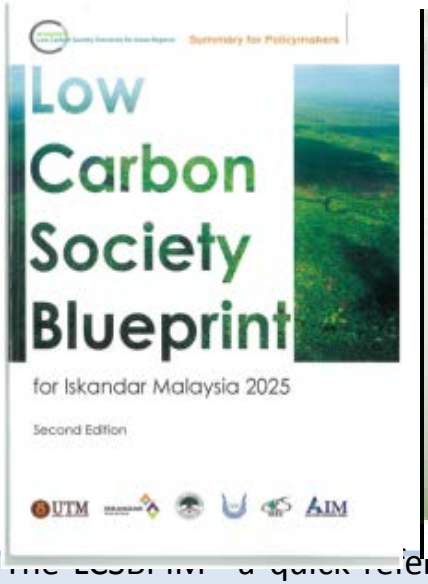


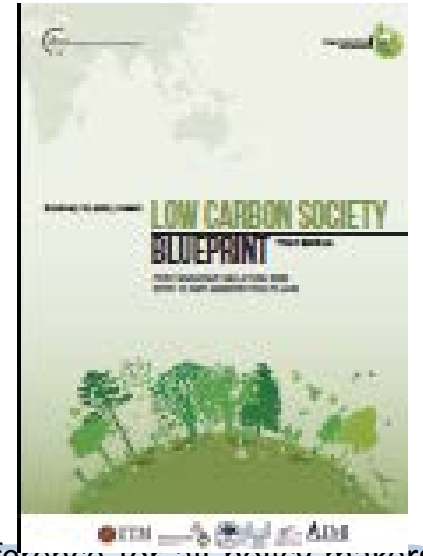
GHG reductions by Actions

Mitigation Options	$ktCO_2$ Reduction	%
Green Economy	6,937	54%
Action 1 Integrated Green Transportation	1,916	15%
Action 2 Green Industry	1,094	9%
Action 3 Low Carbon Urban Governance**	-	-
Action 4 Green Building and Construction	1,203	9%
Action 5 Green Energy System and Renewable Energy	2,725	21%
Green Community	2,727	21%
Action 6 Low Carbon Lifestyle	2,727	21%
Action 7 Community Engagement and Consensus Building**	-	-
Green Environment	3,094	25%
Action 8 Walkable, Safe and Livable City Design	263	2%
Action 9 Smart Urban Growth	1,214	10%
Action 10 Green and Blue Infrastructure and Rural Resources	392	3%
Action 11 Sustainable Waste Management	1,224	10%
Action 12 Clean Air Environment**	-	-
Total	12,467**	100%

RESEARCHERS need to produce Policy document together with Policy makers / FGD

Low Carbon Society Blueprint for Iskandar Malaysia 2025

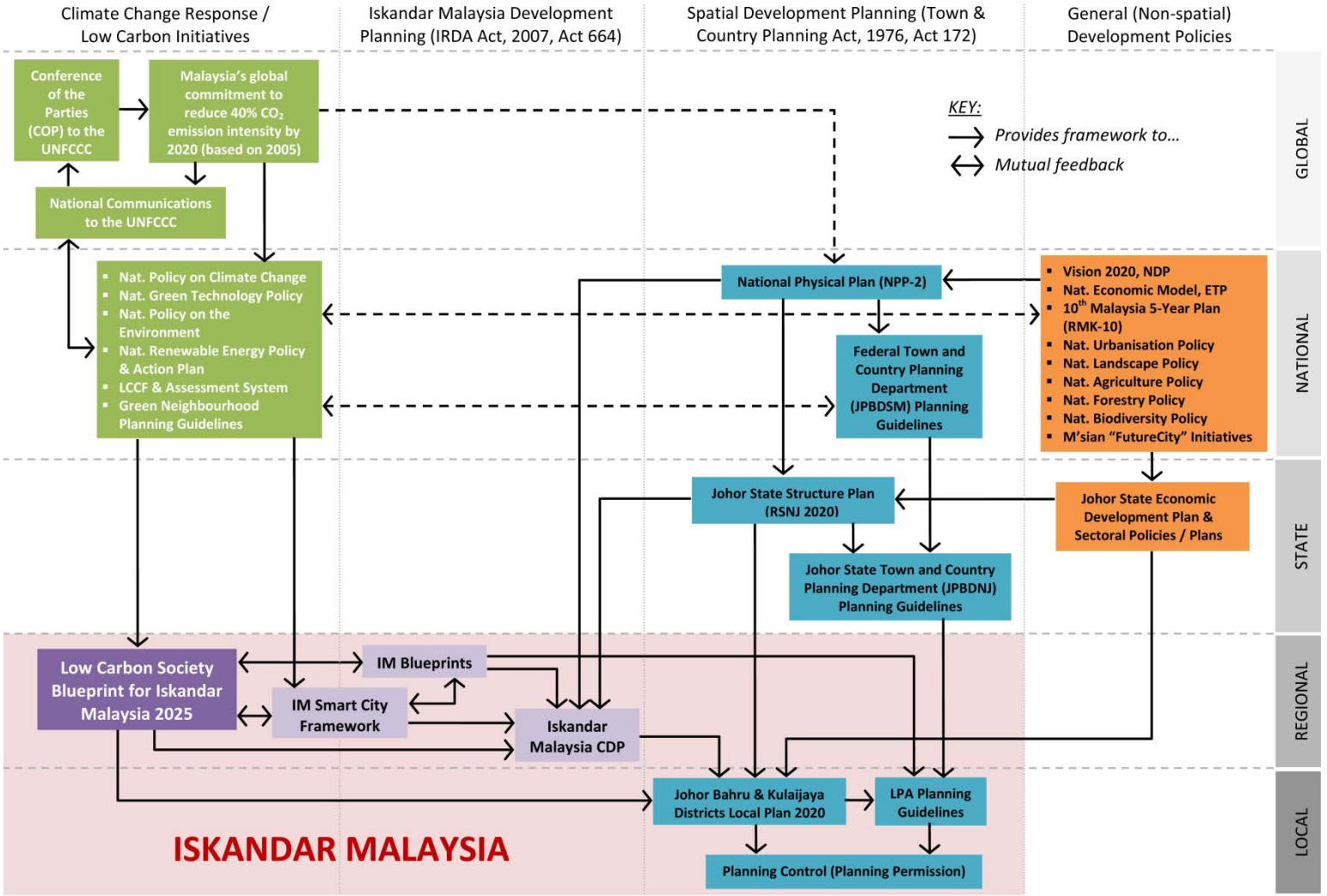




- The LCSBP IM2025 a quick reference for all policy-makers in both public and private sectors as well as IRDA;
- 12 Actions grouped in 3 parts namely: (Green Economy), (Green Community), and Green Environment);281 programmes;
- Each Chapter contains an analysis, list of programmes and the potential GHG emissions reduction;
- IRDA launched its Low Carbon Society Blueprint for Iskandar Malaysia 2025 on 30 November 2012 at the United Nations Climate Change Conference in Doha, Qatar. The ultimate goal is to reduce Iskandar Malaysia's carbon intensity emissions by 50 per cent by 2025.
- The Blueprint was subsequently endorsed by the Prime Minister of Malaysia in December 2012

	Action Names	Themes
1	Integrated Green Transportation	GREEN ECONOMY
2	Green Industry	
3	Low Carbon Urban Governance	
4	Green Buildings & Construction	
5	Green Energy System & Renewable Energy	
6	Low Carbon Lifestyle	GREEN COMMUNITY
7	Community Engagement & Consensus Building	
8	Walkable, Safe, Livable City Design	GREEN ENVIRONMENT
9	Smart Growth	
10	Green and Blue Infrastructure & Rural Resources	
11	Sustainable Waste Management	
12	Clean Air Environment	

RESEARCHERS need to understand Positioning the *Policy plan* within the context of existing national, state and local development policies and plans



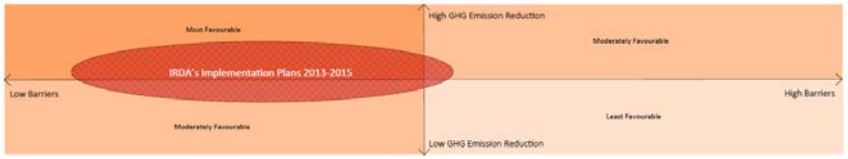
OUTPUT 2: LCS scenarios for policy development in IM

How to make the LCS happen in IM

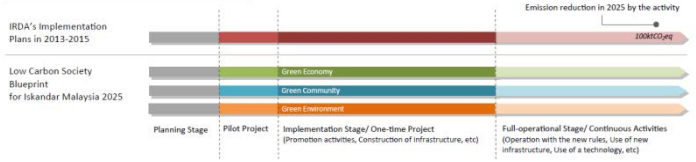
A Roadmap towards Low Carbon Iskandar Malaysia 2025

Rationales for Implementation Phasing

A good roadmap is characterised by well justified phasing of projects. Priority projects would be those that have relatively low barriers but high GHG reduction impacts (see diagram below). Implementation barriers include cost, human capital, institution and legislation framework, societies readiness (stakeholder acceptance) and technology availability.



Guide to Reading Timeline Diagram

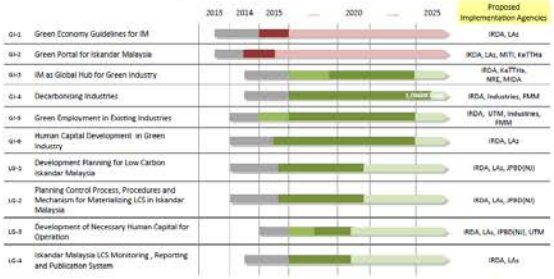


The roadmap comprises of EIGHT (8) implementation sectors demonstrating the implementation plan for TWELVE (12) key policy actions of *Low Carbon Society Blueprint for Iskandar Malaysia 2025* as well as IRDA's Implementation Plans 2013-2015. Each section breaks its policy action(s) into detail strategic plans, their implementation phases and duration and identified potential implementation agencies. These are presented in a series of timeline diagrams.

Please see "Guide to Reading Timeline Diagram" printed overleaf for clarity >>>

Green Industry and Low Carbon Governance (GI, LG)

Action 2 "Green Industry" (GI) and Action 3 "Low Carbon Urban Governance" (LG), IRDA's Implementation Plans; Green Economy Guidelines for IM (GI-1) and Green Portal for Iskandar Malaysia (GI-2) are covered. The main contents are establishment of planning and governance system in IRDA, dissemination activities through a website, and low-carbonizing existing industries through mainly energy efficiency improvement and to encourage production of green goods and services required in a low carbon society.

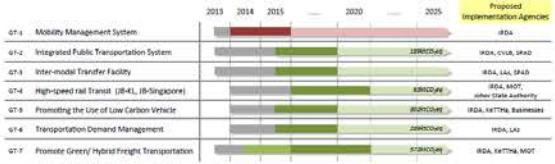


Green Building and Energy System (GB, GE)

This roadmap describes implementation of Action 4 "Green Building and Construction" (GB) and Action 5 "Green Energy System and Renewable Energy" (GE) with IRDA's implementation plan of GAIA (Green Accord Initiative Award) (GB-1). The roadmap includes implementation of GAIA in IM, establishment of green building design, technology and construction, and its standardization in IM with financial scheme. At the same time, the roadmap covers diffusion of renewable and alternative energies in IM through strengthening financial support scheme for the energies and encouraging public awareness by Energy Conservation Center in Iskandar Malaysia.

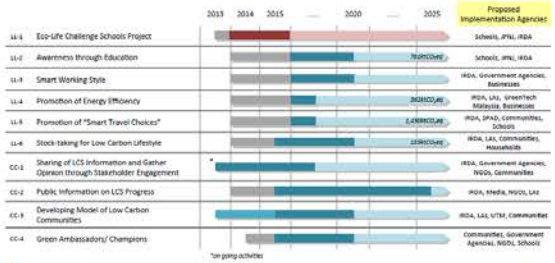
Green Transportation (GT)

Action 1 "Green Transportation" (GT) and Mobility Management System (GT-1), IRDA's Implementation Plan are covered. The main contents are development of the integrated public transportation system, high-speed rail connection between Johor Bahru (JB)-Kuala Lumpur (KL) and JB-Singapore, development of inter-modal transfer facility and promotion of the use of low carbon passenger vehicle and freight transport.



Green Community (LL, CC)

This roadmap describes implementation of Action 6 "Low Carbon Lifestyle" (LL) and Action 7 "Community Engagement and Consensus Building" (CC) with IRDA's Implementation Plan, Eco-Life Challenge Schools Project (LL-1). Strong connections among people or communities forms an indirect support for direct impact inducing change to low carbon lifestyle.



Clean Air Environment (CA)

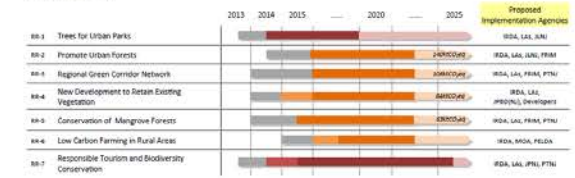
Action 12 "Clean Air Environment" (CA) is covered. The main contents are establishment of comprehensive air quality management system, installation of air quality monitoring station and pollutant emission control device in the industry sector. Green passenger and freight transportation are also considered. Cross-border cooperation to avoid regional haze pollution from open biomass burning is tightened.

Green Urban Design (WC, SC)

Action 8 "Walkable, Safe and Livable City Design" (WC) and Action 9 "Smart Urban Growth" (SG) are covered. The main contents for walkable city are establishment of walkable city centers and neighborhoods, cyclist-friendly city, safe city from crime, and civilized and livable streets through traffic calming. The main contents for smart urban growth are promotion of the polycentric growth pattern in IM, compact urban development, transit supportive land use planning and smart digital city.

Green and Blue Infrastructure, and Responsible Tourism (RR)

This roadmap describes implementation of Action 10 "Green and Blue Infrastructure and Rural Resources" (RR) with IRDA's Implementation Plans; Trees for Urban Parks (RR-1) and Responsible Tourism and Biodiversity Conservation (RR-7). The main contribution of this roadmap to emission reduction is enhancement of carbon sink by forests, including conservation of natural forests, such as mangrove forests, and tree planting in urban area.



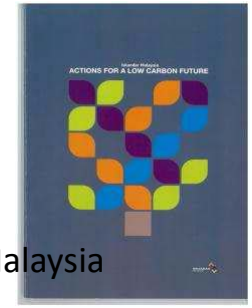
Sustainable Waste Management (WM)

This roadmap covers Action 11 "Sustainable Waste Management" (WM) that includes five sub-actions which cover waste from five different sectors - municipal (household and commercial), agriculture, industry, waste water, and construction and demolition. IRDA implementation plan of *Nafas Baru* Pasir Gudang will become the platform for promoting Sustainable Municipal Solid Waste Management through pilot project of waste separation at source and also focusing on upgrading of landfill management.

RESEARCHERS needs to How to make the LCS happen in shorter terms by preparing a short term plan "*Actions for a Low Carbon Future*"

- Near term action plans "Actions for a Low Carbon Future" from year 2013 to 2015 have been proposed based on the *Low Carbon Society Blueprint for Iskandar Malaysia 2025*.
- It listed up 10 programmes which IRDA has started implementing. It was launched by Malaysia Prime Minister Dato' Sri Mohd Najib Tun Abdul Razak on 6th November 2013.

	Programmes
1	Integrated Green Transportation – Mobility Management System
2	Green Economy Guidelines
3	Eco-Life Challenge Project for Schools
4	Portal on Green Technology
5	Trees for Urban Parks/Forests
6	Responsible Tourism and Biodiversity Conservation
7	Bukit Batu Eco-Community
8	GAIA – Green Accord Initiative Award
9	Low Carbon Village FELDA Taib Andak
10	Special Feature: Smart City –Nafas Baru Pasir Gudang: CLEAN AND HEALTHY



How to link near term actions to LCSBP Iskandar Malaysia

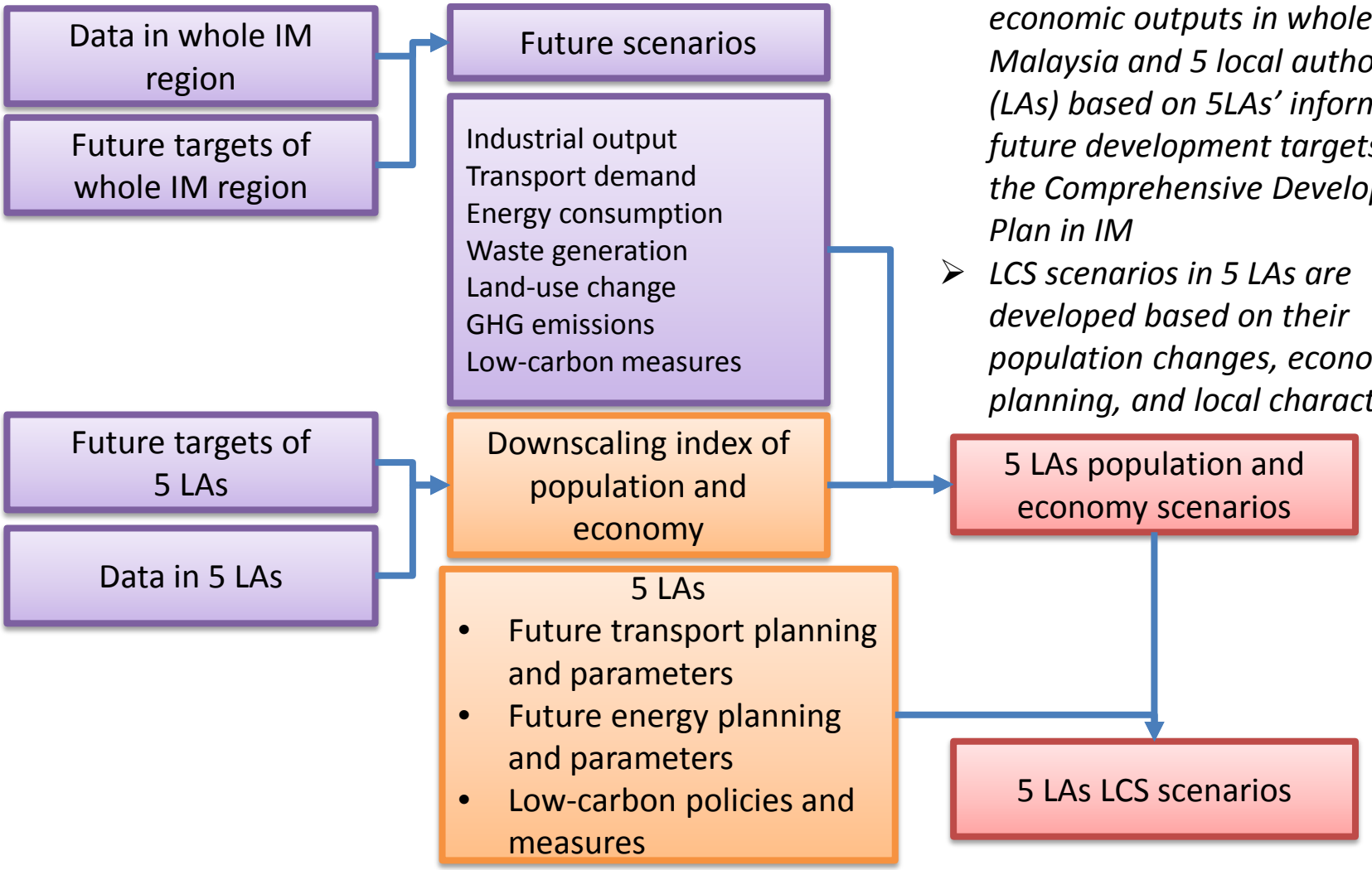
Relationship Matrix

The matrix below shows the relationship between IRDA's Implementation Plans 2013-2015 and key policy actions of the *Low Carbon Society Blueprint for Iskandar Malaysia 2025*. Out of IRDA's TEN (10) implementation plans, SEVEN (7) of them are included in this roadmap. These implementation plans are IRDA's first attempt at good initiatives towards a climate resilient economy in Iskandar Malaysia. The plans have been proposed according to the recommendation of the *Low Carbon Society Blueprint for Iskandar Malaysia 2025*. The implementation plans cover THREE (3) major themes that underpin the low carbon society concept - Green Economy, Green Community and Green Environment. However, THREE (3) special projects covering specific area namely; (i) Bukit Batu Eco-Community, (ii) Low Carbon Village Felda Taib Andak and (iii) *Nafas Baru* Pasir Gudang that require comprehensive study are not discussed in this roadmap.

	12 Actions in the *Low Carbon Society Blueprint for Iskandar Malaysia 2025* \ IRDA's Implementation Plan 2013-2015	Specific Action-based Projects							Special Projects		
		GI-1 Green Economy Guidelines for IM	GI-2 Portal on Green Technology for Iskandar Malaysia	GB-1 GAIA (Green Accord Initiative Award)	GT-1 Mobility Management System	LL-1 Eco-Life Challenge Schools Project	RR-1 Trees for Urban Parks/ Forests	RR-7 Responsible Tourism and Biodiversity Conservation	Bukit Batu Eco-Community	Low Carbon Village Felda Taib Andak	*Nafas Baru* Pasir Gudang - Clean and Healthy City
Green Economy	Action 1 Integrated Green Transportation (GT)				●				○		○
	Action 2 Green Industry (GI)	●	●								
	Action 3 Low Carbon Urban Governance (LG)										
	Action 4 Green Building and Construction (GB)			●							
	Action 5 Green Energy System and Renewable Energy (GE)			●					○		
Green Community	Action 6 Low Carbon Lifestyle (LL)					●			○	○	○
	Action 7 Community Engagement and Consensus Building (CC)										
Green Environment	Action 8 Walkable, Safe and Livable City Design (WC)										
	Action 9 Smart Urban Growth (SG)										
	Action 10 Green and Blue Infrastructure and Rural Resources (RR)						●	●		○	
	Action 11 Sustainable Waste Management (WM)								○		○
	Action 12 Clean Air Environment (CA)								○	○	○

RESEARCHERS need to Make the Actions more close to the People (1)

Development of LCS scenarios for five Local Authorities



- *Projections of populations and economic outputs in whole Iskandar Malaysia and 5 local authorities (LAs) based on 5LAs' information, future development targets, and the Comprehensive Development Plan in IM*
- *LCS scenarios in 5 LAs are developed based on their population changes, economy planning, and local characteristics.*

Make the Actions more close to the People (2)

Set LCS Action Plans in place to five Local Authorities

- Majlis Perbandaran Johor Bahru Tengah (MPJBT),
- Majlis Bandaraya Johor Bahru (MBJB)
- Majlis Perbandaran Pasir Gudang (MPPG)
- Majlis Perbandaran Kulaijaya (MPKu)
- Majlis Daerah Pontian (MDP)

5 Local Authorities in Iskandar Malaysia

(Source: CDP 2006)

Kulai

Pasir Gudang

Johor Bahru

Johor Bahru Tengah

Pontian

Kulaijaya Scenario 2025

It is envisioned that by 2025 the MPKu area will host clusters for distribution and logistics services, airport and air cargo activities, high-tech industries, aviation and aerospace industries, R&D facilities, retail and shopping, oil palm plantation and agro-business.

Economic Structure

- Gross Domestic Product (GDP) of the MPKu area in 2025 is expected to be RM5,539 million (3.67 times of the 2005 GDP).
- The share of future primary industry sector in MPKu will decrease from 10% (2005) to 5% (2025).
- The secondary industry sector's share is expected to decrease from 41% (2005) to 36% (2025).
- Tertiary industry sector will become the main economic sector in MPKu, its share rising from 49% in 2005 to 59% in 2025.

Socio-Economy

- Population in MPKu in 2025 is expected to increase to 251,579 (1.44 times compared to 2005).
- Number of households in the MPKu area will increase from 39,777 (2005) to 57,320 (2025).
- GDP per capita in the MPKu area is expected to increase from RM31,727 (2005) to RM80,869 (2025).

Transportation

- Passenger transport demand in the MPKu area will increase from 1,124 million passenger-kilometres (2005) to 6,393 million passenger-kilometres (2025).
- Freight transport demand will increase from 1,284 million tonne-kilometres (2005) to 3,749 million tonne-kilometres (2025).

Table 1: Estimation Results of Scenario Quantification in 2025, MPKu

Scenario Quantification	2005	2025	2025/2005	Scenario Quantification	2005	2025	2025/2005
Population	174,584	251,579	1.44	No. of households	39,777	57,320	1. 44
GDP (mil RM)	5,539	20,345	3.67	GDP per capita (RM)	31,727	80,869	2.55
Primary Industry (mil RM)	539	934	1.73	Passenger Transport Demand (mil p-km)	1,124	6,393	5.68
Secondary Industry (mil RM)	2,271	7,328	3.23	Freight Transport Demand (mil t-km)	1,284	3,749	2.92
Tertiary Industry (mil RM)	2,728	12,083	4.43				

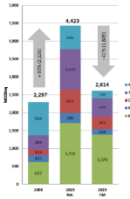


Figure 1 shows the total carbon emission of the MPKu area by key emission sectors in 2005 (base year), 2025BaU (Business as Usual) and 2025CM (Counter Measures) scenarios.

GHG emission of the MPKu area in year 2005 is about 2,297 ktCO$_2$eq which doubles to 4,423 ktCO$_2$eq in year 2025 if no mitigation measures are taken.

However, the scenario will be better if mitigation measures are introduced. An estimated 41% GHG reduction (1,809 ktCO$_2$eq) may be achieved under the 2025CM as compared to 2025BaU scenario.

Specifically, emission of the waste sector can be reduced up to 67% (-440ktCO$_2$eq) while the reduction for the transport sector is 54% (-609ktCO$_2$eq), commercial sector 47% (-308ktCO$_2$eq), residential sector 45% (-131ktCO$_2$eq), and industry sector 19% (-327ktCO$_2$eq).

Figure 1. GHG emission by sector

Table 2: Energy demand, GHG and emission intensity of MPKu area

Unit	2005	2025 BaU	2025
Final energy Demand (ktoe)	356	986	
GHG emissions (ktCO$_2$eq)	2,297	4,423	2,6
Per capita CO$_2$ emissions (tCO$_2$eq)	13.1	17.6	10.
GHG intensity (ktCO$_2$eq / mil RM)	0.41	0.22	0.1

Johor Bahru Tengah Scenario 2025

It is envisioned that by 2025, the MPJBT area will become the centre for green livable city & creative innovation belt of tertiary education, creative industries, tourism, entertainment and theme parks, SME, seaport activities, warehousing, distribution, medical and wellness services.

Economic Structure

- Gross Domestic Product (GDP) of the MPJBT area in 2025 is expected to be RM49,076 (4.31 times of the performance in 2005).
- The share of future primary industry sector in MPJBT will increase from 43% (2005) to 57% (2025).
- Secondary industry sector's share is expected to increase from 25% (2005) to 75% (2025).
- Tertiary industry sector is expected to become a key economic sector in MPJBT (from 16% in 2005 to 84% in 2025).

Socio-Economy

- Population in MPJBT in 2025 is expected to increase to 1,443,921 (2.66 times compared to 2005).
- Number of households in the MPJBT area will increase from 136,649 (2005) to 363,749 (2025).
- GDP per capita of the MPJBT area is expected to increase from RM 20,974 (2005) to RM 33,988 (2025)

Transportation

- Passenger transport demand in the MPJBT area will increase from 3,949 million passenger-kilometres (2005) to 25,399 million passenger-kilometres (2025).
- Freight transport demand will increase from 2,638 million tonne-kilometres (2005) to 9,043 million tonne-kilometres (2025).

Table 1: Estimation Results of Scenario Quantification in 2025, MPJBT

Scenario Quantification	2005	2025	2025/2005	Scenario Quantification	2005	2025	2025/2005
Population	542,436	1,443,921	2.66	No. of households	136,649	363,749	2.66
GDP (mil RM)	11,377	49,076	4.31	GDP per capita (RM)	20,974	33,988	1.62
Primary Industry (mil RM)	217	288	1.33	Passenger Transport Demand (mil p-km)	3,949	25,399	6.43
Secondary Industry (mil RM)	38,57	11,581	3.00	Freight Transport Demand (mil t-km)	2,638	9,043	3.43
Tertiary Industry (mil RM)	7,303	37,207	5.09				

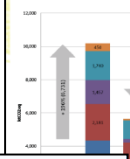


Figure 1 shows the total carbon emission of the MPJBT area by key emission sectors in 2005 (base year), 2025BaU (Business as Usual) and 2025CM (Counter Measures) scenarios.

GHG emission of MPJBT in year 2005 is 3,428 ktCO$_2$eq, the value is expected to increase 196 % to 10,159 ktCO$_2$eq in year 2025 if no mitigation measures are taken.

However, the current GHG scenario could be improved if control measures are introduced. An expected reduction of 45% (4,526 ktCO$_2$eq) may be achieved as compared to 2025BaU.

Specifically, emission of the waste sector can be reduced up to 79% (-358 ktCO$_2$eq) while the reduction for the passenger transport and freight transport sectors are respectively 65% (-1,236.8 ktCO$_2$eq) & 36% (-426 ktCO$_2$eq), commercial sector 47% (-1,020 ktCO$_2$eq), residential sector 45% (-830.7 ktCO$_2$eq) and industry sector 18% (-455 ktCO$_2$eq).

emission intensity of MPJBT area

2005	2025 BaU	2025CM	2025BaU/2005	2025CM/2005	2025CM/2025BaU
772	2401	1504	3.11	1.95	0.63
3,428	10,159	5,633	2.96	1.64	0.55
6.3	7.0	3.9	1.11	0.62	0.56
0.30	0.21	0.11	0.7	0.37	0.52

Pontian Scenario 2025

It is envisioned that by 2025, the three sub-districts of MDP will become the hub for eco- and rural tourism, petrochemical and oil and gas industry as well as power plant.

Economic Structure

- Gross Domestic Product (GDP) of the MDP area in IM in 2025 is expected to be RM6,550 million (1.84 times of the 2005 GDP).
- The share of future primary industry sector of the area will decrease from 10% (2005) to 5% (2025).
- Secondary industry sector's share is expected to decrease from 41% (2005) to 36% (2025).
- Tertiary industry sector will become the main economic sector of the area (from 49% in 2005 to 59% in 2025).

Socio-Economy

- Population in the three sub-districts of MDP in 2025 is expected to increase to 54,142 (1.84 times compared to 2005).
- Number of households in the sub-districts will increase from 6,550 (2005) to 12,101 (2025).
- GDP per capita of the sub-districts is expected to increase from RM 21,667 (2005) to RM35,481 (2025)

Transportation

- Passenger transport demand in MDP area within IM will increase from 205 million passenger-kilometres (2005) to 1,169 million passenger-kilometres (2025).
- Freight transport demand will increase from 147 million tonne-kilometres (2005) to 354 million tonne-kilometres (2025).

Table 1: Estimation Results of Scenario Quantification in 2025, Pontian within IM

Scenario Quantification	2005	2025	2025/2005	Scenario Quantification	2005	2025	2025/2005
Population	29,307	54,142	1.84	No. of households	6,550	12,101	1.84
GDP (mil RM)	635	1,921	3.03	GDP per capita (RM)	21,667	35,481	1.64
Primary Industry (mil RM)	124	165	1.33	Passenger Transport Demand (mil p-km)	205	1,169	5.71
Secondary Industry (mil RM)	336	946	2.82	Freight Transport Demand (mil t-km)	147	354	2.40
Tertiary Industry (mil RM)	175	809	4.62				

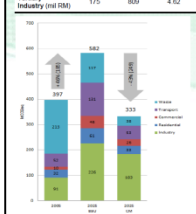


Figure 1. GHG emission by sector

Table 2: Energy demand, GHG and emission intensity of Pontian area

Unit	2005	2025 BaU	2025CM	2025BaU/2005	2025CM/2005	2025CM/2025BaU
Final energy Demand (ktoe)	49	122	85	2.49	1.73	0.70
GHG emissions (ktCO$_2$eq)	397	582	333	1.47	0.84	0.57
Per capita CO$_2$ emissions (tCO$_2$eq)	13.55	10.75	6.15	0.79	0.45	0.57
GHG intensity (ktCO$_2$eq / mil RM)	0.63	0.30	0.17	0.48	0.28	0.57

Johor Bahru Scenario 2025

It is envisioned that by 2025, the MBJB area will become the centre for cosmopolitan living, retail and shopping, hotel, culture and heritage tourism, city campuses for colleges, financial services, professional services, medical services, SME, and transportation terminal.

Economic Structure

- Gross Domestic Product (GDP) of the MBJB area in 2025 is expected to be RM 40,940 (4.08 times of the performance in 2005).
- The share of future primary industry sector in MBJB will decrease from 0.24% (2005) to 0.08% (2025).
- The secondary industry sector's share is expected to decrease from 32.15% (2005) to 23.33% (2025).
- Tertiary industry sector will become the main economic sector in MBJB, its share rising from 67.61% in 2005 to 76.59% in 2025.

Socio-Economy

- Population in MBJB in 2025 is expected to increase to 920,850 (2.03 times compared to 2005).
- Number of households in the MBJB area will increase from 113,893 (2005) to 230,852 (2025).
- GDP per capita in the MBJB area is expected to more than double from RM 22,100 (2005) to RM 44,459 (2025).

Transportation

- Passenger transport demand in the MBJB area will increase from 3,391 million passenger-kilometres (2005) to 21,171 million passenger-kilometres (2025).
- Freight transport demand will increase from 2,237 million tonne-kilometres (2005) to 7,544 million tonne-kilometres (2025).

Table 1: Estimation Results of Scenario Quantification in 2025, MBJB

Scenario Quantification	2005	2025	2025/2005	Scenario Quantification	2005	2025	2025/2005
Population	454,310	920,850	2.03	No. of households	113,893	230,852	2.03
GDP (mil RM)	10,038	40,940	4.08	GDP per capita (RM)	22,100	44,459	2.01
Primary Industry (mil RM)	24	33	1.33	Passenger Transport Demand (mil p-km)	3,391	21,171	6.24
Secondary Industry (mil RM)	3,227	9,552	2.96	Freight Transport Demand (mil t-km)	2,327	7,544	3.24
Tertiary Industry (mil RM)	6,786	31,355	4.62				

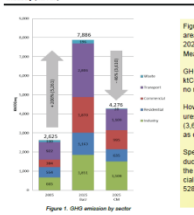


Figure 1. GHG emission by sector

Table 2: Energy demand, GHG and emission intensity of the MBJB area

Unit	2005	2025 BaU	2025CM	2025BaU/2005	2025CM/2005	2025CM/2025BaU
Final energy demand (ktoe)	681.23	1,934.97	1,157.62	2.97	1.78	0.60
GHG emissions (ktCO$_2$eq)	2,625.04	7,886.26	4,276.03	3.00	1.63	0.54
Per capita CO$_2$ emissions (tCO$_2$eq)	5.78	8.58	4.64	1.48	0.80	0.54
GHG intensity (ktCO$_2$eq / mil RM)	0.26	0.19	0.10	0.74	0.40	0.54

Pasir Gudang Scenario 2025

It is envisioned that by 2025, the MPPG area will support the concentration of Liquid and Bulk Cargo Port Activities, Warehouse and Distribution Activities, Manufacturing, Petrochemical and Oleo-chemical Industries, Oil and Gas, Palm Oil Plantation & Agro-Business.

Economic Structure

- Gross Domestic Product (GDP) of the MPPG area in 2025 is expected to be RM29,118 (3.6 times of the performance in 2005).
- The share of future primary industry sector in MPPG will decrease from 2% (2005) to 1% (2025).
- Secondary industry sector's share is expected to remain constant to 75% for 2025 and remain as a key economic sector in MPPG.
- Tertiary industry sector will increase from 23% (2005) to 24% (2025)

Socio-Economy

- Population in the MPPG area in 2025 is expected to increase 329,509 (2.16 times compared to 2005).
- Number of households in the MPPG area will increase from 152,564 (2005) to 329,509 (2025).
- GDP per capita of the MPPG area is expected to increase from RM 52,961 (2005) to RM 88,369 (2025)

Transportation

- Passenger transport demand in MPPG area will increase from 895 million passenger-kilometres (2005) to 5,391 million passenger-kilometres (2025).
- Freight transport demand will increase from 1,873 million tonne-kilometres (2005) to 5,365 million tonne-kilometres (2025).

Table 1: Estimation Results of Scenario Quantification in 2025, MPPG

Scenario Quantification	2005	2025	2025/2005	Scenario Quantification	2005	2025	2025/2005
Population	152,564	329,509	2.16	No. of households	34,859	75,289	2.16
GDP (mil RM)	8,080	29,118	3.60	GDP per capita (RM)	52,961	88,369	1.67
Primary Industry (mil RM)	134	231	1.72	Passenger Transport Demand (mil p-km)	895	5,391	6.02
Secondary Industry (mil RM)	6,048	21,832	3.61	Freight Transport Demand (mil t-km)	1,873	5,365	2.86
Tertiary Industry (mil RM)	1,899	7,055	3.72				

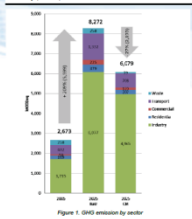


Figure 1. GHG emission by sector

Table 2: Energy demand, GHG and emission intensity of MPPG region

Unit	2005	2025 BaU	2025CM	2025BaU/2005	2025CM/2005	2025CM/2025BaU
Final energy Demand(ktoe)	659	2,200	1,809	3.34	2.75	0.82
GHG emissions (ktCO$_2$eq)	2,673	8,272	6,079	3.40	2.27	0.74
Per capita CO$_2$ emissions (tCO$_2$eq)	17.5	25.1	18.4	1.45	1.05	0.73
GHG intensity (ktCO$_2$eq / mil RM)	0.33	0.28	0.21	0.85	0.64	0.75

Low Carbon Society Brochures for 5 Municipalities within IM

Local Action Plan: Cover and Theme (Example)

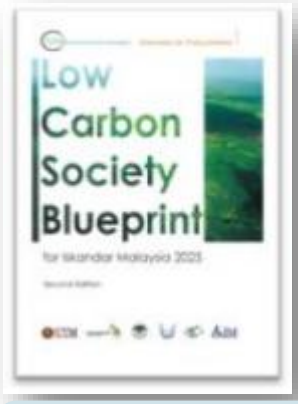
Johor Bahru	Johor Bahru Tengah	Pasir Gudang	Kulaijaya	Pontian
Vibrant world class cosmopolis of the south	***Green livable city & creative innovation belt***	***Green & clean industrial port city***	***Smart integrated logistic hub***	***Clean energy and agro-biodiversity hub***

Training in JB, August 2015

Training in Phnom Penh, September 2015

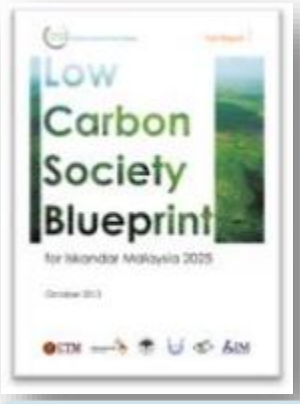
Low Carbon Society for Iskandar Malaysia Publications

2012



Low Carbon Society Blueprint for Iskandar Malaysia 2025- Summary for Policymakers

2013



Low Carbon Society Blueprint for Iskandar Malaysia 2025- Full Report

2013

A Roadmap towards Low Carbon Iskandar Malaysia 2025

2013

Iskandar Malaysia: Action for a Low Carbon Future

2014

Low Carbon Society Brochures for 5 Municipalities within IM

COP 18, Doha

MOA, 2012

MOA, 2013

COP 19, Warsaw

COP 20, Lima

11th December 2012
The PM endorses the launching of LCSBPIM at COP 18 during MoA

6th November 2013
The PM launched Actions for a Low Carbon Future during MoA


PARLIMEN
MALAYSIA


UNITED NATIONS
CLIMATE CHANGE


KEMPEN 3R & PENGKOMPOSAN SISA MAKANAN
DI FELDA TAIB ANDAK


ECO-LIFE


"FutureCity" Initiative
Cabinet Office
UTM


SUSTAINABLE & LOW CARBON
SCHOOLS EXHIBITION 2013


United Nations
Climate Change Conference 2012
COP18·CMP8


UNIVERSITI TEKNOLOGI MALAYSIA


4 JULY 2011
@ THE PUTERI PACIFIC HOTEL JOHOR BAHRU
SYMPOSIUM ON LOW CARBON ASIA
RESEARCH PROJECT
&

Media Highlights 2013-2014 (LCS AND IM)


BORNEO POST online
THE LARGEST ENGLISH NEWS SITE IN BORNEO

Najib lancar buku panduan pastikan kualiti hidup lebih baik penduduk Wilayah Iskandar


THE STAR ONLINE
all in or nothing

Community

CHOO FORCE — EXECUTIVE AIDE-DE-CAMP

Johor to reduce power consumption in support of low carbon society

NUSAJAYA: Johor is making a pledge to reduce power consumption at all state government buildings here at least by 5% to show its support and commitment to the low carbon society.


京都大学

AIC approves "Low Carbon Society Blueprint for Iskandar Malaysia 2025" formulated by international research team including Kyoto University (20 March, 2014)

The "Low Carbon Society Blueprint for Iskandar Malaysia 2025," an action plan for the realization of a low carbon society formulated by an international team of researchers from Kyoto University, Universiti Teknologi Malaysia, and other institutions was formally approved on March 20, 2014. Endorsement was granted by the Approval and Implementation Committee (AIC)*. This is the first example of a practical formulation of a low carbon blueprint at the regional level (equivalent to Japan's prefectural level) in an ASEAN country, and it is expected to become a model for creating low carbon cities in Asian nations.


新系统优化城市交通
依区明年管制车流量
低碳社区蓝图计划之一
减碳环保防天灾


NEW STRAITS TIMES
EDITORIAL
Online MBA
by UK & US BUSINESS SC
1,000 trees planted in Iskandar
KBU Enrol now for July intake 03-7727 3200
GO GREEN: Residents of Sungai Buluh Recreational Park plant tree saplings to reduce the carbon footprints


'Services, logistics investments rising'
BULLISH MOOD: Iskandar has been enjoying 7pc-8pc annual growth, says Irda head
MUHAMMED AHMAD HAMDAN

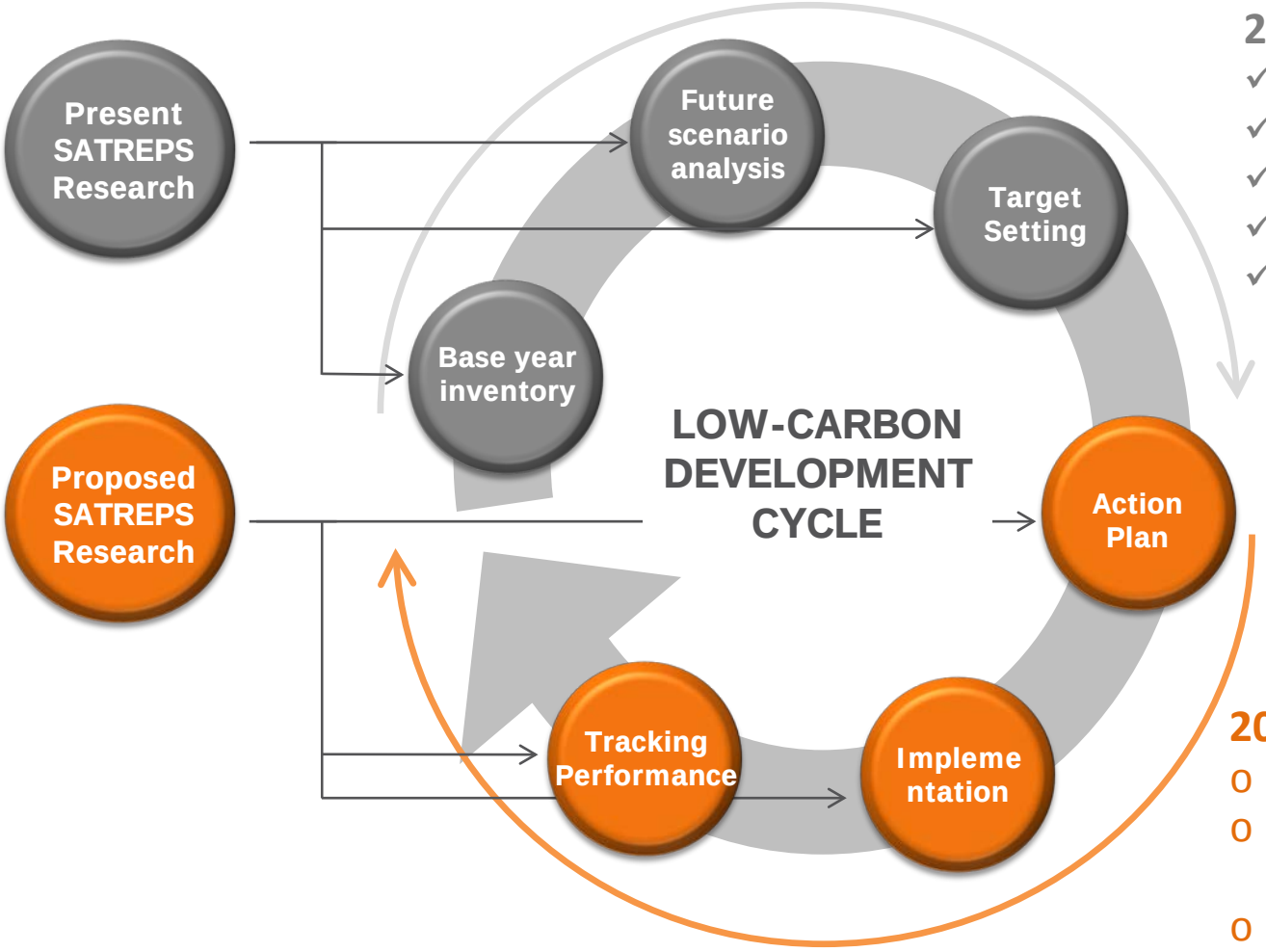

BUSINESSTODAY
MDV
The Nation's Leadin
Need financing for technology
Iskandar Malaysia Aiming to be Low Carbon City
ISKANDAR


theSundaily
Low Carbon Cities (Part 2) - Iskandar's unique blueprint


Iskandar Malaysia akan lancar sistem pengurusan mobiliti
KUALA LUMPUR: Pihak Berkuasa Wilayah Pembangunan Iskandar akan memperkenalkan sistem pengurusan mobiliti di Iskandar Malaysia pada suku pertamatahun depan, kata Ketua Eksekutifnya Datuk Ismail Ibrahim.


Practices of Iskandar Economic Zone, Malaysia
Low Carbon Society Blueprint for Iskandar Malaysia

(The importance of Implementation and Monitoring)



2011 - 2016

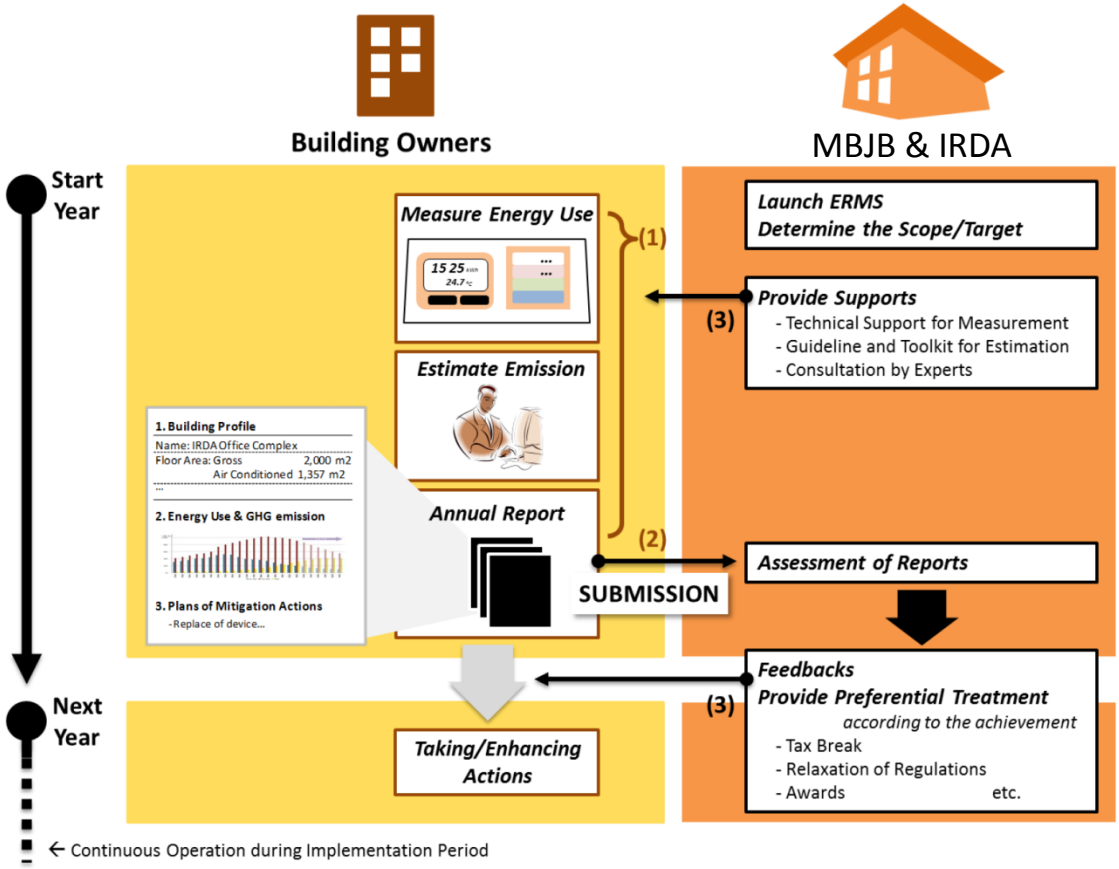
- ✓ LCS baseline study
- ✓ LCS scenario development
- ✓ GHG modelling
- ✓ LCS policy design
- ✓ IM (regional) level action plan

2016 - 2021

- o City level detailed action plan
- o Sectorial specific strategic mitigation
- o Adaptation
- o Carbon monitoring

Example of Inventory
Building energy reporting system
- Low Carbon Society Johor Bahru 2025

BERMS (Building Energy Reporting and Monitoring System)



(1) The proposed system requests building owners to measure their energy consumption, estimate emissions and create action plans for mitigation.
(2) Building owners submit reports summarizing their energy usage, emissions and actions to the authorities annually.
(3) IRDA and/or 5LAs assess(s) the achievements of actions, provide(s) feedbacks and supports to encourage building owners to take actions.

CASBEE : PILOT PROJECT

CASBEE Japan

Adaptation / Customisation

Assessment criteria

CASBEE Iskandar

Local Context

- Climate
- Socio-cultural
- Technology
- Governance

Malaysia on track for sustainable development SDG 2030

- **UN2030 Agenda – Priority for people economy**
- Malaysia **reaffirms its commitment** to meet UN 2030 Agenda for Sustainable development
- **Inclusiveness and sustainable development** has long been the heart of Malaysia transformation from **developing economy to achieving high income status by 2020**

United Nations Sustainable Development Summit 2015
25 – 27 September 2015, New York

Malaysia on track to become high-income nation by 2020: 29 SEPTEMBER 2015
: http://www.nst.com.my/news/2015

KUALA LUMPUR LOW CARBON SOCIETY BLUEPRINT 2030

SCIENCE INTO POLICY – LOW CARBON CITY DEVELOPMENT

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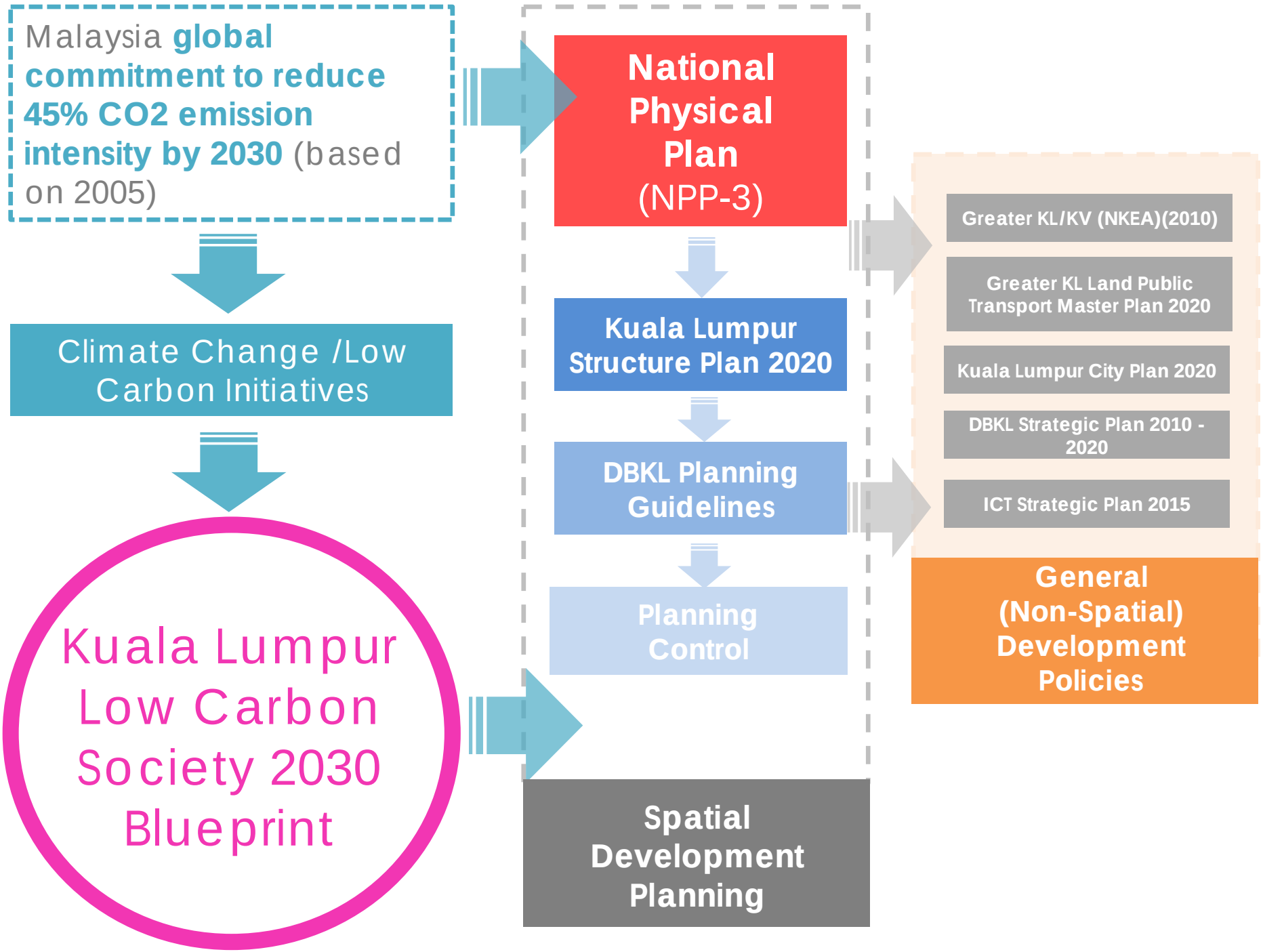
Malaysia global commitment to reduce 45% CO2 emission intensity by 2030 (based on 2005)
Climate Change /Low Carbon Initiatives
Kuala Lumpur Low Carbon Society 2030 Blueprint
National Physical Plan (NPP-3)
Kuala Lumpur Structure Plan 2020
DBKL Planning Guidelines
Planning Control
Spatial Development Planning
Greater KL/KV (NKEA)(2010)
Greater KL Land Public Transport Master Plan 2020
Kuala Lumpur City Plan 2020
DBKL Strategic Plan 2010 - 2020
ICT Strategic Plan 2015
General (Non-Spatial) Development Policies

Framework of KL LCS 2030

KL LCSBP 2030 framework towards achieving World Class Sustainable City 2020.

List of 17 Sustainable Development Goals (SDGs)
2030 by United Nations (UN)

Concluding remarks

- **Role of research communities** towards NDC development and implementation is by working **collaborating with policy makers with good methodology, baseline study with models and develop scenarios for policy makers to make better objective decision.**
- AIMS contribution to science based policy making and implementation of **LCS blueprint / LCS action plan with the help of AIMs models**
- Effective implementation of low carbon measures at city level needs **multi disciplinary professional input and multi stakeholders** and **buy in.**
- Low carbon measures has to relate **to local co benefits** (safety, income generation or increase in property value, health improvement, better air quality, saving from commuting, stronger community engagement and interaction)
- **S2A (Science to Action) paradigm** can facilitates the formulation and implementation of **science-based policies for low-carbon developme**nt in the Asian region order to realise a sustainable future based on a stabilised climate.
- **Monitoring PDCA cycle involving inventory and reporting system** are important component of S2A

Thank You Terima Kasih 谢谢 धन्यवाद ありがとう

Thank you for your attention!

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