



3rd International Forum On Sustainable Future in Asia

Seri Pacific Hotel Kuala Lumpur, Malaysia on Jan 23-24 2018

Science to Policy actions (S2A) in Pursuing Low Carbon Development for Sustainability in Malaysian Cities

Chin Siong Ho, LW Chau and Gabriel Ling

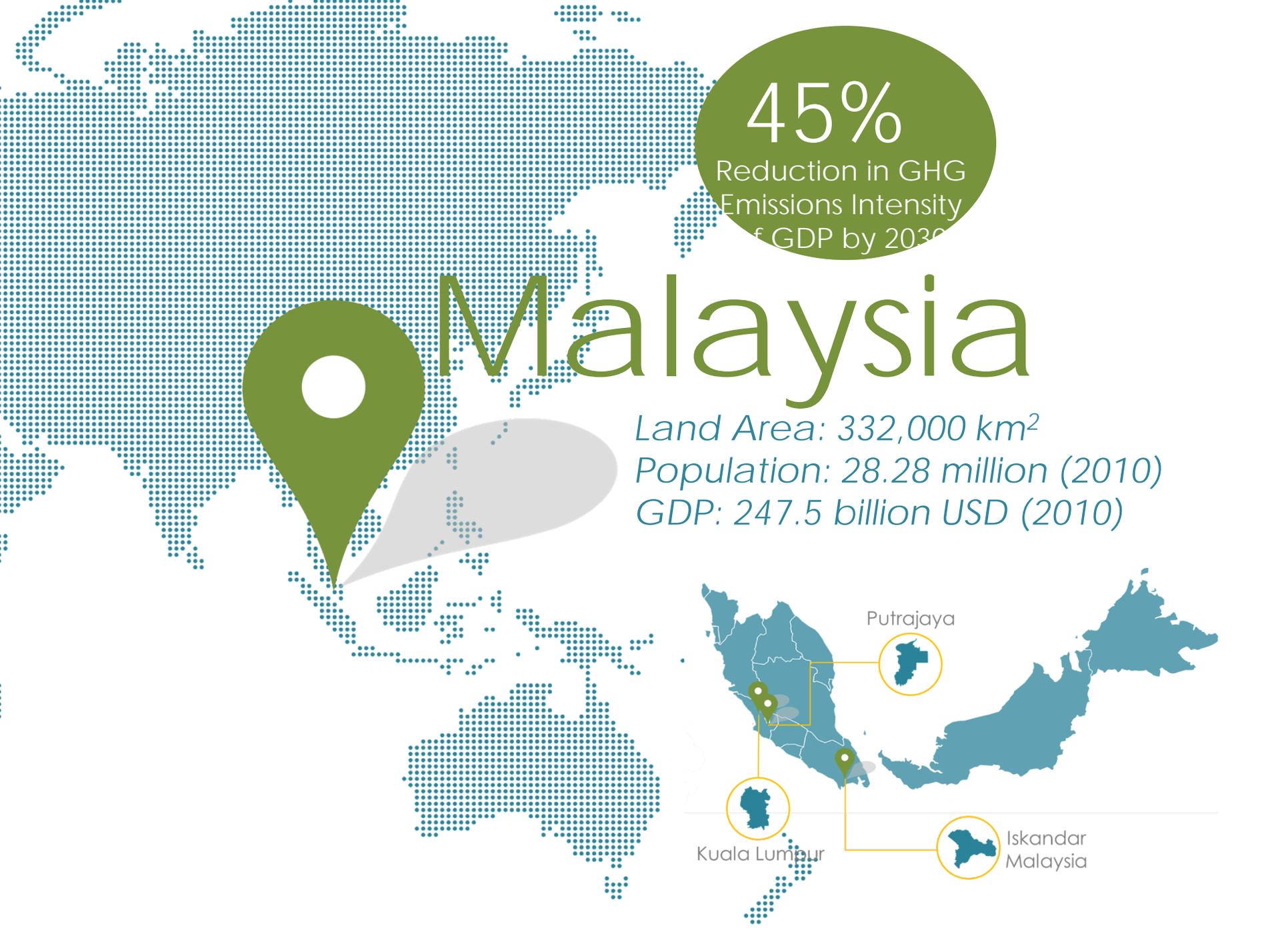
UTM-LOW CARBON ASIA RESEARCH CENTRE

DEPARTMENT OF URBAN AND REGIONAL PLANNING

FACULTY OF BUILT ENVIRONMENT

UNIVERSITI TEKNOLOGI MALAYSIA





45%

Reduction in GHG
Emissions Intensity
of GDP by 2030

Malaysia

Land Area: 332,000 km²

Population: 28.28 million (2010)

GDP: 247.5 billion USD (2010)



UTM-LOW CARBON ASIA RESEARCH CENTRE

Department of Urban and Regional Planning, Faculty of Built Environment, Universiti Teknologi Malaysia

PROJECTS

2017

PENGERANG LOW CARBON SOCIETY 2030 INCEPTION REPORT
KUALA LUMPUR LOW CARBON SOCIETY 2030 BLUEPRINT

2016

KUALA LUMPUR LOW CARBON SOCIETY 2030 INTERIM REPORT
KUALA LUMPUR LOW CARBON SOCIETY 2030 INCEPTION REPORT
CASBEE ISKANDAR FOR BUILDING (TECHNICAL MANUAL PILOT VERSION 2016)
CASBEE ISKANDAR FOR CITY/MUNICIPAL (TECHNICAL MANUAL PILOT VERSION 2016)
CASBEE ISKANDAR FOR URBAN DEVELOPMENT (TECHNICAL MANUAL PILOT VERSION 2016)

2015

LOW CARBON SOCIETY ACTION PLAN 2025 JOHOR BAHRU 2025 : VIBRANT WORLD CLASS COSMOPOLIS OF THE SOUTH
LOW CARBON SOCIETY ACTION PLAN 2025 JOHOR BAHRU TENGAH 2025 : GREEN LIVABLE CITY AND CREATIVE INNOVATION BELT
LOW CARBON SOCIETY ACTION PLAN 2025 KULAI 2025 : SMART INTEGRATED LOGISTIC HUB
LOW CARBON SOCIETY ACTION PLAN 2025 PASIR GUDANG 2025 : GREEN AND CLEAN INDUSTRIAL CITY
LOW CARBON SOCIETY ACTION PLAN 2025 PONTIAN 2025 : CLEAN ENERGY AND AGRO-BIODIVERSITY HUB
CASBEE-ISKANDAR PILOT PROJECT

2014

LOW CARBON SOCIETY BLUEPRINT FOR ISKANDAR MALAYSIA THIRD EDITION - SUMMARY FOR POLICYMAKERS
PASIR GUDANG GREEN AND SMART CITIES
ISKANDAR MALAYSIA ECO-LIFE CHALLENGE 2014

2013

LOW CARBON SOCIETY SCENARIOS MALAYSIA 2030
LOW CARBON SOCIETY BLUEPRINT FOR ISKANDAR MALAYSIA 2025 - SUMMARY FOR POLICYMAKERS SECOND EDITION
LOW CARBON SOCIETY BLUEPRINT FOR ISKANDAR MALAYSIA 2025 - FULL REPORT
ISKANDAR MALAYSIA : ACTION FOR A LOW CARBON FUTURE

2012

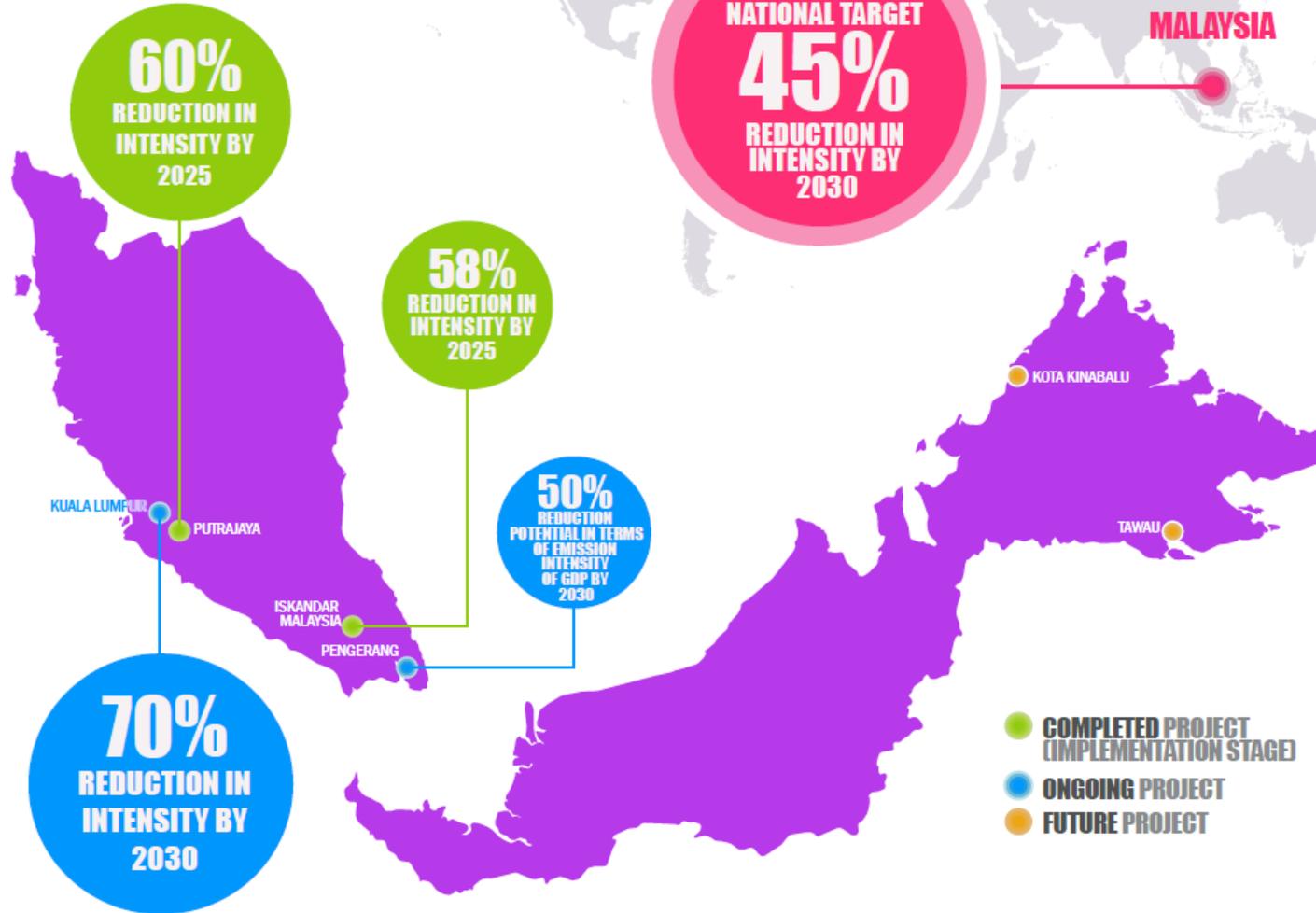
LOW CARBON SOCIETY BLUEPRINT FOR ISKANDAR MALAYSIA 2025 - SUMMARY FOR POLICYMAKERS 1ST EDITION

2011

PUTRAJAYA GREEN CITY 2025

2009

LOW CARBON CITY 2025 : SUSTAINABLE ISKANDAR MALAYSIA



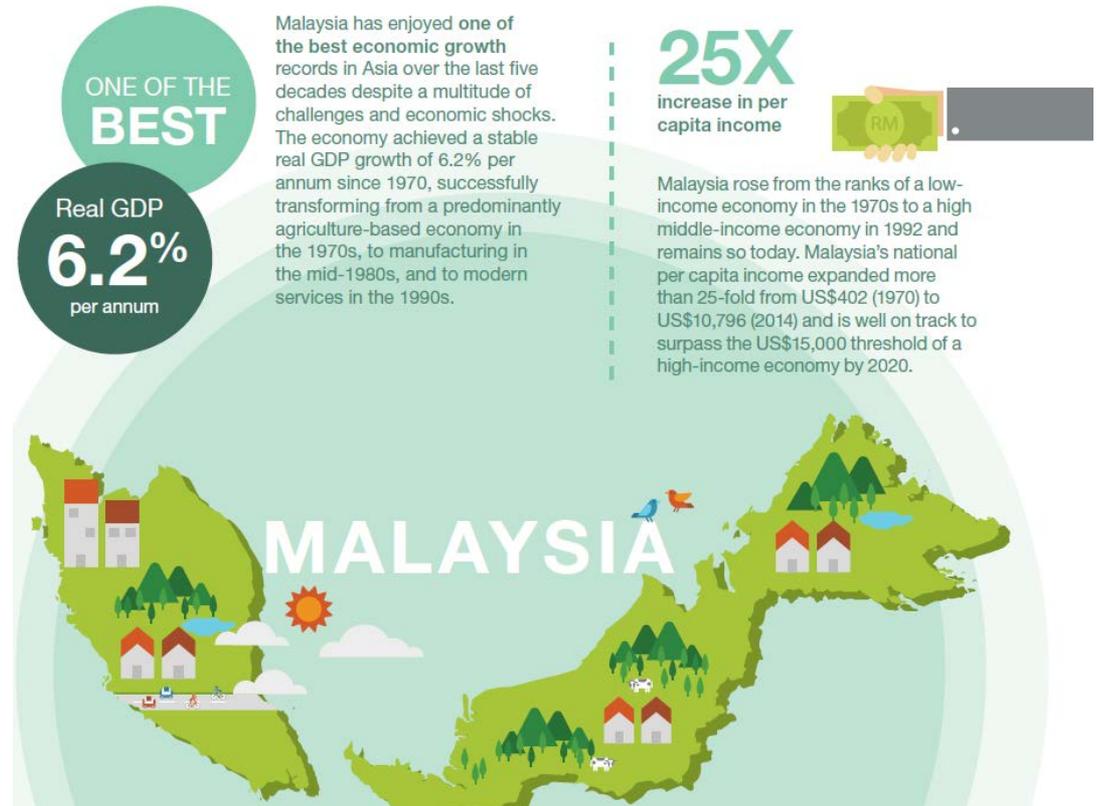
In retrospect

Malaysia- background

Journey realizing Vision 2020- A fully developed nation along all dimensions – economically, politically , socially, psychologically and culturally by 2020.

Themes related to low carbon development

- Digital nation,
- Green growth cities
- Competitive cities
- Promote biodiversity
- Environmental awareness
- Enable energy plan,
- Inclusiveness,
- Enable energy plan

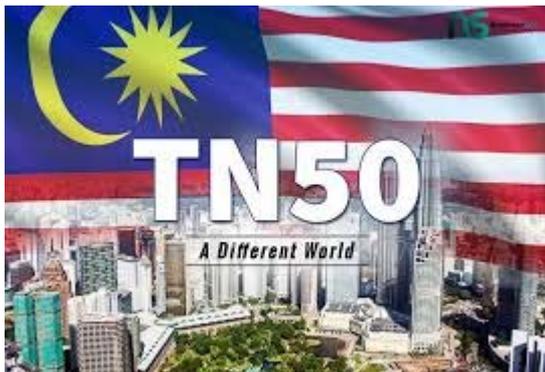


	CO2 emission ('000metric tons	CO2 per capita metric ton	Carbon intensity Kg / kg oil equiv
1990	56,593	3.1	2.6
2000	216,804	7.7	3.0
2010	295,000	9.2	4.2

TN50

NATIONAL TRANSFORMATION 2050

TN50 is a long term initiatives to chart Malaysia's future- shaped by the aspirations of its citizens –towards the year 2050. Ultimately TN50 aspires for Malaysia to become **Top 20 nation in economic development, social advancement and innovation by 2050**



NASIONAL TRANSFORMATION 2050

A VERY DIFFERENT WORLD IN 2050

2000

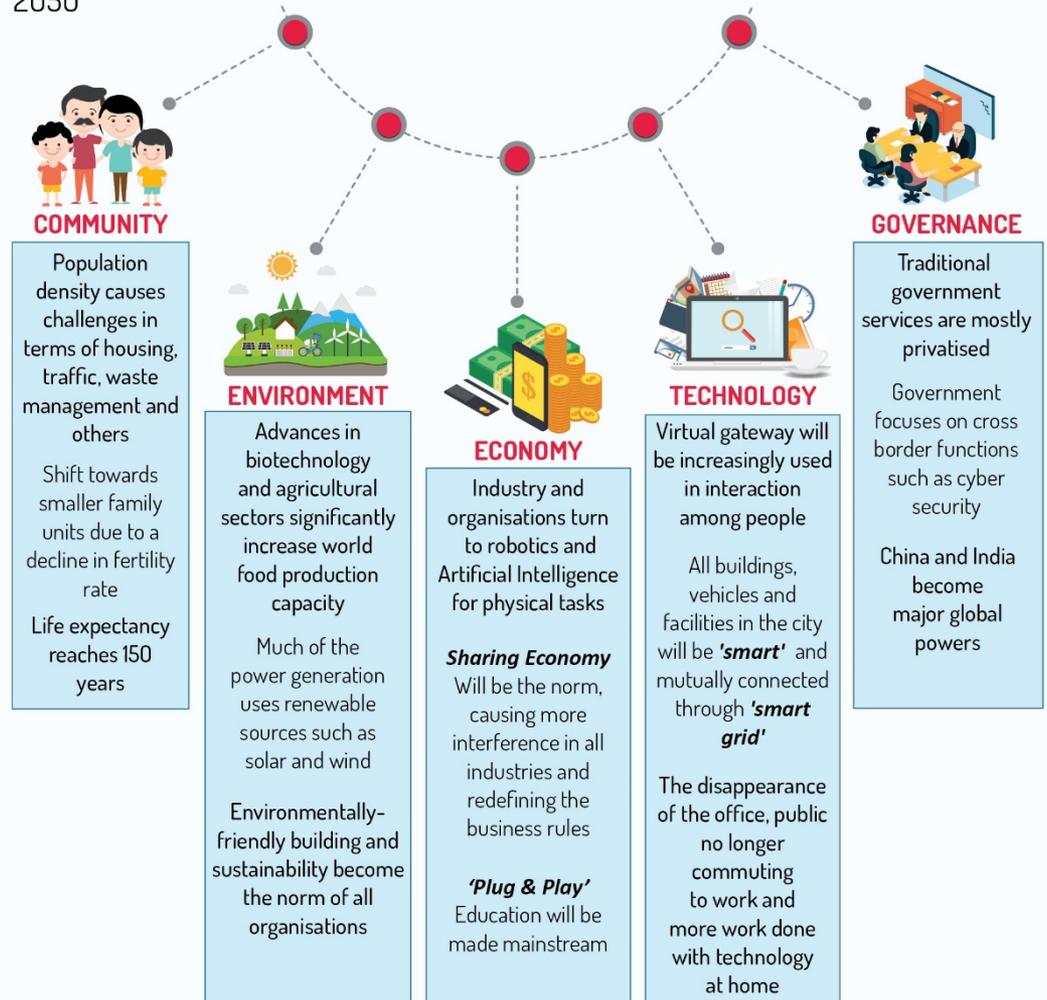
22 mobile phones per 100 people
23million population
62 percent urbanisation rate

2020

158 mobile phones per 100 people
32million population
78 percent urbanisation rate

2025

40million population
99 percent urbanisation rate



Eleventh Malaysia Plan 2016-2020

Green Growth Policy

INVESTING IN COMPETITIVE CITIES- Major Shifts

- ❑ **Economic Density**
 - -Increase Density
- ❑ **Urban Form**
 - Transit Oriented Development (TOD)
- ❑ **Resource usage**
 - - Efficient SWM
- ❑ **Housing**
 - -Quality and Affordable
- ❑ **Industry Focus**
 - Knowledge Intensive Industries
- ❑ **Role of Local authorities**
 - - Strategic drivers of local economy and social development

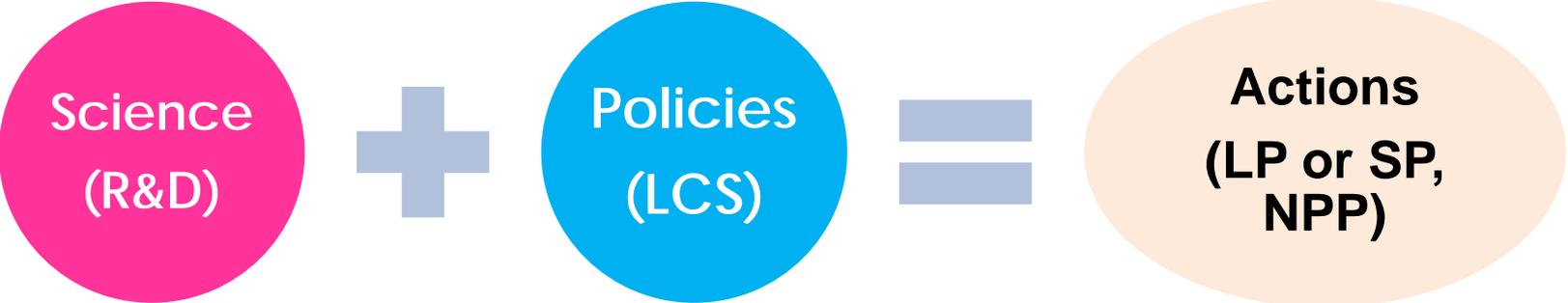
Shift away from 'grow first and clean up later' development model towards one that is **resilient, low carbon, resource efficient and socially inclusive.**

Why is green growth important for Malaysia?

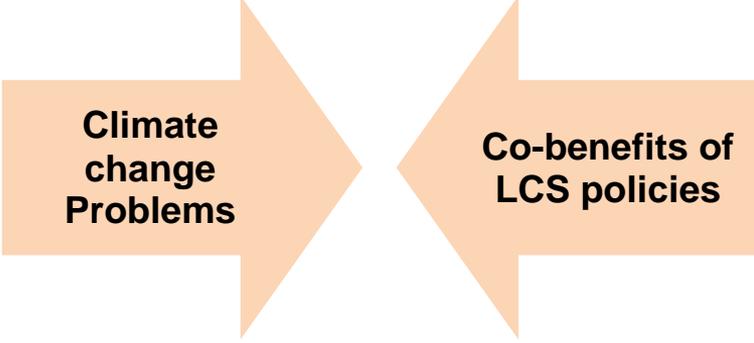
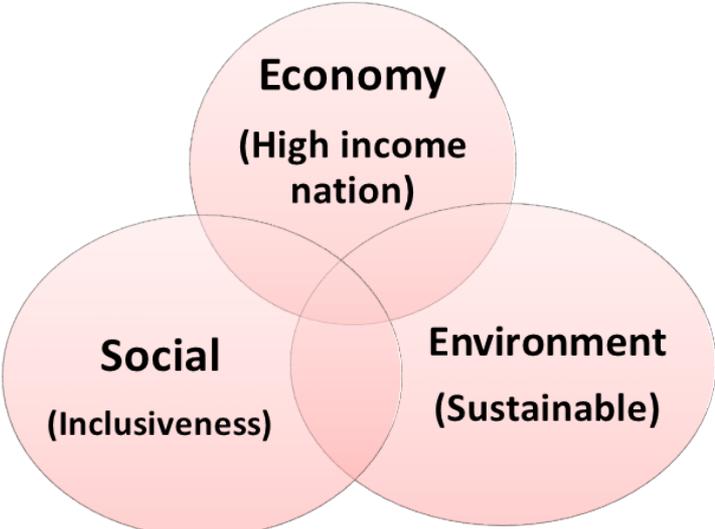
- Increasing **intensity and frequency of extreme** weather events.
- Malaysia's **commitment to renew and increase its commitment to the environment and long-term sustainability**
- Application of **Green Technology ? As Strategic industry**

Harnessing contribution of Science and Technology

Sustainable development approach/ Climate Actions



Key Elements of Sustainable Development
= PRO GROWTH, PRO JOB , PRO POOR and PRO ENVIRONMENT



Promoting resilient, low carbon, resource efficient and socially inclusive development

Importance of S2A (SCIENCE to ACTION)

for objective and informing green Low carbon policy

EVIDENCE based

- Science provide evidence and objective based result for Policy making

OPTIMAL CHOICE

- Scenario based research help better understanding – Baseline modelling

PARTICIPATORY

- Science facilitates Consensus Building / FGD identifying local issues

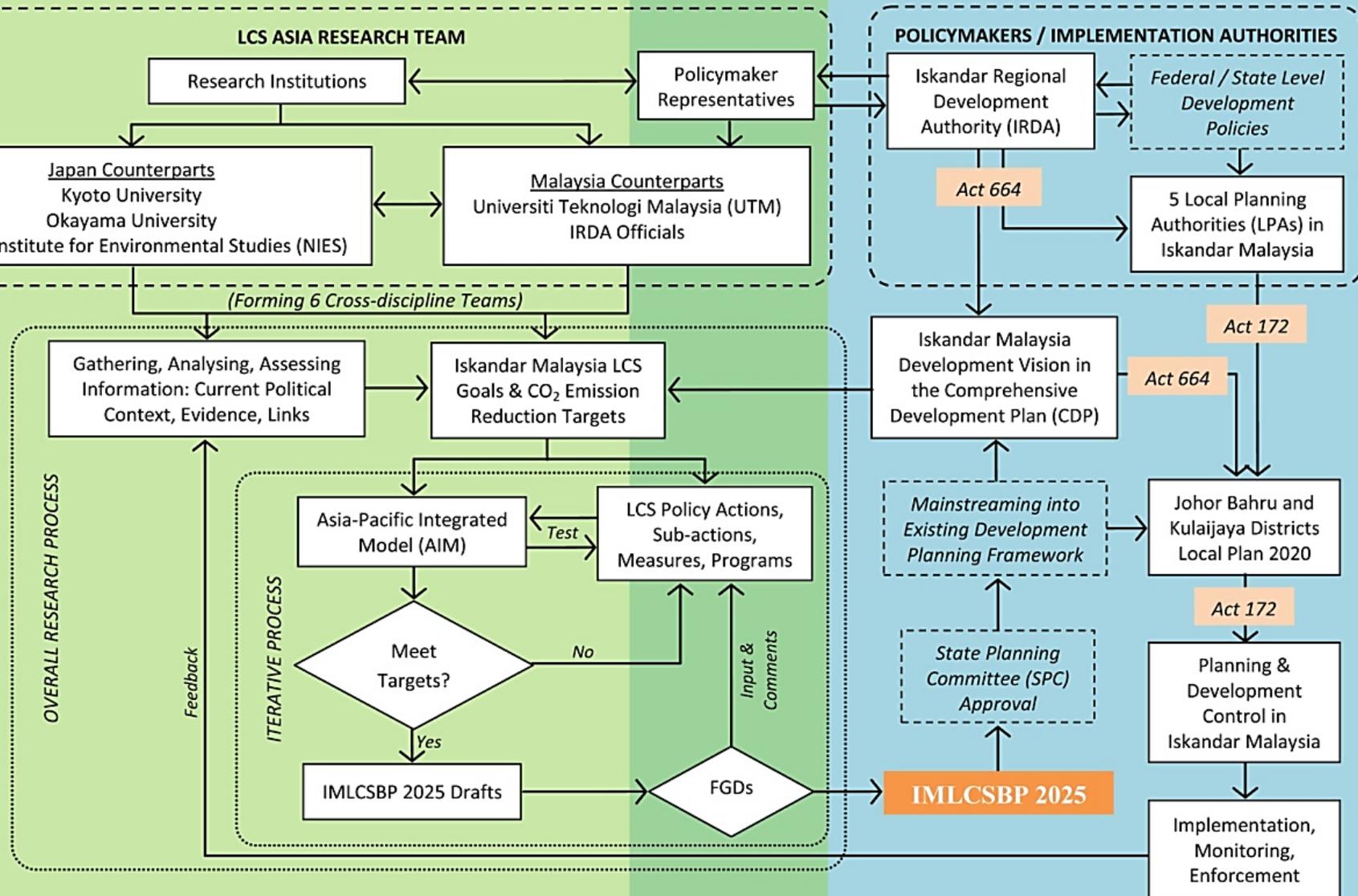
INTERDISPLINARY

- Highly technical issues needs interdisciplinary approach.

IMLCSBP2025 : Science to Action

LCS SCIENCE / RESEARCH REALM

ISKANDAR MALAYSIA POLICY REALM



CASE STUDY 1 -ISKANDAR MALAYSIA ECONOMIC CORRIDOR



FLAGSHIP A

- JOHOR BAHRU CITY CENTRE**
- Central Business District (CBD) as heritage and cultural city
 - Customs, Immigration and Quarantine Complex (CIQ)
 - Johor – Singapore Causeway

FLAGSHIP B

- NUSAJAYA**
- Kota Iskandar
 - EduCity
 - Medical Park
 - International Destination Resort
 - Southern Industrial & Logistics Clusters (SILC)
 - Puteri Harbour

FLAGSHIP C

- WESTERN GATE DEVELOPMENT**
- Port of Tanjung Pelepas (PTP)
 - Tanjung Bin Power Plant
 - 2nd Link Access to Singapore
 - RAMSAR World Heritage Park
 - Tanjung Piai – Southernmost Tip of Mainland Asia
 - Maritime Centre

FLAGSHIP D

- EASTERN GATE DEVELOPMENT**
- Tanjung Langsat Industrial Complex
 - Johor Port
 - Tanjung Langsat Port
 - Pasir Gudang Industrial Park

FLAGSHIP E

- SENAI-SKUDAI**
- Senai Airport City
 - Senai High-Tech Park
 - Sedenak Industrial Park
 - MSC Cyberport City
 - Johor Technology Park
 - University Technology Malaysia (UTM)



BASELINE/ POLICY DOCUMENTATION : IMLCSBP2025 : TBL/ ACTION THEMES

MEASUREMENT / MODELLING/
 BASELINE
 IMLCS ACTIONS : Potential CO₂
 Reduction

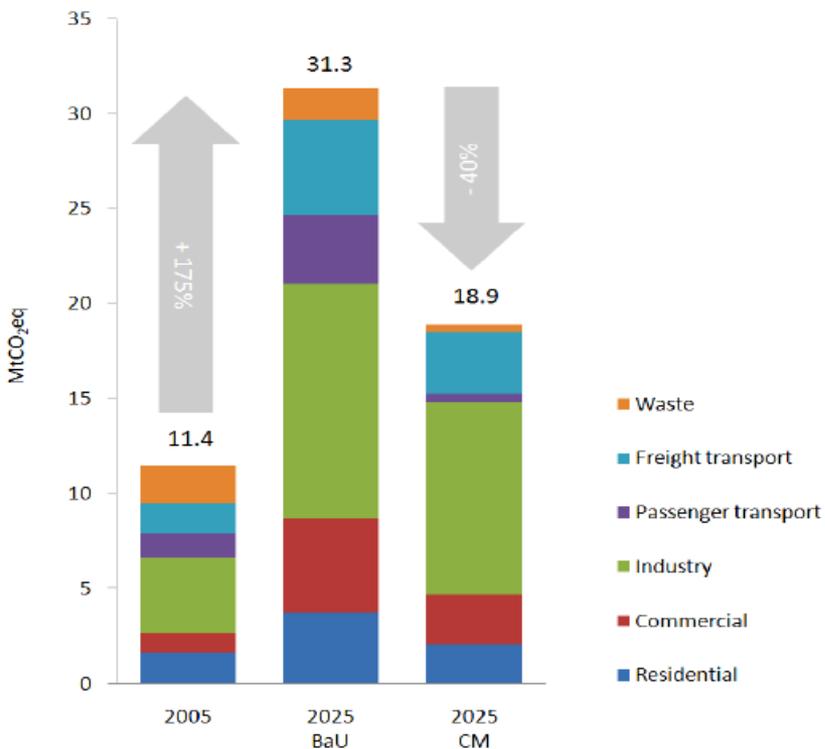


Figure 1: GHG emissions by sectors

	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 Urban Growth	
10	Green and Blue Infrastructure & Rural Resources	
11	Sustainable Waste Management	
12	Clean Air Environment	

2,216 km²

1.64 million people (2010)

3 million people (2025)

Iskandar Malaysia

Main southern development corridor in Johor, Malaysia

58%

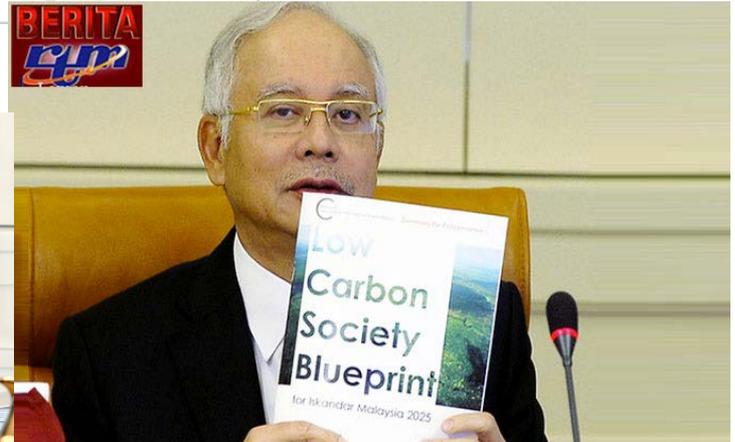
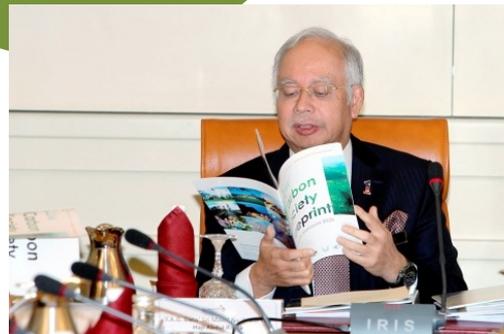
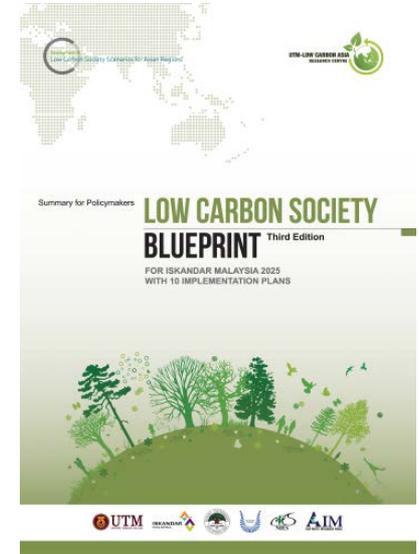
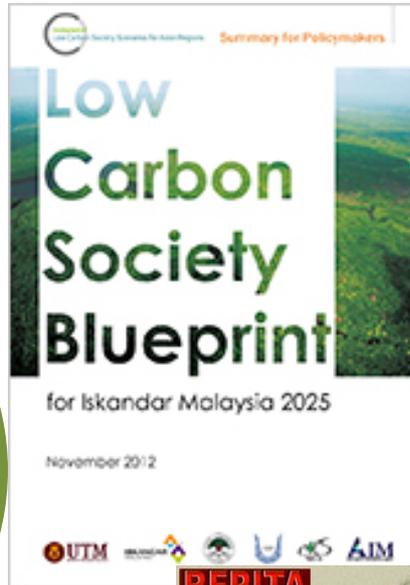
Reduction in GHG Emissions Intensity of GDP by 2025

12

Actions

281

Programs



United Nations Climate Change Conference

DOHA 2012
UN CLIMATE CHANGE CONFERENCE
COP18|CMP8

IMPLEMENTATION AT LOCAL LEVEL

Iskandar Malaysia LCS Blueprint 2025



Iskandar Malaysia

main southern development corridor in
Johor, Malaysia

**High level endorsement
PM and MB Johor launched the
Low Carbon Society Action Plans on
Dec 15 2015 during the Meeting of
Authority (MoA) in Putrajaya**



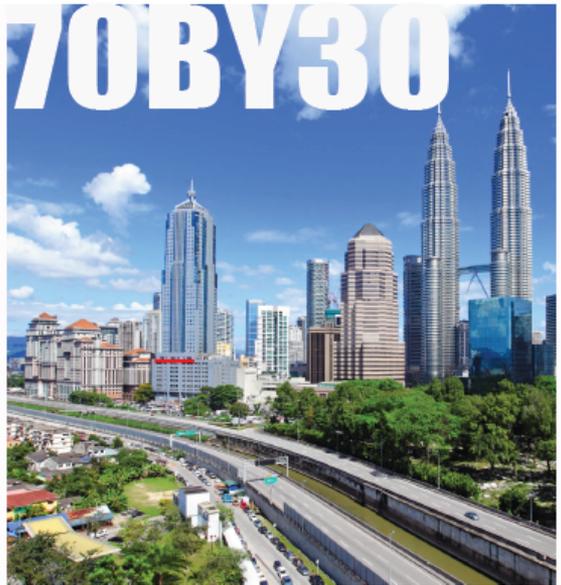
Local authorities' commitment for Implementation

The 5 local authorities in Iskandar region - Low Carbon Society in the Making



Low Carbon Action Plans for 5 local authorities in Iskandar Malaysia @ Kota Iskandar
Officially Handed Over to Datuk Bandar and YDPs of 5LAs/PBTs
By MB Johor – 25 Feb 2016

GREENER BETTER KUALA LUMPUR



BASIC PROFILE

Area
242km² (24,221 hectares)

Population
(2010) 1,674,621
(2020 Projected) 2,198,400
(2030 Projected) 2,488,399

Gross Domestic Product
RM 84,852 million (2010)
RM 227,621 million (2020)
RM 399,013 million (2030)

Location
On the central west coast of Peninsular Malaysia, enclave within the State of Selangor and Klang Valley

Function
National capital of Malaysia. One of the major cultural, commercial, education, entertainment, financial, healthcare and tourism centres of Asia.



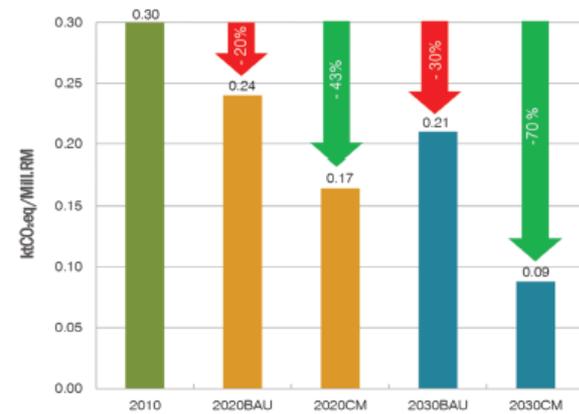
KUALA LUMPUR LOW CARBON SOCIETY BLUEPRINT 2030



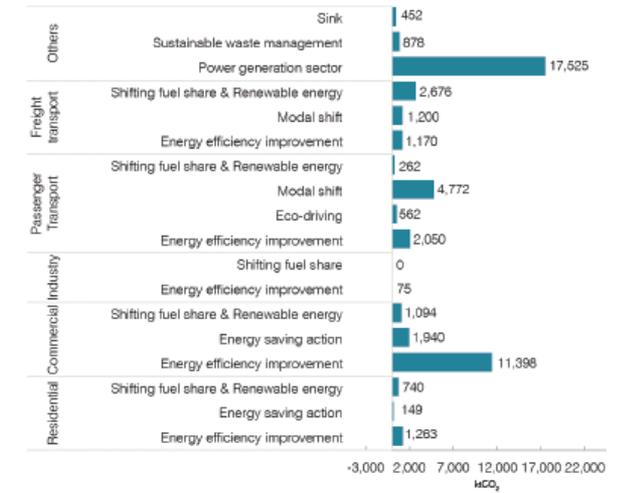
ROAD TO ACHIEVING 70 BY 30 GOAL

Current Vision KLSP 2020 Draft KLCP 2020	WORLD CLASS CITY 2020		
LCS Vision for Kuala Lumpur	WORLD CLASS SUSTAINABLE CITY 2030 70 by 30: A Greener Better Kuala Lumpur		
Triple Bottom line of sustainability	Economy	Social	Environment
Thrusts	Thrust 1 Prosperous, Robust and Globally Competitive Economy	Thrust 2 Healthy, Creative Knowledgeable and Inclusive Community	Thrust 3 Ecologically Friendly Liveable and Resilient Built Environment
Sustainable Development Goals 2030	Goals: 1,2,7,8,9,11,12,13,17	Goals: 3,4,5,10,11,12,13,16,17	Goals: 6,11,13,14,15,17
New Urban Agenda Transformative Commitments	Sustainable and Inclusive urban prosperity and opportunities for all	Sustainable urban development for social inclusion and ending poverty	Environmentally sustainable and resilient urban development
Key Principles Draft KL City Plan 2020	World-class Business Environment	World-class Working Environment	World-class Living Environment
KL Low Carbon Society Actions	World-class Governance		
	Green Growth	Community Engagement and Green Lifestyle	Low Carbon Green Buildings
	Energy Efficient Spatial Planning	Sustainable Water and Wastewater Management	Green and Blue Network
	Green Mobility		Sustainable Waste Management
Sustainable Energy System	Green Urban Governance		

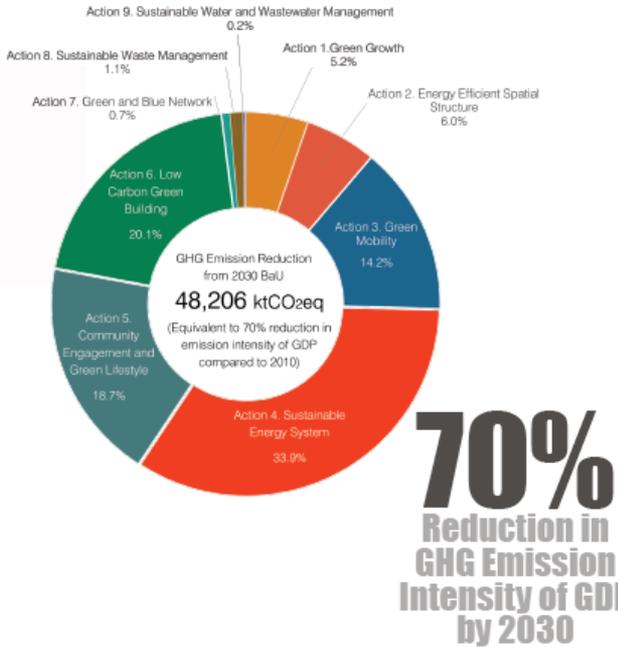
GHG EMISSION INTENSITY BY GDP



MITIGATION POTENTIAL OF KUALA LUMPUR 2030

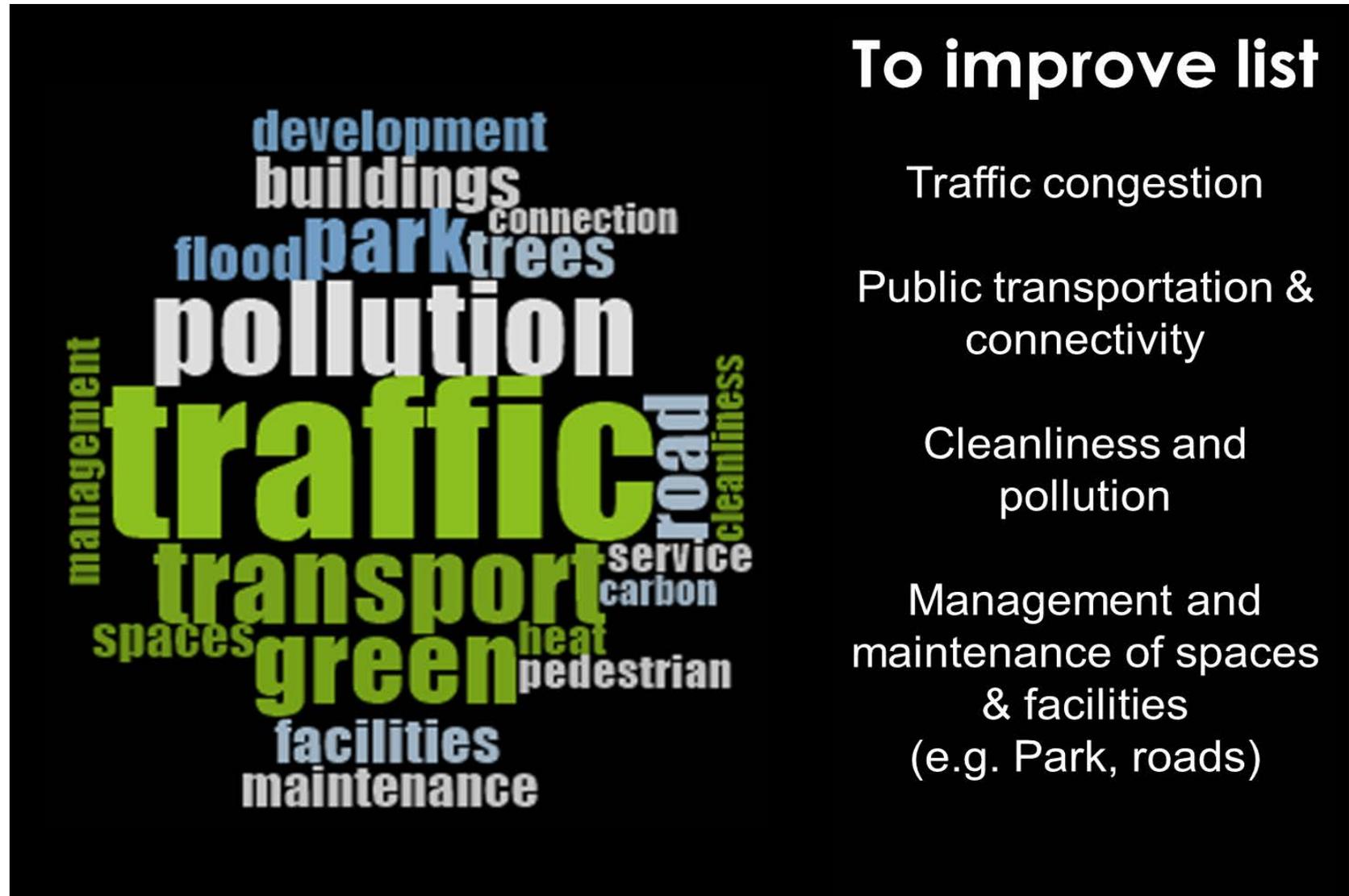


EMISSION REDUCTION CONTRIBUTION BY ACTION



OUTCOME FROM Focus Group Discussion 1

PROJECT EVALUATION THROUGH FGD



To improve list

Traffic congestion

Public transportation & connectivity

Cleanliness and pollution

Management and maintenance of spaces & facilities (e.g. Park, roads)

OUTCOME FROM FGD2 – Wish list/ programs

ROADMAP OF KL LCSBP 2030

WHAT? Action, sub-action, measures and programs in Kuala Lumpur Low Carbon Society Blueprint 2030

To identify implementation timeline for each programs based on the result of ranking in the previous FGD (FGD2).

WHEN? The timeline of implementation are arranged into three; short term (2015-2020), medium term (2021-2025) and long term (2026-2030)

Based on FGD2 feedbacks, the result of ranking are use to indicate the scores (high, medium, low) for each program.

WHO? To identify potential actor/ caretaker for each program and supporting agencies (Office in charge/ Supporting agency/ implementer.

OUTCOME FROM FGD 3

ROADMAP OF KL LCSBP 2030

Responsible KLCH Dept. :

KLCH department with primary responsibility for initiating, coordinating, liaising with relevant external agencies, monitoring, and/or approving implementation of programs

Partners:

Technology providers, funding agencies or entities, and relevant government agencies with approving authority for, and/or statutory duty of regulating, facilitating and overseeing implementation of programs

Implementers:

Agencies, entities and/or parties that implement, or are needed to implement, programs due to the statutory duty, ownership rights, institutional responsibility, and/or effective serving of communal interests

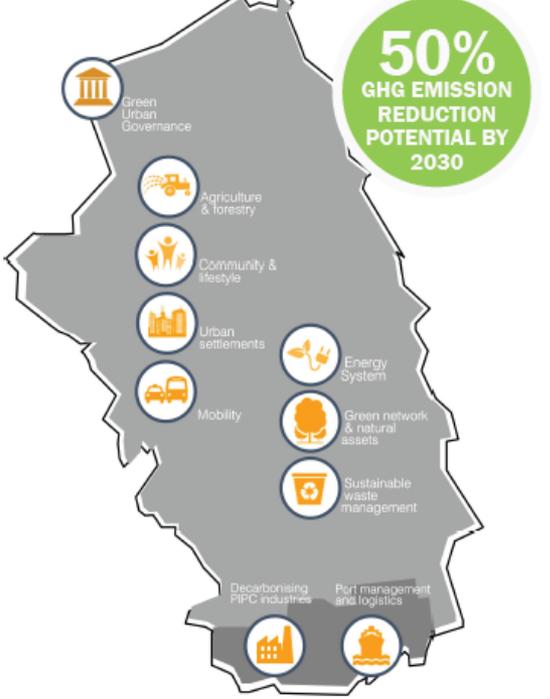


CLEAN | GREEN SAFE | SMART PENGERANG

PENGERANG LOW CARBON SOCIETY BLUEPRINT 2030

Pengerang Low Carbon Society Blueprint 2030 (PLCSBP2030) aims to provide a clear policy framework with implementation programmes to achieve low carbon development that enhances the economy, empowers communities and conserves the environment in the Pengerang Local Authority administrative area towards realising a Clean, Green, Safe and Smart Pengerang.

Based on the overall framework, PLCSBP 2030 focuses on 10 LCS Actions that provide a clear scope for measuring, assessing and mitigating greenhouse gases (GHG) emissions in Pengerang



**50%
GHG EMISSION
REDUCTION
POTENTIAL BY
2030**

BASIC PROFILE OF PENGERANG

Population
86,632 (2010),
128,500 (2020),
251,771 (2030)

Gross Domestic Product
RM1,321 mil (2010)

Area
Pengerang : 1,288.3 km²
Pengerang Integrated Petrochem Complex: 83.35 km²

Location
At the southern east coast of Peninsular Malaysia, within the State of Johor

Function
Regional Oil & Gas Storage and Trading Hub, Tourism Industries and Eastern Johor Economic Corridor.

Economy of Pengerang 2010

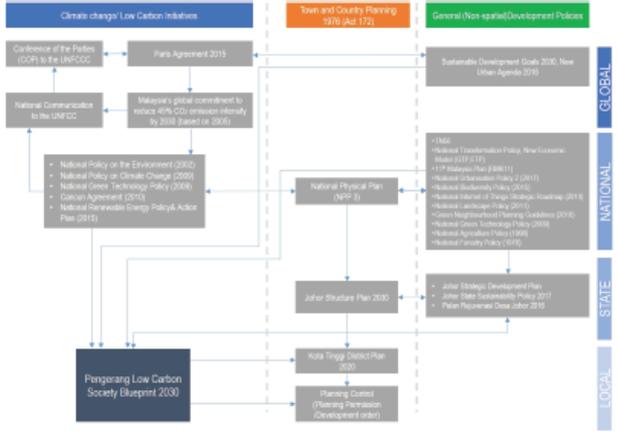
Economy		
Pengerang GDP	RM 1,320.95 mil.	
Johor GDP	RM 52,748 mil.	
Johor Per capita GDP	RM 15,247	
Malaysia GDP	RM 559,554 mil.	
Pengerang/Malaysia GDP	0.24%	
Pengerang/Johor GDP	2.50%	
Economy (by sector)		
Sector	RM (mil.)	%
Primary (Mil. RM)	1215.27	92
Secondary (Mil. RM)	50.20	2
Tertiary (Mil. RM)	55.48	6

Pengerang Land use 2010

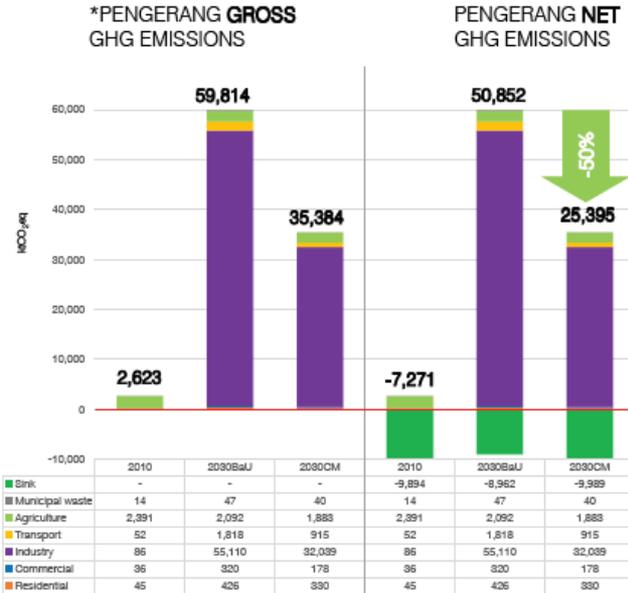
Land use	Area (hectare)	%
Residential	16,653.96	12.93
Commercial	3,327.71	2.56
Industrial	5,975.61	4.64
Open space and recreational area	835.30	0.65
Public facilities	1,228.80	0.95
Infrastructure and utilities	483.90	0.38
Transportation	4,211.62	3.27
Forest	11,670.41	9.06
Agriculture and aquaculture	78,750.58	61.13
Water bodies (including river)	5,692.12	4.42
Total	128,830.00	100

PENGERANG LCS DEVELOPMENT PATHWAY

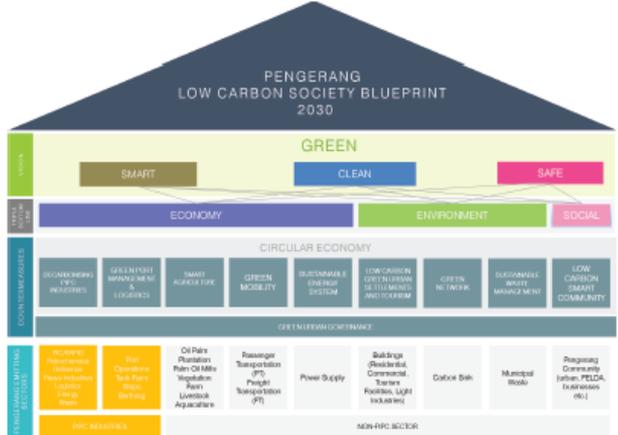
Policy Context of PLCSBP 2030



Pengerang GHG Emission 2010, 2030BaU & 2030CM (Preliminary result)



Overall Framework of PLCSBP 2030



Note: *Pengerang's Gross GHG Emission do not account for carbon sink exist in Pengerang. NB: Subject to change pending availability of more detailed data and in depth analysis. Not advised for adoption as official figures. Source: PLCSBP 2030 study, October 2017

Unit	2010	2030BaU	2030CM	2030BaU/2010	2030CM/2010	2030CM/2030BaU
Final energy demand (ktoc)	87	14,470	12,115	166.32	139.25	0.84
GHG emissions (ktCO ₂ e)	-7,271	50,852	25,395	**22.80	**13.49	0.50
Per capita CO ₂ emissions (tCO ₂ e)	-83.58	201.18	100.47	**7.81	**4.66	0.50
GHG Intensity (tCO ₂ e / M.RM)	-5.50	0.42	0.21	**0.25	**0.15	0.50

Note: **Gross GHG emission values are used instead of Net GHG emission to compute this preliminary result for 2030BaU/2010 and 2030CM/2010 columns, for "GHG emissions", "Per capita CO₂ emissions" and "GHG intensity". Source: PLCSBP 2030 study, October 2017

Case study of Pengerang as East Johor Economic Corridor

Why Pengerang? **Strategic location** at the south-east tip of Peninsular Malaysia...

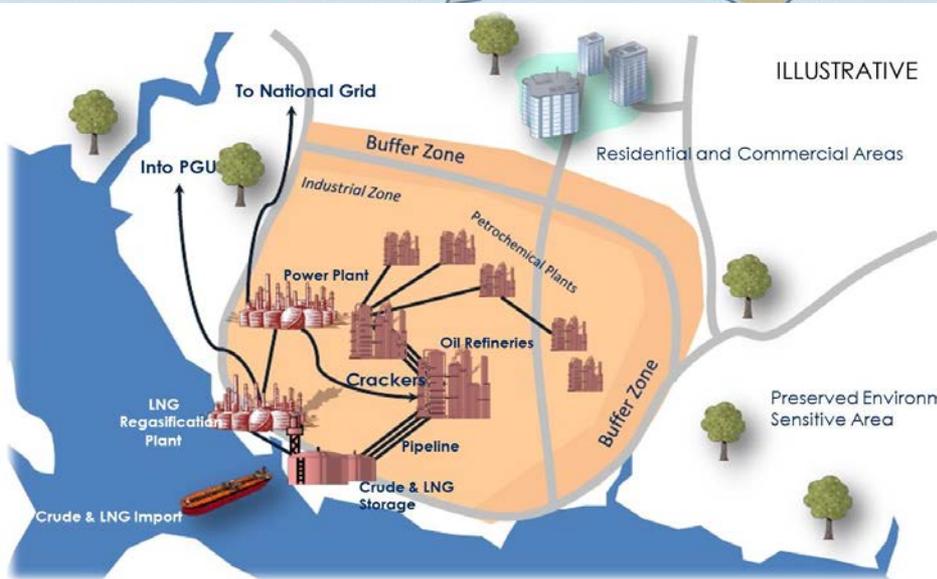


Strategic Location

- Access to existing major **international shipping lanes**.
Middle East – Singapore – China
- Proximity to an existing major trading hub; **Adjacent to Singapore**
- **Deep water of -24m** enables VLCCs and ULCCs
- **Very few Environmentally Sensitive Areas** (ESAs) which are easily preserved

- Low negative socioeconomic impact
- **Relatively unpopulated** leading to minimal population relocation
- **Safe and sheltered harbour**
- No breakwater required with sufficient seagoing passage for VLCCs and ULCCs
- Availability of sufficient development land
- **A single candidate plot in excess of 20,000 acres**

PENGERANG LOW CARBON SOCIETY BLUEPRINT 2030



SCOPE OF PLCSBP 2030



**1. DECARBONISING
PIPC INDUSTRIES**



**2. GREEN PORT
MANAGEMENT
& LOGISTICS**



**3. SMART
AGRICULTURE**



**4. GREEN
MOBILITY**



**5. SUSTAINABLE
ENERGY
SYSTEM**



**6. LOW CARBON
GREEN URBAN
SETTLEMENTS**



**7. GREEN
NETWORK**



**8. SUSTAINABLE
WASTE
MANAGEMENT**



**9. LOW CARBON
SMART
COMMUNITY**



**10. GREEN
URBAN
GOVERNANCE**

1st FOCUS GROUP DISCUSSION

PROPOSED FGD1 MAIN COMPONENTS:

**Proposed Tagline
For PLCSBP 2030**

50 by 30:

**PENGERANG CAN
REDUCE ITS
CARBON INTENSITY
54% BY 2030**

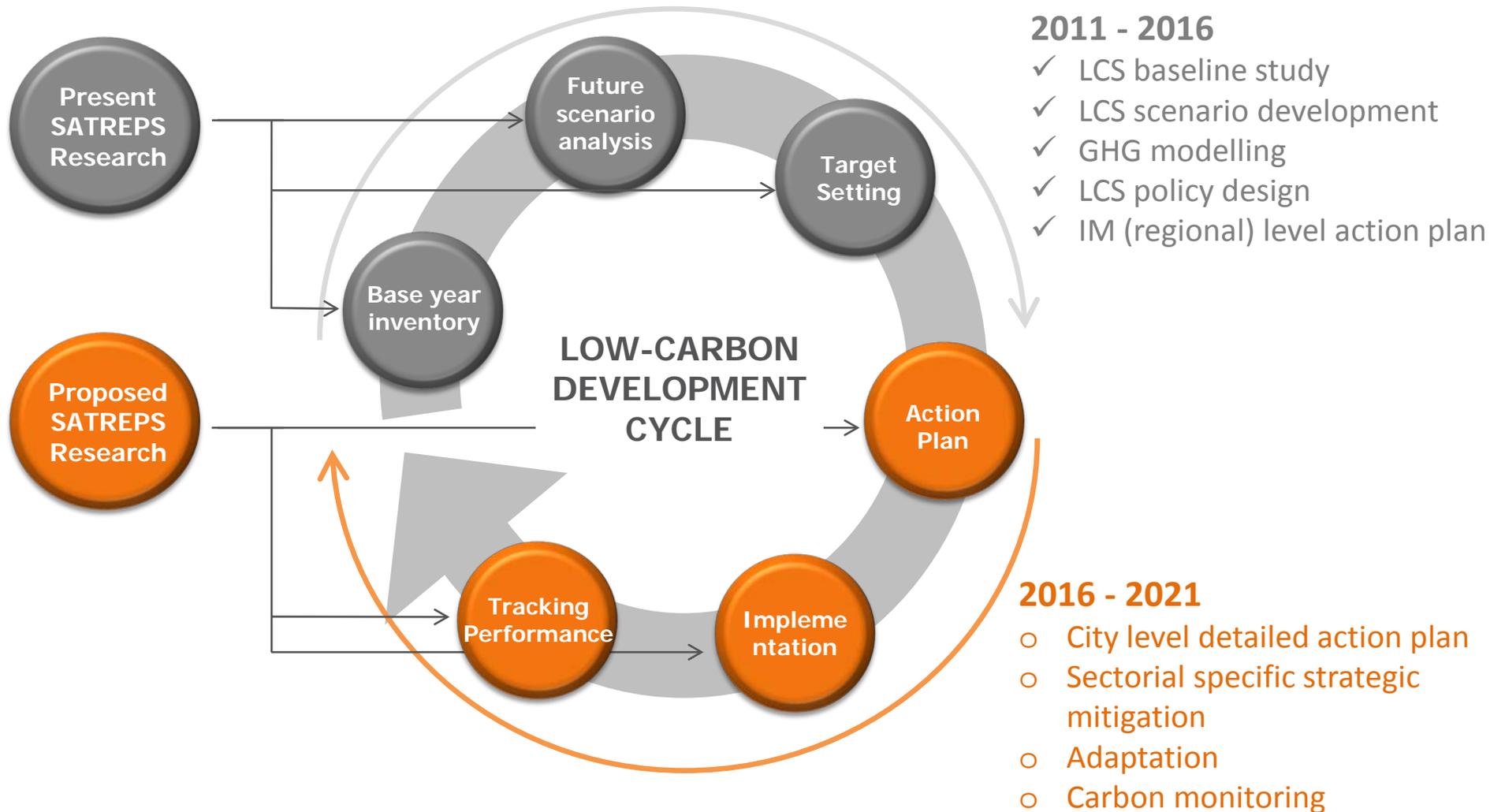
Clean

Green

Safe &
Smart



THE IMPORTANCE OF IMPLEMENTATION AND MONITORING



Changing Mindset / buy in stakeholders – Low carbon development actions at local level in Malaysia (Science to Action (S2A))



Starts

Year 2005 with 1 school to all public elementary schools (177) in Kyoto City in year 2010 (until 2011)
 Year 2013 with 23 schools to all public primary schools (226) in Iskandar Malaysia in 2015

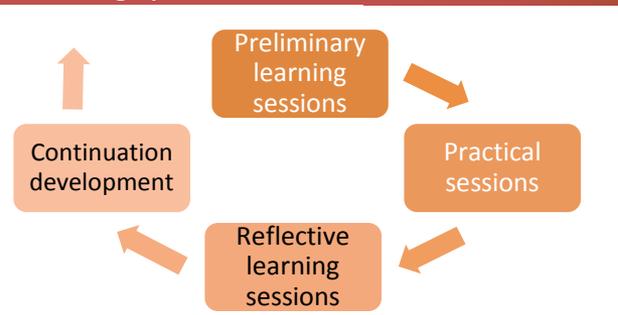
Partnership / organization

Kyoto City Council, Kyoto City Board of Education, KIKO Network, Miyako Ecology Centre
 Johor State Education Department (JPNJ), IM KIKO, Iskandar Regional Development Authority (IRDA), Universiti Teknologi Malaysia (UTM)

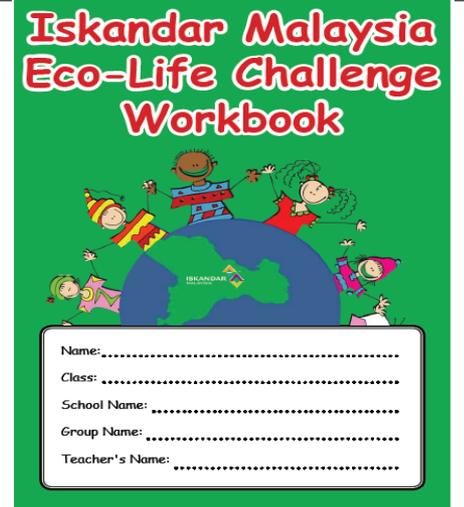
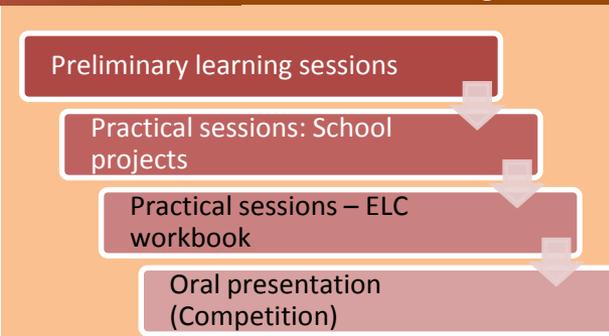
Participants

4th to 6th graders (age 10-12) in all public elementary schools
 Standard 6 students (age 12) in all public primary schools, as post-UPSR programme

Learning cycle



Learning format



IMELC focuses on energy household accounting. School children track the energy consumption, waste generation and management, travelling choices, frugal consumption and utilizing renewable energy resources (sunlight). The aim is to raise children's awareness level on low carbon aspects.

FINDINGS

The findings showed that there is a **concrete and practical steps for low carbon transformation for developing countries.**

Low carbon and resilient development initiatives can be strategically **integrated with the existing development agenda** to further promote urban sustainability.

"Science to Action" (S2A) is the way forward towards creating low carbon futures, i.e. ensuring good, **scientifically grounded and community-rooted LCS policies are materially acted upon**, yielding real cuts in GHG emissions with simultaneous **socioeconomic co-benefits** for the *people*.

Consideration are

- existing **policy direction, geographical setting, political cultural, socio-economic, financial capacity** and human capital are essential for **climate change plan formulation.**

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UTM-LOW CARBON ASIA
RESEARCH CENTRE



REGIONAL CENTRE OF EXPERTISE
ON EDUCATION FOR
SUSTAINABLE DEVELOPMENT



ACKNOWLEDGED BY



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Environmental
Studies

IGES

Institute for Global
Environmental Strategies



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PLANMalaysia



ENGINEERING TECHNOLOGY AND
BUILT ENVIRONMENT CLUSTER



CLIENTS



ISKANDAR
REGIONAL
DEVELOPMENT
AUTHORITY



北九州市
CITY OF KITAKYUSHU



ECO-IDEAL
CONSULTING SDN BHD

Thank you for your attention!

Thank You Terima Kasih 谢谢 धन्यवाद ありがとう