



LCS-RNet 11th Annual Meeting at ENEA Headquarter (Rome) on 17-18 October 2019

Technology transfer and international collaboration to achieving Low
Carbon Societies DAY 1 session 1-1

IMPLEMENTATION OF NEW TECHNOLOGIES IN MALAYSIA TO ACHIEVING LOW CARBON SOCIETIES-INNOVATION, CAPACITY BUILDING AND STAKEHOLDER INVOLVEMENT.

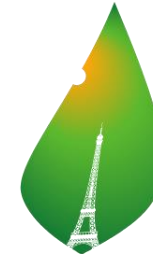
Chin Siong Ho

*UTM-Low Carbon Asia Research Centre
Department of Urban and Regional Planning
Faculty of Built Environment
Universiti Teknologi Malaysia*



Background

Asian and Malaysia cities : Key Challenges



PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

Voluntary
45%
reduction of
CO₂
emission
intensity by
2030



Size: 330,803 km²

Population: 32 mil. (2016) | 1.32%pa growth rate

GDP: 1.321 tril. RM (2016) 5% p.a growth rate

Issues

- Rapid urbanization and industrialization (7%pa)
- Relatively high carbon intensity dependence on fossil fuel (80%^)
- High private car ownership (15% public)
- Low density development and urban sprawl
- Low efficiency appliances and Renewable energy (5%)

Government Policy Directions

- _ National Green Technology Policy
- _ National Policy on Climate Change
- _ National Renewable Energy Policy and Action Plan
- _ National Policy on the Environment
- _ 11th Malaysia Plan (2016-2020)
- _ Green Neighborhood Planning Guideline
- _ Low Carbon Cities Framework and Assessment System
- Localisation of SDG 2030

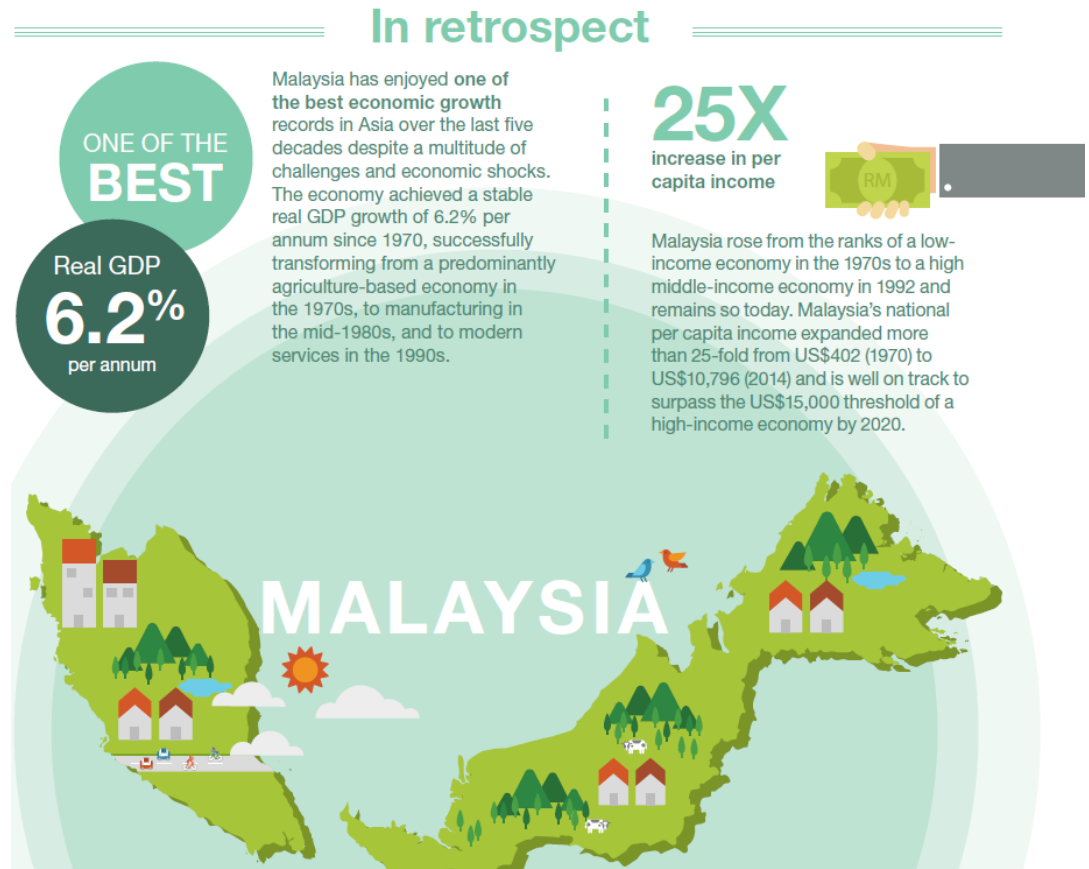
AUSTRALIA

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,
- SDG 2030



	CO2 emission ('000metric tons)	CO2 per capita metric ton	Carbon intensity kg CO2eq/RM
2000	222,990	9.5	0.62 (source NC2 2010)
2014	317,626	10.3	0.3137 kg (source NC2 2018)

ASIAN URBAN PROBLEMS and technology transfer On Climate Actions to achieve Low carbon society – EE , RE, SWM and Transport

Material and Energy technology



Mobility and Green technology



ASIAN URBAN PROBLEMS and technology transfer On Climate Actions to achieve Low carbon society – Green economy, governance and capacity building

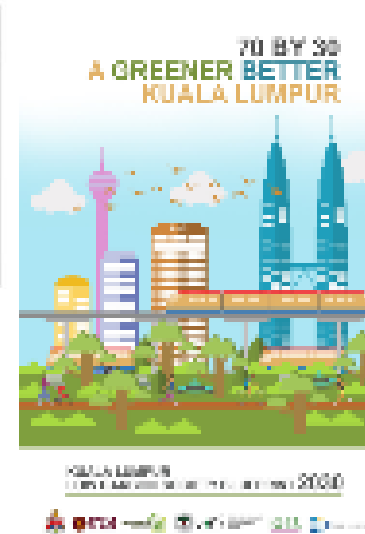
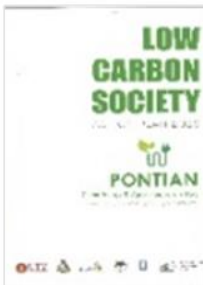
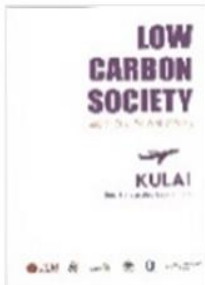
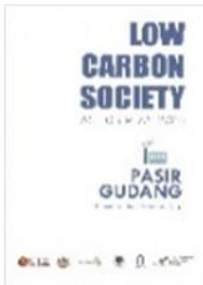
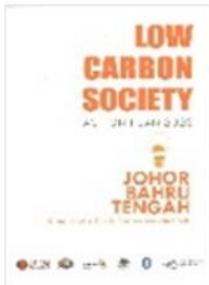
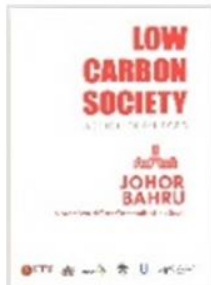
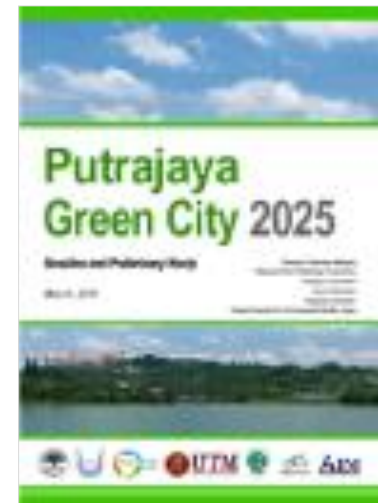
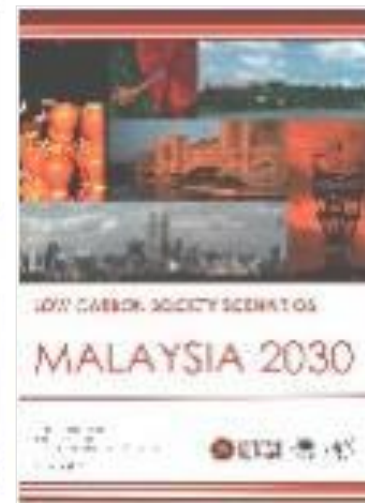
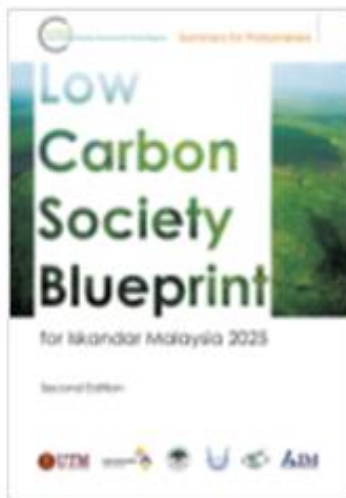
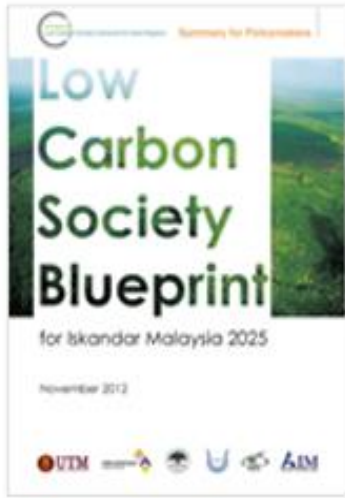
Social/ People



Economy/ Engine of Growth



Selected Climate Action Plans by UTM-LCARC



2009-2018

UTM-LCARC Research Approach

S2A

We believe in

Science

to Action

in making

Low Carbon Society

a Reality

UTM-LCARC S2A Approach



Pro-Growth

SCIENCE

Baseline Inventory &
Scenario Development

GHG Modelling

Community / Stakeholder
Engagement

Policy Framework

POLICY- MAKING

Political / Corporate Buy-ins

Mainstreaming

Capacity
Building

Pro-Job

Pro-Env.

Policy Review

Reporting

Monitoring

Tracking

ACTION

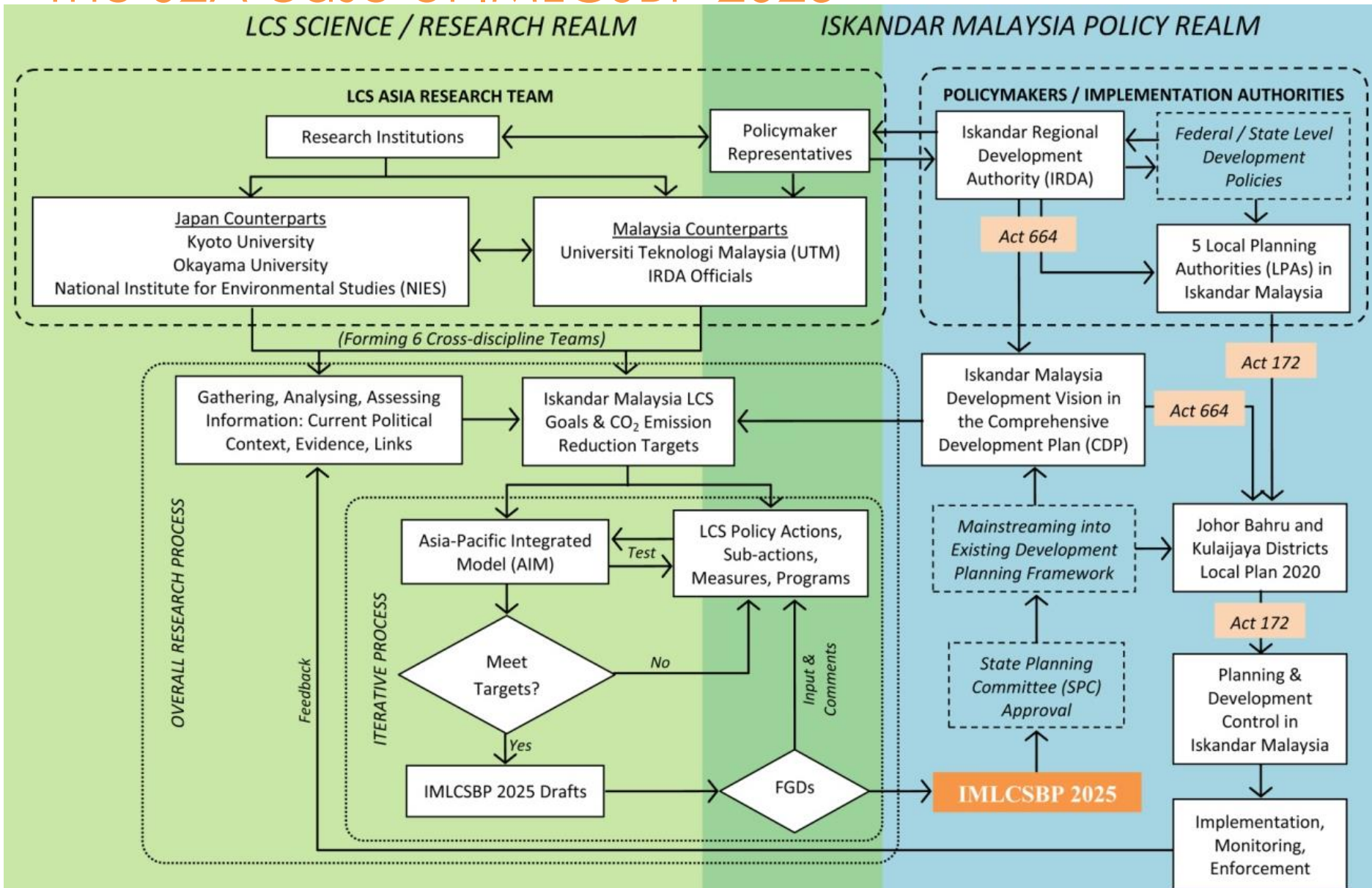
Policy Roadmap

Pro-Poor



S2A

Polycymaking with Implementation in Mind: The S2A case of IMLCSBP 2025



Iskandar Malaysia – Potential CO₂ Reduction

Table 1: Projected main socio-economic variables

	2005	2025	2025 /2005
Population (1000)	1,353	3,000	2.22
Household (1000)	303	706	2.33
GDP (Bill. RM)	35.7	141.4	3.96
Gross output (Bill. RM)	121.4	438.9	3.61
Primary industry	1.5	2.4	1.59
Secondary industry	86.2	274.0	3.18
Tertiary industry	33.7	162.5	4.82
Passenger transport demand (Mill. passenger-km)	9,565	59,524	6.22
Freight transport demand (Mill. ton-km)	8,269	26,054	3.15

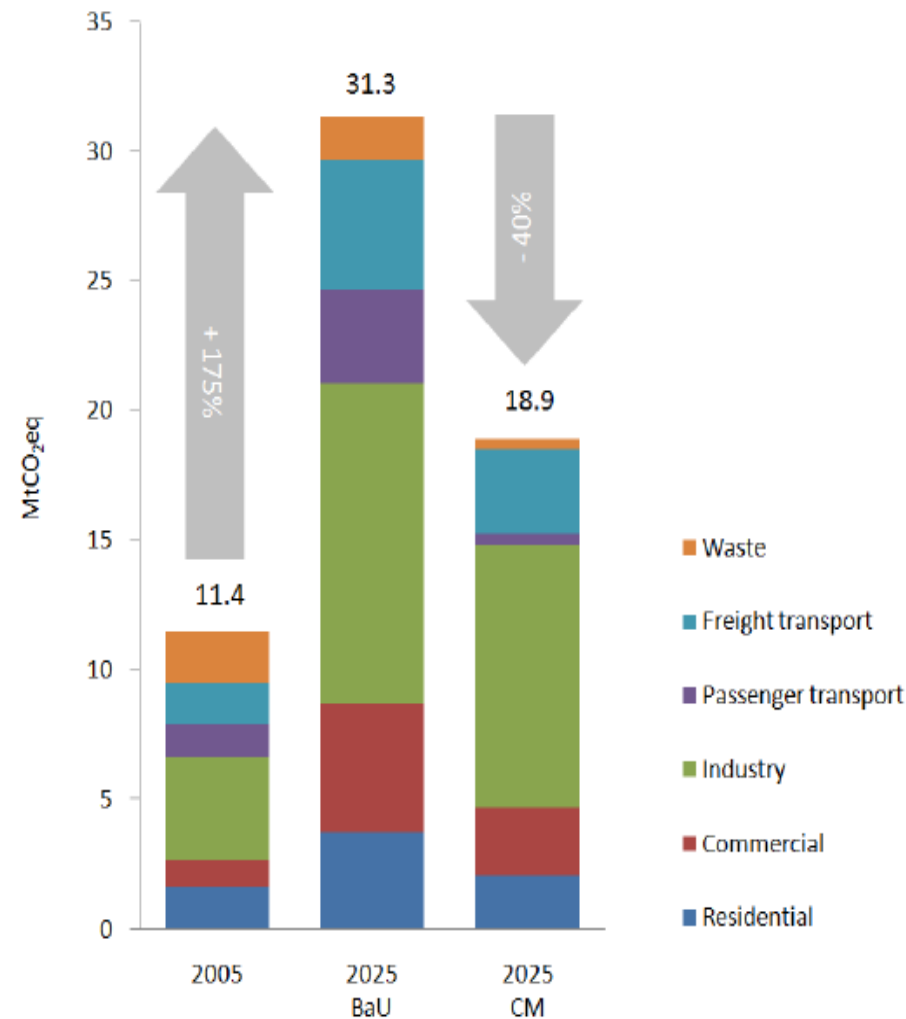
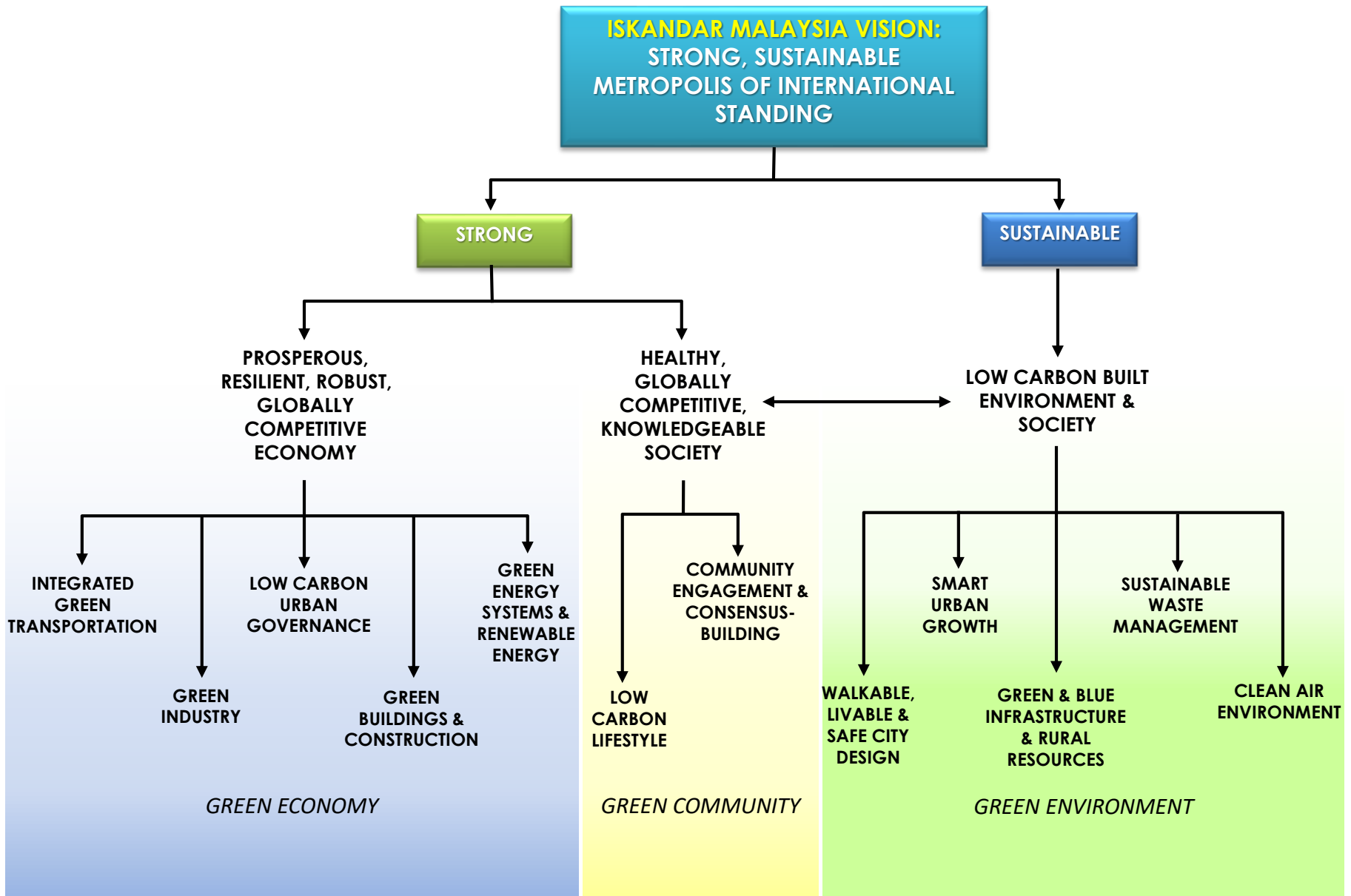


Figure 1: GHG emissions by sectors

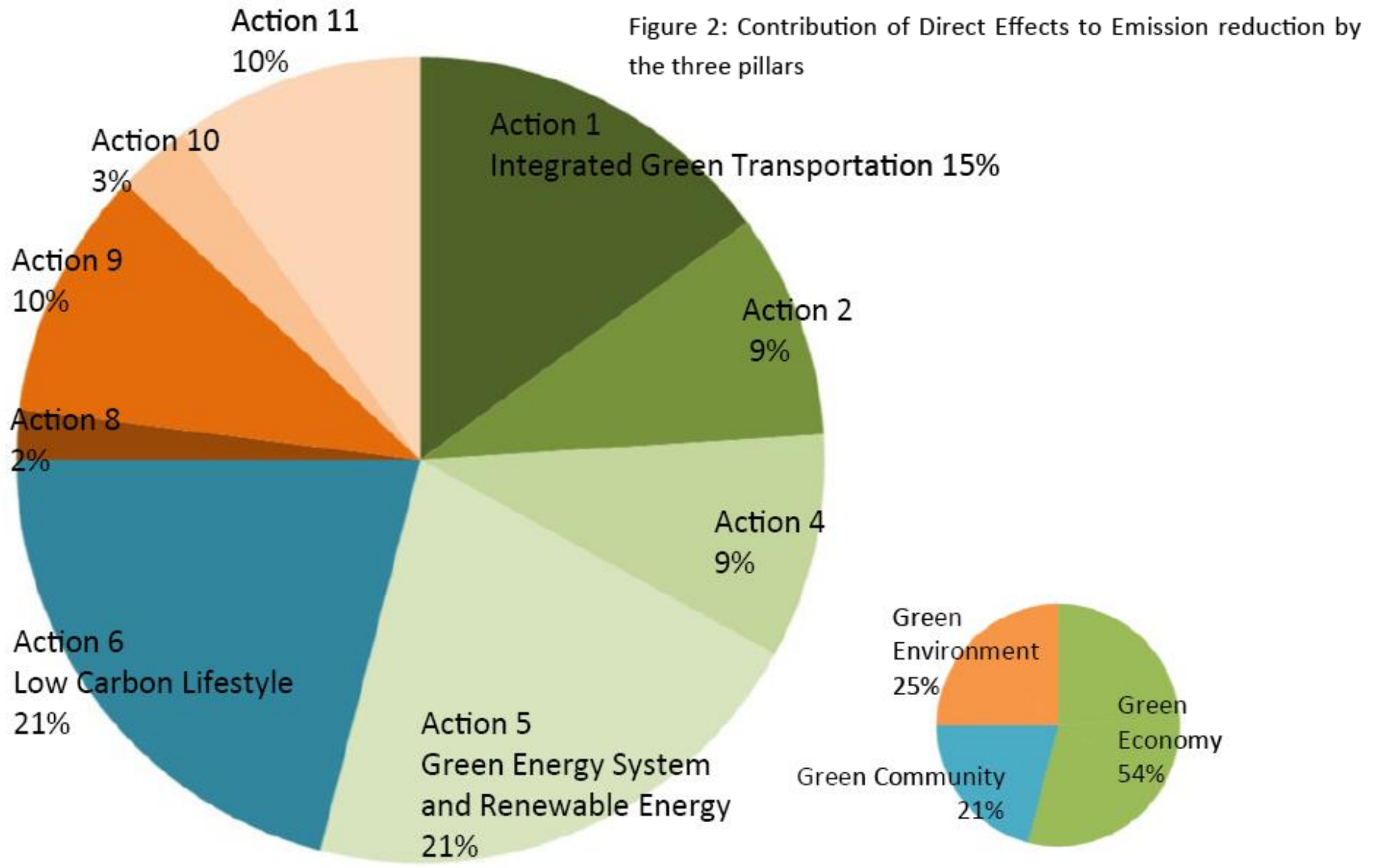
Policy Scoping for IMLCSBP 2025



LCS Actions for IM by Three Main Themes

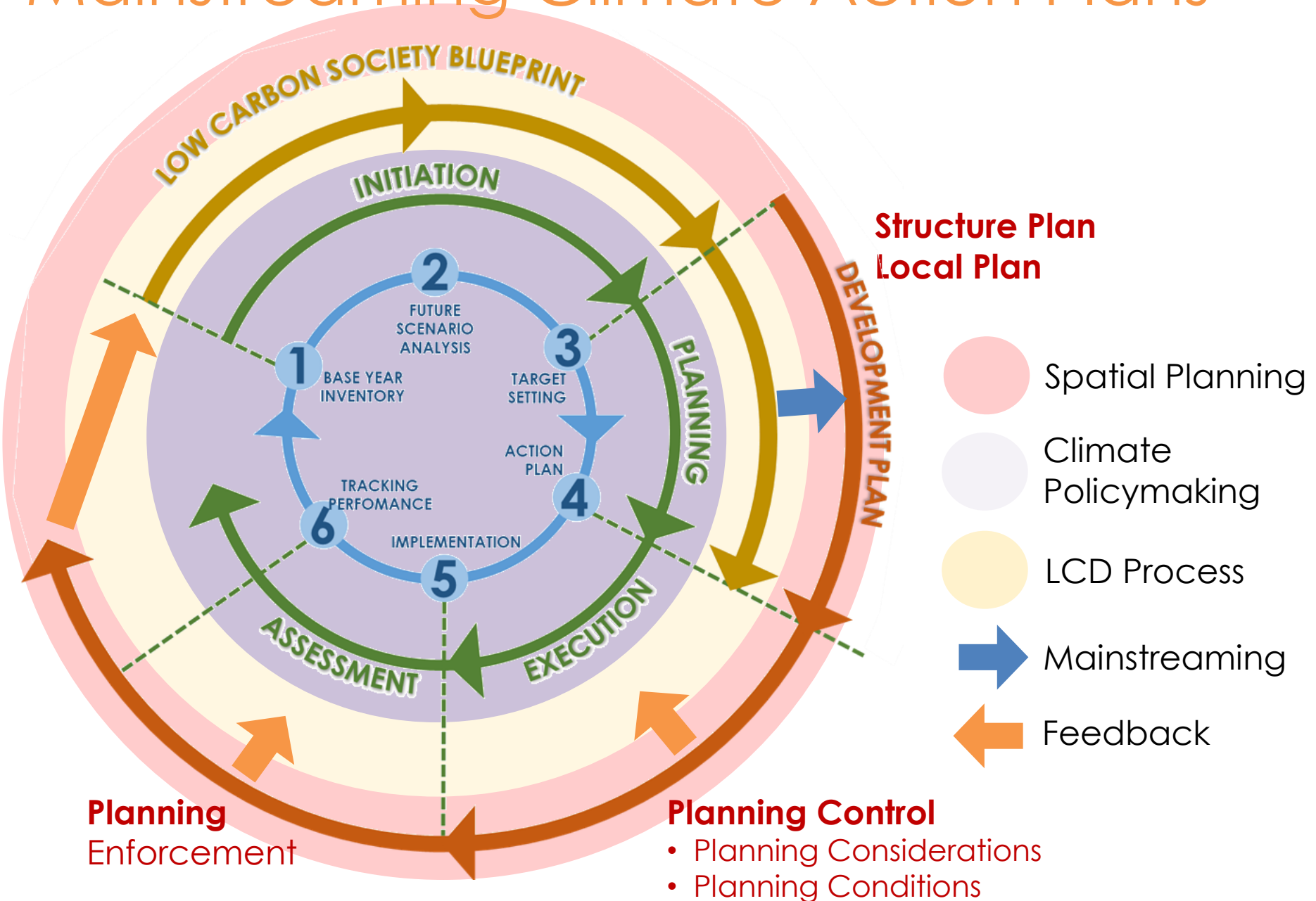
	Action Names	Themes
1	Integrated Green Transportation	GREEN ECONOMY
2	Green Industry	
3	Low Carbon Urban Governance	
4	Green Buildings & Construction	
5	Green Energy System & Renewable Energy	
6	Low Carbon Lifestyle	GREEN COMMUNITY
7	Community Engagement & Consensus Building	
8	Walkable, Safe, Livable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

LCS Actions for IM – Potential CO₂ Reduction



Source: Low Carbon Society Blueprint for Iskandar Malaysia 2025 – Summary for Policymakers (2nd Ed.), 2013, p.2

Mainstreaming Climate Action Plans

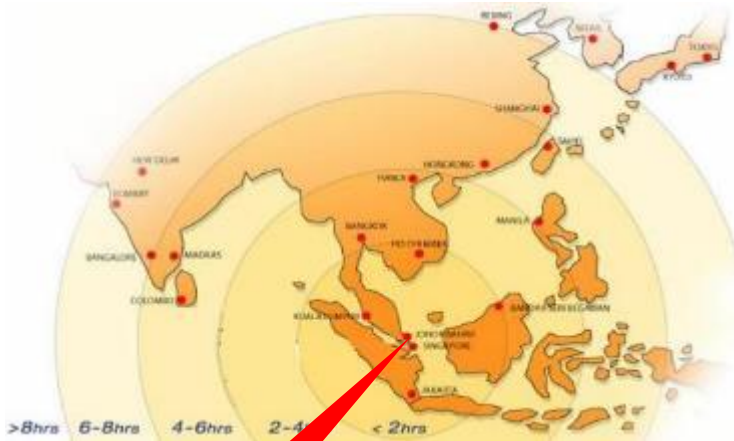




CASE 1 : Iskandar Malaysia

Iskandar Malaysia, established 2006. Total area: 2,217 sq km (12% of Johor State); New Area: 4749 sq km

Iskandar Malaysia covers FIVE local planning authorities.

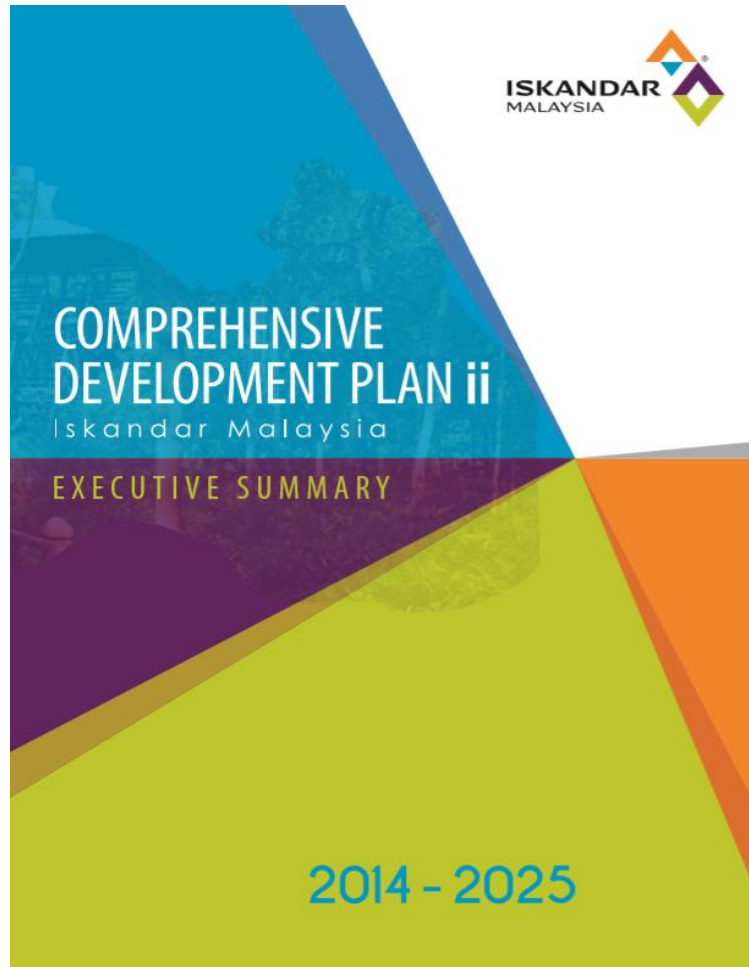


Indicator	2015	2025 (CDP II)
Population (mil)	1.95	3.0
GDP per capita (PPP) in RM	33,634	42,631
Labour Force (mil)	0.94	1.46
Employment (mil)	0.92	1.43

Source: Johor State Economic Report 2015/2016, Johor State Economic Planning Unit

LCS Mainstreamed into the Iskandar Malaysia Comprehensive Development Plan-2 (CDP-ii)

Iskandar Malaysia CDP-ii is a statutory plan prepared under Parliamentary Act No. 664

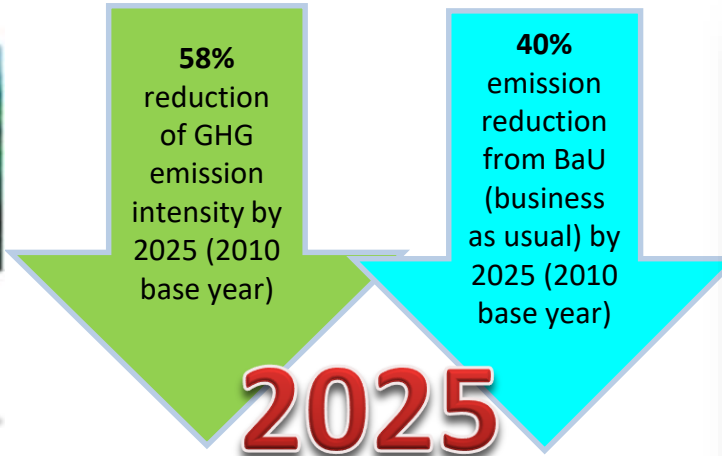
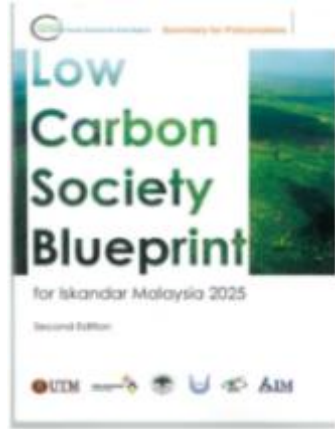


Iskandar Malaysia
Circle of Sustainability: LCS as one
of the CDP-ii's three main pillars





Low Carbon Society Blueprint for Iskandar Malaysia 2025



- The LCSBPIM2025 – a guide for policy-makers, businesses, NGOs and others into going green;
- **12 Actions grouped in 3 parts: Green Economy, Green Community, and Green Environment = 281 programmes;**
- Each Action 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 UNFCCC in Doha, Qatar. **GOAL: to reduce Iskandar Malaysia’s GHG intensity emission by 50% by 2025;**
- Endorsed by the Prime Minister of Malaysia in Dec 2012;
- 2018: 65 programmes implemented.
- 12.9% GHG intensity reduction in 2017.

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	

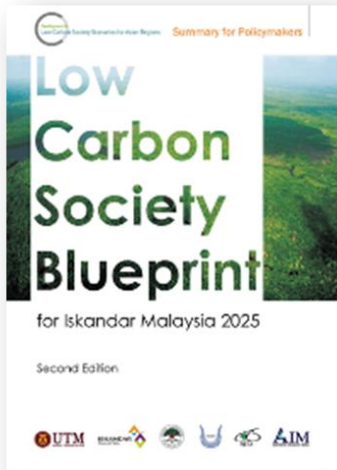


GOVERNMENT OF MALAYSIA

Low Carbon Society Blueprint For Iskandar Malaysia 2025



Lima-Paris Action Agenda

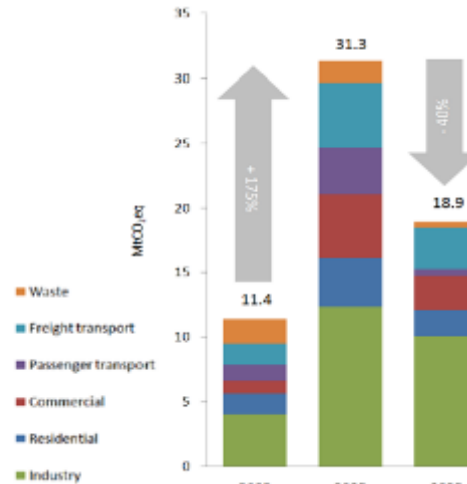


DOHA 2012 UN CLIMATE CHANGE CONFERENCE COP18|CMP8

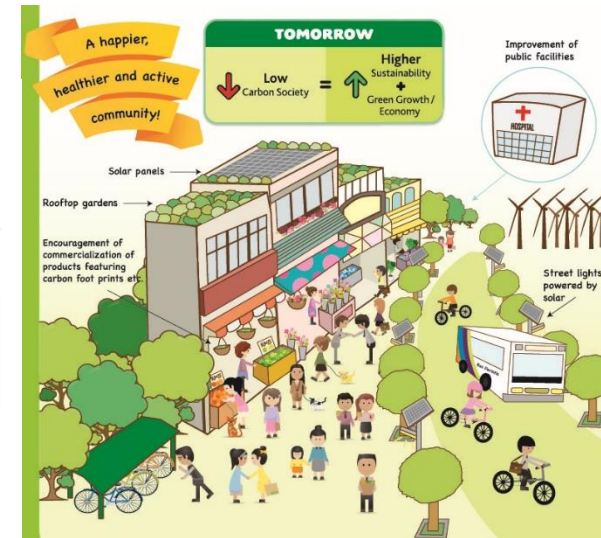
58% reduction of GHG emission intensity (2010 base year)

40% emission reduction from BaU (business as usual) (2010 base year)

2025



Iskandar Malaysia GHG Emission by Sectors



- Launched on 30 November 2012 at the UNFCCC in Doha, Qatar.
- A guide for policy-makers, businesses, NGOs and others into going green.
- 12 Actions grouped into 3 Themes -> 281 Programmes.
- Each Action contains an analysis, list of programmes and **potential reduction of GHG emission**
- 2018: 60 programmes implemented and completed;
- 2017: **12.9%** GHG intensity reduction.



Low Carbon Society Blueprint: programme updates and notable achievements:



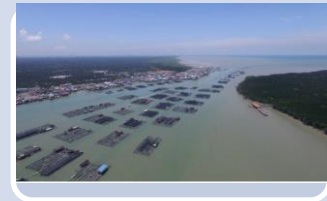
Iskandar Malaysia Ecolife Challenge (IMELC)



Comprehensive Assessment System for Built Environment Efficiency



Partnership for Interdisciplinary Studies on Shoreline Ecosystems (PESISIR)



Aquaculture Strategic Framework and Kukup Revitalisation Proposal (2019 – 2025)



Feasibility Study: Setting up of Iskandar Malaysia-Environment-Related Centre of Excellence



Iskandar Malaysia Greenhouse Gas Inventory 2017



Global Covenant of Mayors for Climate and Energy (GCoM) – Climate Action Planning.



Conference of Parties (COP), UNFCCC – from Cancun to Katowice



National project funded by UNDP GEF.



LCSBIM2025 is Malaysia's first climate action plan document. Global agenda, local impact.

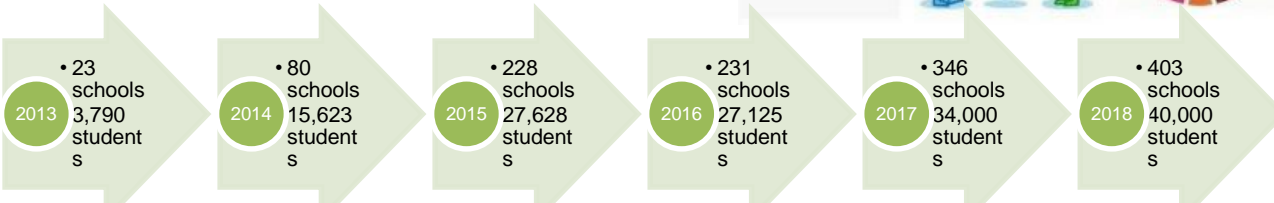
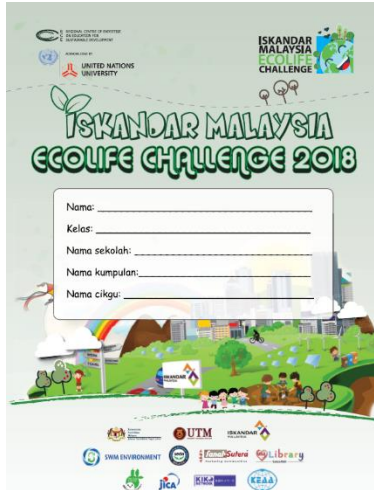


GOVERNMENT OF MALAYSIA

Iskandar Malaysia Eco-Life Challenge 2018



ISKANDAR MALAYSIA ECOLIFE CHALLENGE



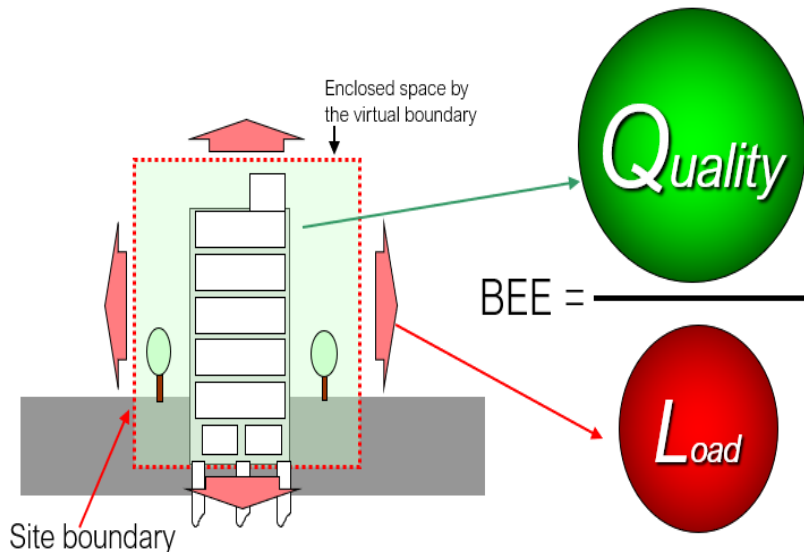
- IMELC objectives are: (a) to educate both students, parents and teachers on low-carbon issues and ideas; and (b) to share the tools with which LCS is developing in Iskandar Malaysia.
- IMELC2018 attracted participations from 403 schools and recorded the involvement of 40,000 students within the Iskandar Malaysia.
- Some of the significant achievements of Eco-Life Challenge initiatives from the committed schools are as follows:
 - The total carbon reduction by participating schools in IMELC 2018 is **590,662.64kgCO₂**;
 - RM174,925.14 electricity bills and RM32,923.82 water bills were saved and RM58,664.55 was collected from recycling.
 - Therefore, **a total of RM266,513.51** was saved and earned by the participating schools in IMELC 2018.



CASBEE Iskandar Malaysia

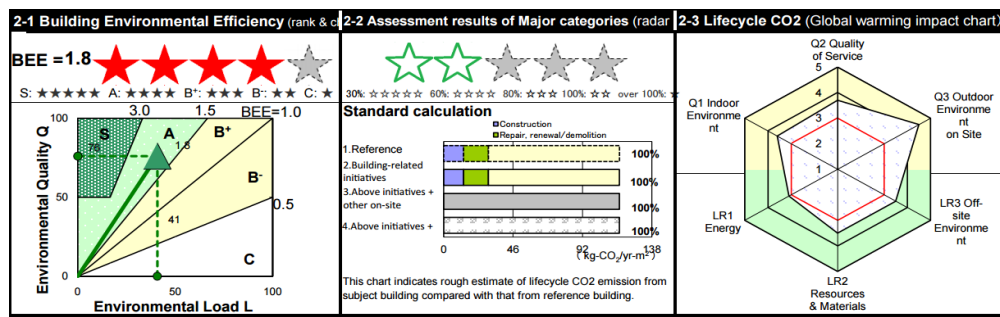
CASBEE is an assessment framework built upon the concept of environmental efficiency or eco-efficiency; evaluating Built Environment Efficiency (BEE) that takes into account the level of quality within the target built environment, while accounting for environmental load outside the target built environment.

CASBEE Iskandar will be the guiding manual for local authorities, developers and business enterprises in developing green cities, neighbourhood and buildings. It is currently being used as an assessment tool for Iskandar Malaysia's Green Accord Initiative Award (GAIA) certification. Takes account of UN's 17 Goals.

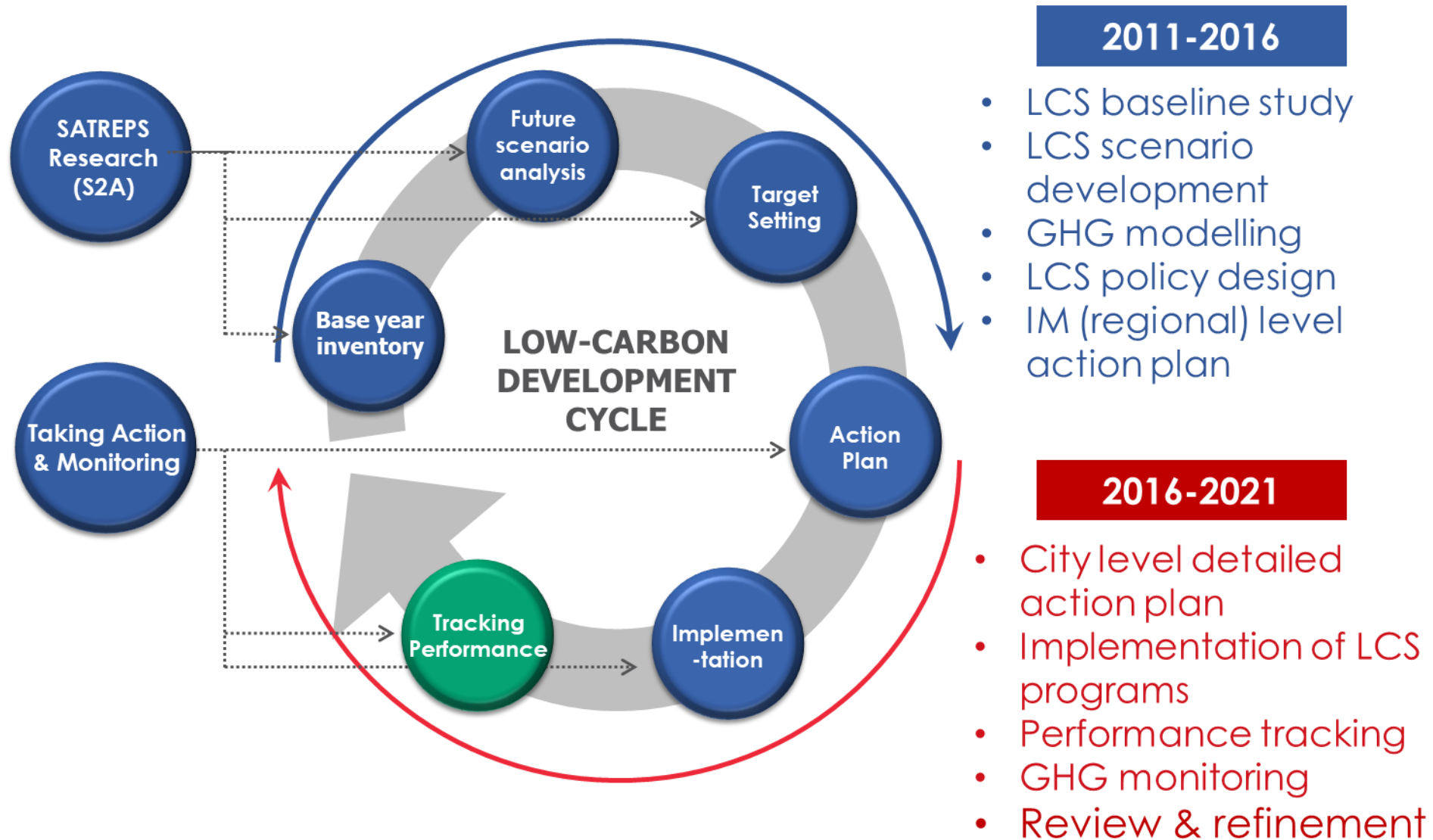


NEW CASBEE Assessment and Certification for selected buildings - Nong Chik Mosque (NCM) and Johor Port

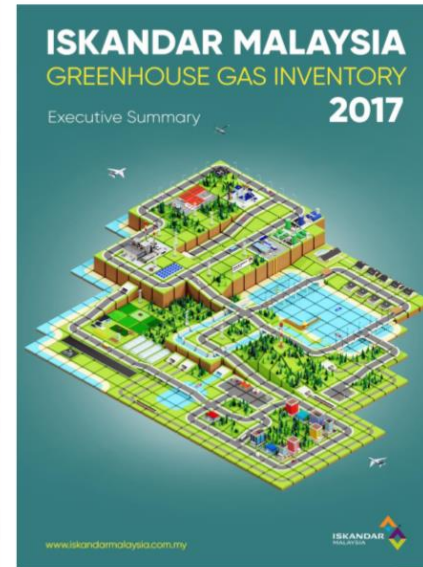
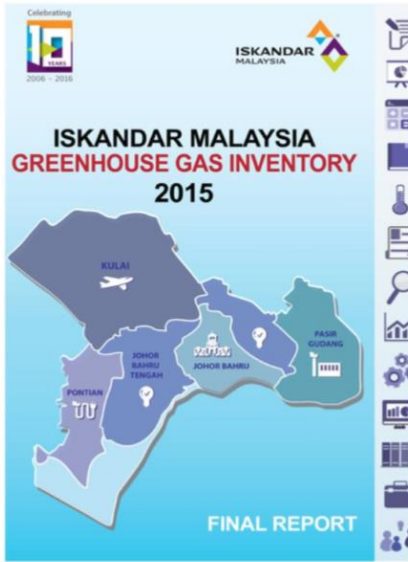
- ✓ The project was funded by the Johor State Government via Johor State Investment Centre (JSIC) as per Surat Terima Tawaran JSIC/14/94/Bil.2 (30)-2(A)
- ✓ The objective of the project was to conduct assessment and certification for green buildings with using the Comprehensive Assessment System for Built Environment Efficiency (CASBEE).
- ✓ This is **another successful showcase** for knowledge and technology transfer from Japan to Johor.
- ✓ It also increases investors trust and interest to invest in Johor with having this international standard tool.



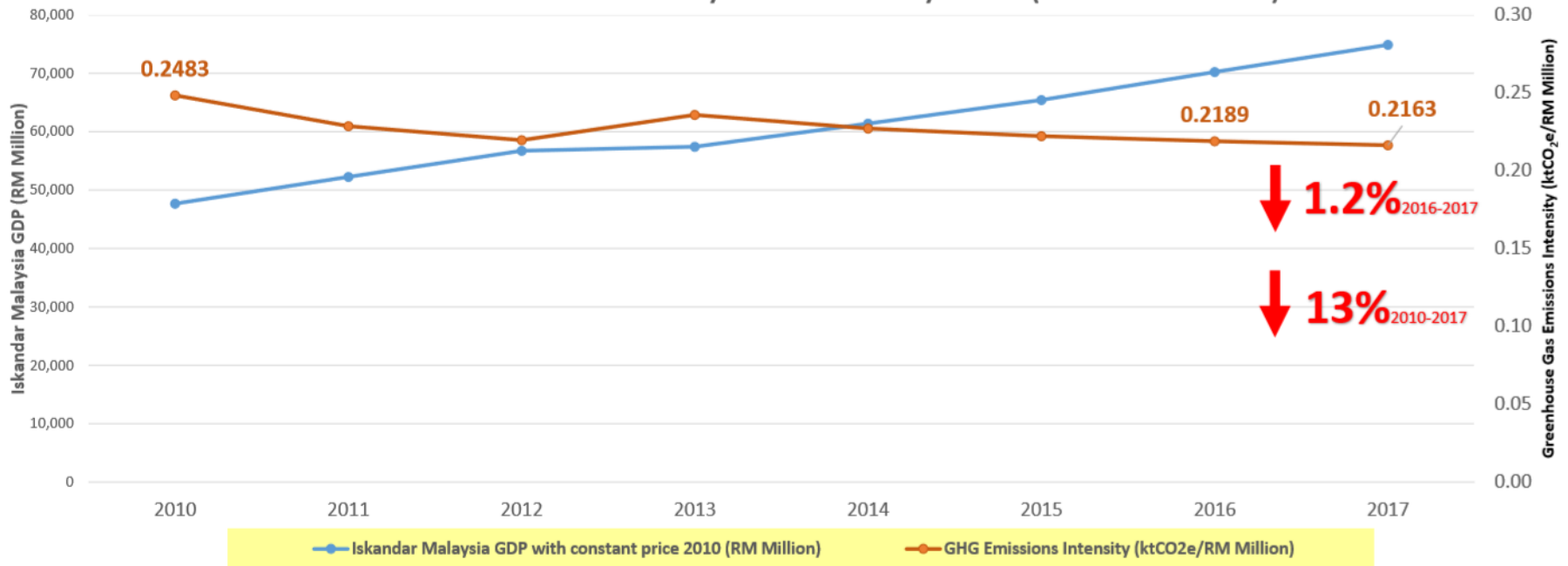
Iskandar Malaysia LCSBP Comes Full Cycle



Iskandar Malaysia LCSBP Comes Full Cycle



Greenhouse Gas Emissions Intensity vs Iskandar Malaysia GDP (2010 Constant Price)

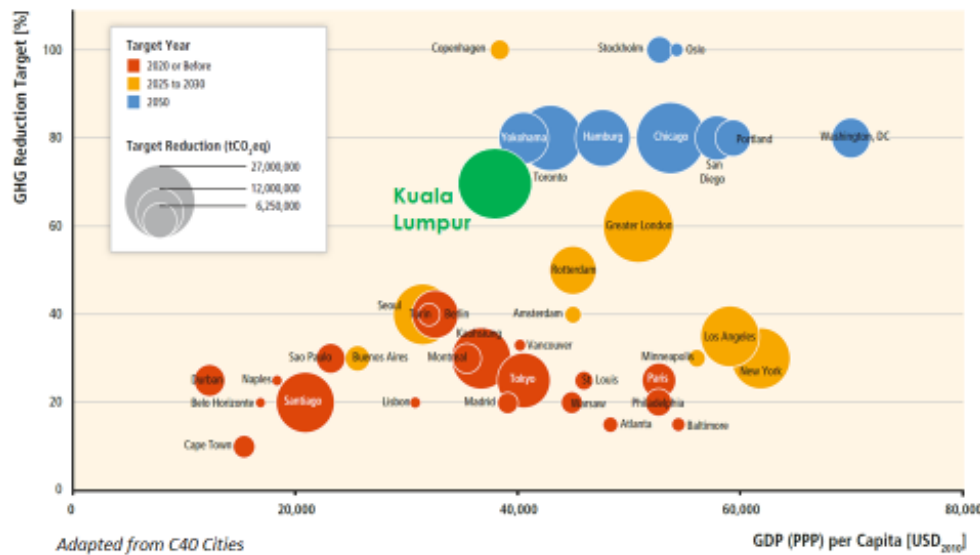


CASE 2 ;Extending IM's Experiences – KL LCSBP 2030



WHY GO FOR LOW CARBON?

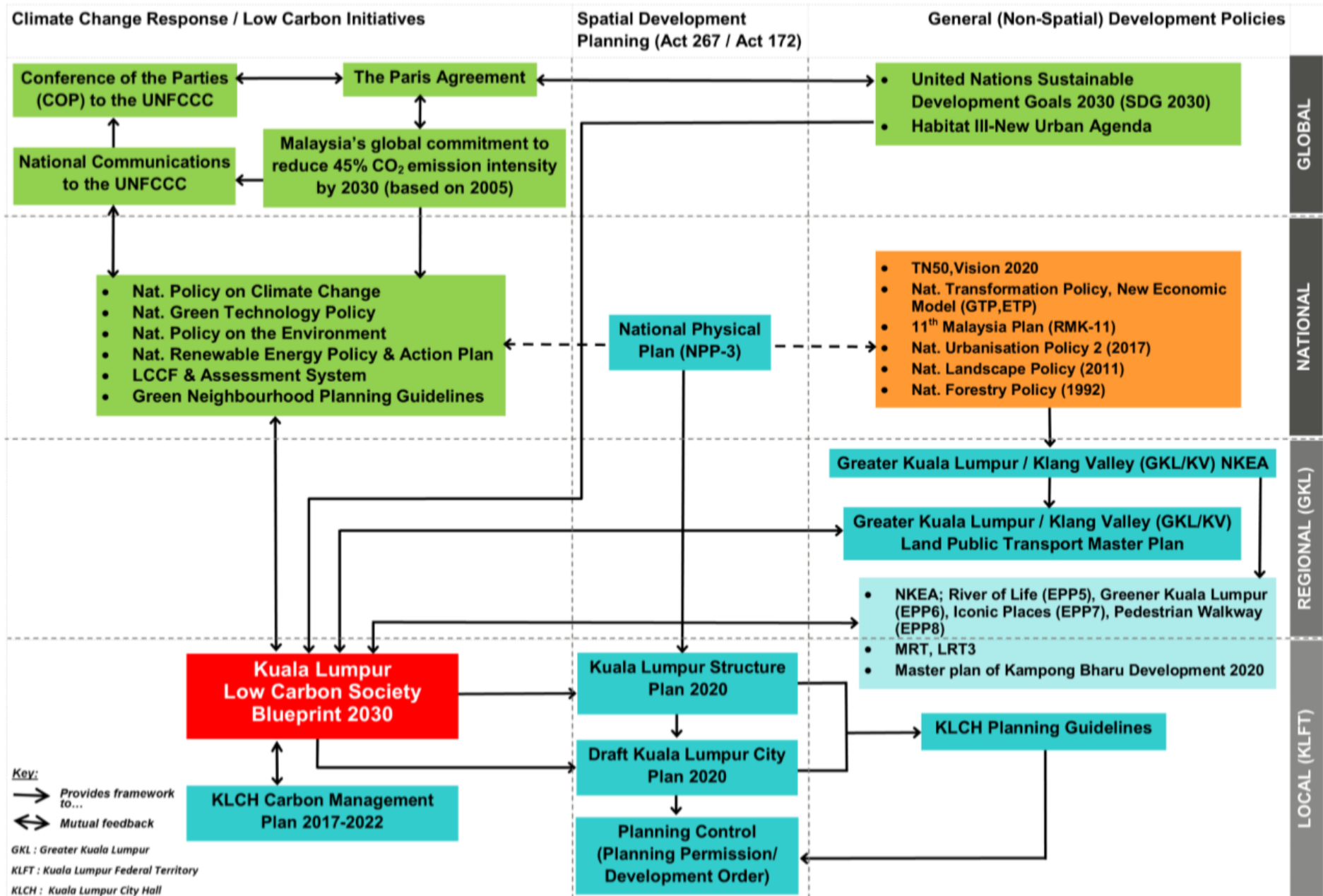
FURTHER ENHANCING KL'S INTERNATIONAL STANDING



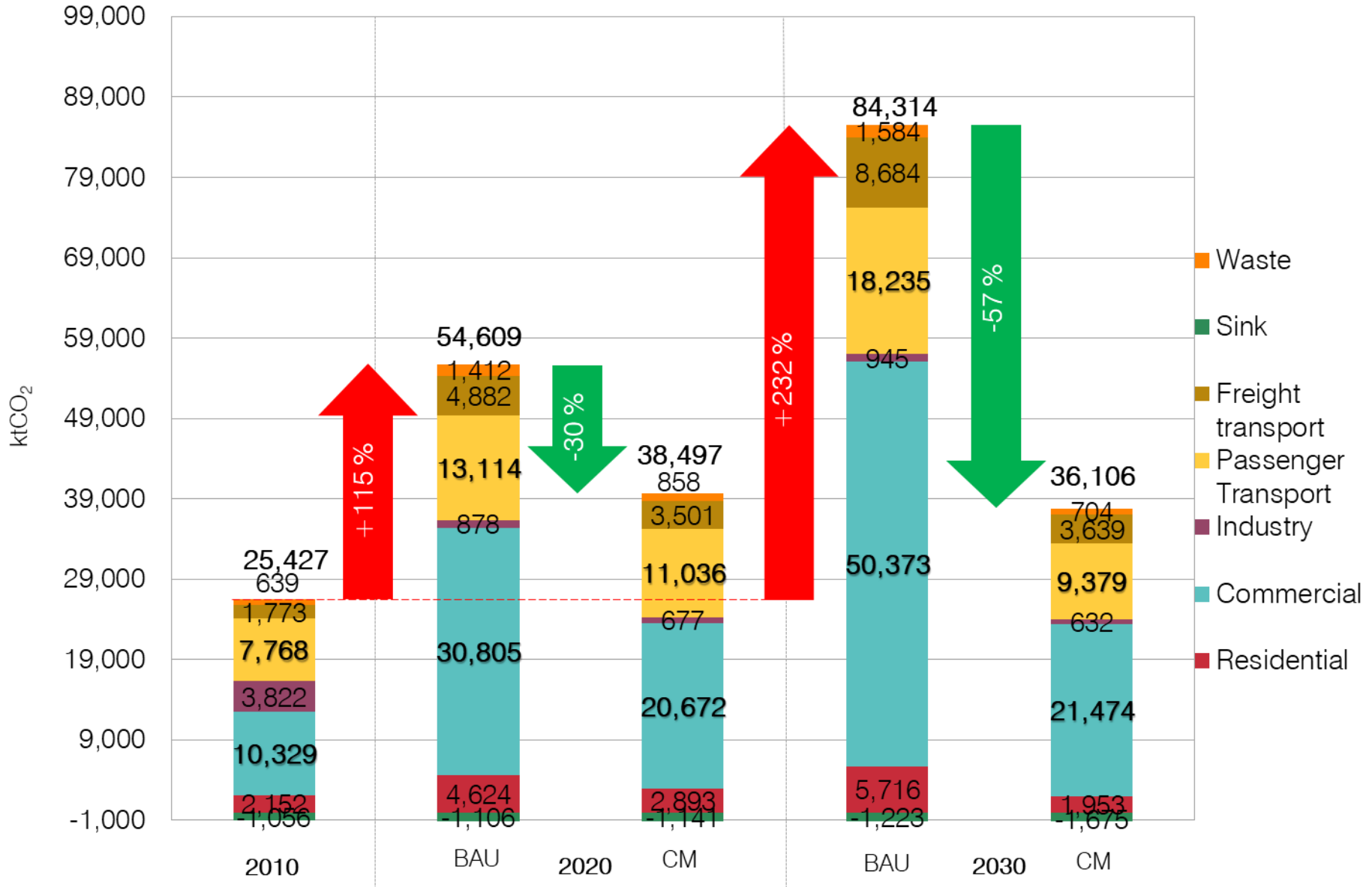
DRAFT KUALA LUMPUR
LOW CARBON SOCIETY BLUEPRINT 2030



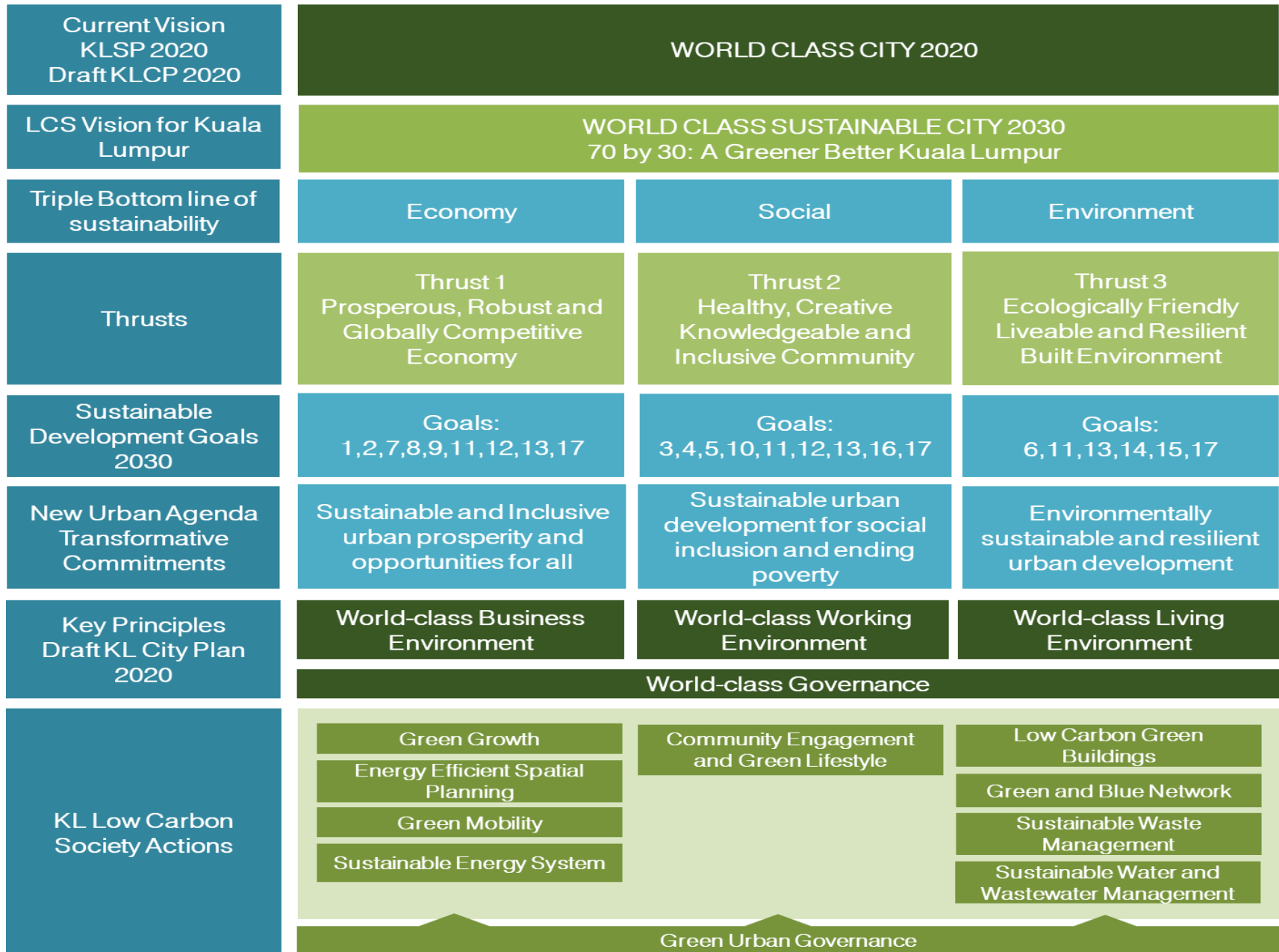
Policy Positioning: Raison D'être of KL LCSBP 2030



Kuala Lumpur GHG Emissions Reduction Potential



Policy Scoping & Framework for KL LCSBP 2030



KL LCSBP 2030 GHG Emissions Reduction Potential

Thrusts	Actions	Reduction (ktCO ₂ eq)	Share (%)*
Economy (59%)	Action 1 Green Growth (GG)	2,502	5.2
	Action 2 Energy Efficient Spatial Structure (SS)	2,872	6.0
	Action 3 Green Mobility (GM)	6,868	14.2
	Action 4 Sustainable Energy System (SE)	16,327	33.9
Social (19%)	Action 5 Community Engagement and Green Lifestyle (CE)	9,015	18.7
Environment (22%)	Action 6 Low Carbon Green Building (GB)	9,673	20.1
	Action 7 Green and Blue Network (BG)	316	0.7
	Action 8 Sustainable Waste Management (WM)	527	1.1
	Action 9 Sustainable Water and Wastewater Management (WW)	105	0.2
Enabler	Action 10 Green Urban Governance (UG)	0	-
Total		48,206	100

KL LCSBP 2030 Implementation Roadmap

Action 5 COMMUNITY ENGAGEMENT AND GREEN LIFESTYLE

Programs	2015-2020	2021-2025	2026-2030	Responsible KLCH Department	Key Partners	Implementers
				Measure 5.1.1 Foster Sustainable Consumption Behaviour		
CE 1 Survey sustainable consumption practice				Health & Environment Dept.	KLCH (Branch Services Dept., Information Management Dept.), JPWPKL, HEIs	KLCH (Housing Management & Community Development Dept.), Local research and higher learning institutions, NGOs, Resident's assoc.
CE 2 Stimulate sustainable consumption practice				Health & Environment Dept.	KLCH (Housing Management & Community Development Dept., Branch Services Dept.)	LA21KL, NGOs, Resident's assoc.

KL LCSBP 2030 Implementation Roadmap

Responsible KLCH Dept. :

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

Key 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 their statutory duty, ownership rights, institutional responsibility, and/or effective serving of communal interests

Tokyo Metropolitan Government and Kuala Lumpur collaboration of Energy Management system project 2019-2020 (IGES/ UTM and SEDA)

Buildings contribute up to **49%** of total GHG emissions in Kuala Lumpur



1,955 units

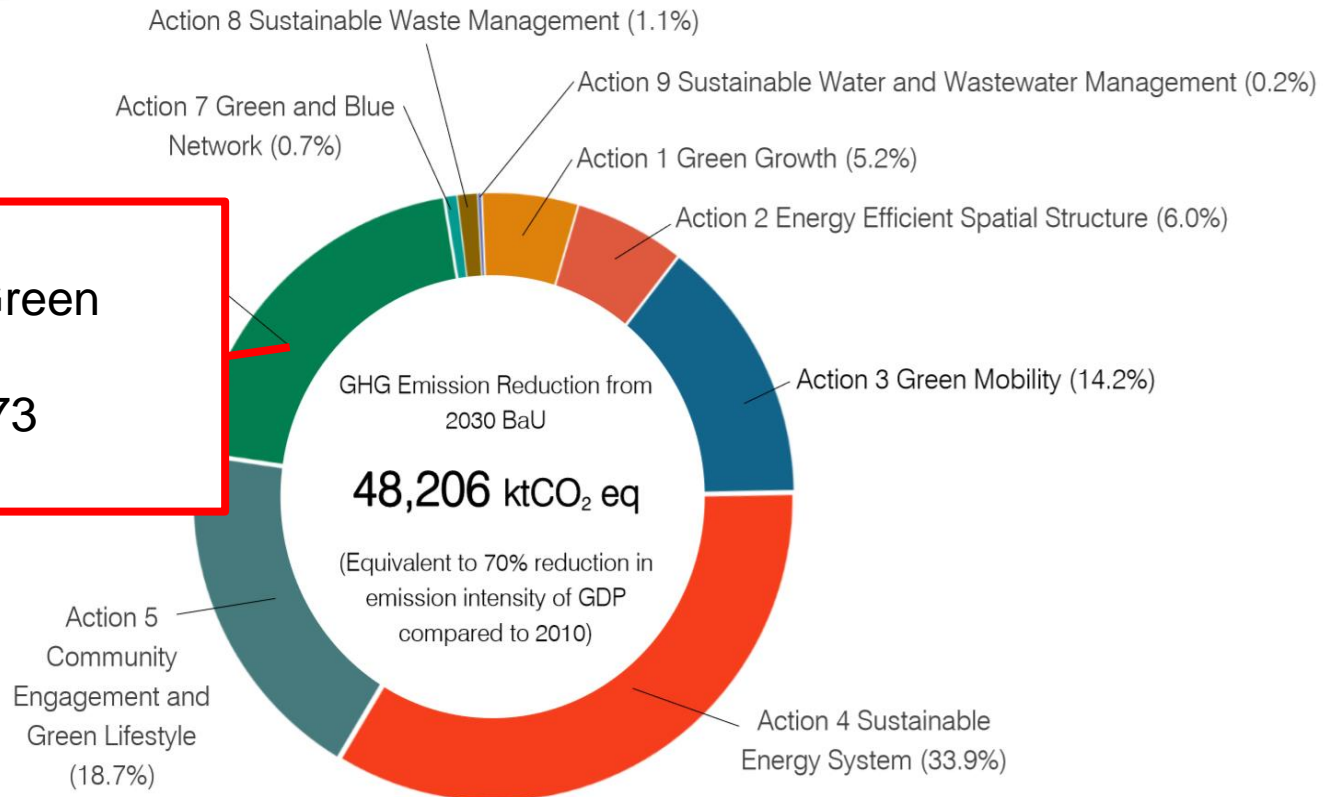


MYR 60 million/year for electricity bills

70 BY 30
A GREENER BETTER
KUALA LUMPUR

**Action 6
Low Carbon Green
Building
(20.1%) = 9,673
ktCO₂eq**

KUALA LUMPUR
LOW CARBON SOCIETY
BLUEPRINT 2030



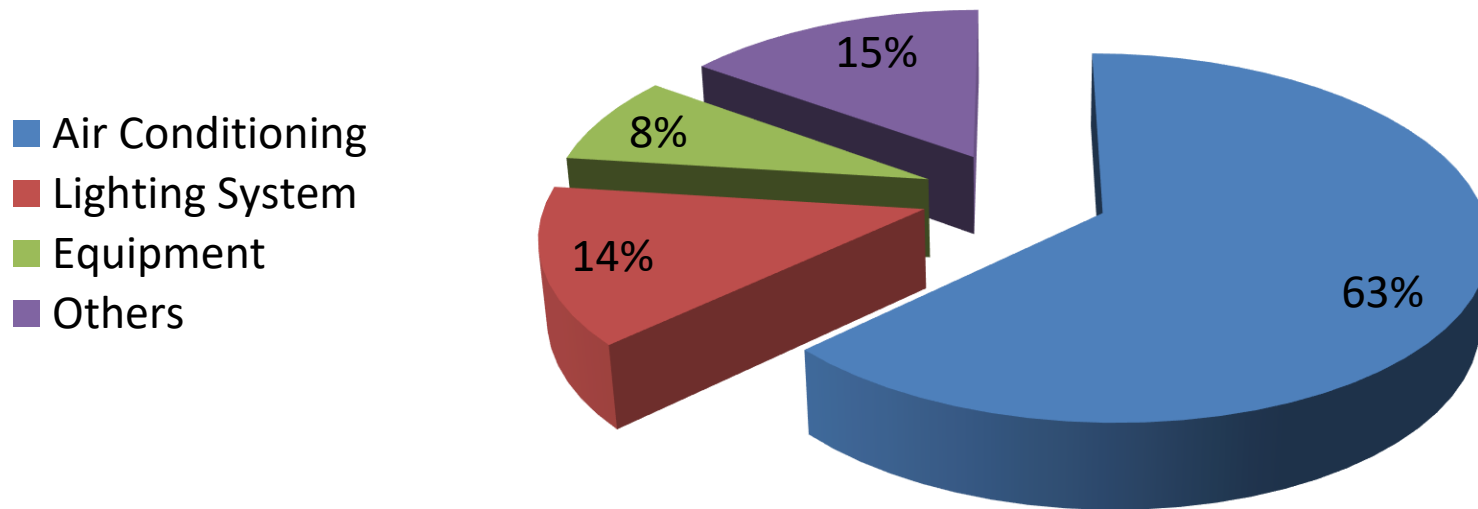
KLCH Buildings By Type

No	Type of Building	No. of Building
1	Living Quarter	1,063
2	Office	35
3	Clinic	15
4	Library	8
5	Building under NADI	13
6	Building under Jabatan Penilaian & Pengurusan Harta	592
7	Guesthouse	23
8	Public Toilet	34
9	Market	38
10	Hawker Centre	45
11	Kiosk	26
12	Community Centre & Multipurpose Hall	30
13	Stadium & Sport Complex	15
14	Park	16
15	Others	2
Total		1,955

ON GOING TOKYO-KL CITY TO CITY COLLABORATION STARTS WITH CITY HALL ASSETS FIRST AND PLAN TO ROLLS OUT TO ALL BUILDINGS IN KUAL LUMPUR



63% OF POWER CONSUMPTION BY KLCH BUILDINGS IS
FROM **SPACE COOLING**



POSSIBLE TECHNOLOGICAL SOLUTIONS

Building Envelope	1	Infiltration - Airtight Building Envelope
	2	Reduce Direct Sunlight - Shading, Window Blind
	3	Insulation - Green Roof, Roof Insulation, Wall Insulation, Window Tinted, Window Glass
Air-Conditioning System	4	Outdoor Air Ventilation Control
	5	Zoning & Control of Air Distribution System - VAV, Temperature & Humidity Control, Setback & Shut-off Control, Off-hour control
	6	High Efficiency Fan System
	7	High Efficiency Air Filtration
	8	Effective Piping & Ducting Insulation
	9	High Efficiency Unitary Air Conditioning System - Single Split, Package, Multi Split, VRF
	10	High Efficiency Centralized Air Conditioning System - Chiller, Hydronic System, Cooling Tower
	11	Control of Centralized Air Conditioning System - Automation & Optimization
Lighting	12	Lighting Control - Daylight Control, luminance Control, Zoning Control, Motion Control, Off-hour Control
	13	High Efficiency Lighting System - Indoor & Outdoor
Energy Management Control System	14	Control of Equipment, Monitoring of Equipment, Integration of Equipment and Other Sub-systems, Energy related Data Collection and Analyses
Renewable Energy	15	Solar PV

City Climate Action Impacts (some KL examples)



Malaysian LCS at COP 24



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University



COP24·KATOWICE 2018
UNITED NATIONS CLIMATE CHANGE CONFERENCE

University of Technology Malaysia
(UTM)

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COP24·KATOWICE 2018
UNITED NATIONS CLIMATE CHANGE CONFERENCE

UTM LOW CARBON ASIA
RESEARCH CENTRE

PROJECTS

- 80% GREENHOUSE GAS EMISSIONS REDUCED
- 60% ENERGY CONSUMPTION REDUCED
- 70% WASTE REDUCED

LIST OF PROJECTS (JAWA HARI)



UTM-LOW CARBON ASIA
RESEARCH CENTRE

UTM
UNIVERSITY OF TECHNOLOGY MALAYSIA

JOHOR BAHRU
LOW CARBON SOCIETY
ACTION PLAN 2025
(REVISED)

UTM
UNIVERSITY OF TECHNOLOGY MALAYSIA

INTERNATIONAL COLLABORATIONS

SUSTAINABLE DEVELOPMENT GOALS

OF FORESTRY &
TECHNOLOGY

Malaysian LCS at COP 24

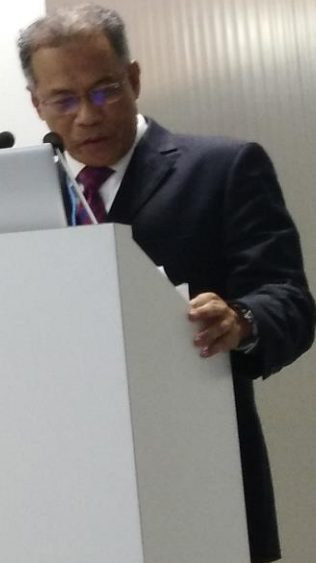


Malaysian LCS at COP 24



JAPAN
PAVILION

Lead the world forward.



Accelerating Climate Actions in Malaysian Cities (towards 2030 and beyond)

COP 21 National Target: 45% Reduction*

COP 15 National Target: 40% Reduction*

**All reduction targets are in terms of GHG emissions intensity of GDP*

UTM-LCARC
S2A

- Tawau CAP (GCoM CRF)
- Penampang CAP (GCoM CRF)
- Ipoh (GCoM CRF)
- Kampung Bahru CAP (GCoM CRF)
- Muar CAP (GCoM CRF)

RTD Muar 2030 (Target: 65% Reduction*)

PLCSBP 2030 (Target: 50% Reduction*)

KL LCSBP 2030 (Target: 70% Reduction*)

PGC 2025 (Target: 60% Reduction*)

LCSBP-IM 2025 & 5LAs LCSAP (Target: 58% Reduction*)

2005 2009 2015 2020 2025 2030

CONCLUSION

- 1) Technology transfer and international collaboration in City Climate Actions at city level to achieving Low Carbon Societies
- 2) Implementation of new technologies in Malaysia-
 - a) Innovation – Green technology application (EE measures eg LED, space cooling, SWM , Rain harvesting,
 - b) Capacity building – Tokyo- Kuala Lumpur City Collaboration on Energy management, SATREPS JICA/JST, AIMS –NIES, GCOM, UCLG workshop
 - c) Stakeholder involvement - Community engagement with local authorities , NGOs and Business communities
- 3) It **CAN** be done! If we **ALL WORK TOGETHER!** Good News:Because it **HAS** been done!

Thank you for your attention!

Thank You Terima Kasih 谢谢 धन्यवाद ありがとう