National Institute for Environmental Studies, Japan

The 25th AIM International Workshop
National Institute for Environmental Studies
November 18-19, 2019

11:00-12:40 Session 2: Climate Mitigation in Asia

The Case of Malaysian Cities.

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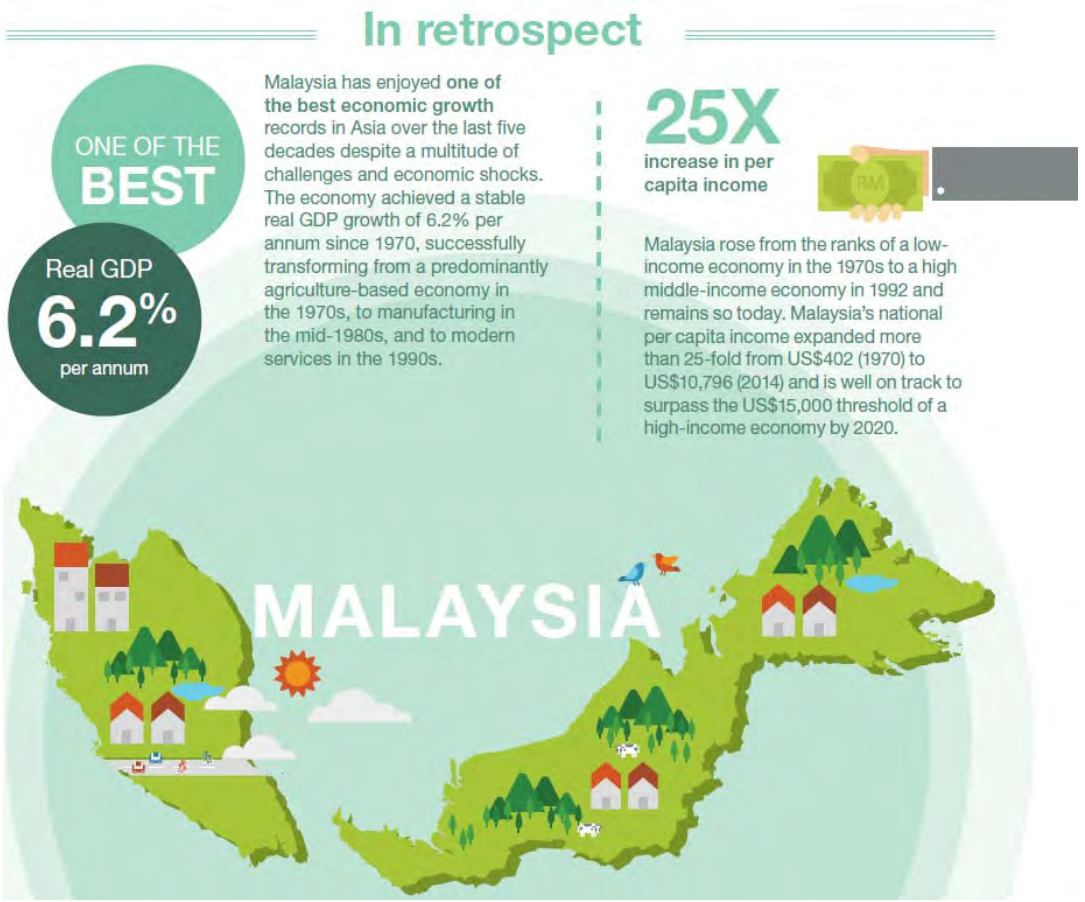
UTM UNIVERSITI TEKNOLOGI MALAYSIA
UTM-LOW CARBON ASIA RESEARCH CENTRE

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

- 20% **RE capacity mix** by 2025(4GW RE injection)
- Smart cities framework / **Cities 4.0** (2019)
- (National Fiberisation and Connectivity Plan 2019-2030
- SDG 2030
- Drafting Climate Change Act



	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

GHG Emission 1994, 2000, 2011, 2014 MALAYSIA

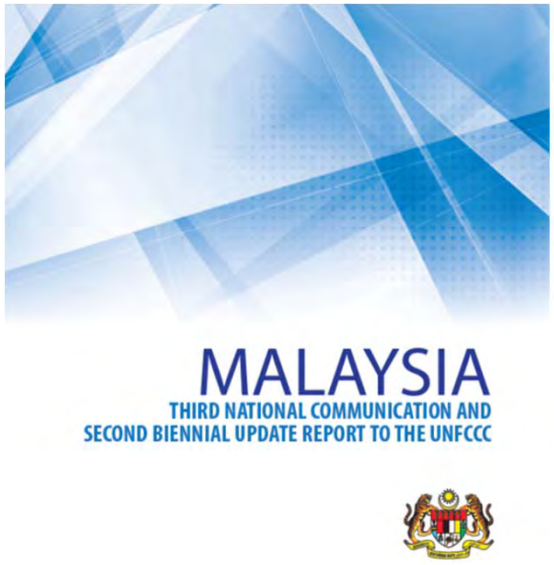


Table 2.9: Greenhouse Gas Emissions for the Years 1994, 2000, 2005, 2011 and 2014

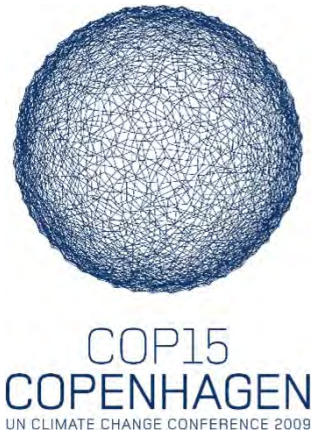
Sector	Emissions/ Removals (Gg CO_2eq)				
	1994	2000	2005	2011	2014
Energy	92,049.66	143,141.29	198,514.01	225,060.62	253,517.24
Industrial Processes and Product Use	5,678.85	11,531.89	15,101.60	17,058.02	20,257.83
Agriculture	7,867.26	8,547.20	10,027.98	9,688.04	10,850.77
LULUCF (Emissions)	137,523.00	54,298.83	35,985.19	3,560.42	3,317.15
LULUCF (Removals)	-211,843.11	-235,244.29	-233,918.04	-242,586.19	-267,147.77
Waste	12,603.47	16,670.31	21,927.44	26,958.80	28,217.35
Other (Cross Sectoral Indirect N_2O)	566.53	854.04	1,112.01	1,208.90	1,466.48
Total Emissions	**256,288.77**	**235,047.55**	**282,668.23**	**283,534.80**	**317,626.83**
Net Total (After Subtracting Sink)	**44,445.66**	**-196.74**	**48,750.19**	**40,948.62**	**50,479.06**

MALAYSIA
THIRD NATIONAL COMMUNICATION AND
SECOND BIENNIAL UPDATE REPORT
TO THE UNFCCC

The increase emissions from 256.3 million (1994) to 317.6 million (2014)over time is from energy sector while LULUCF sink capacity has stabilised. The GHG per capita is 10.343 tCO2 eq/capita and 0,3137kgCO2/RM eq.
The GHG emission intensity per unit GDP had improved 33% by 2014 compared with 2005 levels.
The population and GDP increase is 17.9% and 53.5% respectively over 2005-2014

WHY GO FOR LOW CARBON?

MALAYSIA COMMITMENT



"..Malaysia is adopting an indicator of a voluntary reduction up to **40% in terms of emission intensity of GDP** by the year 2020 compared to 2005 levels."

- COP15 Copenhagen December 2009

"..Reduction up **to 45% in terms of emission intensity of GDP** by the year 2030 compared to 2005 levels as indicated in INDC submitted to COP21."

- COP21 Paris December 2015

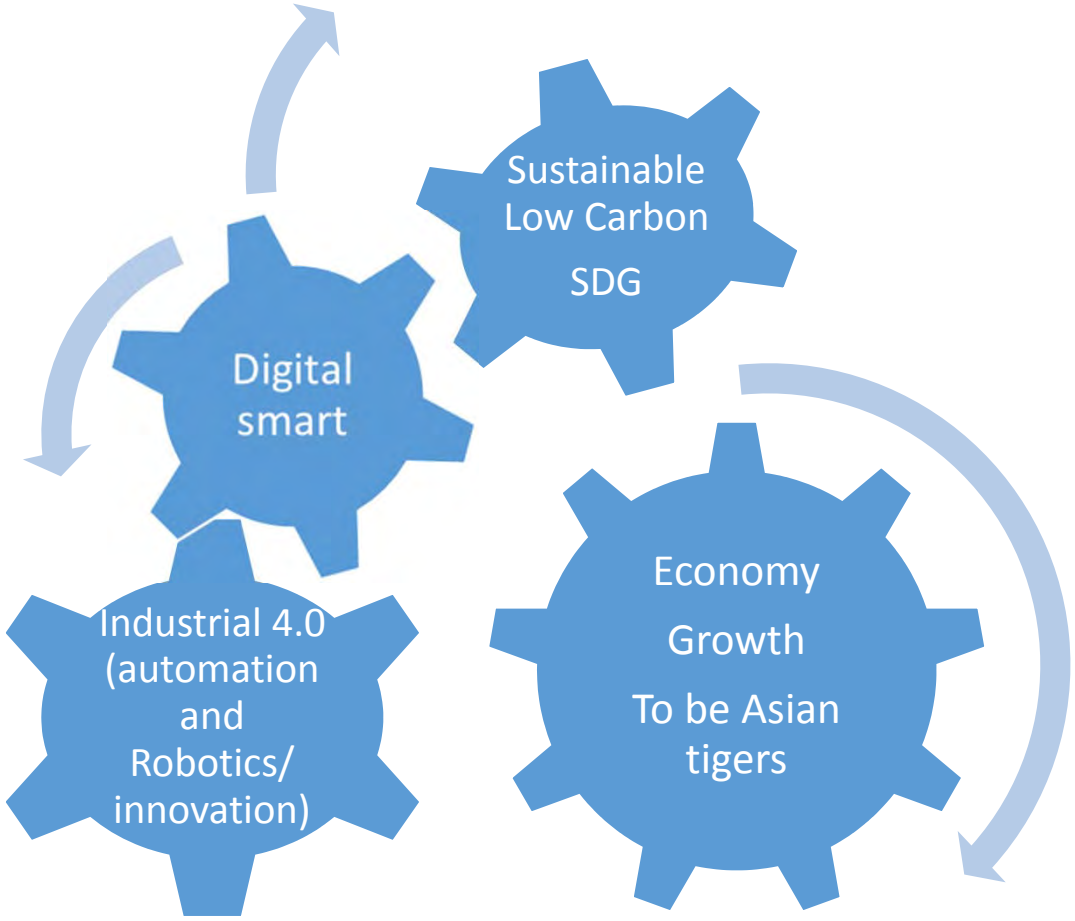
MALAYSIA - SDG 2030

Mitigation measures and outcomes in Malaysia

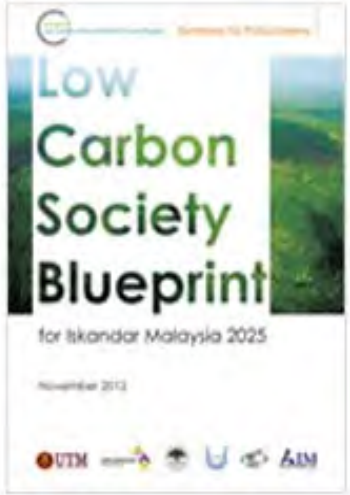
Summary of mitigation strategies and the expected outcomes.

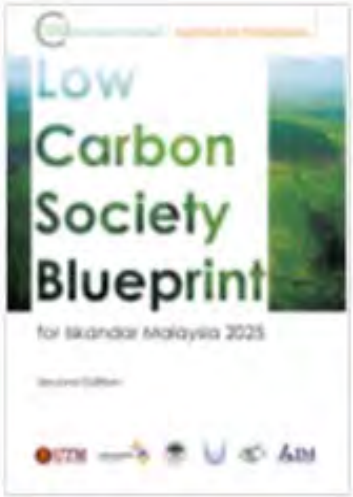
Sector	Strategy	Expected outcome
General (NRS, 2001)	National Policy on Climate Change, 2009	Promote efficient utilization of resources and environmental conservation.
General, with focus mainly on economic development (EPU, 2015; CSDU, 2017)	Eleventh Malaysian Plan (2016–2020), capturing the national key economic areas derived from the new economic model	Pursue green growth for sustainability and resilience.
Energy (Yau and Hasbi, 2017)	Enactment of the Efficient Management of Electrical Energy Regulations 2008	Ensure efficient management of electrical energy by users or generators of electricity.
Energy (CSDU, 2017)	National Green Technology Policy 2009	Promote green energy development
Energy (CSDU, 2017)	Enactment of Renewable Energy Act 2011	Boost renewable energy generation via a special tariff system
Energy use in buildings (NRE, 2015)	Energy Performance Contracting	Promote efficient utilization of energy in buildings via energy conserving design of new buildings and improvement of energy efficiency in existing buildings.
Energy use in buildings (NRE, 2015)	Adoption of standards such as ISO150001	Certify energy management system that ensures efficient organizational energy use.
Palm oil (Murad et al., 2010)	Installation of methane avoidance facilities	Reduce emission of GHGs particularly methane via improved milling process and biogas capture.
Biofuel (NRE, 2015)	Passing of the National Biofuel Industry Act 2007	Regulate and facilitate the development of biofuel in Malaysia
Transportation (EPU, 2015)	National Land Public Transport Master Plan (2012–2030)	Enhance planning of public transportation and manage increase of private vehicles. It also drives the inclusion of "low-carbon mobility in the Eleventh Malaysian Plan.
Waste management (NRE, 2015; CSDU, 2017)	Reduce, Reuse, Recyle (3R) programme via the Solid Waste and Public Cleansing Management Act 2007	Mandate separation of waste at household level.
Ecological conservation (Laurance et al., 2010)	REDD+	Keep at least 50% of land mass in Malaysia forested.
Ecological conservation and oil palm (Ab Rahman et al., 2013)	Certification schemes, e.g. Malaysian Sustainable Palm Oil (MSPO) and Roundtable on Sustainable Palm Oil (RSPO)	Promote and recognize sustainability practices of the oil palm cultivation.
Agriculture (NRE, 2015)	National Agro-food Policy (2011−2010)	Safeguard sustainability of agro-food industry.
Agriculture (EPU, 2015)	Malaysian Good Agricultural Practices (MyGAP)	Initiate certification and incentive scheme for sustainable agricultural practices

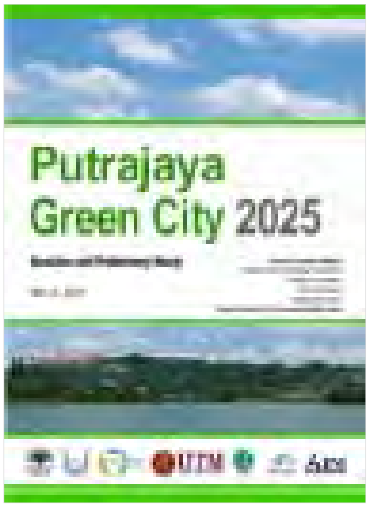
ASEAN Competitive Cities future

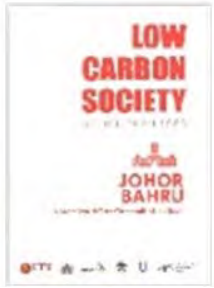


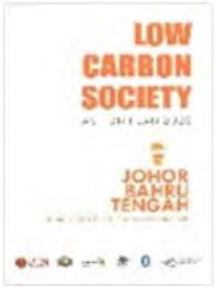
Selected Climate Action Plans by UTM-LCARC

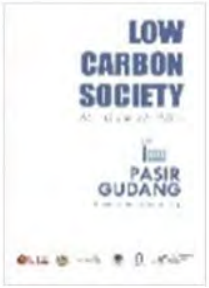


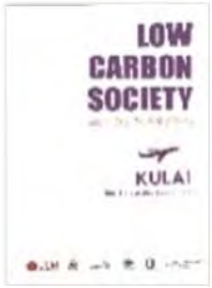


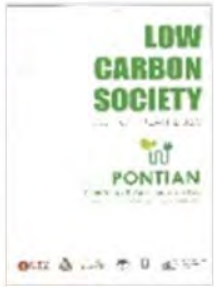




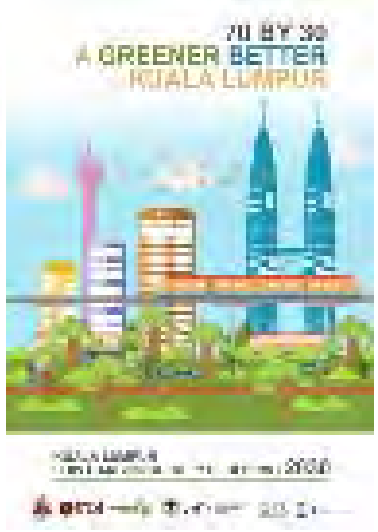




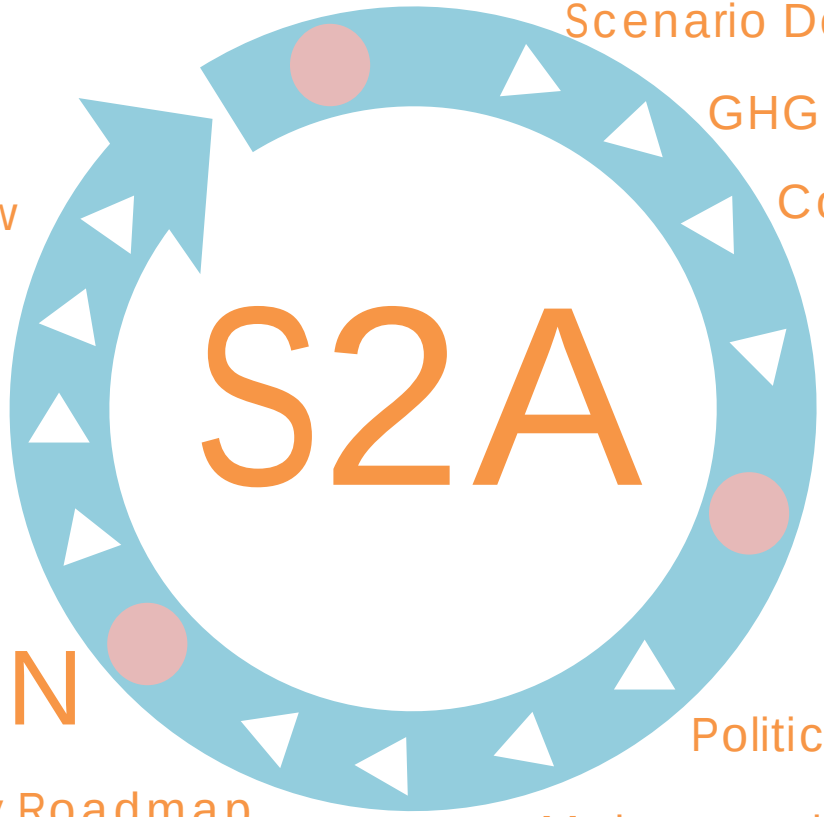




2009-2018



UTM-LCARC S2A Approach



Pro-Growth

Pro-Env.

Pro-Poor

Pro-Job

SCIENCE

Baseline Inventory & Scenario Development

GHG Modelling

POLICY-MAKING

Community / Stakeholder Engagement

Policy Framework

Political / Corporate Buy-ins

Mainstreaming

ACTION

Policy Review

Reporting

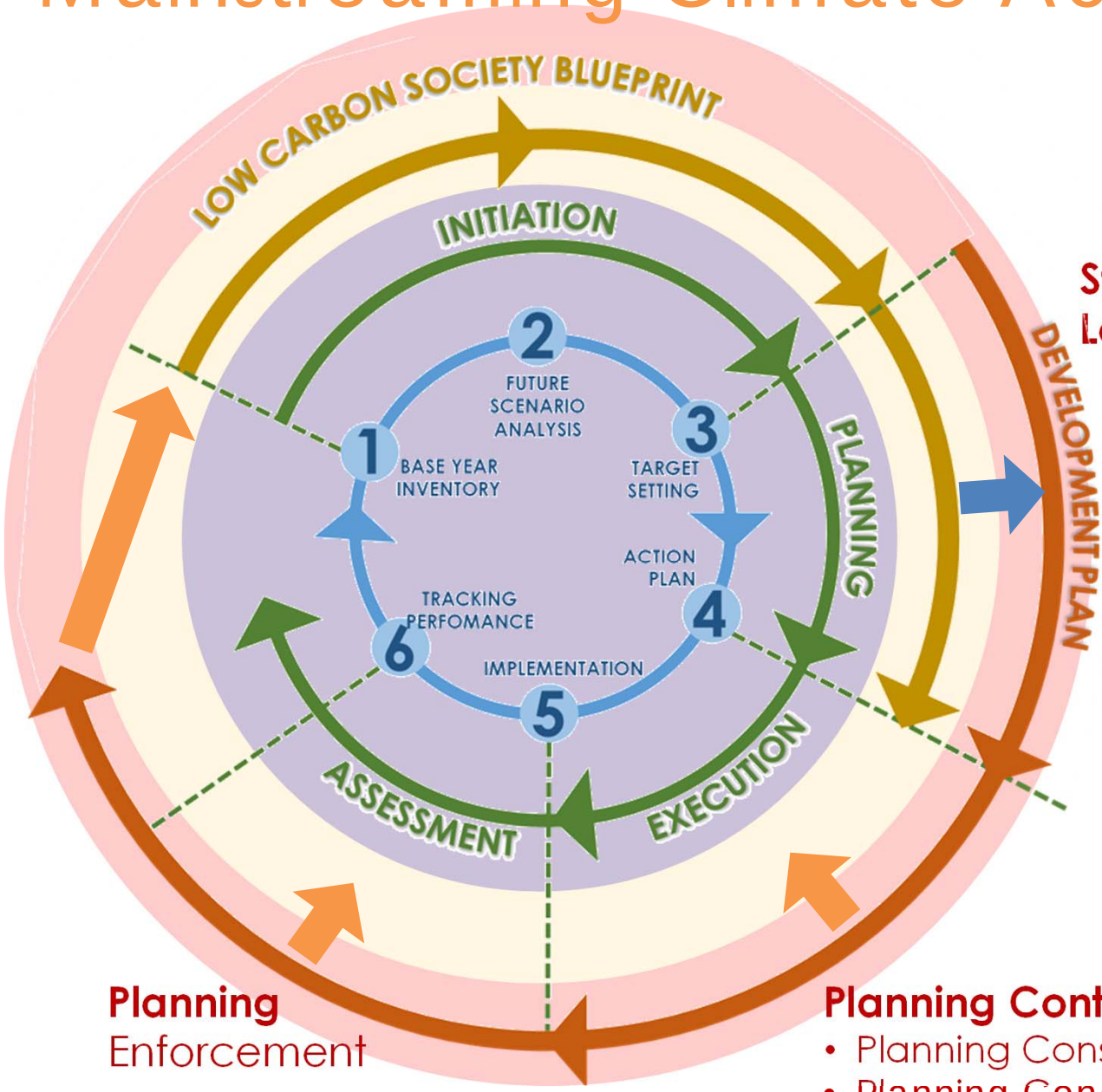
Monitoring

Tracking

Policy Roadmap

Capacity Building

Mainstreaming Climate Action Plans



Structure Plan
Local Plan

Spatial Planning

Climate Policymaking

LCD Process

Mainstreaming

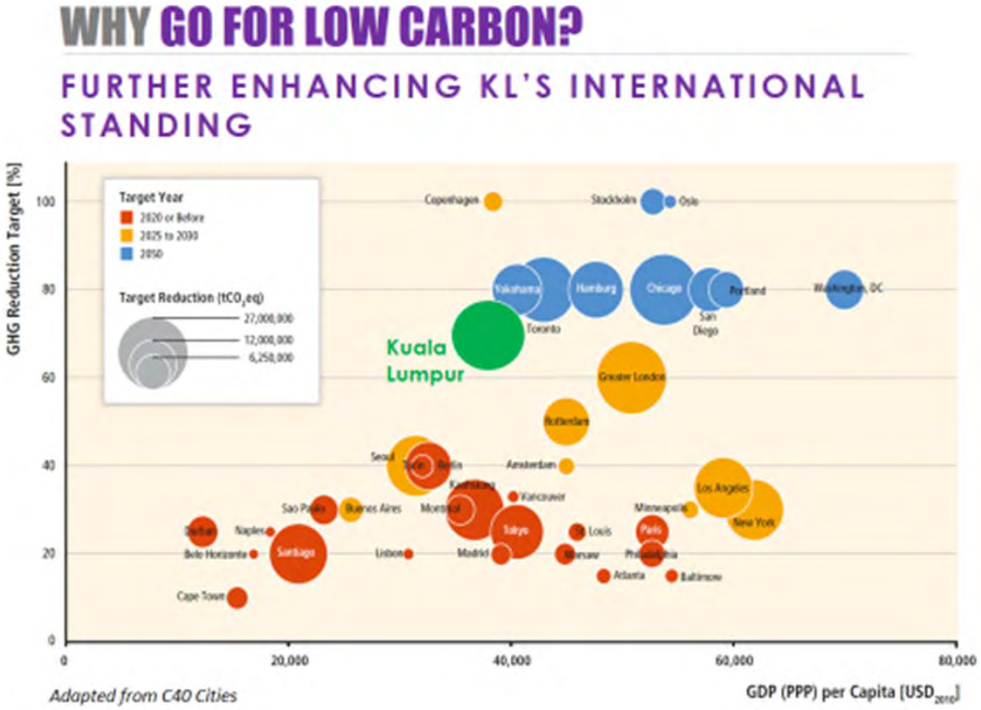
Feedback

Planning
Enforcement

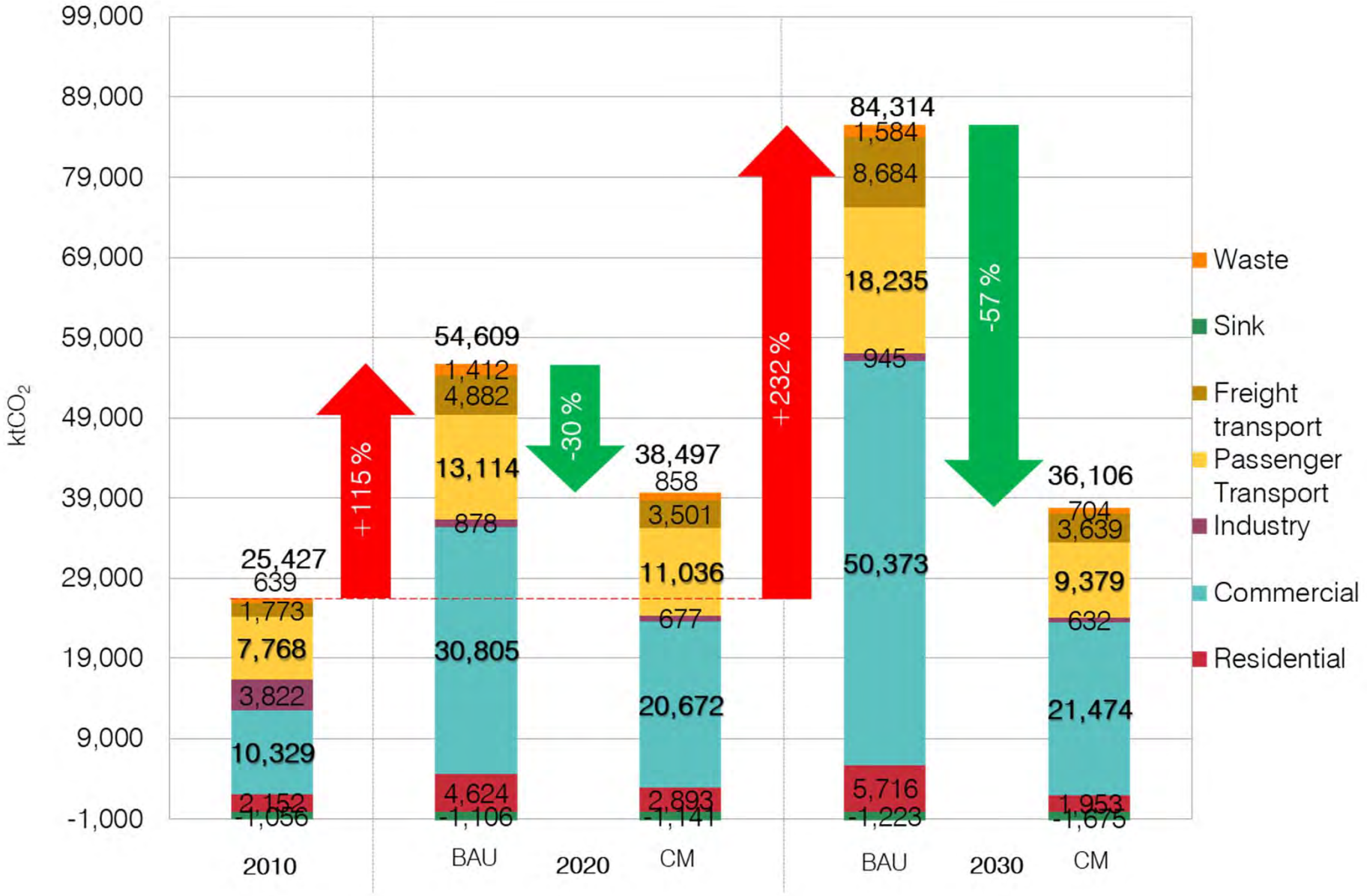
Planning Control
- Planning Considerations
- Planning Conditions

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

DRAFT KUALA LUMPUR
LOW CARBON SOCIETY BLUEPRINT 2030



Kuala Lumpur GHG Emissions Reduction Potential



KL LCSBP 2030 GHG Emissions Reduction Potential

Thrusts	Actions	Reduction ($ktCO_2eq$)	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

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:

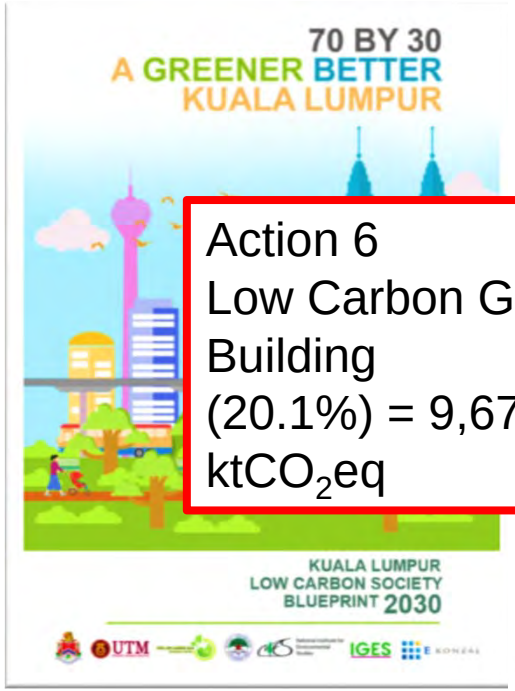
Agencies, entities and/or parties that implement, or are needed to implement, programs due to their statutory duty, ownership rights, institutional responsibility, and/or effective serving of communal interests

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

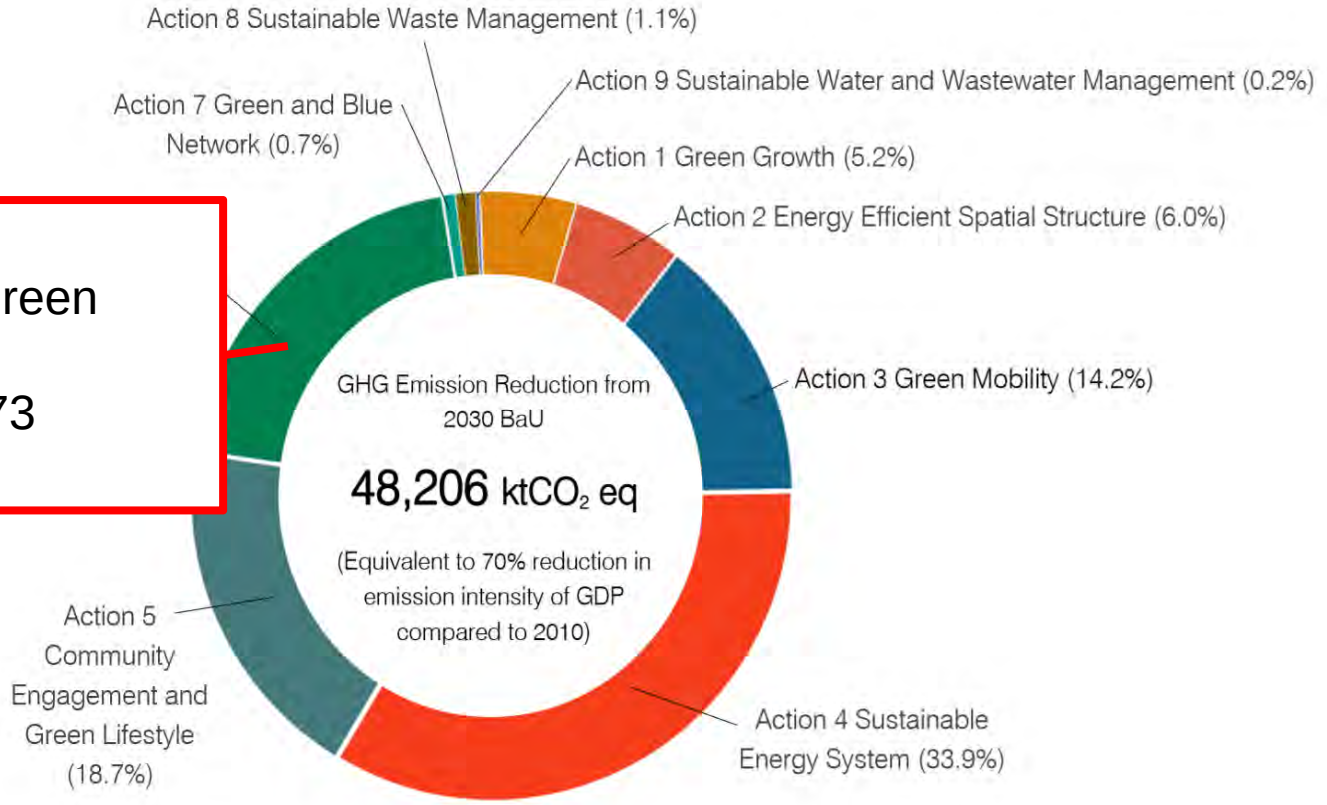
Buildings contribute up to 49% of total GHG emissions in Kuala Lumpur

1,955 units

MYR 60 million/year
for electricity bills



Action 6
Low Carbon Green Building
(20.1%) = 9,673 $ktCO_2eq$

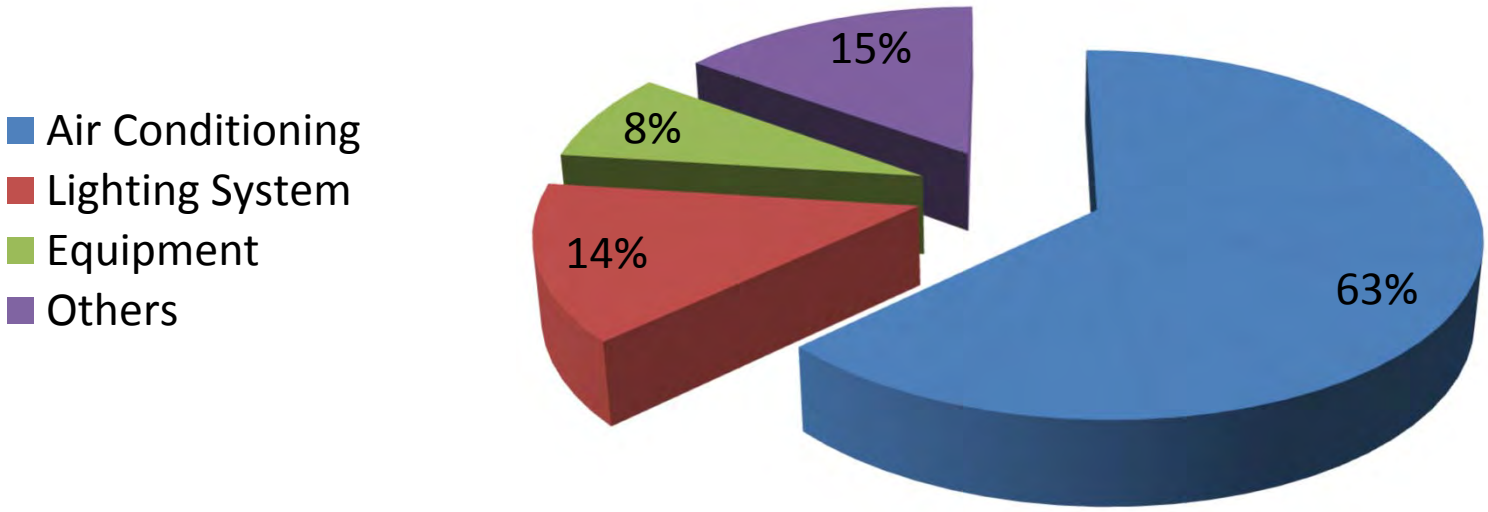


KLCH Buildings By Type

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 BUILDINGSIN KUAL LUMPUR

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



POSSIBLE TECHNOLOGICAL SOLUTIONS

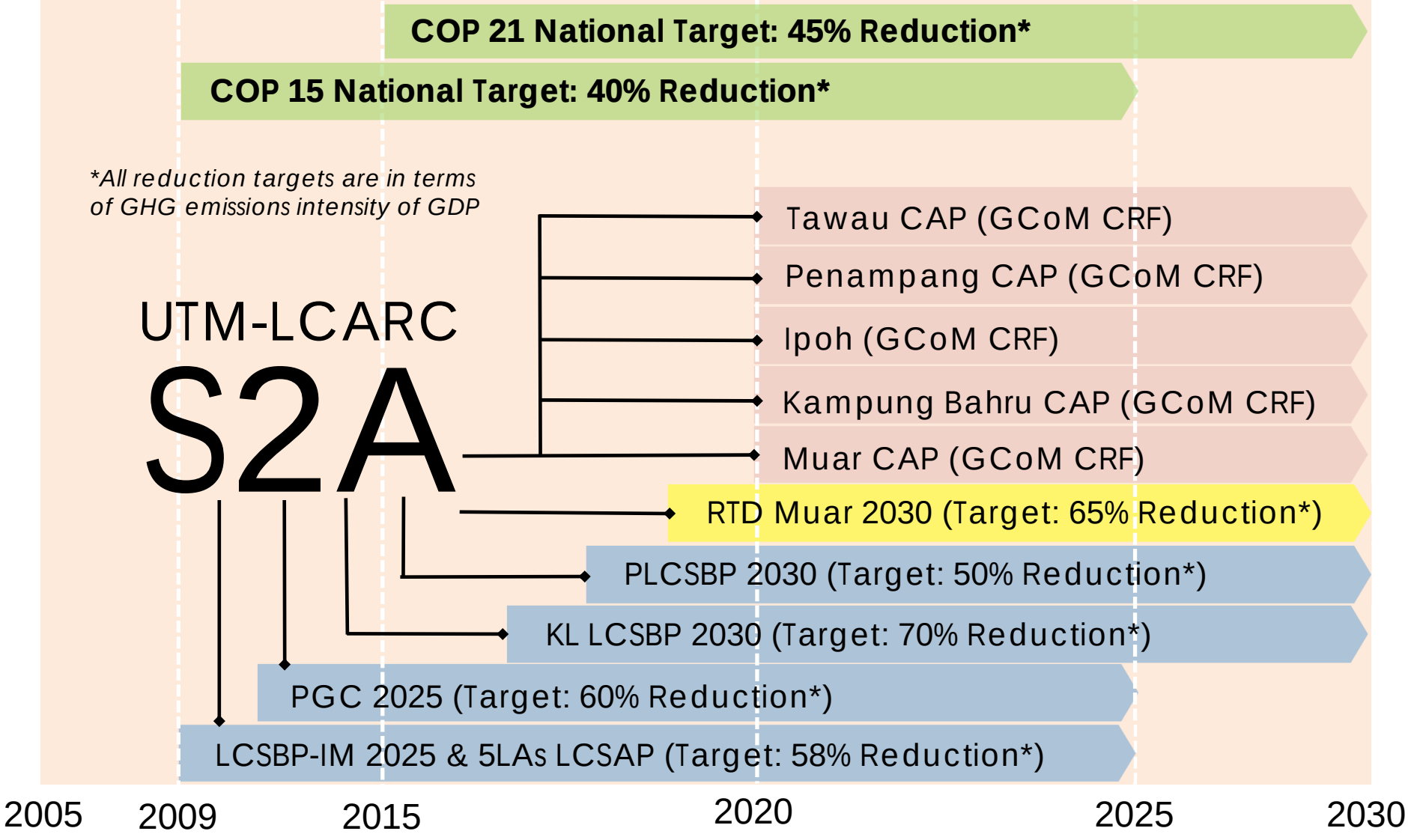
Building Envelope	1	Infiltration - Airtight Building Envelope
	2	Reduce Direct Sunlight - Shading, Window Blind
	3	Insulation - Green Roof, Roof Insulation, Wall Insulation, Window Tinted, Window Glass
Air-Conditioning System	4	Outdoor Air Ventilation Control
	5	Zoning & Control of Air Distribution System - 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

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



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, SW, 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