LOW CARBON SOCIETY

ACTION PLAN 2025

PONTIAN

Clean Energy & Agro-biodiversity Hub

(Jeram Batu, Serkat & Sg.Karang Sub-districts)

UTM UNIVERSITI TEKNOLOGI MALAYSIA

ISKANDAR MALAYSIA

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Universiti Teknologi Malaysia
Majlis Daerah Pontian
Iskandar Regional Development Authority
Kyoto University
Okayama University
National Institute for Environmental Studies

Low Carbon Society Action Plan for Pontian 2025: Clean Energy and Agro-Biodiversity Hub

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FOREWORD

Y.A. B Dato' Seri Mohamed Khaled Nordin
Menteri Besar of Johor
Co-Chairman of Iskandar Regional Development Authority

The Low Carbon Society Action Plan for Johor Bahru 2025 is a great initiative taken by all five local authorities within the Iskandar Malaysia economic region. The local authorities are Majlis Bandaraya Johor Bahru (MBJB), Majlis Perbandaran Johor Bahru Tengah (MPJBT), Majlis Perbandaran Pasir Gudang (MPPG), Majlis Perbandaran Kulai (MPKu) and Majlis Daerah Pontian (MDP).

These local authorities are among the first few in Malaysia to take address climate change issues to meet world community demands for concrete action in global environment conservation. I am confident that these plans will ensure the wellbeing and sustainable growth of Iskandar Malaysia.

In the State of Johor and Iskandar Malaysia, we understand that astute and careful management of the environment and natural resources is key to pursuing sustainable green growth and ensuring a resilient development. This sets the context within which all other factors from land use proposals and development to social engineering, service provision and economic growth substantial, supported by solid scientific research and strong buy-in from the various stakeholders.

Therefore, the implementation must be done through collaboration with the local communities,m whose knowledge and intimate experiences of their environment are crucial for a well-planned economic region. This will enhance the value proposition of such developments, without sacrifing the future.

I would like to commend all parties involved, especially the local authorities for taking up this challenge and making Johor a better living environment for all.

FOREWORD

Y.Bhg Haji Suhairi bin Haji Hashim
Yang Dipertua Majlis Daerah Pontian

Pontian District Council (MDP) aims at addressing economic growth, societal well-being and development, as well as environmental preservation and management in Pontian in a holistic manner, and the Low Carbon Society initiative is one of the various mechanisms that have been deployed to achieve these objectives.

We learned the idea of low carbon society through the Low Carbon Society Blueprint for Iskandar Malaysia 2025 prepared by Universiti Teknologi Malaysia (UTM) and Iskandar Regional Development Authority (IRDA), with support from the Japanese government and research institutions. The Blueprint gives us a clear view to an innovative approach and concrete framework for contributing to sustainable development in Pontian, beginning with the three Sub-districts (Jeram Batu, Serkat and Sg. Karang Sub-districts) that are located within Iskandar Malaysia. We are pleased to be part of the Iskandar Malaysia region that is on the path to realising low carbon society, enhancing inclusiveness by emphasising community centric development and promoting green growth for greater prosperity while at the same time reducing our GHG emissions. This Low Carbon Society Action Plan for Pontian (Jeram Batu, Serkat, Sg. Karang) 2025, with its 12 Actions and 197 programmes, will be implemented in a timely and proactive manner, with MDP performing the leading role.

We wish to thank UTM and Japanese researchers from Kyoto University, the National Institute for Environmental Studies (NIES) and Okayama University; and funders of the project, the Japan International Cooperation Agency (JICA) and Japan Science and Technology Agency (JST), for their invaluable research efforts, diligence, support and commitment to the sustainable, low carbon growth of Pontian. This is a major contribution towards the realisation of MDP's vision of making the three sub-districts of Pontian a Clean Energy and Agro-Biodiversity.

PREFACE

Ho Chin Siong
Project Manager
Professor
Universiti Teknologi Malaysia

Yuzura Matsuoka
Project Leader
Professor
Kyoto University

Malaysia is experiencing rapid urbanization and transformation. The government is aiming to become a high income nation that is both inclusive and sustainable by 2020. One of the major strategic thrusts of Eleventh Malaysia Plan 2016 – 2020 is stressing on the green growth for better wellbeing and quality of life. It is important to develop low carbon, vibrant and liveable communities in our major economic growth corridors that adopt climate resilient growth strategies. The formulation of a Low Carbon Action Plan for the cities of metropolis is one of the approaches to empower local authorities to implement climate resilient growth strategies to reduce emissions of greenhouse gases (GHGs) at local level.

This action plan is a complementary document builds upon the Low Carbon Society Blueprint for Iskandar Malaysia 2025 with the focus on Pontian region specifically. Apart of emphasizing on low carbon development, this action plan is align with the vision of Pontian – Clean Energy and Agro-Biodiversity Hub. This report is the outcome of the strong partnership with Pontian District Council (MDP) and Iskandar Regional Development Authority (IRDA) to outline realistic implementation program by involving diverse stakeholders through focus group discussion.

This action plan is a continuous effort of research outputs of our SATREPS (Science and Technology Research Partnership for Sustainable Development) project on the Development of Low Carbon Society for Asian Region sponsored by Japan International Cooperation Agency (JICA) and Japan Science and Technology Agency (JST). The main research institutes involved in this collaboration work are Universiti Teknologi Malaysia (UTM), Kyoto University, National Institute for Environmental Studies (NIES), and Okayama University.

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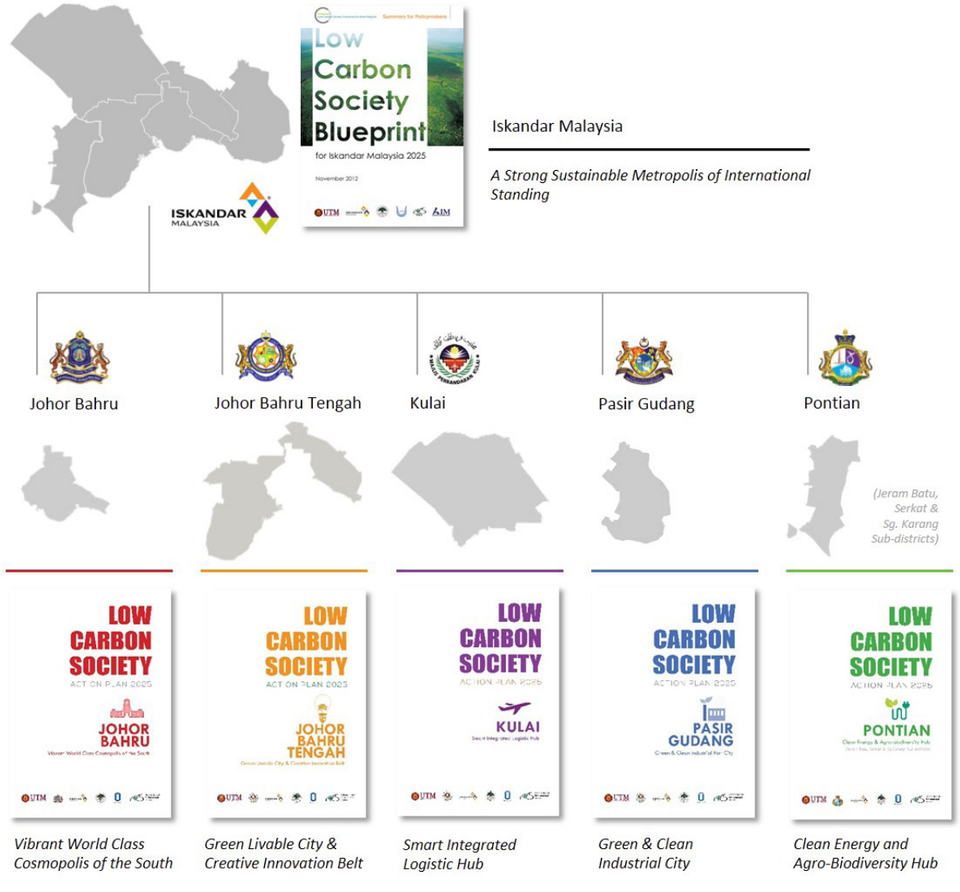
INTRODUCTION

The *Low Carbon Society Blueprint for Iskandar Malaysia 2025* (LCSBP-IM2025), officially launched by the Prime Minister of Malaysia and adopted by the Iskandar Regional Development Authority (IRDA) in 2012, outlines a total of 281 implementation programs which are projected to reduce Iskandar Malaysia's carbon emission intensity by 58% in 2025 compared to 2005 levels. Several strategic programs outlined in the LCSBP-IM2025 have since been implemented. To accelerate the realisation of low carbon society (LCS) in Iskandar Malaysia (IM), which covers four local authority (LA) jurisdictions and part of a fifth LA jurisdiction, a set of five LCS Action Plans are formulated, one for each of the five LA jurisdictions (see figure below). This document presents the LCS Action Plan for the Pontian District Council (Majlis Daerah Pontian, MDP).

These LA-level LCS Action Plans are crucial to ensure effective implementation of the LCSBP-IM2025 as each LCS Action Plan recognises and responds to the distinctive economic, social and environmental characteristics, as well as strengths, potentials and issues unique to each LA. By adopting their respective LCS Action Plan, the LAs are in effect adopting LCS policies and programs within the framework of the LCSBP-IM2025 that are appropriate to their socioeconomic and environmental contexts. To that end, three rounds of focus group discussions (FGDs) have been conducted for each LA prior to, during and after the preparation of the LA's Draft LCS Action Plan between March and October 2015. Through the FGD sessions, LA officials provided direct feedback and comments on the proposed LCS programs in terms of their priority, suitability and feasibility for implementation (see Appendix: Method of Project Evaluation).

This LCS Action Plan 2025 for Pontian aims at facilitating LCS development for the Pontian District area to become a "Clean Energy & Agro-biodiversity Hub". It recommends specific local level LCS programs and provides implementation guidance to policymakers of MDP by identifying the level of importance, timeline and implementation agencies for each program. For consistency and ease of reference, LCS programs in this LCS Action Plan are structured following the 12 LCS Actions in the LCSBP-IM2025. For technical details of each LCS program, readers are referred to the Low Carbon Society Blueprint for Iskandar Malaysia 2025 – Full Report (UTM-LCAR, 2013).



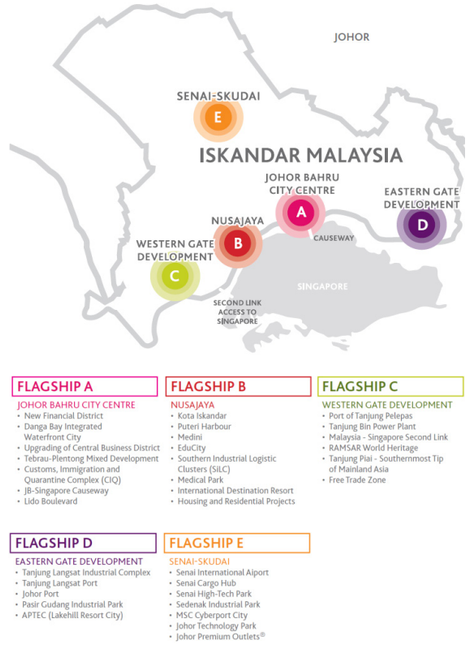
LOW CARBON ISKANDAR MALAYSIA 2025

Iskandar Malaysia (IM) is a visionary economic region in Johor that was established in 2005 as one of the catalyst development corridors to spur growth of the Malaysian economy. Covering an area of 221,634 hectares (2,216.3 km^2), IM is the largest single development project ever to be undertaken in the Southeast Asia region. Strategically located at the southernmost tip of Mainland Asia to tap on a vast market of about 0.8 billion people within a 6-hour flight radius, IM is set to become an integrated global node that synergises with growth of the global City-state of Singapore and Indonesia. To that end, it has been projected that population in IM will more than double from 1.35 million in 2005 to over 2.83 million by 2025, supported by a stable 7-8% annual GDP growth that is primarily driven by services and manufacturing. Towards strengthening the existing economic clusters and diversifying growth, five Flagship Zones have been earmarked as key growth poles for development in Iskandar Malaysia.

In line with IM's vision to be "A strong sustainable metropolis of international standing" and Malaysia's voluntary commitment to reducing the country's carbon emission intensity by 40% by year 2020 (based on 2005 levels), it is vital that the targeted strong growth is achieved while keeping IM's carbon emission at bay. This calls for the LCSBP-IM2025 to nurture a healthy, knowledgeable and globally competitive society that subscribes to low carbon living while at the same time develop a total urban-regional environment that enables rapid economic growth but reduces growth's energy demand and carbon emission intensity. It is a holistic and integrated approach that pulls together measures under green economy, green community and green environment to decouple rapid growth and development from carbon emission in IM. The LCSBP-IM2025 covers wide ranging aspects which include urban planning, transportation, industry, building, energy efficiency, renewable energy, lifestyle change, education and awareness, governance, forest conservation, waste management and air and environmental quality.

The Iskandar Malaysia LCS development is a pilot research project of the project of Development of Low Carbon Society Scenarios for Asian Regions initiated under the auspices of Science and Technology Research Partnership for Sustainable Development (SATREPS). The project aims at showcasing best practices in LCS for Asian Regions and will therefore benefit not only IM and Malaysia, but also the Asian Regions. It is a hands-on project where researchers and government officials of Asian Countries work together in implementing research outputs within the cities or regions involved, leading to the eventual establishment of an Asian Low Carbon Society network.

Iskandar Malaysia's strategic location in Asia
(Source: Iskandar Regional Development Authority)

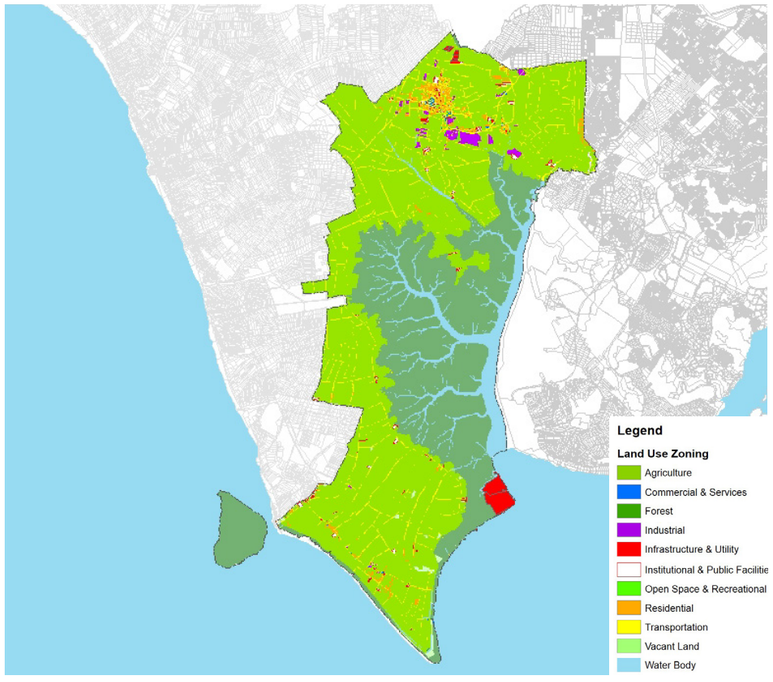


Iskandar Malaysia's five Flagship Zones

LOW CARBON SOCIETY PONTIAN 2025

Pontian is located at the southwest part of Iskandar Malaysia. The areas of Pontian in Iskandar Malaysia are consisting of three sub-districts, namely Jeram Batu, Sungai Karang and Serkat. The region is rich in natural resources and agricultural products. The community of the region inhabited in small towns and traditional villages.

Population in the three sub-districts of Pontian is expected to increase from 34,965 (2010) to 62,600 (2025) (1.79 times compared to 2010). While the number of household in the region will increase from 7,813 (2010) to 15,168 (2025). The GDP per capita of the region is expected to increase from RM 14,901 (2010) to RM 41,406 (2025).



Clean Energy and Agro-Biodiversity Hub

The key economic activities for the part of Pontian in Iskandar Malaysia, is mostly on industrial and trade based activities, but most of the land banks in this area are agriculture land and mangrove forests which can be considered as an advantage for the region to become a Agro-biodiversity hub.

KEY FEATURES OF PONTIAN

Tanjung Bin Power Plant is the first private coal-fired plant in Malaysia and the largest coal-fired power plant in South-East Asia. The plant has a generating capacity of 2,100 MW. Electricity are produced to support various activities in Iskandar Malaysia.

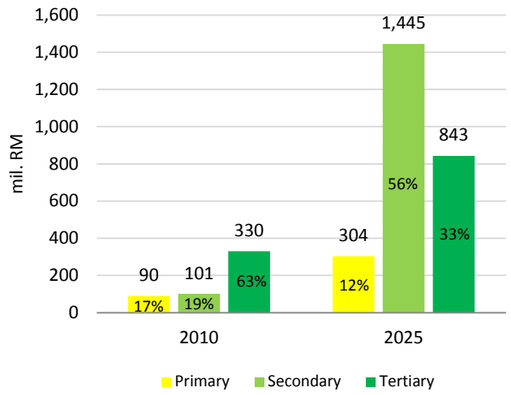
Kukup is a small fishing village located in the district of Pontian. It is famous for its open-air seafood restaurants built on stilts over the water. Some of the restaurants are geared for the tour groups, and it is particularly popular with tourists from Singapore.

Tanjung Piai National Park is the southern point of mainland in Asia. It is a nationally important icon, being one of only five Ramsar sites in Malaysia. Tanjung Piai is an important habitat for endemic mangrove species and migratory birds.

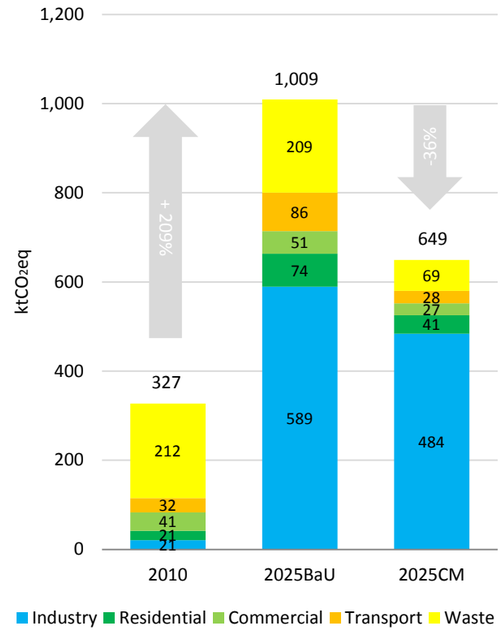
Pekan Nanas is known as Pineapple Town, which located in Jeram Batu sub-district. Pekan Nanas was Malaysia's largest production base for pineapple. Pekan Nanas's pineapple planting area and its output ranked first in the country. The town is near to Gunung Pulai, the famous tourist attraction in Johor.

Economic Structure

Gross Domestic Product (GDP) of the Pontian area in 2025 is expected to be RM 2,592 mil. (4.98 times of the performance in 2010). The share of future primary industry sector in Pontian area will decrease from 17% (2010) to 12% (2025). The secondary industry will become the main economic sector of the Pontian area (from 19% in 2010 to 56% in 2025). Tertiary industry sector's share is expected to decrease from 63% (2010) to 33% (2025).

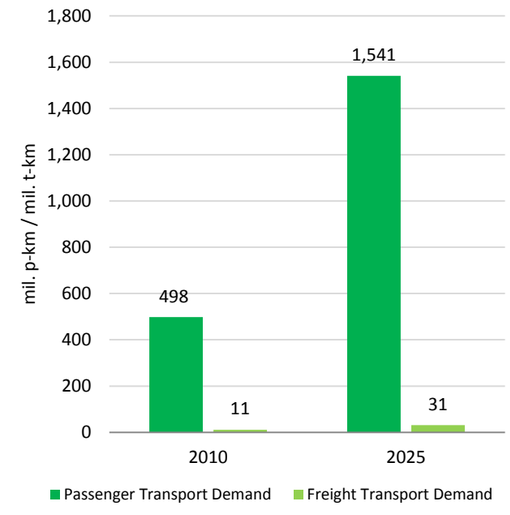


Greenhouse Gas (GHG) Emissions



Transportation Structure

Passenger transport demand in Pontian area within IM will increase from 498 million passenger-kilometres (2010) to 1,541 million passenger-kilometres (2025). While, freight transport demand will increase from 11 million tonne-kilometres (2010) to 31 million tonne kilometres (2025).



The figure above shows the total carbon emission of Pontian area within IM by key emission sectors in 2010 (base year), 2025BaU (Business as Usual) and 2025CM (Counter Measures). The total GHG emissions of Pontian area within IM in year 2010 is about 327 $ktCO_2eq$ and it is projected to increase 209% to 1,009 $ktCO_2eq$ in year 2025 if no mitigation measures are taken.

However, the GHG scenario could be improved if mitigation measures are introduced. An estimated 36% reduction (-360 $ktCO_2eq$) may be achieved under the 2025CM as compared to the 2025BaU scenario.

Specifically the carbon emission from the waste sector can be reduced up to 67% (-140 $ktCO_2eq$), while the reduction for the transport is 67% (-58 $ktCO_2eq$), commercial sector 47% (-24 $ktCO_2eq$) follow by residential sector 45% (-33 $ktCO_2eq$) and industry sector 18% (-105 $ktCO_2eq$).

Unit	2010	2025 BaU	2025 CM	2025BaU/ 2010	2025CM/ 2010	2025CM/ 2025BaU
Final energy Demand (ktoe)	24	31	166	1.29	6.92	5.35
GHG emissions ($ktCO_2eq$)	327	1,009	649	3.09	1.98	0.64
Per capita CO_2 emissions (tCO_2eq)	9.4	16.1	10.2	1.71	1.09	0.63
GHG intensity ($ktCO_2eq$ / mil.RM)	0.63	0.39	0.25	0.62	0.40	0.64

Low Carbon Society Pontian 2025
CLEAN ENERGY AND AGRO-BIODIVERSITY HUB

Integrated Green Transportation

Integrated Public Transportation

1. Route network expansion planning (improve network coverage and connectivity)
2. Increase bus frequency, improve punctuality and reliability
3. Real time arrival information
4. Public transport reimaging
5. Flat rate tickets and central area free shuttle services
6. Web-based journey planner
7. Route network planning
8. Connectivity & integration with existing public transport modes
9. Public transport interchanges as destinations & urban activity nodes
10. 'Park and ride' facilities in suburban transit nodes

Diffusion of Low Carbon Vehicles

1. Government agencies to use hybrid vehicles/ electric vehicles
2. Tax reduction for hybrid vehicle purchase
3. Gradual phasing out for diesel engine buses
4. Subsidy for purchase of hybrid buses

Enhancing Traffic Flow Conditions and Performance

1. Enhancing traffic signal performance

Green Transportation in Rural Areas

1. Provide hybrid bus services from rural areas to urban areas
2. Provide school bus services for students in rural areas
3. Subsidise rural area hybrid bus services

Green Industry

Decarbonising Industries

1.Purchase of energy efficient equipment
2.Investment in energy saving managing system
3.Establish environmental assessment system including carbon emission for new investment
4.Monitoring and enforcement of energy saving actions

Green Employment in Existing Industries

1. Progressive requirement for Corporate Social Responsibility (CSR) reporting (including energy & environmental performance reporting) by existing industries

Human Capital Development in Green Industry

1. Joint government-industry intensive training programs
2. Fiscal incentives for industries that offer continuous professional education for employees

Low Carbon Governance

Development Planning for Low Carbon Pontian

1. Set clear carbon intensity reduction targets for Pontian up to 2025 (minimum 50% based on 2005 emission intensity levels to contribute to the national 40% reduction target announced by the Prime Minister at COP 15)
2. Formulation of achievable & implementable low carbon transition strategies for 2012-2025 and beyond
3. Provide policies to "reward" land development projects that contribute to Pontian's low carbon visions
4. Coordination of LCS guidelines & standards for MDP
5. Revise and update existing use classes order to facilitate mixed use development

Planning Control Process, Procedures and Mechanism for Materialising LCS in Pontian

1. Integrated decision making processes in planning control at State & local levels
2. Expedite approval process for proposed developments that support achievement of Pontian's LCS visions (e.g. developments proposed around planned public transport nodes; developments that retain existing vegetation; green buildings that contribute to energy efficiency)
3. Requirement for submission of a "low carbon statement" in all Planning Permission applications
4. Imposition of planning conditions on granting of planning permissions that support LCS actions (e.g. mandatory provision of walkways in residential neighbourhoods)

Development of necessary human capital for operationalising and implementing Pontian's Low Carbon Society vision

1. Develop low carbon urban & regional planning retraining curriculum for in-service municipal officials
2. Incorporate low carbon society concepts, philosophy, approaches, measures etc. in municipal human capital development programs
3. Systematically prioritise & organise continuous (re)training of officials

Green Building and Construction

EEI of Existing Building (retrofitting)

1. Subsidy and/or tax incentives for building owners

Green Construction

1. All consultants to adopt green design process
2. Encourage production and cost-effective supply chain of green construction materials by industries

Green Building Design and Technology

1. Temperature control at 24°C (air conditioning for government offices)
2. Movement sensors for low occupancy areas
3. Consultants to adopt IBS in their design process
4. Optimal building depths (9-13m) for natural lighting
5. Maximise natural cross ventilation
6. Integrate green landscaping with building facade
7. Maximise use of day lighting
8. Maximise space adaptability

Rural Green Buildings

1. Subsidy for conaservation of vernacular structures such as tradition timber houses, mosques, schools, community centres, clinics, shops & holiday cottages

Green Energy System and Renewable Energy

Promotion of Renewable/ Alternative Energy

1. Encouraging of Solar PV as PV roofing, PV farm and PV on public infrastructure

Establishment of Advanced Energy System

1. Establishing evaluation methods for selecting candidate place to incorporate distributed energy system
2. Evaluating the suitability of energy storage technologies to Pontian
3. Establishing evaluation method for appropriate capacity for Energy Storage which will be installed
4. Conducting Research and Development of power management system with IT technologies for enabling self-healing system features, allowing system transparency within the grid ensuring cyber-security and physical security and allowing system transparency within the grid
5. Promoting the installation of power management system

Provision of Incentives and Subsidies and Derivation of Tariff Rates

1. Evaluating and proposing suitable incentives schemes in the form of tax rebate, Feed-in tariff, capital subsidies and soft loan to promote the installation of RE and alternative energy at household, commercial and industry level.
2. Allocating research fund for R&D on green initiatives
3. Evaluating current tariff scheme to propose new tariff scheme, i.e., on and off-peak tariff scheme for household

Low Carbon Lifestyle

Awareness through Education

1. Awareness programs for community
2. LCS education across curriculum
3. School clubs for LCS & 3R programs
4. Children eco-life challenge project
5. Interschool 3R project competitions
6. 3R measures at schools
7. LCS measures at schools
8. Collaboration with relevant government agencies & NGOs
9. Students to collect reusable & recyclable wastes from home & neighbourhood

Smart Working Style

1. 'Work-from-home' pilot project for government agencies
2. Encourage teleworking/ telecommuting among private sectors employees
3. Promote adoption of flexi working hours in suitable sectors

Promote Energy Efficiency

1. Set up Eco Point system in local stores
2. Promote 'Cool Biz' concept
3. Promote the engagement of Energy Saving Advisors (Environmental Concierge)
4. Real time energy monitoring system for low carbon lifestyle
5. Subsidies for energy efficiency appliance in residential

Promote "Smart Travel Choices"

1."Burn more calories, burn less carbon" campaign
2. Guideline for eco-driving practices

Stock–taking for Low Carbon Lifestyle

1. Development of environmental report system at community level
2. Establish Eco-life check tool for household

Community Engagement and Consensus Building

Share LCS Information and Gather Opinion through Stakeholder Engagement

1. Maintain updated list of stakeholders
2. Invite all key stakeholders to Pontian local action plan processes
3. Brain storming on LCS actions in Pontian with experts' knowledge & local knowledge
4. Disclose/ ongoing feedbacks & comments on LCS actions
5. Feedback and comments during LCS workshops and FGDs
6. Feedback and comments through website

Public Information on LCS progress

1. LCS project updates
2. LCS events announcements
3. Web-based newsletters
4. Distribution of printed newsletter (printed on recycled paper)
5. Dissemination of progress updates/ events announcement via billboards, banners and mass media (newspaper, radio, television)
6. LCS mobile showroom / exhibition (hybrid vehicle) periodic visit to neighborhood
7. Pontian LCS info-kiosks in shopping centres
8. Pontian LCS info-kiosks in community centers (multi-purpose hall, places of worship)

Developing Model Low Carbon Communities

1. Build consensus with related authorities
2. Produce action plans & road maps (through FGD)
3. Formation of implementation committee
4. Continuous monitoring of implementation

Green Ambassadors/ Champions

1. On going monitoring of neighbourhood, company, organisation green initiatives
2. Annual green neighborhood, company, organisation competitions
3. Appoint community level leadership
4. Human resource development for community leaders
5. Green ambassadors in school (students)
6. Champions in school (school management team)

Walkable, Safe and Livable City Design

Designing Walkable City Centers and Neighborhoods

1. Street tree planting for shades
2. Appropriate street furniture
3.Apply universal and inclusive design concepts
4. Create permeable street layouts (maximum street block dimensions of 70m-90m)
5. Identify gaps/ disconnections in existing street network
6. Identify potential new pedestrian connections
7. Create continuous active street frontages
8. Provide safe walking routes to schools

Designing the Cyclist-friendly City

1. Provide dedicated, shaded cycle tracks along major roads
2.Priority signals for bicycles at major junctions
3. Provide sufficient & secure bicycle parking facilities
4. Provide safe cycling routes to schools

Designing the Safe City (from crime)

1. Increase residents' natural surveillance
2. Identify & eliminate blind spots & gap spaces
3. Community patrolling cum recreation
4. GIS database on crime occurrences
5. Set up community police beats at strategic locations
6. Increase police patrolling in neighborhoods
7. community cycling patrol with police

Designing Civilised & Livable Streets through Traffic Calming

1. Enforcing 30km/h zones
2. Installing speed humps
3. Carriageway deflection (chicanes & chokers)
4. Reduce junction turning radii
5. Home zones
6. Gateway design into traffic calmed areas
7. Community landscaping program
8. Carriageway narrowing
9.Pavement widening
10.Kerb extension at junctions
11. Humped pedestrian crossings

Smart Urban Growth

Promote Polycentric Growth Pattern in Pontian

1. Coordination of spatial growth strategies across administrative boundaries of local authorities

Promote Compact Urban Development

1. Setting spatial growth limit of Pontian & enforcing UGB
2. Encourage infill development within existing built up areas (on brownfield & greyfield sites)
3. Preserve urban fringe primary agricultural areas
4 . Mixed residential development (including affordable homes)
5 . Promote locally self-sufficient land use mix in distinct urban neighbourhoods
6 . Design high quality public realms that encourage higher density urban living

Promote Transit Supportive Land Use Planning

1. Identify existing & potential public transport / transit nodes
2. Integrate pedestrian network with transit nodes
3. Orientate and provide direct walking routes from homes to transit stops
4. Permit higher densities & plot ratios within 800m of public transport nodes
5. Incentive to developers in reduced parking requirement.

Develop the 'Smart Digital City'

1. Develop Pontian "People's Information System" (PIS) that integrates various electronic applications towards smart living, smart working, smart learning, smart travelling etc.

Green and Blue Infrastructure

Regional Green Corridor Network

1. Identify potential linking corridors between existing forested areas for future land acquisition
2. Gradually gazette presently ungazetted primary & secondary forests as protected forests

Conservation of Mangrove Forests

1. Gazette all mangrove areas as protected forests
2. Strict enforcement against illegal mangrove clearing
3. Ongoing mangrove species audit
4. Corporate sectors adoption of mangrove regeneration projects
5. Involving students and schools in mangrove trees planting

Promote Urban Forests (urban recreation and green lungs)

1. Identify the species and location of trees to be planted.
2. Involving students and schools in forest tree planting
3. Identify potential plots for urban parks (unused government land)
4. Strengthening existing planning policy to increase green areas
5. Immediate replanting for cut down areas
6. One resident one tree program
7. Tree planting at government/ corporate events
8. Government subsidy for tree saplings

New Development to Retain Existing Vegetation

1. Encourage reporting of illegal tree felling
2. Carry out municipal tree surveys for existing green areas in Pontian

Low Carbon Farming in Rural Areas

1. To reduce agricultural CH_4 and N_2O emissions
2. Plant high quality and fast growing crops and supply to urban area (plant and eat locally to reduce import food)
3. Ongoing technical support & training from government

Ecotourism and Rural-cultural Tourism

1.Introduce low carbon rural tourism packages
2.Promote rural low carbon lifestyle as a tourism product
3.Conserve, enhance & link key rural natural resources in Pontian

Sustainable Waste Management

Sustainable Municipal Solid Waste Management

1. Smart consumption (buy in bulk, refill &concentrate local product)
2. Choose durable item and reusable item
3.Restrict of using non-recyclable packaging.
4. Encourage culture of sharing, borrowing, or renting instead of buying
5. Buy product from recycled materials
6. 'Pay as you throw' system
7. Scheduled waste collection for bulky waste
8. Composting at home
9.Decentralised composting plant
10. Recycling of E-waste
11. Separate waste collection at source
12. Optimization of waste collection routes
13. Use of collection vehicle driven by bio-diesel fuel (BDF) or Natural Gas Vehicle (NGV)

Sustainable Agricultural Waste Management

1. Onsite combustion.
2. Formulation of biomass into animal feed.

Sustainable Industrial Waste Management

1. Select of treatment method with less energy and less material
2. Decentralized scheduled waste treatment plant
3. Encourage cleaner production initiative
4. Waste to fuel and production of BDF

Sustainable Sewage Sludge Management

1. Sewage sludge recycling through composting

Clean Air Environment

Clean Air Quality

1.Quantitatively evaluate the reduction of pollutant emission for each LCS CM
2. Evaluate /predict the improvement of local air quality by model simulation
3. Visualisation of co-benefit of LCS CM in the industrial sector
4. Improve air quality monitoring network
5. Implement tax incentives on purchase of low-emission vehicles
6. Increase investments in public transportation
7. Improve roadside air quality monitoring
8. Install the appropriate removal device when using biomass as fuel

Improve Regional Air Quality

1. Lobby for ministerial level imposition of tougher penalties on slash & burn activities in the region

01 INTEGRATED GREEN TRANSPORTATION

Strong economic development and population growth of Pontian lead to higher passenger and freight transportation demand. In order to mitigate the carbon emission level of the projected increase transportation demand, development of an intergrated green transportation system in Pontian is highly essential. This calls for four (4) strategies of: (1) integrated public transportation; (2) diffusion of low carbon vehicles; (3) enhancing traffic flow conditions and performance and (4) green freight transportation. Under these strategies 18 potential programs are listed for the implementation of intergrated green transportation.

The diagram in the next page shows the list of key projects in and targeted year of implementation.

Source of image: MDP

Key projects	2015	2020	2025	Potential Actors
Integrated Public Transportation				
1. Route network expansion planning (improve network coverage and connectivity)				SPAD, PPAJ, MDP, Enterprises
2. Increase bus frequency, improve punctuality and reliability				PPAJ, MDP, Enterprises
3. Real time arrival information				PPAJ, MDP
4. Public transport reimaging				SPAD, PPAJ, MDP
5. Flat rate tickets and central area free shuttle services				SPAD, PPAJ,MDP
6. Web-based journey planner				SPAD, PPAJ, MDP
7. Route network planning				SPAD, PPAJ, MDP
8. Connectivity & integration with existing public transport modes				SPAD, PPAJ, MDP
9 Public transport interchanges as destinations & urban activity nodes				SPAD, PPAJ, MDP
10. 'Park and ride' facilities in suburban transit nodes				SPAD, PPAJ, MDP
Diffusion of Low Carbon Vehicles				
1. Government agencies to use hybrid vehicles/ electric vehicles				SPAD, MDP
2. Tax reduction for hybrid vehicle purchase				SPAD, MDP
3. Gradual phasing out for diesel engine buses				SPAD, PPAJ, MDP
4. Subsidy for purchase of hybrid buses				SPAD, PPAJ, MDP
Enhancing Traffic Flow Conditions and Performance				
1. Enhancing traffic signal performance				SPAD, PPAJ, MDP
Green Transportation in Rural Areas				
1. Provide hybrid bus services from rural areas to urban areas				SPAD, PPAJ, MDP
2. Provide school bus services for students in rural areas				SPAD, PPAJ, MDP
3. Subsidise rural area hybrid bus services				SPAD, PPAJ, MDP

Importance level

High Medium Low

02 GREEN INDUSTRY

Industry is one of the activities that contribute GHG emissions in Pontian. It is important for ensuring the industry sector to be environment friendly for a sustainable future of Pontian. In order to promote green industry in Pontian, there are three (3) major strategies. These strategies are (1) decarbonising industries; (2) green employment in existing industries and (3) human capital development in green industry. A total of 7 potential projects have been identified for green industry development in Pontian toward low carbon society. Implementation of programmes under these strategies are expected to begin from year 2015.

Diagram on the next page shows the list of key projects for Pontian green industry and the target year for implementation.

Source of image: Jiman Energy Ventures Sdn Bhd

Key projects	2015	2020	2025	Potential Actors
Decarbonising Industries				
1. Purchase of energy efficient equipment				MDP, KeTTHa, GreenTech, BEM
2. Investment in energy saving managing system				MDP, MIDA, GreenTech, KeTTHa
3. Establish environmental assessment system including carbon emission for new investment				DOE-GIVC, KeTTHa, GreenTech, IRDA, MDP
4. Monitoring and enforcement of energy saving actions				GreenTech, KeTTHa, SEDA, IRDA, MDP
Green Employment in Existing Industries				
1. Progressive requirement for Corporate Social Responsibility (CSR) reporting (including energy & environmental performance reporting) by existing industries				IRDA, MDP, GreenTech Industries
Human Capital Development in Green Industry				
1. Joint government-industry intensive training programs				IRDA, MDP, MITI, KeTTHA, GreenTech, MoHR, industries
2. Fiscal incentives for industries that offer continuous professional education for employees				SME Bank, Banks, GreenTech KeTTHa, MoHR, MDP

Importance level

High Medium Low

03 LOW CARBON URBAN GOVERNANCE

At the local level where decisions about urban form and structure are made, low carbon urban governance is indispensable. Low carbon urban governance measures and programs are essential to the effective implementation of vital CO_2 emission reduction measures and programs related to integrated green transportation; green building and construction; walkable, safe and livable city design; smart urban growth; and green and blue infrastructure.

Development Planning for Low Carbon Pontian

Development planning plays an indispensable role in guiding development on the ground and shaping the urban future. Once low carbon targets and policies are in place in the development plant, all developments in Pontian will statutorily need to comply with the plans in order to obtain planning permission as well as other development approvals. This will contribute to ensuring Pontian's continuous growth while meeting the carbon reduction targets.

Planning Control Process, Procedures and Mechanism for Materialising LCS in Pontian

Department must looks into carbon reduction as an overarching element for development approval.

Development of necessary human capital for operationalising and implementing Pontian's Low Carbon Society vision

Officers in local authority must implement the Federal and State policies and regulations. Hence, it is important for officers in the planning departments in local level to have sufficient knowledge, appreciation and technical knowhow about low carbon society.

Pontian LCS Monitoring , Reporting and Publication System

Ongoing monitoring of the progression towards LCS targets.

Source of image: MDP

Key projects	2015	2020	2025	Potential Actors
Development Planning for Low Carbon Pontian				
1. Set clear carbon intensity reduction targets for Pontian up to 2025 (minimum 50% based on 2010 emission intensity levels to contribute to the national 40% reduction target announced by the Prime Minister at COP 15)				GreenTech, KeTTHa, DOE Johor, IRDA, MDP
2. Formulation of achievable & implementable low carbon transition strategies for 2015-2025 and beyond				DOE Johor, IRDA, MDP
3. Provide policies to "reward" land development projects that contribute to Pontian's low carbon visions				JPBD Johor, IRDA, MDP
4. Coordination of LCS guidelines & standards for MDP				JPBD Johor, IRDA, MDP
5. Revise and update existing use classes order to facilitate mixed use development				JPBD Johor, IRDA, MDP
Planning Control Process, Procedures and Mechanism for Materialising LCS in Pontian				
1. Integrated decision making processes in planning control at State & local levels				JPBD Johor, IRDA, MDP
2. Expedite approval process for proposed developments that support achievement of Pontian's LCS visions (e.g. developments proposed around planned public transport nodes; developments that retain existing vegetation; green buildings that contribute to energy efficiency)				JPBD Johor, IRDA, MDP
3. Requirement for submission of a "low carbon statement" in all Planning Permission applications				JPBD Johor, IRDA, MDP
4. Imposition of planning conditions on granting of planning permissions that support LCS actions (e.g. mandatory provision of walkways in residential neighbourhoods)				JPBD Johor, IRDA , MDP
Development of necessary human capital for operationalising and implementing Pontian's Low Carbon Society vision				
1. Develop low carbon urban & regional planning retraining curriculum for in-service municipal officials				JPBD Johor, IRDA, MDP
2. Incorporate low carbon society concepts, philosophy, approaches, measures etc. in municipal human capital development programs				JPBD Johor, IRDA, MDP
3. Systematically prioritise & organise continuous (re)training of officials				JPBD Johor, IRDA, MDP

Importance level

High Medium Low

04 GREEN BUILDING AND CONSTRUCTION

With the strong economic implication from Iskandar Malaysia, building and construction sector of Pontian is increasingly significant. This action is aims to bring the stakeholders in the building industry towards creating a LCS Pontian. Communication amongst the stakeholders, planners, architects, engineers, contractors, developers, manufactures and the local authorities is vital to create common goals. In order to achieve green building and construction in Pontian there are four (4) major strategies: (1) energy efficiency improvement of existing buildings (retrofitting); (2) green construction in existing industries; (3) green building design and technology and (4) rural green buildings. There are a total 12 potential projects have been identified for green building and construction in Low Carbon Society of Pontian.

The diagram on the next page shows the list of key projects in and targeted year of implementation.

Source of image : MDP

Key projects	2015	2020	Potential Actors
EEI of Existing Building (retrofitting)			
1. Subsidy and/or tax incentives for building owners			CIDB, LAM, GreenTech, JPBD Johor, IRDA, MDP
Green Construction			
1. All consultants to adopt green design process			CIDB, LAM, JPDB Johor, MDP Contractors, Developers
2. Encourage production and cost-effective supply chain of green construction materials by industries			CIDB, Contractors, Developers, IRDA, MDP
Green Building Design and Technology			
1. Temperature control at 24℃ (air conditioning for government offices)			IRDA, MDP, Government Institutions, offices
2. Movement sensors for low occupancy areas			IRDA, JPBD Johor, MDP, Premises
3. Consultants to adopt IBS in their design process			IRDA, JPBD Johor, MDP, Premises
4. Optimal building depths (9-13m) for natural lighting			IRDA, JPBD Johor, MDP, Premises
5. Maximise natural cross ventilation			IRDA, JPBD Johor, MDP, Premises
6. Integrate green landscaping with building facade			IRDA, JPBD Johor, MDP, Premises
7. Maximise use of day lighting			LAM, JPBD Johor, MDP, Premises
10. Maximise space adaptability			JPBD Johor, IRDA, MDP , Premises
Rural Green Buildings			
1. Subsidy for conservation of vernacular structures such as tradition timber houses, mosques, schools, community centres, clinics, shops & holiday cottages			LAM, IRDA, MDP

Importance level

High Medium Low

05 GREEN ENERGY SYSTEM AND RENEWABLE ENERGY

Energy system is an important driver for every development in Pontian. Thus, by encouraging more efficient and renewable energy system, it helps to reduce the impact of environment. Key strategies and programs in this action which have been identified for implementation are (1) promotion of renewable and alternative energy; (2) establishment of advanced energy system and (3) provision of incentives and subsidies and derivation of tariff rates. A total of 9 potential projects have been identified for green energy system and renewable energy in Low Carbon Society of Pontian.

Diagram on the next page shows the list of key projects in and targeted year of implementation.

Source of image : Metta Engineering Sdn Bhd

Key projects	2015	2020	2025	Potential Actors
Promotion of Renewable/Alternative Energy				
1. Encouraging of Solar PV as PV roofing, PV farm and PV on public infrastructure				SEDA , KeTTHa, GreenTech, JPBD Johor, IRDA, MDP
Establishment of Advanced Energy System				
1. Establishing evaluation methods for selecting candidate place to incorporate distributed energy system				SEDA, JPBD Johor, IRDA, MDP
2. Evaluating the suitability of energy storage technologies to Pontian				SEDA, EC, IRDA, MDP
3. Establishing evaluation method for appropriate capacity for Energy Storage which will be installed				SEDA, EC, IRDA, MDP
4. Conducting Research and Development of power management system with IT technologies for enabling self-healing system features, allowing system transparency within the grid ensuring cyber-security and physical security and allowing system transparency within the grid				SEDA, EC, IRDA, MDP
5. Promoting the installation of power management system				SEDA, EC, IRDA, MDP
Provision of Incentives and Subsidies and Derivation of Tariff Rates				
1. Evaluating and proposing suitable incentives schemes in the form of tax rebate, Feed-in tariff, capital subsidies and soft loan to promote the installation of RE and alternative energy at household, commercial and industry level.				SEDA. EC, KeTTHa, GreenTech, IRDA, MDP
3. Allocating research fund for R&D on green initiatives				SEDA, EC, KeTTHa, Banks, IRDA, MDP
4. Evaluating current tariff scheme to propose new tariff scheme, i.e., on and off-peak tariff scheme for household				SEDA, EC, GreenTech, KeTTHa, Banks, UTM, IRDA, MDP

Importance level

High Medium Low

06 LOW CARBON LIFESTYLE

Low carbon lifestyle refers to living and working in a sustainable way of life. This means that having a living pattern that reduces carbon foot print per person. Low carbon lifestyle promotes low energy consumption through using appliances with higher energy efficiency and adopting energy saving practices, opting for lower energy transportation mode, and switching to a healthier lifestyle. Low carbon lifestyle calls for involvement from individuals of all levels, communities, government offices, and private businesses to support low carbon development in Pontian giving a minimum impact to the environment without compromising the quality of life.

Awareness Through Education
Raising awareness through education (public education and formal education at schools) needs the involvement of government agencies, non-governmental organisations (NGOs), schools and local communities.

Smart Working Style
It is about finding good practices on more flexible arrangement and alternative working style. By sharing the knowledge on how we can reduce working hours, it can save our energy and lead a good life.

Promote Energy Efficiency
To promote spending less, consuming less and emitting less CO_2 will eventually lead to the society towards a low carbon lifestyle.

Promote "Smart Travel Choices"
Making individuals feel good, smart and socially rewarding travelling on foot, riding bicycle, using public transport, practicing car-pooling as well as eco-driving.

Stock-taking for Low Carbon Lifestyle
Calculating CO_2 emission from residents and communities.

Source of image: Ikhwan

Key projects	2015	2020	2025	Potential Actors
Awareness through Education				
1. Awareness program s for community				MDP, NGO, community
2. LCS education across curriculum				IRDA, MDP, JPNJ[1], Schools
3. School clubs for LCS & 3R programs				JPNJ[1], schools, MDP
4. Children eco-life challenge project				JPNJ[1], schools, MDP
5. Interschool 3R project competitions				JPNJ[1], schools, MDP
6. 3R measures at schools				JPNJ[1], schools, MDP
7. LCS measures at schools				JPNJ[1], schools, MDP
8. Collaboration with relevant government agencies & NGOs				JPNJ[1], schools, MDP
9. Students to collect reusable & recyclable wastes from home & neighbourhood				JPNJ[1], schools, MDP
Smart Working Style				
1. 'Work-from-home' pilot project for government agencies				MDP, Government agencies, businesses
2. Encourage tele-working / telecommuting among private sectors employees				MDP, Government agencies, businesses
3. Promote adoption of flexi working hours in suitable sectors				MDP, Government agencies, businesses
Promote Energy Efficiency				
1. Set up Eco Point system in local stores				MDP, GreenTech, businesses
2. Promote 'Cool Biz' concept				MDP, GreenTech, businesses
3. Promote the engagement of Energy Saving Advisors (Environmental Concierge)				MDP, GreenTech, businesses
4. Real time energy monitoring system for low carbon lifestyle				MDP, GreenTech, businesses
5. Subsidies for energy efficiency appliance in residential				MDP, GreenTech, businesses, community
Promote "Smart Travel Choices"				
1."Burn more calories, burn less carbon" campaign				MDP, SPAD, communities, schools
2. Guideline for eco-driving practices				MDP, SPAD, communities, schools
Stock–taking for Low Carbon Lifestyle				
1. Development of environmental report system at community level				MDP, SPAD, communities, households
2. Establish Eco-life check tool for household				MDP, SPAD, communities, households

Importance level

High Medium Low

07 COMMUNITY ENGAGEMENT AND CONSENSUS BUILDING

This action engages with the community through consensus building to develop LCS for Pontian. The process of moving towards LCS involves various stakeholders in Pontian. Strong collaboration among these stakeholders are needed to work as a whole. Community engagement aims at building an on-going and strong partnership among stakeholders or communities in Pontian moving towards LCS. The formation of relationship is for the benefits of the communities involved.

Consensus building is to create mutual agreement to meet the interests of all stakeholders and to raise awareness among all parties who are relevant in creating LCS. It is a process to help mediate conflict between stakeholders, remove misunderstanding, clarify interests and establish common grounds between concerned parties based on negotiations. Both community engagement and consensus building are long-term process and on-ongoing efforts for related parties, supporting low carbon development in Pontian.

This can be achieved through (1) sharing LCS information and gathering opinion through stakeholder engagement, (2) public information on LCS progress, (3) developing model for low carbon communities and (4) appointing green ambassadors or champions. 24 potential projects have been identified for community engagement and consensus building in Low Carbon Society of Pontian.

Source of image : Peggy Loh

Key projects	2015	2020	2025 Potential Actors
Share LCS Information and Gather Opinion through Stakeholder Engagement			
1. Maintain updated list of stakeholders	Medium		IRDA, MDP, Government agencies, NGOs, communities
2. Invite all key stakeholders to Pontian development processes	Medium		IRDA, MDP, Government agencies, NGOs, communities
3. Brain storming on LCS actions in Pontian with experts' knowledge & local knowledge	Medium		IRDA, MDP, Government agencies, NGOs, communities
4. Disclose/ ongoing feedbacks & comments on LCS actions	Medium		IRDA, MDP, Government agencies, NGOs, communities
5. Feedback and comments during LCS workshops and FGDs	High		IRDA, MDP, Government agencies, NGOs, communities
6. Feedback and comments through website	Medium		IRDA, MDP, Government agencies, NGOs, communities
Public Information on LCS progress			
1. LCS project updates	Medium	Medium	MDP, Media, NGOs
2. LCS events announcements	Medium	Medium	MDP, Media, NGOs
3. Web-based newsletters	Medium	Medium	MDP, Media, NGOs
4. Distribution of printed newsletter (printed on recycled paper)	Medium	Medium	MDP, Media, NGOs
5. Dissemination of progress updates/ events announcement via billboards, banners and mass media (newspaper, radio, television)	Medium	Medium	MDP, Media, NGOs
6. LCS mobile showroom / exhibition (hybrid vehicle) periodic visit to neighborhood	Low	Low	MDP, Media, NGOs
7. Pontian LCS info-kiosks in shopping centres	Low	Low	MDP, Media, NGOs
8. Pontian LCS info-kiosks in community centers (multi-purpose hall, places of worship)	Low	Low	MDP, Media, NGOs
Developing Model Low Carbon Communities			
1. Build consensus with related authorities	Low		IRDA, MDP, UTM, communities
2. Produce action plans & road maps (through FGD)	Low		IRDA, MDP, UTM, communities
3. Formation of implementation committee	Low		IRDA, MDP, UTM,
4. Continuous monitoring of implementation	Low	Low	IRDA, MDP UTM,
Green Ambassadors/ Champions			
1. On going monitoring of neighbourhood, company, organisation green initiatives	Low	Low	IRDA, MDP, Government agencies, communities, NGOs
2. Annual green neighborhood, company, organisation competitions	Low	Low	IRDA, MDP, Government agencies, communities, NGOs, school
3. Appoint community level leadership	Low	Low	IRDA, MDP, Government agencies, communities, NGOs, school
4. Human resource development for community leaders		Low	IRDA, MDP, Government agencies, communities, NGOs, school
5. Green ambassadors in school (students)	Low	Low	IRDA, MDP, Government agencies, communities, NGOs, school
6. Champions in school (school management team)	Low	Low	IRDA, MDP, Government agencies, communities, NGOs, school

Importance level

High Medium Low

08 WALKABLE, SAFE AND LIVABLE CITY DESIGN

A low carbon city should offer its inhabitants a high quality, healthy and safe living environment while contributing to mitigating CO_2 emission. Designing walkable and livable cities is therefore an important facet of a low carbon society. It is to induce a voluntary modal shift from motorised vehicles to walking and cycling for short to medium distance trips while creating world-class environments to live, work, learn and play in. Walkable and livable city design is crucial to ensure that Pontian to be the choice location to invest, live and work in. The actions and programs to be implemented in Pontian are: (1) designing walkable city centres and neighborhoods; (2) designing the cyclist-friendly city; (3) designing the safe city (from crime) and (4) designing civilised and livable streets through traffic calming.

Source of image : Khir Khalid

Key projects	2015	2020	2025	Potential Actors
Designing Walkable City Centers and Neighborhoods				
1. Street tree planting for shades				MDP, Developers, JLN, ILAM
2. Appropriate Street furniture				MDP, Developers, JLN, ILAM
3. Apply universal and inclusive design concepts				MDP, Developers ,JLN, ILAM
4. Create permeable street layouts (maximum street block dimensions of 70m-90m)				MDP, Developers, JLN, ILAM
5. Identify gaps/ disconnections in existing street network				MDP, Developers, JLN,
6. Identify potential new pedestrian connections				MDP, Developer, JLN, ILAM
7. Create continuous active street frontages				MDP, Developers, JLN, ILAM
8. Provide safe walking routes to schools				MDP, Developers, JLN, ILAM
Designing the Cyclist-friendly City				
1. Provide dedicated, shaded cycle tracks along major roads				MDP, Developers, JLN, ILAM
2. Priority signals for bicycles at major junctions				MDP, Developers, JLN, ILAM
3. Provide sufficient & secure bicycle parking facilities				MDP, Developers, JLN, ILAM
4. Provide safe cycling routes to schools				MDP, Developers, JLN, ILAM
Designing the Safe City (from crime)				
1. Increase residents' natural surveillance				MDP, Police, IRDA, JLN, ILAM
2. Identify & eliminate blind spots & gap spaces				MDP, Police, IRDA, JBPDSM, KPKT, JLN, ILAM
3. Community patrolling cum recreation				MDP, Police, IRDA, JLN, ILAM
4. GIS database on crime occurrences				MDP Police, IRDA Communities, JBPDSM, JLN, ILAM
5. Set up community police beats at strategic locations				MDP, Police, IRDA Communities, JLN, ILAM
6. Increase police patrolling in neighborhoods				MDP, Police, IRDA Communities, JLN, ILAM
7. community cycling patrol with police				MDP Police, IRDA Communities, JLN, ILAM
Designing Civilised & Livable Streets through Traffic Calming				
1. Enforcing 30km/h zones				MDP, Developers, JKR, JLN, ILAM
2. Installing speed humps				MDP, Developers, JKR, JLN, ILAM
3. Carriageway deflection (chicanes & chokers)				MDP, Developers, JKR, JLN, ILAM
4. Reduce junction turning radii				MDP, Developers, JKR, JLN, ILAM
5. Home zones				MDP, Developers, JKR, JLN, ILAM
6. Gateway design into traffic calmed areas				MDP, Developers, JKR, JLN, ILAM
7. Community landscaping program				MDP, Developers, JKR, JLN, ILAM
8. Carriageway narrowing				MDP, Developers, JKR, JLN, ILAM
9.Pavement widening				MDP, Developers, JKR, JLN, ILAM
10.Kerb extension at junctions				MDP, Developers, JKR, JLN, ILAM
11. Humped pedestrian crossings				MDP, Developers, JKR, JLN, ILAM

Importance level

High Medium Low

09 SMART URBAN GROWTH

Due to the rapid economic growth and urban development of Pontian, its population is expected to double from 34,965 in 2010 to 62,600 in 2025. Supporting and managing rapid growth while keeping energy demand and GHG emissions at bay becomes a critical issue. Smart urban growth strategies could reduce average number of trips, trip distance and vehicle mile travel (VMT) and at the same time increase the use of public transport by providing a spatial framework for sustainable growth.

Smart urban growth strategies consist of: (1) promoting a polycentric growth pattern; (2) promoting compact urban development; (3) promoting transit supportive land use planning and (4) developing the 'Smart Digital City'. Under these strategies, 13 potential programs are listed for the implementation of smart urban growth.

Diagram on the next page shows the list of key projects in and targeted year of implementation.

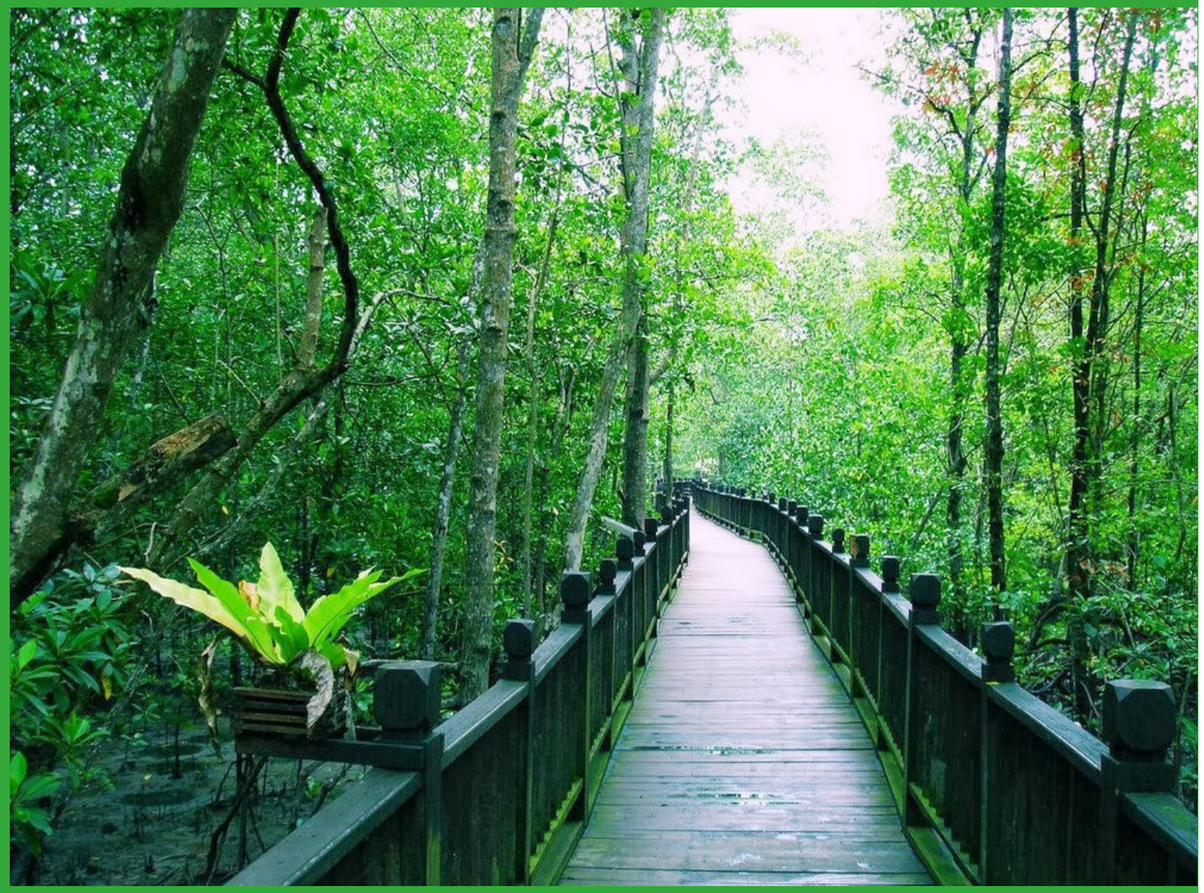
Source of image : Azhan M.Maidin

Key projects	2015	2020	2025	Potential Actors
Promote Polycentric Growth Pattern in Pontian				
1. Coordination of spatial growth strategies across administrative boundaries of local authorities				MDP, JPBD Johor, Developers
Promote Compact Urban Development				
1. Setting spatial growth limit of Pontian & enforcing UGB				MDP, JPBD Johor, Developers
2. Encourage infill development within existing built up areas (on brownfield & greyfield sites)				MDP, JPBD Johor, Developers
3. Preserve urban fringe primary agricultural areas				MDP JPBD Johor, Developers
4. Mixed residential development (including affordable homes)				MDP, JPBD Johor, Developers, SUKJ
5. Promote locally self-sufficient land use mix in distinct urban neighbourhoods				MDP, JPBD Johor, Developers
6. Design high quality public realms that encourage higher density urban living				MDP, JPBD Johor, Developers
Promote Transit Supportive Land Use Planning				
1. Identify existing & potential public transport / transit nodes				MDP, JPBD Johor, PPAJ, Developers , PPAJ
2. Integrate pedestrian network with transit nodes				MDP, JPBD Johor, PPAJ, Developers
3. Orientate and provide direct walking routes from homes to transit stops				MDP, JPBD Johor, PPAJ, Developers
4. Permit higher densities & plot ratios within 800m of public transport nodes				MDP, JPBD Johor, Developers
5. Incentive to developers in reduced parking requirement				MDP, JPBD Johor, Developers
Develop the 'Smart Digital City'				
1. Develop an Pontian "People's Information System" (PIS) that integrates various electronic applications towards smart living, smart working, smart learning, smart travelling etc.				MDP, MSC Cyber port, Businesses, MCMC

Importance level

High Medium Low

10 GREEN AND BLUE INFRASTRUCTURE



Green and blue infrastructure includes the natural environmental components and green and blue spaces that lie within and between our cities and towns. It helps to sequestrate and stores excessive CO_2 from the atmosphere, moderating high temperature in the cities (large trees, lakes and water courses) and reducing GHG emissions by conserving energy used for space cooling. Pontian has less of green infrastructure exist compared to other municipality that should be managed wisely in term of safeguarding, creating, enhancing, maintaining and promoting. There are six (6) major strategies in promotion for green and blue Infrastructure of Pontian: (1) regional green corridor network; (2) conservation of mangrove forests; (3) promote urban forests (urban recreational and green lungs); (4) new development to retains existing vegetation; (5) low carbon farming and (6) ecotourism and rural-culture tourism. There are 23 potential projects have been identified for green and blue infrastructure of Pontian.

Source of image: Sedqal

Key projects	2015	2020	2025	Potential Actors
Regional Green Corridor Network				
1. Identify potential linking corridors between existing forested areas for future land acquisition				PTNJ , MDP, WWF, NRE,JPNJ[2]
2. Gradually gazette presently ungazetted primary & secondary forests as protected forests				PTNJ , MDP, WWF, NRE
Conservation of Mangrove Forests				
1. Gazette all mangrove areas as protected forests				PTNJ, MDP, WWF, NRE , JPNJ[2], PTG
2. Strict enforcement against illegal mangrove clearing				PTNJ, MDP, WWF, NRE , JPNJ[2]
3. Ongoing mangrove species audit				PTNJ, MDP, WWF, NRE , JPNJ[2]
4. Corporate sectors adoption of mangrove regeneration projects				PTNJ, MDP, WWF, NRE , JPNJ[2]
5. Involving students and schools in mangrove trees planting				PTNJ, MDP, WWF, NRE , JPNJ[2]
Promote Urban Forests (urban recreation and green lungs)				
1. Identify the species and location of trees to be planted				PTNJ, MDP, WWF, NRE , JPNJ[2], JLN
2. Involving students and schools in forest tree planting				PTNJ, MDP, WWF, NRE , JPNJ[2], JLN
3. Identify potential plots for urban parks (unused government land)				PTNJ, MDP, WWF, NRE , JPNJ[2], JLN
4. Strengthening existing planning policy to increase green areas				PTNJ, MDP, WWF, NRE , JPNJ[2], JLN
5. Immediate replanting for cut down areas				PTNJ, MDP, WWF, NRE , JPNJ[2], JLN
6. One resident one tree program				PTNJ, MDP, WWF, NRE , JPNJ[2], JLN
7. Tree planting at government/ corporate events				PTNJ, MDP, WWF, NRE , JPNJ[2], JLN
8. Government subsidy for tree saplings				PTNJ, MDP, WWF, NRE , JPNJ[2], JLN
New Development to Retain Existing Vegetation				
1. Encourage reporting of illegal tree felling				PTNJ, MDP, WWF, NRE , JPNJ[2], PTD
2. Carry out municipal tree surveys for existing green areas in Pontian				PTNJ, MDP, WWF, NRE , JPNJ[2]
Low Carbon Farming in Rural Areas				
1. To reduce agricultural CH_4 and N_2O emissions				MDP, FAMA, MOA, FRIM, FELDA
2. Plant high quality and fast growing crops and supply to urban area (plant and eat locally to reduce% import food)				MDP, FAMA, MOA, FRIM, FELDA
3. Ongoing technical support & training from government				MDP, FAMA, MOA, FRIM, FELDA
Ecotourism and Rural-cultural Tourism				
1.Introduce low carbon rural tourism packages				JPNJ[3], MDP, PTNJ, NRE
2.Promote rural low carbon lifestyle as a tourism product				JPNJ[3], MDP, PTNJ, NRE
3.Conserve, enhance & link key rural natural resources in Pontian				JPNJ[3], MDP, PTNJ, NRE

Importance level

High Medium Low

11 SUSTAINABLE WASTE MANAGEMENT

Sustainable waste management can reduce waste generation and enhance material and energy recovery of solid waste in order to fulfil the challenge of building both low carbon and material recycling society. Four (4) sub-actions and 20 programs were considered in Pontian context which are: (1) sustainable municipal solid waste management; (2) sustainable agriculture waste management; (3) sustainable industrial waste management and (4) sustainable sewage sludge management.

Diagram on the next page shows the sub-actions, programs, implementation year and potential actors for the programs.

Source of image: Janette Coates

Key projects	2015	2020	2025	Potential Actors
Sustainable Municipal Solid Waste Management				
1. Smart consumption (buy in bulk, refill &concentrate local product)				MDP, JPSPN, SWCorp, SWM, communities
2. Choose durable item and reusable item				MDP, JPSPN, SWCorp, SWM, communities
3. Restrict of using non-recyclable packaging				MDP, JPSPN, SWCorp, SWM, Communities
4. Encourage culture of sharing, borrowing, or renting instead of buying				MDP, JPSPN, SWCorp, SWM, communities
5. Buy product from recycled materials				MDP, SWCorp, SWM, communities
6. 'Pay as you throw' system				MDP, SWCorp, SWM, communities
7. Scheduled waste collection for bulky waste				MDP, SWCorp, SWM, communities
8 Composting at home				MDP, SWCorp, SWM, communities
9. Decentralised composting plant				MDP, SWCorp, SWM, communities
10. Recycling of E-waste				MDP, SWCorp, SWM, communities
11. Separate waste collection at source				MDP, SWCorp, SWM, communities
12. Optimization of waste collection routes				MDP, SWCorp, SWM, communities
13. Use of collection vehicle driven by bio-diesel fuel (BDF) or Natural Gas Vehicle (NGV)				MDP, JPSPN, SWCorp, SWM
Sustainable Agricultural Waste Management				
1. Onsite combustion				MDP, JPSPN, SWCorp, SWM, Communities
2. Formulation of biomass into animal feed				MDP, MOA, FELDA, SWCorp, SWM
Sustainable Industrial Waste Management				
1. Select of treatment method with less energy and less material				MDP, JPSPN, SWCorp, SWM, DOE Johor
2. Decentralized scheduled waste treatment plant				MDP, JPSPN, SWCorp, SWM, DOE Johor
3. Encourage cleaner production initiative				MDP, JPSPN, SWCorp, SWM,
4. Waste to fuel and production of BDF				MDP, JPSPN, SWCorp, SWM
Sustainable Sewage Sludge Management				
1. Sewage sludge recycling through composting				MDP, JPSPN, SWCorp, SWM, communities, SPAN

Importance level

High Medium Low

12 CLEAN AIR ENVIRONMENT

Air pollution is one of the issue in Pontian, mainly caused by the emissions of particular matter (PM), SO_2, NO_x, CO and VOC from vehicles in transportation, industrial activity, and trans-boundary pollution by biomass burning, which is known as "Haze". There are many good strategies to improve local air quality under the Low Carbon Society policies.

Clean Air Quality

In order to introduce a suitable countermeasure that is effective for the emission reduction of both greenhouse gases (GHGs) and air pollutants, it is necessary to reflect the quantitative evaluation of co-benefit of each countermeasure during the policymaking process. To quantify the co-benefit of each LCS CMs, it is required the detail spatial and temporal emission estimation by using Geographical Information System (GIS). Then, air pollution model and exposure model are used to evaluate the impact to human health and eco-system. Then, the effect of air pollution abatement potential of each LCS CMs have to be visualised simply and intelligibly.

Improve Pontian Air Quality

Continuous monitoring and realtime publishing of Air Pollutant Index (API) information is important for achieving good air quality of Pontian. Air quality monitoring stations are necessary for Pontian air quality management to attain the national ambient air quality standards (NAAQS). Air pollution monitoring network brings the possibility of controlling of emissions from large point sources, such as power plant and big industrial sites.

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, freight transportation, cross-border cooperation is also considered.

A total 9 potential projects have been identified to improve Pontian air environment.

Source of image : MDP

Key projects	2015	2020	2025	Potential Actors
Clean Air Quality				
1. Quantitatively evaluate the reduction of pollutant emission for each LCS CM				MDP, DOE Johor, SPAD, Industries
2. Evaluate /predict the improvement of local air quality by model simulation				MDP, DOE Johor, SPAD, Industries
3. Visualisation of co-benefit of LCS CM in the industrial sector				MDP, DOE Johor, Industries
4. Improve air quality monitoring network				MDP, DOE Johor
5. Implement tax incentives on purchase of low-emission vehicles				MDP, DOE Johor, SPAD, SPAD, Banks, communities
6. Increase investments in public transportation				MDP, Banks, DOE Johor, PAIM, SPAD
7. Improve roadside air quality monitoring				MDP, DOE Johor
8. Install the appropriate removal device when using biomass as fuel				MDP, SPAD
Improve Pontian Air Quality				
1. Lobby for ministerial level imposition of tougher penalties on slash & burn activities in the region				MDP, DOE Johor, NRE, UTM

Importance level

High Medium Low

ACRONYMS AND ABBREVIATIONS

3R	Reduce, Reuse and Recycle
API	Air Pollutant Index
BaU	Business as Usual
BEM	Board of Engineers Malaysia
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COP	Conference of the Parties
CM	Counter Measures
CIDB	Construction Industry Development Board
DOE Johor	Department of Environment
DOE-GIVC	Department of Environment–Green Industry Virtual Centre
EC	Energy Commission
EEI	Energy Efficiency Improvement
E-waste	Electronic waste
FAMA	Federal Agricultural and Marketing Authority Malaysia
FELDA	The Federal Land Development Authority
FGD	Focus Group Discussion
FRIM	Forest Research Institute
GIS	Geographic Information System
GHG	Greenhouse Gas
GreenTech	Malaysian Green Technology Corporation
IBS	Industrialised Building System
IDRA	Iskandar Regional Development Authority
IM	Iskandar Malaysia
IWK	Indah Water Consortium
JLN	National Landscape Department
JPBDSM	Town and Country Planning Department of Peninsular Malaysia
JPBD Johor	Town and Country Planning Department of Johor State
JPNJ[1]	Johor Education Department
JPNJ[2]	Johor State Forestry Department
JPNJ[3]	Tourism Department of Johor
JPSPN	National Solid Waste Management Department
KeTTHa	Ministry of Energy, Green Technology and Water
KPKT	Ministry of Urban Wellbeing, Housing and Local Government
LCS	Low Carbon Society
LAM	Board of Architects Malaysia
MATRADE	Malaysia External Trade Development Corporation
MCMC	Malaysian Communications and Multimedia Commission
MDP	Pontian Municipal Council
MITI	Malaysia International Trade and Industry
MIDA	Malaysia Investment Development Authority
MOA	Ministry of Agriculture
MoHR	Ministry of Human Resources Development Malaysia
MSC	Multimedia Super Corridor
NGOs	Non-governmental organisations
NRE	Ministry of Natural Resources and Environment
N_2O	Nitrous Oxide
NO_x	Nitrogen Oxide
PPAJ	Johor Public Transportation Corporation
PTD	District Land Office
PTG	Johor Land and Mines Office
PTNJ	Johor National Park Corporation
PV	Photovoltaic
PWD	Public Work Department
RTD	Road Transport Department
SEDA	Sustainable Energy Development Authority
SIRIM	Standards and Industrial Research Institute of Malaysia
SME Bank	Small and Medium Enterprises Bank
SO_2	Sulfur Dioxide
SPAD	Land Public Transport Commission
SPAN	National Water Services Commission
SWCorp	Solid Waste Management and Public Cleansing Corporation Johor
SWM	Southern Waste Management Environment
SUKJ	Johor State Secretary
UGB	Urban growth boundary
UTM	Universiti Teknologi Malaysia
VOC	Volatile Organic Compound
WiFi	Wire free internet
WWF	World Wide Fund for Nature

UNIT

km^2	kilometre squared
$ktCO_2eq$	kilotonne carbon dioxide equivalent
ktoe	kilotonne oil equivalent
mil. p-km	million passenger-kilometres
mil.RM	million Ringgit Malaysia
mil. t-km	million tonne-kilometre
MW	mega watts
tCO_2eq	tonne carbon dioxide equivalent

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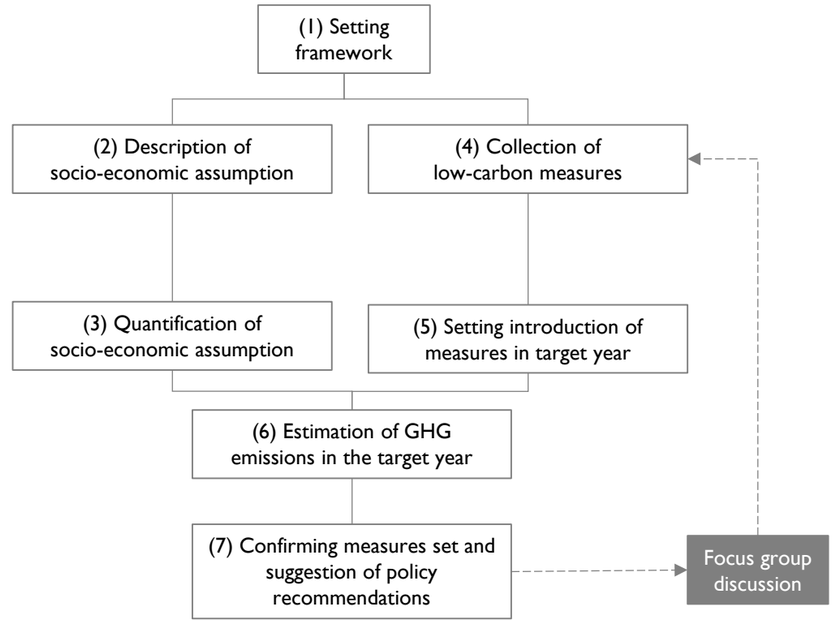
APPENDIX

Method of Low Carbon Society Scenarios Development

The method is based on the idea of "back casting" to create a local low carbon society scenario.



Procedure to create a local LCS scenario

(1) Setting framework
Aspects included in a LCS scenario framework are: the target area, base year, environmental targets and a number of scenarios. The target year is compared with base year. In Iskandar Malaysia, the target year for GHG emission reduction is 2025.

(2) Description of socioeconomic assumptions
Qualitative future image of lifestyle, economy, industry, land use and other related aspects should be written (based on assumptions from IM's CDP and other key official documents).

(3) Quantification of socioeconomic assumptions
Values of exogenous variables and parameters are set in order to estimate the future image of (2). Then, using these values, ExSS calculates key socio-economic indices of the target year.

(4) Collection of low carbon measures
Counter measures which are thought to be available in the target year are collected. Meanwhile, technical data that are required to estimate their effects on GHG emission reduction are gathered.

(5) Setting introduction of measures in target year
Suitable framework and level of introduction of low carbon measures are recommended considering technological parameters related to energy efficiency that have been defined.

(6) Estimation of GHG emissions in target year
GHG emissions are calculated based on target year socioeconomic indices (for BaU scenario) and level of introduction of low carbon measures (for low carbon scenario). GHG emission results and proposed LCS policy package are shared with stakeholders in FGD for evaluation and feedback.

(7) Confirming measures set and suggestion of policy recommendations
Suitable LCS measures and policy package are confirmed and proposed. Suitability of the policy should be in accordance with specific socioeconomic and environmental contexts of the local authority area in order to yield an optimal reduction potential of measures.

Method of Project Evaluation through FGD

Three rounds of Focus Group Discussions (FGD) have been conducted between March and October 2015 corresponding to stages prior to, during and after the preparation of the Draft Low Carbon Society Action Plan 2025 each local authority (LA). The purpose of the first round of FGD has been to present and explain to LA officials in detail LCS programs in the LCSBP-IM2025 and get buy-in, support and preliminary ideas from the officials for the preparation of the LCS Action Plan 2025 for their LA area. Based on the outcome of the first FGD, the Draft Low Carbon Society Action Plan 2025 was prepared outlining specific LCS programs proposed for implementation in the LA area and their projected GHG reduction potentials. The second round of FGD has been aimed at gathering direct feedback, views and comments from LA officials on the priority, suitability and feasibility of every LCS project to be proposed in the Draft LCS Action Plan (see below). Based on the second FGD, the Final Draft LCS Action Plan was prepared with a refined list of LCS programs and their respective implementation timeline and agencies, and updated GHG reduction results. The Final Draft LCS Action Plan was sent to the LAs for final review and evaluation in the third FGD, which led to this current Low Carbon Society Action Plan 2025 document.

During the second FGD, every potential project for the development of LCS for the LA is evaluated based on three (3) main criteria: i) priority, ii) suitability and iii) feasibility.

Priority
measures the extent to which proposed LCS Projects are in line with institutional policy directions and prioritisation as may have been outlined in the LA's official policy documents (e.g. the Johor Bahru and Kulai District Local Plan, the LA's strategic plan and other sectorial policies). It is usually closely associated with the project's contribution towards the LA's current policy direction. Participants are encouraged consider purely the dimension of priority for implementation (not suitability and feasibility, see below) with respect to their LA's vision and policy direction.

Suitability
measures the appropriateness of the proposed projects to fit into the LA's local geographic setting and political-cultural context. This may be characterised by the acceptability and readiness of the local community, businesses/enterprises and industries in the LA area (e.g. Car Free Day Program; New Development to Retain Existing Vegetation). Here, participants are to only consider the suitability dimension for implementation (not priority and feasibility) of the proposed projects with respect to the LA's geographic and socio-cultural contexts.

Feasibility
measures the "implementability" of the proposed projects with respect to the LA's financial capacity and human capital, as well as local technology and material resource availability to develop, manage and operate the projects (e.g. Citywide Photovoltaic and LED Street/Public Lighting; Centralised Utility Provider in Industrial Parks). Participants are to evaluate each proposed project based only on its feasibility for implementation (not priority and suitability).

LA officials have been requested to assign a rating to each proposed LCS project for the above three criteria according to three (3) levels, which are Low (L), Medium (M) and High (H) (see example in table below).

Programs	PRIORITY Institutional Vision / Policy Direction			SUITABILITY Local Geography Setting / Socio-cultural			FEASIBILITY Finance / Human Capital / Local Technology / Material		
	L	M	H	L	M	H	L	M	H
Route network expansion planning			✓			✓		✓	
Increase bus frequency, improve punctuality and reliability			✓			✓		✓	
Real time arrival information			✓			✓		✓	
Public transport reimaging			✓			✓		✓	
Flat rate tickets and central area free shuttle services			✓			✓	✓		
Web-based journey planner			✓			✓			✓

The resultant rating levels for each proposed LCS program according to the criteria of priority, suitability and feasibility are then analysed using the 'weighted scoring method', involving: i) the allocation of weights to each of the evaluation criteria to reflect their relative importance and ii) the allocation of scores to each rating level to reflect each LCS project's performance in relation to each criterion. The result is a single weighted score for each criterion, which may be summed across each proposed LCS projects being evaluated. The sum weighted score indicates the overall performance of the potential project that combines all three criteria of priority, suitability and feasibility.

1) **Weight the criteria to reflect their relative importance**

The weights of the criteria are decided to reflect group consensus about the relative importance of each of the criteria. Justification for the weights ascribed are recorded to ensure the basis of the weights assigned is fully understood and accepted. In this LCS Action Plan 2025, weights for three (3) criteria are expressed in percentages, which is most common approach and readily comprehended, as follows:

Priority – 40%
Suitability -20%
Feasibility - 40%

Both criteria of priority and feasibility are given highest and same weights because they are considered the most important criteria compared to suitability. All the weights sum to 100.

2) Score the levels to reflect how each option performs against each criterion

The next step is to score each level against each criterion on a suitable scale. The ordinal scale is used in this analysis for simplicity of operation, where a score value of 1, 2 or 3 is assigned correspondingly to a rating level of L, M or H. This can be simply explained via table below:

Criteria	Priority (40%)			Suitability (20%)			Feasibility (40%)		
Level	Low	Medium	High	Low	Medium	High	Low	Medium	High
Score	1	2	3	1	2	3	1	2	3

3) Calculate the weighted scores

This simply involves multiplying each score by the weight of each criterion for every LCS project. The resulted weighted scores are summed to obtain an aggregate weighted score for each potential project (see table below):

Programs	PRIORITY (40%) Institutional Vision / Policy Direction	SUITABILITY (20%) Local Geography Setting / Socio-cultural Context	FEASIBILITY (40%) Finance / Human Capital / Local Technology / Material	Weighted Score
Route network expansion planning	3	3	2	87
Increase bus frequency, improve punctuality and reliability	3	3	2	87
Real time arrival information	3	3	2	87
Public transport reimaging	3	3	2	87
Flat rate tickets and central area free shuttle services	3	3	1	73
Web-based journey planner	3	3	3	100

4) Interpret the results

The results are then interpreted carefully to guide decisions on each LCS project's overall level of importance for implementation, which integrates the project's priority, suitability and feasibility for implementation in the LA area. The results also translate into the implementation timeline of each proposed LCS project.

Weighted scores	0-39	40-79	80-100
Colour			

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