Developing Low Carbon Society (LCS) Scenarios –Iskandar Malaysia –

1. If we cannot go to LCS,…
2. LCS offers higher QOL with less energy demand and lower-carbon energy supply
3. LCS needs good design, early action, and innovations

Junichi FUJINO On behalf of AIM team
NIES (National Institute for Environmental Studies), Japan

Japan Pavilion in Warsaw, Nov 13, 2013
AIM (Asia-Pacific Integrated Model) since 1990

- AIM (Asia-Pacific Integrated Model) is an integrated assessment model to assess mitigation options to reduce GHG emissions and impact/adaptation to avoid severe climate change damages.
Overall research procedure of our LC development approach

- Area
- Base year
- Target year
- Covered sectors
- Actors/Players
- LCS target

Setting framework

Qualification of Socio-economic Vision

Quantification of Socio-economic Visions and GHG emission

Try and error to keep consistency and unity among Socio-Economic policies and LCD targets

Analysis of Alternative LCD scenarios and measures

Design LCD Actions and Roadmaps from the analysis

- Demography
- Lifestyle
- Economy
- Transport
- Building
- Resource efficiency
- Energy strategy
- Power supply

Quantifications of parameters:
- Population
- Final demand
- Transport parameters
- Energy service demand generation
- Energy device share
- Power supply assumptions

Evaluation of Scenarios / measures:
- Transportation system
- Energy service demand generation
- Energy device share
- Power supply options
- Renewable energy
- Carbon sink
- etc.
How to reach to Low Carbon Society in Asia?

Development of Asia LCS Scenarios

(1) Depicting narrative scenarios for LCS
(2) Quantifying future LCS visions
(3) Developing robust roadmaps by backcasting

Policy Packages for Asia LCS

Funded by Ministry of Environment, Japan (GERF, S-6) and NIES
Low-Carbon Society Scenarios in Asia using AIM

Japan

Shiga, Japan

Kyoto, Japan

Jilin, China

Guangzhou, China

Ahmedabad, India

Bhopal, India

Indonesia

Iskandar, Malaysia

Putrajaya, Malaysia

Cyberjaya, Malaysia

Vietnam

Bangladesh

What is NEXT???

http://2050.nies.go.jp
Background

Iskandar Malaysia: Key Challenges

Issues

Rapid urbanization and industrialization
Higher energy demand and CO2 emission
Decouple economic growth and emission on fossil fuel

Blueprint – 3 main thrusts – Green economy, community and environment.
=12 actions
Joint collaboration work of UTM, KU, NIES under SATREPS program

Background of Project
Development of Low Carbon Society Scenarios for Asian Regions

Research Team: Universiti Teknologi Malaysia (UTM), Kyoto University (KU), Okayama University (OU), National Institute for Environmental Studies (NIES)

Joint Coordinating Committee: Iskandar Regional Development Authority (IRDA), Federal Department of Town and Country Planning (JPBD), Malaysia Green Technology Corporation (MGTC)

Sponsorship: Japan International Cooperation Agency (JICA), Japan Science and Technology (JST)

Period: 2011 - 2016

Research Output:

i. **Methodology** to create LCS scenarios which is appropriate for Malaysia is developed.

ii. LCS scenarios are created and utilised **for policy development** in IM.

iii. **Co-benefit of LCS policies** on air pollution and on recycling-based society is quantified in IM.

iv. **Organizational arrangement of UTM** to conduct trainings on LCS scenarios for Malaysia and Asian countries is consolidated, and a network for LCS in Asia is established.
Potential Mitigation Options for Iskandar Malaysia

Green Economy, Green Community and Green Environment

<table>
<thead>
<tr>
<th>Unit</th>
<th>2005</th>
<th>2025</th>
<th>2025Ba</th>
<th>2025CM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Energy (Mtoe)</td>
<td>2.5</td>
<td>7.6</td>
<td>5.2</td>
<td>3.11</td>
</tr>
<tr>
<td>Demand (Mtoe)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GHG emissions (MtCO2eq)</td>
<td>10.5</td>
<td>30.2</td>
<td>18.3</td>
<td>2.88</td>
</tr>
<tr>
<td>Per Capita CO2 (tCO2eq)</td>
<td>7.7</td>
<td>10.1</td>
<td>6.1</td>
<td>1.30</td>
</tr>
<tr>
<td>GHG Intensity (kgCO2eq/RM)</td>
<td>0.29</td>
<td>0.21</td>
<td>0.13</td>
<td>0.73</td>
</tr>
</tbody>
</table>
# LCS Actions for IM by Three Main Themes

## Development of Low Carbon Society Scenarios for Asian Regions

<table>
<thead>
<tr>
<th>Action Names</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Integrated Green Transportation</td>
<td><strong>GREEN ECONOMY</strong></td>
</tr>
<tr>
<td>2 Green Industry</td>
<td></td>
</tr>
<tr>
<td>3 Low Carbon Urban Governance</td>
<td></td>
</tr>
<tr>
<td>4 Green Building &amp; Construction</td>
<td></td>
</tr>
<tr>
<td>5 Green Energy System &amp; Renewable Energy</td>
<td></td>
</tr>
<tr>
<td>6 Low Carbon Lifestyle</td>
<td><strong>GREEN COMMUNITY</strong></td>
</tr>
<tr>
<td>7 Community Engagement &amp; Consensus Building</td>
<td></td>
</tr>
<tr>
<td>8 Walkable, Safe, Livable City Design</td>
<td><strong>GREEN ENVIRONMENT</strong></td>
</tr>
<tr>
<td>9 Smart Growth</td>
<td></td>
</tr>
<tr>
<td>10 Green and Blue Infrastructure &amp; Rural Resources</td>
<td></td>
</tr>
<tr>
<td>11 Sustainable Waste Management</td>
<td></td>
</tr>
<tr>
<td>12 Green and Clean Environment</td>
<td></td>
</tr>
</tbody>
</table>
LCS Actions for IM – Work Breakdown Structure
Development of Low Carbon Society Scenarios for Asian Regions

Work Breakdown Structure of 12 LCS Actions

1.0 Key Policy Actions needed to achieve the final goal of the project (targeted 50% cut in carbon emission intensity by 2025 based on 2005 levels)

1.1 Sub-actions needed to produce policy outcomes that jointly lead to the achievement of a key Policy Action

1.1.1 Measures that are more detailed breakdown and interpretation of Sub-actions into strategies with a clearer implementation dimension

1.1.1.1 Programs – Specific activities, deliverables, from which resource requirements, budget, implementation agencies and duration may be identified/estimated
Action 1: Integrated Green Transportation

1. Integrated Public Transportation
   1.1 Public transport system improvement
       - 1. Route network expansion planning (improve network coverage and connectivity)
       - 2. Increase bus frequency, improve punctuality and reliability
       - 3. Real time arrival information
       - 4. Bus priority measures
       - 5. Public transport reimagining
       - 6. Flat rate tickets and central area free shuttle services
       - 7. Web based journey planner
   
   1.2 Introducing rail- & water-based public transport

1.2.1 Intercity high-speed rail transit (HSR)

2. Public transport interchanges as destinations & urban activity nodes
   - 3. Park and ride facilities in suburban transit nodes

1.3 Diffusion of Low Carbon Passenger Vehicles

1.3.1 Promote use of low carbon vehicles

1.4 Enhancing Traffic Flow Conditions & Performance

1.4.1 Transportation Demand Management (TDM)

1.5 Green Transportation in Rural Areas

1.5.1 Improve public transport services & use in rural areas

1.6 Green Freight Transportation

1.6.1 Modal shift to greener freight transport modes
   - 1. Modal shift from road-based to rail-based freight transport
   - 2. Modal shift to ship-freight transport

1.6.2 Promote green/hybrid freight transport
   - 1. Tax incentives for freight operators in acquisition of hybrid freight vehicles

1.6.3 Real time arrival information
   - 4. Tidal flow and contra-flow along primary radial routes
   - 5. Increase parking charges
Potential Mitigation Options for Iskandar Malaysia
12 Actions Towards Low Carbon Future

<table>
<thead>
<tr>
<th>Mitigation Options</th>
<th>CO2 Reduction</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Green Economy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action 1 Integrated Green Transportation</td>
<td>1,916</td>
<td>15%</td>
</tr>
<tr>
<td>Action 2 Green Industry</td>
<td>1,085</td>
<td>9%</td>
</tr>
<tr>
<td>Action 3 Low Carbon Urban Governance**</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Action 4 Green Building and Construction</td>
<td>1,338</td>
<td>11%</td>
</tr>
<tr>
<td>Action 5 Green Energy System and Renewable Energy</td>
<td>3,061</td>
<td>24%</td>
</tr>
<tr>
<td><strong>Green Community</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action 6 Low Carbon Lifestyle</td>
<td>2,557</td>
<td>21%</td>
</tr>
<tr>
<td>Action 7 Community Engagement and Consensus Building**</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Green Environment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action 8 Walkable, Safe and Livable City Design</td>
<td>264</td>
<td>2%</td>
</tr>
<tr>
<td>Action 9 Smart Urban Growth</td>
<td>1,214</td>
<td>10%</td>
</tr>
<tr>
<td>Action 10 Green and Blue Infrastructure and Rural Resources</td>
<td>620</td>
<td>5%</td>
</tr>
<tr>
<td>Action 11 Sustainable Waste Management</td>
<td>412</td>
<td>3%</td>
</tr>
<tr>
<td>Action 12 Clean Air Environment**</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>12,467**</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Contribution to GHG emission reduction from 2025BaU to 2025CM ** Action 3, 7 and 12 does not have direct emission reduction, but their effect is included in other Actions. *** Since contribution of Action 10 includes carbon sink by forest conservation and urban tree planting, the total of contribution of the 12 Actions is greater than difference of the GHG emissions between 2025BaU and 2025CM in Figure 2 and Table2.
Launching of the LCSBPIM – COP18 Doha 2012
The *Low Carbon Society Blueprint for Iskandar Malaysia 2025*, officially launched by the Prime Minister of Malaysia and adopted by the Iskandar Regional Development Authority (IRDA) in 2012, sets a target for 58% carbon intensity reduction in 2025 as compared to the 2005 level and recommends a total of 283 strategic policies towards minimising carbon emissions in Iskandar Malaysia (IM).

Taking the blueprint into the implementation phase poses several questions:

**Which policies should come first?**  
**How long should the implementation period be?**  
**When should these policies be implemented?**  
**Who are the potential implementation agencies involved with these policies?**
Introduction

A Roadmap towards Low Carbon Iskandar Malaysia 2025

This roadmap has been formulated to serve as a complementary document to the blueprint. It provides a pathway to guide the implementation of policy actions proposed in the blueprint by outlining implementation programmes according to the given priority, timeline and related implementation agencies, including the 10 implementation plans that IRDA has identified for 2013-2015 period.
# 01 Introduction

LCS Blueprint, IRDA’s Implementation Plan and LCS Roadmap

<table>
<thead>
<tr>
<th>Green Economy</th>
<th>Specific Action-based Projects</th>
<th>Special Projects</th>
</tr>
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<tbody>
<tr>
<td>Action 1 Integrated Green Transportation (GT)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Action 2 Green Industry (GI)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Action 3 Low Carbon Urban Governance (LG)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Action 4 Green Building and Construction (GB)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Action 5 Green Energy System and Renewable Energy (GE)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Action 6 Low Carbon Lifestyle (LL)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Action 7 Community Engagement and Consensus Building (CC)</td>
<td>[ ]</td>
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<th>Specific Action-based Projects</th>
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<td>[ ]</td>
</tr>
<tr>
<td>Action 9 Smart Urban Growth (SG)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Action 10 Green and Blue Infrastructure and Rural Resources (RR)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Action 11 Sustainable Waste Management (WM)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Action 12 Clean Air Environment (CAI)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

IRDA’s Implementation Plan 2013-2015

12 Actions in the Low Carbon Society Blueprint for Iskandar Malaysia 2025
1. Integrated Green Transportation – Mobile Management System
2. Green Economy Guidelines
3. Eco-Life Challenge Project for Schools
4. Portal on Green Technology
5. Trees for Urban Parks/Forests
6. Responsible Tourism and Biodiversity Conservation
7. Bukit Batu Eco-Community
8. GAIA – Green Accord Initiative Award
9. Low Carbon Village FELDA Taib Andak
10. Special Feature: Smart City – Pasir Gudang ‘NAFAS BARU’: CLEAN AND HEALTHY CITY
our side events...

Nov 13\(^{\text{th}}\) (Wed) 15:00-16:30 at Japan Pavilion
“Pathways toward low carbon societies in Asia by 2050 and contribution of Japan to their realization”

Nov 15\(^{\text{th}}\) (Fri) 11:30-13:00 at Room Wroclaw
“Roadmap and Actions toward Low Carbon Societies in Malaysia and throughout Asia”

Nov 18\(^{\text{th}}\) (Mon) 9:00-10:00 at Japan Pavilion
“Low Carbon Implementation in Asia – Launching Iskandar Malaysia Low Carbon Implementation Plan”