Development of Low Carbon Society Scenarios for Asian Regions

SYMPOSIUM ON LOW CARBON ASIA RESEARCH PROJECTS
July 5th, 2011, University Teknologi Malaysia

Yuzuru Matsuoka
NOW WE ARE LAUNCHING A NEW PROJECT TITLED:

“Development of Low-Carbon Society Scenarios for Asian Regions”

• Project Period: Five years (2011 ~ 2015)

• Project Area: Iskandar Development Region (IM), Malaysia

• Project Purpose
  Establishment of a Methodology to create Low-Carbon Society (LCS) scenarios and applied to Iskandar Development Region (IM), as well as other regions in Malaysia, and the research findings are disseminated to Asian Countries.

• Under the project funding scheme called SATREPS, sponsored by JICA and JST
What is the “SATREPS” and what are the objectives of the project?

SATREPS: Science and Technology Research Partnership for Sustainable Development, a Japanese government program supported by JICA and JST, to promote international joint research targeting global issues.

JICA: the Japan International Cooperation Agency
JST: the Japan Science and Technology Agency

Iskandar Development Region
Area: 2,216 km²
Population: 1,353,200
MAJOR ACTIVITIES AND EXPECTED OUTPUTS OF THE PROJECT

1. Establish a Methodology to create LCS scenarios which is appropriate for Malaysia

2. Creation and Utilization of LCS scenarios for policy development in IM (Iskandar Malaysia).

3. Quantification of Co-benefits of LCS policies on air pollution and on recycling-based society in IM.

4. Conduct training activities on LCS scenarios for Malaysia and Asian countries, and establish a network for LCS in Asia.
MEMBERS (MALAYSIAN SIDE)

Prof. Dr. Marzuki bin Khalid (Project Director)
Prof. Dr. Ho Chin Siong (Project Manager)

Integration and Cross cutting group (Activity 1,2,3,4)
Dr Ho (UTM), Dr. Rosly (JPBD), Mr Boyd (IRDA), Mr. Azman (MGTC)

LCS group (Activity 1,2,4)
Dr Zaly & Gobi – Transport
Dr Rafee – Land use
Dr Ibrahim & Mr Rahim – Social disparity/ Rural
Dr
Dr Ismail and Chau, Dr Ho – LCS Modelling

SWM Group (Activity 2,3,4)
Dr. Zainura and Dr. Razman – LCA
Dr. Lee and Ms. Azila – Biomass recycling
Dr Fatin – Education/ Awareness
Dr Ho /Teh – Eco city
Dr Ahmad/ Ariffin – Solid Waste Management

Energy Group (Activity 1,2,4)
Dr. Zainuddin & Sharifah – Energy system

Air Environment Group (Activity 2,3,4)
Dr. Rashid and Dr Rafee – Air Pollution
Dr Zainura/ Dr Rafee – Heat Island
MEMBERS (JAPANESE SIDE)

Kyoto University
- Dr. Yuzuru Matsuoka, Environmental Systems Analysis, Activity 1,2, 4
- Dr. Gakuji Kurata, Air pollution, Activity 3,4
- Ms. Reina Kawase, Low Carbon Scenario Modeling, Activity 1,4
- Dr. Kei Gomi, (Model/Tool Development, Activity 1,2,4

National Institute for Environmental Studies
- Dr. Mikiko Kainuma, National Level Low Carbon Society Scenario, Activity 1,2,4
- Dr. Junichi Fujino, Low Carbon Society Network, Activity 1,2,4
- Dr. Shuichi Ashina, Developing Policy Roadmap by Backcasting, Activity 1,2,4
- Dr. Genku Kayo, Diffusing LCS Scenarios in Building Sector, Activity 1,2,4
- Ms. Maiko Suda, Policy Roadmap, Activity 2,4

Okayama University
- Dr. Takeshi Fujiwara, Solid Waste Management, Activity 3,4

JICA
- Ms. Kazumi Sato, Long-term expert
ACTIVITY 1: LCS Scenario Developing Methodology

- Describe desirable socio-economic visions of Malaysia in the future target year (2030).

- Collect socio-economic data, environmental loads, energy and technology, then develop an integrated model of socio-economic, disparity and GHG emission assessment to create LCS visions.

- Develop a back-casting model to prepare policy roadmaps.

- Develop a technical manual to create LCS scenarios.

- Improve reality and applicability of the above tools to create LCS scenarios and revise the technical manual.

- Outline the LCS scenario for Malaysia by adopting the developed methodology (tools and the technical manual).
ACTIVITY 2: Implementation to Iskandar Development Region

- Carry out training workshop on LCS scenario creation for IRDA and JPBD staff in Japan and Malaysia.

- Create the LCS vision for IM by adopting the integrated model of socio-economic, disparity and GHG emission assessment.

- Prepare the policy roadmap for IM by adopting the back-casting model.

- Set up an arrangement for discussion among concerned groups, private sector and civil society to undertake the policies based on the LCS scenarios.

- Formulate the IM LCS action plan to be implemented by IRDA.

- Revise IM blueprints of relevant areas on the basis of the IM LCS action plan formulated in the above activity.
ACTIVITY 3: Integration with regional environmental issues

AIR ENVIRONMENT
• Conduct the observation of air quality to clarify the current condition and estimate air pollutant emissions in IM.
• Develop methodology to quantify impact on health by air pollutant and estimate the mitigation effect of impact on health of air pollution by LCS measures in IM.

SOLID WASTE MANAGEMENT
• Conduct survey of current solid waste generation in residential and industrial sectors.
• Estimate future waste generation and GHG emissions from waste management in IM.
• Propose solid waste management strategy which is appropriate in a low-carbon city in IM.
• Develop a manual to quantify co-benefit of LCS measures.
ACTIVITY 4: Dissemination to Asian region

- Prepare UTM as a coordinating body, for capacity building of some researchers involved in the project as trainers on LCS scenarios through the activities from 1 to 3.

- Carry out trainings continuously on LCS scenarios for researchers and government officers of Malaysia and Asian countries in LCS Research Centre as well as in Japan.

- Transmit and share information of research and trainings on LCS scenarios among researchers and government officers in Asian countries.
# Project Schedule of Iskandar Study

## ACTIVITY 1: METHODOLOGY
- Apply the whole methodology and tools
- Revising and Improvement

## ACTIVITY 2: IMPLEMENTATION
- Design the scenarios and roadmaps
- Details for Implementation
- Implementation
- Revising and Improvement

## ACTIVITY 3: AIR & SWM
- Detailed basic survey
- System integration
- Manual development
- Wrap up the project

## ACTIVITY 4: DISSEMINATION
- International Expert Workshop once per year
- International Training Workshop once per year

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Stage 1  
Stage 2  
Stage 3  
Stage 4

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From: Yuzuru Matsuoka  
Date: 2011/07/05
STAGE 1: OVERALL DESIGN OF IM LCS

1. Quantifications of IM vision in 2010 and 2030 (BaU) with latest information using various Quantification models and complimentary field surveys
   - Demography: population and household dynamics
   - Land-use and its transition matrix
   - Economic and Industry structure
   - Traffic volume and characteristics
   - Energy supply and consumption structure
   - Solid waste and air pollutants’ generation

Integration as the form of inter-linked Social, Economic, Land-use, Energy and Environmental Accounting Tables

2. Listing up of potential measures and their rough but comprehensive assessment
   - Energy supply, land-use, traffic, building, residential and commerce sectors
   - Engineering, Economic and Institutional aspects

3. Hierarchical organization of potential measures to LCS roadmap

From: Yuzuru Matsuoka Date: 2011/07/05
STAGE 2: DESIGN OF LCS ROADMAP

4. Tentative design of IM LCS Roadmap
   • Estimation of Institutional, financial and human capacity obstacles of LCS measures’ implementation, and also listing up the resolution
   • Interactive and intensive discussion with IRDA
   • Feedback from stakeholders and experts

5. Documentation and Dressing up the STAGE 1 results towards real world application
   • As supporting materials for Blueprint s and relevant official guidance Energy supply, land-use, traffic, building, residential and commerce sectors
   • As training and education materials

Proposal of Actions and their roadmap towards Low Carbon Iskandar Accounting Tables

Publication of the “Low Carbon IM approach” and their dissemination

By the Spring of 2013

From: Yuzuru Matsuoka  Date: 2011/07/05
AN EXAMPLE OF ACTION ROADMAP FOR LCS

Kyoto-style Buildings and Forest Management

Planning of consultation system for energy-efficient buildings
Operation of consultation system for energy-efficient buildings
Diffusion of better insulated houses
Design of CASBEE Kyoto system
Operation of CASBEE Kyoto system
Holding training workshops of CASBEE Kyoto system
Propagation of better insulated houses
Propagation of better insulated offices
Planning Heisei Kyo-Machiya type housing
Construction of Heisei Kyo-Machiya prototypes
Implementation of Heisei Kyo-Machiya type housing
Diffusion of Heisei Kyo-Machiya type housing
Publishing guidance of wooden house specification
Converting public buildings to wooden ones
Implementation of Integrated forestry plan
Implementation of forestry management activation project
Operating subsidize system of tree planting
Planting tree on private space
Planting tree on roadside

Actor
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C, I
G
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C, I
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I, G
I, G
C, I
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I, G
I, G
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C, I
G

C: Citizen I: Industry G: Government O: Outside of the city
STAGE 3: DETAILED AND AUGMENT RESEARCH TO MORE REALISTIC AND EFFICIENT LCS SCENARIOS

• Put more emphasis on sector specific researches for supplementing and improving the proposal of the LCS vision and roadmaps in Stage 1

• Adjustment with International and national trends of LCS policies

STAGE 4: WRAPPING UP

• Final revision of the IM LCS vision, roadmap.

• Publishing and disseminating the technical details as reference material of Asian region’s LC activity

From: Yuzuru Matsuoka     Date: 2011/07/05

Until Autumn of 2014

By the Autumn of 2015
Organizational Arrangement of the project

- National specific studies
- Local region specific studies
- Proposal/collaborative activity on LCS scenario and roadmap making
- Request of more practical, realistic roadmaps and also tractable tools for real world
- Application and development to actual LCS processes
- Each country’s domestic/ local research institute
- Development and maintenance of study tools/models
- Research members

Policy makers
Central/ regional government managers
NGOs

From: Yuzuru Matsuoka    Date: 2011/07/05
## NATIONAL STUDIES NOW GOING ON

<table>
<thead>
<tr>
<th>Country</th>
<th>Progress up to now</th>
<th>Collaborating Research Institutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Up to now, disclosed national LCS scenarios, occasionally. Now preparing provincial energy, industrial, and economic database in order to integrate national level and provincial level scenarios.</td>
<td>China Energy Research Institute</td>
</tr>
<tr>
<td>India</td>
<td>Proposed national scenarios with global LCS scenarios by combining AIM/enduse and other models.</td>
<td>IIM Ahmedabad</td>
</tr>
<tr>
<td>Thailand</td>
<td>Preliminary analysis of Thailand energy related LCS with ExSS was finished</td>
<td>Thammasat University</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Preliminary analysis of Indonesia energy related LCS with ExSS was finished</td>
<td>Institut Teknologi Bandung</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Preliminary analysis of Vietnam energy related LCS with ExSS was finished</td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Preparation of related information</td>
<td></td>
</tr>
<tr>
<td>Peninsula Malaysia</td>
<td>Preliminary analysis of Peninsula Malaysia energy related LCS with ExSS was finished</td>
<td>Universiti Teknologi Malaysia</td>
</tr>
</tbody>
</table>
## LOCAL REGIONAL STUDIES NOW GOING ON

### Local region studies

<table>
<thead>
<tr>
<th>Local region</th>
<th>Progress up to now</th>
<th>Collaborating Research Institutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iskandar, Malaysia</td>
<td>Feasibility study finished and consolidating full-scale research task force composed of implementation agencies and research institutions</td>
<td>Universiti Teknologi Malaysia Iskandar Regional Development Authority Federal Department of Town and Country Planning Malaysia Malaysian Green Technology Corporation</td>
</tr>
<tr>
<td>Putrajaya, Malaysia</td>
<td>Feasibility study and identification of policy option was finished</td>
<td>Universiti Teknologi Malaysia Putrajaya Corporation</td>
</tr>
<tr>
<td>Ratchaburi, Thailand</td>
<td>Preliminary analysis of energy related part almost finished with ExSS, now adding AFOLU part</td>
<td>King Mongkut's University of Technology</td>
</tr>
<tr>
<td>Guangzhou, China</td>
<td>Preliminary analysis of energy related part almost finished with ExSS</td>
<td>Guangzhou Institute of Energy Conversion</td>
</tr>
<tr>
<td>Ahmedabad, India</td>
<td>Preliminary analysis of energy related part finished with ExSS</td>
<td>IIM Ahmedabad</td>
</tr>
<tr>
<td>Bhopal, India</td>
<td>Preliminary analysis of energy related part almost finished with ExSS</td>
<td>Maulana Azad National Institute of Technology, Bhopal School of Planning and Architecture, Bhopal</td>
</tr>
<tr>
<td>Liau, Indonesia</td>
<td>Developing FOLU modeling</td>
<td>Bogor Agricultural University</td>
</tr>
<tr>
<td>Kyonggi Province, Korea</td>
<td>Preliminary analysis of energy related part are conducting with ExSS</td>
<td>Seoul National University</td>
</tr>
</tbody>
</table>
COLLABORATING SCHEME OF OUR ASIAN LCS STUDY

Policy makers
- Central/regional government managers
- NGOs

National specific studies

Proposal/collaborative activity on LCS scenario and roadmap making

Each country’s domestic/local research institute

Application and development to actual LCS processes

Research members

Development and maintenance of study tools/models

Pan-Asian study covering whole countries and regions in Asia

Request of more practical, realistic roadmaps and also tractable tools for real world

Local region specific studies

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