

The objectives of the Asia Low-Carbon Society (LCS) scenarios' development

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Environmental Systems Engineering. Developed AIM (Asian Pacific Integrated Model for climate change) during past 20 years

Introduction

In order to achieve significant reductions in greenhouse gases, it is essential for the developing countries of Asia to participate in international frameworks and work actively to reduce emissions. Therefore, there is an urgent need to present policies for reducing greenhouse gas emissions that do not compromise economic growth in these countries, and to encourage positive action.

Since around 1990, we have undertaken joint research with institutions in Asian countries based on integrated assessment models of global warming issues, and we have presented the findings to the world through the Intergovernmental Panel on Climate Change (IPCC) and other channels. Furthermore from 2004, we began research on developing scenarios for low-carbon societies covering Japan as a whole, and several cities and regions in Japan and other countries. The Japanese government and some local governments are making use of these findings in formulating specific policies towards realizing a low-carbon society. Given the necessity of significantly reducing greenhouse gas emissions in emerging countries, it is a matter of urgency to apply and improve these approaches to low-carbon society scenarios developed mainly in Japan in the developing nations of Asia and to raise their social effectiveness.

Two approaches for designing Low Carbon Societies

The low-carbon society scenarios that we have developed so far and that we sought to improve through this research integrate the following two approaches. The first involves exploring the degree of mitigation of global warming estimated in a top-down fashion from climate stabilization targets, and how far the technical, economic, and institutional potential required to achieve them has been developed. The second involves establishing how to reconcile the realization of this potential with the unique situation in each country and region, as well as presenting and implementing specific measures. In order to promote these two research approaches as transparently and concretely as possible, we have developed many models. These models include bottom-up, end-use models concerning energy production and consumption, future low-carbon society vision quantification tools, and a general equilibrium model of economic and energy systems. Using them appropriately whether on a worldwide scale or a regional level requires first that:

- 1) We identify options for reductions that are feasible, reliable and acceptable to the community from a technical and economical standpoint in line with the

future vision for social and economic systems (Stage 1 in Figure 1).

2) We carry out basic design of social groups that can achieve sweeping reductions in greenhouse gas emissions, while meeting the social and economic vision for the future by combining end use models, various energy service demand models and so on (Stage 2).

3) We identify representative items from among these and quantitatively design roadmaps using backcasting models to arrive at them (Stage 3).

Through this work, we can identify issues relating to achieving low-carbon societies with a mid to long-term time scale of several dozen years, and present policies that should be implemented right away. In the initial stages, developing the approaches and tools is work that should be done by research groups through trial and error. But for actual application of the methodologies, the national and regional policy makers and agencies responsible for implementing policy should involve the stakeholders and use their capabilities to carry out the policies. The role of the researchers is to strengthen and codify the techniques by applying these approaches, and cultivate the capabilities required by the stakeholders .

Towards realizing Asian Low Carbon Societies

From this perspective, we have conducted training workshops for policy makers and researchers in Asian countries over the past decade. In addition, through cooperation with regional policy making and research institutions, we have applied them at the national level in Japan, India, China, Indonesia, Thailand and so on. At the regional level, we have conducted research to design low carbon societies in Shiga Prefecture, Kyoto, the federal territory of Putrajaya in Malaysia, the Indian cities Ahmedabad and Bhopal, Kyeonggi province in Korea and Guangzhou and Dalian cities in China among other places. Some of these initiatives have reached the stage of implementation by the administrative authorities, while others remain at the research and proposal stage. Representative of them will be introduced in the next session. At present, in formulating scenarios primarily for the Iskandar region in Malaysia with support from SATREPS, we are seeking the full involvement of local research and policy making institutions to develop this approach further and ensure its widespread use in Asian region. We are confident that by continuing these activities, we can contribute to achieving a low-carbon society in Asia.

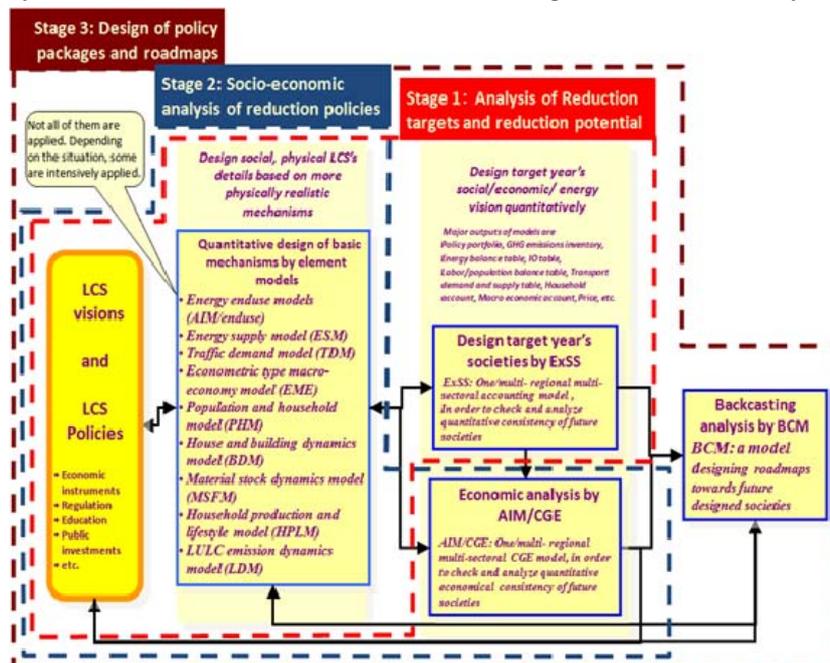


Figure 1 Deployment and allocation of models/tools for LCS design in our study