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Panelist

Top-down approach from global GHG emission reduction and bottom-up approach from country reduction target

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1. Development of low carbon society in Asia

In order to develop a low carbon society, many greenhouse gas (GHG) emission reduction targets have been discussed. For example, the global mean temperature will be lower than 2 degree of centigrade compared with the pre-industrial level, the global GHG emissions in 2050 will be half of the present level, and so on. Under these circumstances, what kind of role will be taken by Asia, which is recognized as to be the most rapid economic growth area in the world? To address this crucial issue both the top-down and bottom-up approaches are being used in the research project. The top-down approach draws the consistent scenarios realizing the global GHG emission reduction targets directly, and the bottom-up approach indicates pathways achieving the country GHG emission reduction targets such as Copenhagen Accord etc.

In the top-down approach, the global computable general equilibrium model with recursive dynamics is the main tool. In this model, the global area is split into 24 regions including 9 Asian countries/regions, and the future population and technology change in each region up to 2050 has been considered. In the reference scenario, which shows non-intervention of climate mitigation policy, Asia in 2050 will occupy the half of global population, one third of global GDP, and more than 40% of CO_2 emissions from fossil fuel combustion. In the case of countermeasure scenario, in which the global GHG emissions in 2050 will be half compared with those in 1990, the CO_2 emissions from Asia in 2050 will be 40% of the global emissions, and from 2020 to 2050, the CO_2 emissions will be reduced by 60%. In order to realize the drastic reduction, various countermeasures will be required. The countermeasures of renewable energy supplies increase of more than 50% compared with those in 2000 level, energy intensity (total primary energy supply to GDP) improvements at 3.7% per year between 2020 and 2050, and the carbon capture and storage technology installations etc., would be of prime importance.

2. Towards the low carbon Asia

In number of Asian countries, various activities toward individual low carbon society have

already been started. The low carbon targets are being decided from the viewpoint of the economic development pathway in each country. Assessing various countermeasures to realize these targets is an importance issue. In order to assess the local GHG emission reduction target, collaborating with the researchers in each country, the snapshot-tool has been developed. The capacity building workshops for the snapshot-tool were organized, and not only, the country level low carbon scenarios for China, India, Thailand, Vietnam, Indonesia etc., but also, the regional level low carbon scenarios such as Iskandar in Malaysia, Bhopal in India etc. have been developed. Besides the quantification of low carbon scenarios, the dialogues for low carbon society target setting and policy formulation to achieve them have also been carried out with policy makers in these countries and regions. The developed scenario reports can be downloaded from http://2050.nies.go.jp/LCS/

The results of both the top-down and bottom-up approaches show that, there exists a big gap between the global GHG emission reduction target to be halved from 1990 to 2050 and local GHG emission reduction target. One of the future issues is how to bridge the gap between these two targets and how to realize the countermeasures proposed in each country and region.

This report is a summary of the research studies carried out by the following members (titles omitted); Yuzuru Matsuoka, Reina Kawase, Kei Gomi, and Hiromi Nishimoto (Kyoto University), Go Hibino, Tomoki Ehara, Kazuya Fujiwara, Yuko Motoki and Kazuyo Oyamada (Mizuho Information and Research Institute), and Mikiko Kainuma, Junich Fujino, Yasuaki Hijioka, Tatsuya Hanaoka, Shuichi Ashina, Yuko Kanamori, Aashish Deshpande, Maiko Suda, Osamu Akashi, and Shinichiro Fujimori (National Institute for Environmental Studies). In addition to the above, many researchers and policy makers in Asian countries contributed in the Asian low carbon scenario development project.

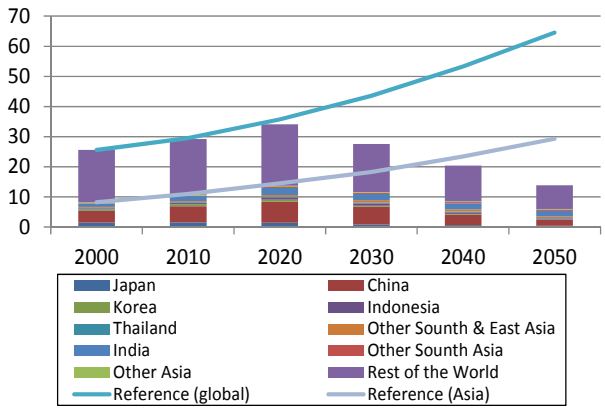

Figure 1: CO_2 emissions from fossil fuel combustion under the scenario of the halved global GHG emission in 2050 (unit: billion ton of CO_2)

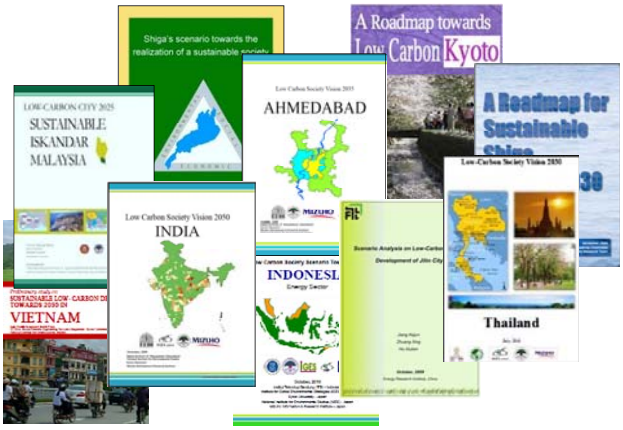

Figure 2: Country and regional scenarios developed in 'Development of low carbon society in Asia' research project