

Research on Development of Integrated Scenarios on Climate Change and
Assessment of Climate Policies using Asia-Pacific Integrated Model

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[Abstract]

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The aims of this study are to develop and revise the AIM (Asia-Pacific Integrated Model), which is an integrated assessment model for global scale and national scale climate policy assessment, and to apply it to quantify the future emission scenarios consistent with socio-economic activities.

In order to assess the middle-term greenhouse gas (GHG) emission reduction target in Japan, the AIM/Enduse [Global], the AIM/Enduse [Japan] and the AIM/CGE [Japan] were applied. The AIM/Enduse [Global] quantified the relationship between reduction potential in Japan and those in other countries. By the AIM/Enduse [Japan], countermeasures to achieve the targets for emission reductions in Japan were estimated. The AIM/CGE [Japan] then quantified the economic impacts of these climate change mitigation activities. The AIM/Enduse [Japan] and the AIM/CGE [Japan] contributed to assess the 25% reduction of GHG emissions in Japan in 2020 compared to the 1990 level, and we concluded that the 25% reduction target was feasible though quite tough, and by introducing the appropriate policies, the economic loss could be mitigated.

The GHG emission pathway for RCP6, which is to stabilize at 6W/m^2 of the radiative forcing, and its detailed grid data of GHG emissions and land use were estimated by using the AIM/CGE [Global] and other related models, and the information was provided to the climate models. The results from the AIM/Enduse [Global] and the AIM/CGE [Global] contributed to the international research programs. The simulation results indicated that in order to keep the GHG concentration in the atmosphere below 450ppm CO₂ equivalent, large introduction of renewable energies and the drastic energy efficiency improvement were necessary.

The climate change mitigation options are especially important for the developing

countries in Asia. The national scale models developed in this research were applied to China, India and Thailand in cooperation with the researchers in these countries. Moreover, in order to promote the climate policies in the developing countries, the air pollution model was developed. From these research activities, the various types of models constituting the AIM were developed, modified, and applied to the global scale, Japan and Asian countries, and subsequently quantified future scenarios of the greenhouse gas emission reductions and their impacts were estimated.