Abstract

[Research Title]

A study on global decarbonization pathways considering technological, economic and social feasibility

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This research (1) developed and improved an innovative integrated evaluation model and evaluate its technical and economic feasibility through quantitative scenario analysis. The integrated assessment model is based on the AIM model, which has been widely used in various places such as the IPCC and international model comparison studies, and adds new energy and food models to it. In particular, the project improved the representation of technology types, sector classifications, regional classifications, etc., which had been treated abstractly, and approach the feasibility of scenarios. (2) Based on the quantitative information, clarify the social feasibility through stakeholder meetings, etc. (3) Taking into account the results, an improved integrated evaluation model was used to evaluate the economy, emissions, energy supply and demand, and food, with additional input conditions such as the introduction of innovative technology, lifestyle changes, and various environmental policies other than carbon taxes. The project quantified consumption, etc. and showed a path to achieving large-scale GHG reductions.

The project consists of three subthemes from the perspective of method and subject. Theme 1 examines feasibility from an economic and social perspective, and the economic model combining the applied general equilibrium model (AIM-Hub) and a model that deals with household income and consumption structures on a micro level was used to deal with macroeconomics and inequality. In addition, the subtheme held stakeholder meetings and examined the feasibility of the scenarios by socially questioning the output of the integrated assessment model and the latest scientific knowledge obtained from this research. Theme 2 mainly examined feasibility from an energy technology perspective. Energy system model was developed with the most advanced power sector resolution. Theme 3 examines its feasibility from the perspective of agriculture and food, quantifying the details of food demand and developing a model that depicts the lifestyle of food and its closely related health effects. As a contribution to environmental policy, the project contributed to long-term climate policies in Japan, and provided continuous inputs of research findings into international reports such as the IPCC.

[References]

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