

Laboratory of Environmental/Energy Economics and Policy

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We analyze environmental, energy, and resource issues and the related policies quantitatively using simulation models. Our special interests and specialized fields are climate change and energy fields using simulation models such as computable general equilibrium (CGE) models and agent-based models (ABMs).

Keywords: Environmental policy and economics; Climate change; Energy; Market; CGE; ABM

(1) ANALYSIS OF CLIMATE CHANGE POLICIES USING CGE MODELS

Climate change is one the most significant environmental issues, and at the same time one of the most serious social issues of this century. We need to consider climate change measures from a long-term perspective. In doing so, economic perspectives such as considering the costs and benefits of mitigation and adaptation and the optimum timing to introduce the policies and measures are indispensable. We use CGE models to answer these questions. In addition, we are also interested in the relationships among environmental policies, technological change, and economic implications. [Grant-in-Aid for Scientific Research (A): collaboration with Meijo University, etc.; Grant-in-Aid for Scientific Research(C): collaboration with Hiroshima Shudo University]

(2) INFORMATION GATHERING AND EXAMINATION ON SOCIOECONOMIC SCENARIOS TOWARD STABILIZATION TARGET SETTING

In order to stabilize climate change, it is important to show the future image. We develop future socioeconomic scenarios based on scientific data and knowledge by collaborating studies of the socioeconomic (social science) area and climate change analysis (natural science) area. [Program for Risk Information on Climate Change of MEXT: collaboration with Japan Agency for Marine-Earth Science and Technology, etc.]

(3) EVALUATION OF ENERGY SECURITY USING CGE MODELS

There is a strong relationship between climate change issues and energy issues. Currently, the situation related to "energy" is getting more severe, especially for energy-importing countries, because of high energy prices and geopolitical risks. By applying climate change mitigation measures, supply and trade (import) of energy will decline. By using CGE models, climate change policies are evaluated from the perspective of energy security. [Grant-in-Aid for Young Scientist (B), collaboration with ESCP Europe]

(4) CLIMATE CHANGE IMPACT AND ADAPTATION

Climate change impact is inevitable in the future, even if mitigation measures are introduced. Therefore, effective adaptation measures are necessary, especially for vulnerable countries. However, adaptation measures are costly. This research is to analyze the way to introduce efficient adaptation measures from financial viewpoints and the effective adaptation measures. In addition, the concept of ecosystem-based adaptation is applied. [Strategic R&D Area Project S14 of the Environmental Research and Technology Development Fund of MOE: collaboration with Forestry and Forest Products Research Institute]

(5) APPLICATION OF ABMS FOR ANALYSIS OF ENVIRONMENTAL AND ENERGY POLICIES

ABM is a relatively new method in economic and policy analysis. However, it is possible to handle the concepts that was difficult (or impossible) to consider in the traditional economic models. We develop ABMs and apply the models to analyze emissions trading markets, energy (such as oil and natural gas) supply and demand, etc.

OTHER RESEARCH PROJECTS

Below are the other studies we are doing.

- Comparative analysis of environmental and energy policy using a multi-criterial evaluation method.
[Collaboration with National and Kapodistrian University of Athens, etc.]
- Evaluation of renewable energy and climate change policy in Japan