

Abstract

[Project Information]

Project Title:	Material Flow Structures in Japan in Harmony with a Carbon Neutrality Target
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Japan has set material flow indicators with targets to promote a sound material-cycle society. Japan has also declared the realization of a carbon-neutral society by 2050, and therefore aligning decarbonisation and material flow targets is essential. There is therefore an urgent need to accumulate scientific knowledge to support these goals. The aim of this research project is to develop a new model to calculate GHG emissions based on the dynamics of material flows, stocks, circulation and disposal in the economy and society, and to identify the material flow structure in Japan that is consistent with a carbon-neutral society in 2050. As a methodology, two models were developed: a top-down material flow/stock model that captures material flows in Japan from the economy-side perspective and a bottom-up model that assembles material flows in circulation and disposal based on actual survey data. In addition, a review of previous studies on CCUS (Carbon Capture, Utilisation and Storage) technology for waste treatment was performed and a life cycle assessment method on the CCUS were developed.

Based on the findings of this research project, we made the following nine policy proposals on material flow management toward a carbon-neutral society.

1. Proposal for carbon neutrality in material use without reliance on innovative decarbonization technologies for materials
2. Proposal for a method for structural understanding of material flows leading to carbon neutrality and setting long-term goals

3. Proposal of a preliminary evaluation method for the environmental impacts and effectiveness of circular business models
4. Proposal of collaborative initiatives for the utilisation of by-products in the materials industry
5. Proposal of a cost optimization model for large-scale and integrated waste treatment
6. Proposal for halving food waste and reducing life cycle GHG emissions through changes in consumer behaviour
7. Proposal of the significance and challenges of CCUS technology for waste management
8. Proposal of decarbonization assessment indicators for CCUS technology for waste management
9. Proposal for the installation of facilities for CCUS technology for waste management

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