

Lessons from results of integrated assessment on carbon tax in Japan

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From the simulation analysis based on the different 3 models -enduse model, global economy model, and country economy model-, it is concluded that the existing or practical technologies can reduce the CO₂ emissions in Japan to the target of the Kyoto Protocol in the first commitment period. In order to achieve the target of the CO₂ emissions reduction, the necessary carbon tax rate from 2004 onward is estimated to be about 45,000 yen/tC. When the carbon tax is introduced and simultaneously its tax revenue is utilized as a subsidy to lower the fixed costs of the countermeasures to reduce CO₂ emissions, the necessary carbon tax ratio becomes 3,400 yen/tC. The GDP loss in Japan by introducing this carbon tax policy with subsidy is estimated to be 0.061% compared to the GDP in the reference scenario in the first commitment period. The activity in the sectors producing the energy saving equipment such as electrical machinery industry are promoted, and as result, it can mitigate the losses caused by increase of the energy price.

One year later, the input data were updated, and the carbon tax policy was simulated again. The shorter the time period until the 1st commitment period is (it was assumed the carbon tax policy started in 2005), the more expensive CO₂ reduction options must be introduced. As a result, the price of the carbon tax is changed from 45,000 JPY/tC to 60,000 JPY/tC. The increase of the carbon price can be interpreted as the cost of inaction.