

Study on Ancillary Benefits of CO₂ Mitigation in China

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1. INTRODUCTION

In this study, we developed a model to estimate CO₂, SO₂, NO_x and PM10 emissions in future and ancillary benefits of global warming mitigation to other environmental problems like air pollution. It is intended to support integration of policy making process on global warming and air pollution. We applied this model to China.

2. OUTLINE OF THE MODEL

Energy consumptions, CO₂ and air pollutants emissions in future are estimated by the model. Fig.1 shows the structure of the MABC Model. Linear programming method is adopted to obtain the optimal combination of energy service technologies in the future. Future energy service demand is exogenously generated based on the socioeconomic scenarios. Technology selection module then solves the linear programming problem, which objective is the minimization of costs with the constraints of primary energy supply, technology options and future policy options. MABC is divided into two categories: emission from large-scale plants, and from other sources.

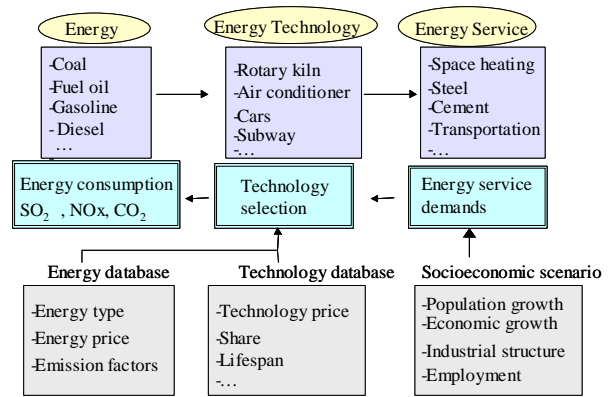


Fig.1 Structure of the MABC Model

3. APPLIED MODEL TO CHINA

We applied the model to China. We estimated CO₂, SO₂, NO_x and PM10 emission amount, from 2000 to 2030, under CO₂ tax policies.

Fig.2 shows CO₂ emissions in different tax rate. It shows that around 3.0 yuan/kg-CO₂ could be effective for the reduction of CO₂. Fig.3 shows strong correlation between emission reduction rate of CO₂ and that of SO₂. NO_x and PM10 also revealed the correlation with CO₂.

4. CONCLUSIONS

In this study, the result reveals that global warming mitigation is also effective to the reduction of air pollutant like SO₂, NO_x and PM10. It would be the incentives for promoting global warming mitigation, especially in Asia with a focus on air pollution problem.

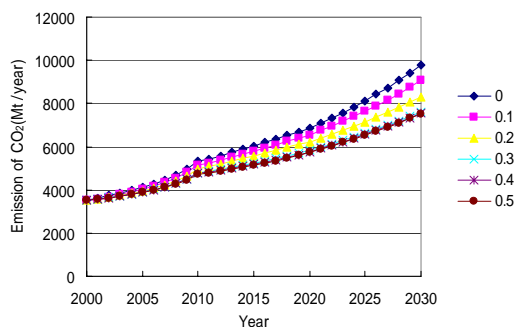


Fig. 2 CO₂ emission estimation in future

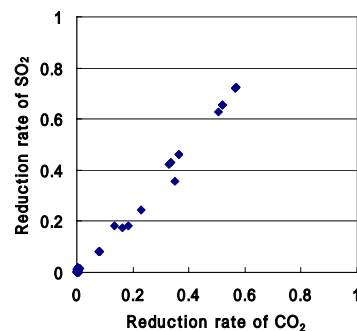


Fig. 3 Reduction rate of CO₂ and SO₂