

[A COMPARATIVE STUDY ON POLICY INSTRUMENTS FOR ACHIEVING THE KYOTO TARGET IN THE US, EUROPE AND JAPAN]

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Overview

The first commitment period of Kyoto Protocol are scheduled to start in the next year, 2008. I would like to compare measures against global warming issues among the US, EU-15 and Japan. Then I would like to discuss specific characters of these area and differences among them. Finally, I would like to make concluding remarks for future options for mitigating global warming issues.

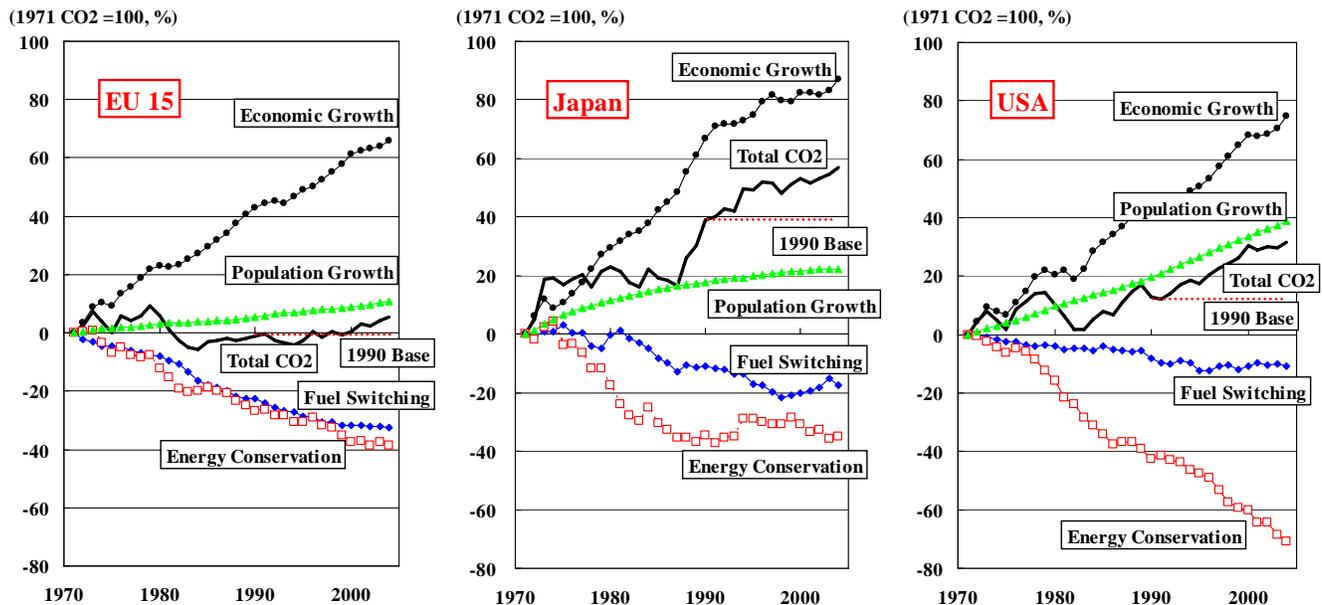
Methods

Using 1) historical time-series data analysis, 2) analysis on affecting factors using differential calculus and 3) comparison analysis, I analyzed the following issues; a) analysis on factors affecting energy- and industry-related CO₂ emissions, b) changes in GHG emissions by sector since 1990 (base year) based on national GHG inventory, and c) Comparison of policy measures on global warming among the US, EU-15 and Japan.

Results

The representative result analyzed in this paper is shown in Fig. 1. The results of this paper are summarized as follows:

Fig. 1 Comparison of factors affecting energy- and industry-related CO₂ emissions



+ In EU-15, CO₂ emissions were almost leveled off but slightly increased recently. The largest factor for increasing emissions was the economic growth factor, but these increases were offset by the energy saving and fuel switching factors especially. In

Japan, CO₂ emissions were decelerated in increase since 1990 mainly because small increasing contribution by the economic growth and energy saving factors. These increases were partly offset by the fuel switching factors such as nuclear and natural gas. In the US, CO₂ emissions were showed a steady increase after 1990, especially by the economic growth factor induced by IT bubble. The largest factor to offset these increases was the energy saving factor.

+ In EU-15 (Kyoto Target: -8%, -320 Mt), GHG emissions were lowered to -200 Mt during 1993 through 2002 but increased to -100 Mt in 2003 and 2004. The main increasing factors are CO₂ emissions from the transport sector (1990—1997) and the power plant sector (2000—2004). In Japan (Kyoto Target: -6%, -75 Mt), GHG emissions were increased to +80 Mt in 1994, but decreased to +30 to +50 Mt during 1998 through 2001, and then again increased to +70 Mt during 2002 through 2004. In the US (Left from Kyoto Protocol since 2001), GHG emissions were raised to +850 Mt (1996--1999) and then again increased to +1,100 Mt in 2004 (+20% increases)

+ EU member countries were tried various policy measures from earlier stages in the beginning of 1990's. But recent trend of GHG emissions in EU-15 was changed from decrease to level-off or increase. EU-15 emission is prospected to be +250 M ton from Kyoto target in 2010. New 10 member countries centering East Europe can offer a powerful option to offset this excess by using their Hot Air. Thus, the emission trading scheme is now a quite important option for mitigating GHG emissions. Japan was also tried to adopt various domestic options such as energy conservation, fuel switching, and forest CO₂ absorption. However, all domestic options have several serious difficulties and we cannot get good results. While the Ministry of Environment is now eagerly making the domestic emission trading system, the Ministry of Economy and International Trade and Industry is focusing Kyoto credit acquisition system. Last year, Japan was the largest buyer CDM credits from developing countries especially in Asia.

Conclusions

Specific characteristics in GHG emissions or CO₂ emissions are quite different among EU-15, Japan and USA. Thus, simple allocation of total reduction percentage (top-down approach) is not a suitable method for GHG reductions.

From 1995 to 2000, the abolishment of CFC had a large effect on reducing GHG emissions but CO₂ emissions related energy and industry has not reduced as expected in all of EU-15, Japan and USA. Even EU, CO₂ emission will be possible to increase.

Kyoto mechanism (emission trading, joint implementation and clean development mechanism) will play a more important role to reduce GHG emissions including CO₂ emissions. We should pursue more efficient and smart use of Kyoto mechanism.

References

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