Assessment of GHG Mitigation measures on Energy, Environmental and Economic Aspects in Thailand towards 2050 using AIM/CGE Model

Panida Thepkhun[1], Bundit Limmeechokchai[1,*], Shinichiro Fujimori[2], Toshihiko Masui[2], and Ram M Shrestha[3]

[1]Sirindhorn International Institute of Technology, Thammasat University
Klongluang, Pathumtani12120, Thailand
[2]National Institute for Environmental Studies, Tsukuba, Japan
[3]Asian Institute of Technology, Pathumtani 12120, Thailand
[*]Corresponding author E-mail: bundit@siit.tu.ac.th

Keywords : GHG mitigation, energy, Computable general equilibrium model, AIM/CGE, Thailand's NAMAs

Abstract

The main primary energy sources in Thailand are natural gas, petroleum and coal causing high greenhouse gas (GHG) emissions from energy utilization and resulting in environmental effects such climate change. By the concept of a low-carbon society (LCS) or low-fossil fuel economy, many countries including Thailand have GHG mitigation policies to mitigate the climate change. This study uses computable general equilibrium (CGE) model which is well known as the tool for analysis for short-term and long-term economic implications of climate change. The AIM/CGE model, which has been developed by Asia-Pacific Integrated Model (AIM) team, has been used to analyze GHG mitigation measures and GHG reduction targets of the Thai government under emission trading policy and carbon capture and storage (CCS) technology. The GHG reduction targets of the Thai climate policy on Nationally Appropriate Mitigation Actions (NAMAs) are proposed at 25, 50, 75 and 100 Mt-CO_2 in 2020. The baseline of GHG emissions is projected to the year 2050. In the analyses, the input-output table in 2005 and energy balance table in 2005 are used as the based data. Results from analyses are presented of effects of climate change measures on economy such as GDP, GHG price, primary energy supply and total final consumption, and GHG mitigation towards 2050.

References:

[1] Limmeechockchai, B. *et al.* 2010. *Low-Carbon Society Vision 2030: Thailand*, Sirindhorn International Institute of Technology, Thammasat University, Pathumthani.

[2] Fujimori, S., Tu, T.T., Masui, T. and Matsuoka, Y. 2011. *AIM/CGE [basic] manual*, National Institute for Environmental Studies, Tsukuba.

[3] Peace, J., Weyant, J. 2008. *Insights not numbers: the appropriate use of economic models,* White paper of Pew Center on Global Climate Change.
[4] Sue Wing, I. 2004. *Computable general equilibrium models and their use in economy-wide policy analysis: everything you ever wanted to know (but were afraid to ask).* Technical Note No.6, MIT Joint Program on the Science and Policy of Global Change. Cambridge, MA.
[5] Hosoe, N., Gasawa, K. and Hashimoto, H. 2010. *Textbook of Computable General Equilibrium Modelling: Programming and Simulations,* Palgrave Macmillan, New York.
[6] Office of the National Economic and Social Development Board. 2005. *Book IO2005.* Bangkok.
[7] Department of Alternative Energy Department and Efficiency. 2005. *Thailand Energy Situation.* Ministry of Energy, Bangkok.
[8] System Planning Division. 2010. *Summary of Thailand Power Development Plan 2010-2030,* Electricity Generating Authority of Thailand.