International Carbon Trade with Endogenous Permits and Cooperation for Greenhouse Gas Mitigation

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ABSTRACT of presentation held on **22 May 2014, room C82, 12.30 – 13.15 hrs., Leeuwenborch**, Wageningen

Most models of International Climate Agreements (ICAs) focus on mitigation agreements. In this paper, we develop an international climate policy game with four stages. First, countries decide on participation in a mitigation agreement (MA) which internalises benefits of carbon mitigation among members. At the second stage, the signatories to the mitigation agreement, acting jointly, and the remaining singletons decide whether or not to participate in a joint carbon market. Those who join, the market participants, will choose an initial endowment of carbon emission permits at the third stage. These permits are tradable and the abatement levels of all players are determined at the final stage. The third and fourth stage of our model implements Helm's (2003) endogenous permits trading mechanism. To compute numerical results, we use a 7-region version of STAbility of COalition (STACO) model. We find that the number and size of stable mitigation coalition decrease with the introduction of a carbon market, compared to the single mitigation agreement, and the mitigation coalition has no incentive to join a carbon market with singletons due to the free-riding incentives. However, some of the singletons would join a carbon trade agreement game which has a positive impact on the size and efficiency of the emissions mitigation. The number of signatories and the amount of global abatement increase as compared to a simple ICA formation game.



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