

Assessment of possible global regulatory measures to reduce greenhouse gas emissions from international shipping

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Abstract

During the last several years, there has been a significant increase in global merchandise trade and it is expected to grow especially between more distant countries. Subsequently, growing trade is likely to stipulate the use of international maritime transport, since roughly ninety percent of the world trade is carried via sea transport. International transportation is one of the substantial sources of global emissions, producing about 14% of global Greenhouse Gas Emissions (GHG), and growing trade is expected to further increase the share of transport emissions and contribute to climate change.

This issue has drawn more attention as the negative impacts of the GHG emissions become more serious and significant. The International Maritime Organization, a UN body, has adopted a Greenhouse Gas Strategy that sets the ambition to reduce GHG emissions by at least 50% in 2050 and phase them out altogether as soon as possible in this century.

In this paper we analyze which policy measures are able to achieve significant maritime transport emission reductions and then we develop assessment criteria for evaluation of the relative merits of the different mid- and long-term policy measures. We also develop a methodology based on the energy-environmental version of the Global Trade Analysis Project (GTAP-E) with transport mode substitution that enables an appropriate representation of the dynamics and responses of both the shipping system and global/national economies. Using our proposed analysis methodology in a number of case studies in order to produce outputs for small island states, developing and least developed countries, we illustrate the methodology and its capabilities, as well as produce evidence about how specific policy measures may have impacts on specific nations' economic development and security.

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