Danish Shipowners' Association

CO_2 emissions from international shipping – possible reduction targets and their associated pathways

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This paper focuses on understanding the potential pathways and scenarios for the future of international shipping, in the context of wider global decarbonisation consistent with the Paris Agreement.

We apply concepts of responsibility and capability to identify possible 'fair' pathways for CO_2 emissions from international shipping, and then use a series of models to simulate how the shipping sector might evolve to achieve these pathways.

The simulations are run from 2010 to 2050. The modelling is initiated in the baseline year 2010 using data obtained that characterizes the different sectors of international shipping (broken down into ship type (e.g. dry bulk carrier, container ships) and size (e.g. Panamax, 8000TEU) at that point in time. The model then simulates the evolving decisions made by shipping owners and operators in the management and operation of their fleets (including the specification of new builds, decisions to retrofit, switch fuel or change average operating speed).

In order to meet a given target for CO_2 emissions, the model uses a carbon price policy mechanism. The price is set for each year of the simulation, such that it enables a sufficient change within shipping (e.g. selection of appropriate low carbon technology, operation, fuel), or purchase of offsets, so that the overall net emissions from shipping follow the required trajectory. Varying constraints are placed on the amount of CO_2 emissions that can be offset out of sector to explore the sensitivity of the results to these constraints.

Based on the results, the study proposes a target for shipping that ensures reductions consistent with the overall ambition of the Paris Agreement. There are a number of different ways to achieve this, but the study recommends that to allow a gradual transition, net emissions will need to peak in 2025, with absolute emission reductions amounting to approximately 400 million tonnes in net emissions, by 2050. Consistent with the Paris Agreement, emissions will then need to reduce to zero during the second half of the 21st century.

Origins:

The Danish Shipowners' Association holds a strong position on shipping and climate change. Shipping must contribute to the Paris Agreement and deliver its fair share of global CO_2 reductions. To have a scientific contribution to the international debate, for instance in the UN International Maritime Organization, the Danish Shipowners' Association commissioned UMAS to carry out the study "*CO_2 emissions from international shipping – possible reduction targets and their associated pathways*".