Issue Cluster

Reduction of Greenhouse Gases in Shipping

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Some 80 to 90 percent (by volume) of world trade and 40 to 45 percent of intra-European trade is carried by sea.[1] With a 2.7 percent share of global CO_2 emissions[2], maritime transport along with inland waterway transport has the lowest CO_2 emissions among commercial modes of transport. These emissions are not negligible, however, and require more effective regulation. This applies all the more because emissions from maritime transport are set to grow further as maritime cargo volumes increase with world trade.[3]

In order to reduce greenhouse gas emissions, a comprehensive and coherent system needs to be developed that combines technical, operational and market-based measures.[4] The EU has a long-term objective of zero-waste, zero-emission maritime transport.[5] In the face of climate change, however, EU-level measures alone are not enough. Binding emission reduction measures should apply for all vessels in the world fleet. Some 75 percent of vessels are currently registered in states that are not signatories the Kyoto Protocol. The EU and its member states should therefore actively work in the IMO to pursue the limitation or reduction of emissions of greenhouse gases from ships of all flag states.[6]

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[1] Commission Communication of 21.01.2009, Strategic goals and recommendations for the EU's maritime transport policy until 2018, COM(2009) 8 final, p. 2; Opinion of the European Economic and Social Committee, 'The Greening of Maritime Transport and Inland Waterway Transport' of 13.05.2009, OJ C 277, 17.11.2009, paragraph 1.2, p. 20.

[2] Opinion of the European Economic and Social Committee, 'The Greening of Maritime Transport and Inland Waterway Transport' of 13.05.2009, OJ C 277, 17.11.2009, paragraph 5.2, p. 22. The figure of 2.7 percent is an IMO estimate, see IMO, Prevention of Air Pollution from Ships, Second IMO GHG Study 2009, MEPC/59/4/7, Annex, URL: http://www.imo.org/includes/blastDataOnly.asp/data_id%3D26046/4-7.pdf (accessed 16.08.2010), p. 6. This contrasts with other estimates, which put the figure at 4.4 percent, see König/Morgenstern, CO2-Emissionen aus dem Schiffsverkehr, in NordÖR 2009, p. 181 (181) (with additional references).

[3] Other things held equal, IMO projects growth of 150 to 250 percent – see IMO, Prevention of Air Pollution from Ships, Second IMO GHG Study 2009, MEPC/59/4/7, Annex, URL: http://www.imo.org/includes/blastDataOnly.asp/data_id%3D26046/4-7.pdf (accessed 16.08.2010), p. 6.

[4] Commission Communication of 21.01.2009, Strategic goals and recommendations for the EU's maritime transport policy until 2018, COM(2009) 8 final, p. 7.

[5] Commission Communication of 21.01.2009, Strategic goals and recommendations for the EU's maritime transport policy until 2018, COM(2009) 8 final, p. 6 f.

[6] Commission Communication of 21.01.2009, Strategic goals and recommendations for the EU's maritime transport policy until 2018, COM(2009) 8 final, p. 6.

Energy efficiency: Technical and operational measures

Energy efficiency can be improved by technical or operational measures. Many such measures need a long time to take effect, however, because they mean vessels have to be refitted or can only apply for new vessels.

Technical measures

Technical measures to cut CO_2 emissions notably include setting technical standards to accelerate the adoption of low-emission and energy-efficient technologies.[7] IMO has developed two indices for the measurement and evaluation of ship energy efficiency: the Energy Efficiency Design Index (EEID)[8] and the Energy Efficiency Operational Indicator (EEOI)[9]. Both of these are to apply for new ships.[10] The EEID is currently being tested on a voluntary basis.

Operational measures

Operational measures comprise emission reductions through improvements in ship management, logistics, and related measures.[11]

An important CO_2 reduction option is the use of alternative fuels in place of the usual heavy fuel oil, known as bunker oil. A complete greening of fuel sources is not to be expected for the time being. Ship propulsion systems with carbon-based fuels will continue to dominate for the foreseeable future, although gas will be used more widely as an alternative fuel when distribution infrastructures become available.[12] Wind power in the form of 'skysails' and solar energy may be used to supplement conventional engine power.[13]

As a first step, alternative energy solutions should be promoted at ports, as with the use of shore-side electricity. This can be achieved to begin

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[7] König/Morgenstern, CO_2-Emissionen aus dem Schiffsverkehr, in NordÖR 2009, p. 181 (182).

[8] See MEPC, Interim Guidelines on the Method of Calculation of the Energy Efficiency Design Index for New Ships, 17.08.2009, MEPC.1/Circ.681, URL: http://www.imo.org/includes/blastDataOnly.asp/data_id%3D26405/681.pdf (accessed 17.08.2010).

[9] See MEPC, Guidelines for the Voluntary Use of the Ship Energy Efficiency Operational Indicator, 17.08.2009, MEPC.1/circ.684, URL: http://www.imo.org/includes/blastDataOnly.asp/data_id%3D26403/684.pdf (accessed 17.08.2010).

[10] For a general overview of the indices and other measures discussed by IMO see IMO, Prevention of Air Pollution from Ships, Second IMO GHG Study 2009, MEPC/59/4/7, Annex, URL: http://www.imo.org/includes/blastDataOnly.asp/data_id%3D26046/4-7.pdf (accessed 16.08.2010), p. 11 f.

[11] König/Morgenstern, CO_2-Emissionen aus dem Schiffsverkehr, in NordÖR 2009, p. 181 (183).

[12] Opinion of the European Economic and Social Committee, 'The Greening of Maritime Transport and Inland Waterway Transport' of 13.05.2009, OJ C 277, 17.11.2009, paragraph 5.10, p. 23.

[13] Opinion of the European Economic and Social Committee, 'The Greening of Maritime Transport and Inland Waterway Transport' of 13.05.2009, OJ C 277, 17.11.2009, paragraph 5.11, p. 22.

with using tax exemptions.[14] Shore-side electricity only delivers benefits, however, if the electricity is renewables-generated.[15]
Travelling at lower speeds, known as 'slow steaming', is currently the most efficient CO_2 reduction measure with immediate significant effect. Unlimited use of this option is not possible however, as its implementation is dictated by the demands of the trade.[16]
Emissions can be reduced and energy saved by using shorter routes. The melting of sea ice in the Arctic Region is progressively opening up opportunities to navigate on routes through the Arctic waters.[17] However, this option in turn poses considerable risks to the sensitive Arctic environment.

Market-based measures: Inclusion of shipping in emissions trading?

As there has been no progress internationally so far towards an emissions trading scheme for the maritime transport sector[18], there are proposals at EU level to include shipping in the existing emissions trading scheme (ETS).[19] Applying the ETS to shipping is far more complex than applying it to aviation, however. Most of the EU vessels have as port of loading or discharge non-EU ports which are determined by the charterer. Many ships call in the EU only occasionally. Refuelling of ships during voyages may take place in non-EU ports, so that fuel consumption between ports can only be estimated. With shipowners, ship operators, charterers, cargo owners and cargo recipients all potentially having different nationalities, multiple countries may be involved in allocating emission reduction allowances. A European ETS would also have to apply to all vessels calling EU ports, with a real possibility of retaliatory measures by non-EU countries not applying the ETS on behalf of their flagged ships.[20]
Any application of the EU ETS to maritime transport would have to be in conformity with international law[21] and must not harm the

[14] Commission Communication of 21.01.2009, Strategic goals and recommendations for the EU's maritime transport policy until 2018, COM(2009) 8 final, p. 7.
[15] Schlacke, cited by Podehl, 17. Rostocker Seerechtsgespräch – CO2-Reduzierung in der Seeschifffahrt: Aktuelle Entwicklungen, Tagungsbericht, in NordÖR 2010, p. 105 (106).
[16] Opinion of the European Economic and Social Committee, 'The Greening of Maritime Transport and Inland Waterway Transport' of 13.05.2009, OJ C 277, 17.11.2009, paragraph 5.5, p. 22.
[17] Opinion of the European Economic and Social Committee, 'The Greening of Maritime Transport and Inland Waterway Transport' of 13.05.2009, OJ C 277, 17.11.2009, paragraph 5.3, p. 22.
[18] For an overview of the available options see König/Morgenstern, CO_2-Emissionen aus dem Schiffsverkehr, in NordÖR 2009, p. 181 (183).
[19] For a detailed discussion see Federal Environment Agency (UBA), Integration of Marine Transport into the European Emissions Trading System: Environmental, Economic and Legal Analysis of Different Options, UBA-Texte 27/2010.
[20] Opinion of the European Economic and Social Committee, 'The Greening of Maritime Transport and Inland Waterway Transport' of 13.05.2009, OJ C 277, 17.11.2009, paragraph 5.8, p. 23.
[21] See König/Morgenstern, CO2-Emissionen aus dem Schiffsverkehr, in NordÖR 2009, p. 181 (187 ff); For a detailed discussion see Federal Environment Agency (UBA), Integration of Marine Transport into the European Emissions Trading System:

competitiveness of European shipping on the world market. In light of this, a global scheme under IMO may be more effective in reducing CO2 emissions from shipping than an EU scheme or other regional scheme.[22]
An alternative to integrating marine transport into the ETS would be to introduce a levy on ship fuels. This would increase the fuel price and so give an incentive to cut fuel consumption and CO_2 emissions.[23] A levy on carbon – on bunker fuels – or some other form of levy could be just as effective and far simpler to operate than the ETS[24], especially since much of the infrastructure needed to collect such levies is already in place.[25]

The first presentation on this topic, *The IMO Options for Reducing Greenhouse Gases* will first outline the current status of the international debate. The following presentation, *Integrating Shipping into the EU Emissions Trading Scheme*, will then explore proposals already formulated in concrete terms at EU level. The aim of the *Working Group: Emissions Reduction and Emissions Trading Systems in Shipping* is to identify interdependencies, links and conflicts between European Union approaches and international law and to contribute in the onward development of legislative measures capable of practical implementation.

Environmental, Economic and Legal Analysis of Different Options, UBA-Texte 27/2010, p. 79 ff.

[22] On the competitive aspect, see Opinion of the European Economic and Social Committee, 'The Greening of Maritime Transport and Inland Waterway Transport' of 13.05.2009, OJ C 277, 17.11.2009, paragraph 5.7, p. 23.

[23] König/Morgenstern, CO_2-Emissionen aus dem Schiffsverkehr, in NordÖR 2009, p. 181 (183).

[24] Opinion of the European Economic and Social Committee, 'The Greening of Maritime Transport and Inland Waterway Transport' of 13.05.2009, OJ C 277, 17.11.2009, paragraph 5.9, p. 23.

[25] König/Morgenstern, CO_2-Emissionen aus dem Schiffsverkehr, in NordÖR 2009, p. 181 (183).