Memorandum

Dr Andre Stochniol, Founder, International Maritime Emission Reduction Scheme, London

This note discusses options for reducing CO2 emissions from fuels used in international maritime transport, particularly using a market-based approach.

The memorandum has been prepared for the UK's Environmental Audit Inquiry entitled Reducing CO2 and other emissions from shipping.

Summary

A. **The UK's share of maritime emissions is estimated at 4% by import data,** seven times higher than the share estimates based on fuel sold in the UK

B. **Maritime emissions should be excluded from national CO2 targets,** and addressed globally instead

C. **International agreement for maritime emissions can be achieved in 2009,** providing it differentiates responsibilities

D. **The UK can lead the creation of the scheme to reduce maritime emissions by 20% by 2020,** that provides $4bn+ for adaptation, and $2bn+ for technology

E. A traditional cap-and-trade regime is inappropriate for complex maritime emissions in the short-term, but **a cap with emission charges (cap-and-charge) would work**

Memorandum focus

1. It is widely accepted that shipping should contribute to climate stabilization and significant overall reductions of greenhouse gases (GHG). However, reducing CO2 emissions from fuels used in international maritime transport (maritime emissions or ME) is one of the most methodologically complex and politically difficult issues facing the international community.

2. Industry experts and stakeholders agree that efficiency improvements – from technical and operational measures – will probably only slow down the growth of ME in the short-term. Therefore, this memorandum focuses on market-based instruments to bring absolute emissions reductions and stimulate technological transformation, including technical and operational improvements.

3. Addressing the growing level of ME and unlocking the deadlock in negotiations is also a major diplomatic and public good opportunity for the UK government.

A. The UK's share of maritime emissions is estimated at 4% by import data

4. Maritime emissions are driven by the level of international trade. It is consumer/end-user demand that results in transport, and thus emissions. Therefore, on an equity basis, a country's share of ME should be related to the quantity of emissions from transporting goods into the country.

5. However ships often transport goods to many countries during the same voyage. This is especially true for container ships. Therefore, making a direct calculation of emissions attributable to different goods is administratively complex and prohibitive at this stage.

6. Instead, I estimate the UK's share of ME as approximately 4% based on:

- The UK's share of maritime import freight costs, calculated as 3.9%;[1]
- The UK's share of imported goods unloaded by weight, calculated as 3.6%;[2]
- The UK's share of merchandise imports by value of 4.7%.[3]

7. The precise quantity of ME is unknown. Estimates vary significantly, most ranging from 0.7 to 1.1 billion tonnes of CO2 (GtCO2) in 2005. I use 1 GtCO2 as a working estimate.

8. Therefore, the UK's share of ME is estimated as 40 MtCO2 in absolute terms.[4] This is:

- Nearly seven times more than ME currently reported based on fuel sold (6 MtCO2),[5]
- More than emissions from international aviation.[6]

9. Such quantity of emissions would add an extra 6% to the UK's carbon budget,[7] and more with time. The quantity of ME attributable to the UK will most likely increase by more than a third (1/3) by 2020, growing annually at a rate of 2%+.

[1] For 2005; based on data from IMF DOTS, and UNCTAD RMT 2006.

[2] For 2005, imports unloaded in the UK 257 Mt, imports unloaded world-wide 7,122 Mt, sources: UK Maritime Statistics 2005, UNCTAD RMT 2006.

[3] WTO, for 2005. This metric is likely less well correlated with the UK's share of ME than the other measures, but is readily available.

[4] This value seems realistic when compared with the domestic shipping emissions of 4.6 MtCO2 in 2005 for two reasons. The foreign import traffic is nearly three (3) times higher than domestic inwards traffic (in tonnes unloaded). Second, international voyages are on average much longer than the domestic ones.

[5] Emissions from fuels for international transport are reported based on fuel sold in the UK. On this basis, the UK's ME are 5.9 MtCO2. The current approach significantly underestimates the ME that should be attributed to the UK. The main reason is that many ships buy their fuel outside the UK.

[6] UK's emissions from international aviation bunkers: 35.4 MtCO2, source UK statistics.

[7] Based on 2005 UK's GHG emissions of 654 MtCO2e; or CO2 emissions of 554 MtCO2.

B. Maritime emissions should be excluded from national CO2 targets

10. After extended deliberation, some EU experts have concluded that including ME in national totals is not feasible due to data problems, evasion possibilities, competitiveness issues, fairness and the polluter pays principle.[8] The difficulty in calculating the UK's share of ME has illustrated these problems to a degree.

11. A global solution to reduce ME is preferred in the International Maritime Organization (IMO). Shipping is a global industry with the majority of CO2 emissions occurring outside national jurisdictions. The structure of shipping does not correlate well with any division between developed and developing countries.

12. Industry stakeholders prefer global regulations over local ones. The worst-case scenario for them is a patchwork of different regulations in different parts of the world that would inevitably lead to competitive distortions and increased end-user prices.

13. Local regulations aimed at reducing global ME will be ineffective as ships can easily avoid them by registering under a different flag, or tanking up large amounts of fuel in countries along their route which do not participate in the emission regime.

14. Therefore, ME should be excluded from national CO2 targets, including in the UK. Instead, ME should be addressed globally through one or more maritime emission bubbles. In this global approach emissions would not be allocated to countries or flag states.

C. International agreement for maritime emissions can be achieved in 2009

15. The current challenge in negotiations can be defined as the following: providing global uniform rules (typical for shipping) while delivering on the differentiated approach embodied in the UNFCCC and the Kyoto Protocol. Without differentiation of responsibilities, political agreement on and participation in international agreement for ME, particularly from developing countries, is unlikely to be secured.

16. The possibility of using emission charges to address global ME has been largely discounted, at least until very recently. Charges have been seen as too similar to unpopular taxes. The possibility was conspicuously absent from the work done in Europe in the last 5 years or so.

17. In mid 2007 Norway submitted a proposal to the IMO for a scheme based on implementing a CO2 charge.[9] The scheme proposed to raise funds to reduce and mitigate maritime emissions, *and* to provide some funding for adaptation to climate change in developing countries. The proposal was

[8] http://unfccc.meta-fusion.com/kongresse/AWG_08/downl/0403_1000_p2/EU%20GHGs.pdf, Graichen (2008); a relevant webcast is also available

[9] IMO MEPC 56/4/9, by Norway, Elements of a possible market-based CO2 emission reduction scheme, 2007.

developed and initiated by the author of this memorandum. Prior to the submission by Norway, a similar proposal was also discussed with the UK Department of Transport but due to coordination difficulties with other departments it was not taken further.

18. The Norway proposal has initiated multilateral discussions and follow-on submissions to the IMO in 2007 and 2008, including two follow-on proposals from Norway, and a proposal from Denmark for a global fuel levy. The proposal has also been discussed within the UNFCCC, during formal negotiations and side events at the Bali conference, and thereafter.

19. The recent submissions and discussions within the IMO have confirmed that a global market-based scheme based on charges or levies is feasible, without requiring the allocation of emissions to countries.

20. At the same time it has been recognized that current financial mechanisms for adaptation to climate change, aimed at helping the world's poor deal with the consequences of global warming, are inadequate in both design and scale. The adaptation needs of developing countries are estimated at tens of $billions per annum; the funding gap is currently about 100 times higher than all anticipated contributions.

21. The first Intersessional Meeting of the IMO Working Group on Greenhouse Gas Emissions (GHG) from Ships took place in Oslo in June 2008. All the delegations that spoke on the issue there supported the notion that revenues aggregated through any economic instrument should mainly be used for mitigation and adaptation measures in developing countries, together with transfer of technology and capacity-building.

22. Within the UNFCCC and the IMO, developing countries argue strongly that a uniform maritime scheme would not fulfil the UNFCCC principle of common but differentiated responsibilities and respective capabilities. Allocating significant funding for adaptation to climate change is not seen as solving the issue entirely. The need for differentiation should be familiar to the UK; within the EU, different member states have different emission reduction commitments.

23. Contradictory to first perception, differentiating obligations for ME can be implemented but doing so requires new thinking. In the proposed scheme emission charges are based on fuel sold. To achieve differentiation on certain routes, emissions could be exempted from charges or subject to an agreed multiplier. This could be based on point of origin, destination point, or both. These emissions charges can be differentiated by exempting certain countries or by using a country-specific multiplier.

24. In its simplest form, differentiation may follow the division between Annex-I and non-Annex I parties to the UNFCCC. Even if after negotiation non-Annex I countries were totally exempt from emission charges, the scheme would still cover 60% of total emissions[10] - a big step up from existing

[10] The Annex I 60% share of emissions has been estimated as for the UK. The estimate calculated from the import costs is 59%. The other estimate based on the share of goods unloaded in Annex I countries, by weight, is 58%. Data sources: IMF DOTS, UNCTAD 2006.

zero coverage under the Kyoto Protocol. Importantly, such a scheme could be legally enforced through ports in Annex I countries

25. This binary differentiation may even be replaced with country-specific obligation factors, which could be used to scale (upwards or downwards) the basic emission charges calculated under an emission reduction scheme. This provides further flexibility to adjust the scheme participation in the future.

26. The above approach would allow the proposed scheme to be fully compliant with the UNFCCC principles of common but differentiated responsibilities, and allow flexibility to negotiate the goal and country obligations. The participation principles could be negotiated and agreed by parties in Copenhagen in 2009.

27. An effort to incorporate differentiated responsibilities further is urgently needed if a deal for ME is to be agreed by 2009.

D. The UK can lead the creation of the scheme to reduce maritime emissions by 20% by 2020

28. In multilateral negotiations, progress can be slow until a concrete submission from a party is put forward. This requires a proactive approach from officials, openness to consider new approaches, and a joint search for a solution.

29. The UK has not submitted or co-sponsored any proposals for ME reduction to the IMO in the last two years. However very recently a high level proposal to develop a new international convention to address GHG emissions from shipping was submitted. Nevertheless, it seems that there is a gap between statements on the need to address climate change and action on ME. In other environmental areas addressed by the IMO, such as air pollution (SOx, NOx), ballast water, and ship recycling, the UK has been quite active. This may reflect lower coordination barriers between departments in these topics.

30. Development, ratification, and entry into force of a new maritime convention may take a decade or longer. A significant amount of work has already been done, including building momentum for action in the IMO. The proposed scheme below has been further developed through discussions with representatives of more than 30 different countries, half of which are from developing countries.

31. The International Maritime Emission Reduction Scheme (IMERS) is a hybrid scheme that combines emission mitigation, adaptation to climate change and technology action in one scheme. It is novel, ambitious but affordable, and legally feasible. Over the last year the schememe has gained

significant traction[11] and has been discussed within the climate change community. It is seen as one of the most promising proposals to fill the adaptation gap.[12]

32. The instrument is based on an emission charge to be applied to the entire international shipping community, or part of it. The charge is calculated based on the prevailing forward market price for CO2 and a negotiated emission reduction goal. This makes it an alternative to cap-and-trade. The emission charge is not a levy or a tax set at some arbitrary level. The goal (cap) together with the market (via the market price for carbon) dictates the level of emission charge, rather than any single body that may be subject to outside influence.

33. A long-term emission reduction goal is the key measure employed in the scheme to enable the shipping industry to equitably and effectively contribute to the reduction of total GHG emissions. To calculate the charge for emissions, IMERS uses a long-term notional emission reduction goal for CO2 for the ships under the scheme. The goal allows the unrealized reductions to be purchased from other sectors and projects, by acquiring emission credits.

34. The setting of such a goal for international maritime transport is within the domain of the UNFCCC. The goal could be established and subsequently adjusted with the changing climate change framework. It could be agreed in Copenhagen in 2009.

35. It is anticipated that the impact of the scheme for a 20% emission reduction goal by 2020 would be about 0.1% increase in prices of imported goods. This is equivalent to $1 for the price of $1,000. The charges paid by fuel buyers are anticipated as equivalent to 5% of fuel price. The level of charge would be announced one year in advance, thus providing enough time for the shipping industry to pass it on to end customers.

36. Therefore, shipping could contribute to climate stabilization through an ambitious yet achievable goal. Furthermore, the aggregation of demand for emission credits, which are required to offset any emissions above the emission goal in a given year, would provide access to cheaper emission credits on primary markets, or through government forestry schemes. This would generate gains which could be utilised to address adaptation issues.

37. The contribution of the shipping industry to climate change action will be substantial: the scheme aggregates small emission charges into approximately 10 billion dollars annually, of which $4bn is for mitigation of ME, $4bn for adaptation to climate change in developing countries, $2bn for maritime technology development and transfer.

38. There is an opportunity for the global maritime solution to be created and operated in the UK. The IMO, the only UN organization in the UK, is in London. London is also the pre-eminent financial centre in Europe and vies to become the centre for carbon markets.

---

[11] See: www.imers.org/buyin/achieve

[12] See: Grubb, Michael et al., (2008), Climate Strategies, Energy and Climate: Opportunities for the G-8, http://www.climate-strategies.org/uploads/2_ClimateStrategiesG8report.pdf

39. Addressing ME globally is also a major diplomatic and public good opportunity. The risk of inaction is twofold: repeat Kyoto's failure to address ME, and fail to provide financing for adaptation to climate change crucially needed for the most vulnerable.

E. A cap with emission charges (cap-and-charge) would work for ME

40. The proposed hybrid scheme can be called cap-and-charge. It sets a cap on the ME and delivers it through charges. It is an alternative to a cap-and-trade scheme.

41. It totally eliminates the three central barriers associated with the cap-and trade-system:

- Emissions baseline: In the proposed scheme, an emissions baseline is not required, removing the need for reliable emissions data as a pre-requisite for scheme operation.
- Allocation of emissions: There is no requirement to allocate emissions between countries, which has been a stumbling block in maritime negotiations
- Distribution of allowances: No allowances need to be distributed to participating ship owners and charterers.

42. The proposed hybrid method reduces the impact of several key implementation issues.

- Impact on competition: The impact on competition of the hybrid scheme will be very low as it is based on a harmonized emission charge that secures a level playing field to all participants transporting goods to a country, small or large.
- Cost: The costs to participants, including the set-up and transactional costs are anticipated to be lower under the cap-and-charge scheme than a standard cap-and-trade scheme. The charges in the proposed hybrid method are set only to have enough funding to purchase the relevant number of emission credits, plus additional contributions for technology.
- Set up time: Compared to cap-and-trade, the set up time is reduced from approximately 5-6 years to 2 years as implementation barriers are eliminated and data requirements lowered.

43. Furthermore, in addition to removing barriers and reducing costs, the proposed cap-and-charge scheme delivers greater value in terms of effectiveness, flexibility and scale.

- Effectiveness: Due to the compliance mechanisms, the coverage of a cap-and-charge scheme can be extended to smaller ships, including ships covered by different registration authorities. This would be difficult and highly costly under a cap-and-trade scheme.
- Flexibility: The proposed cap-and-charge scheme is flexible enough to incorporate new ships, and changing accountability of charterers for emissions. Furthermore, it allows differentiating charges to reflect differentiated responsibilities and capacities.
- Scale: The proposed solution can be extended to a global scale, superceding the regional basis of a potential extension of the EU ETS to shipping.

44. The critical component of the proposed approach is that resources saved on barriers eliminated and implementation issues reduced can be redeployed to raise and create value elsewhere. The proposed approach moves beyond delivering only emission mitigation benefits to:

- Technology benefits, namely near- and long-term improvements
- Adaptation benefits, mainly from contributions to the Adaptation Fund

45. The short-term and long-term technology improvements are essential to dramatically reduce the rapidly growing emissions from transport. Additionally, the reduction of the huge gap in financing of adaptation to climate change in developing countries is essential as the most vulnerable countries are likely to be hit hardest by the impact of a changing climate. A new global scheme could deliver on these in an affordable manner.

Concluding remarks

46. The deadlock to address CO2 emissions from international maritime transport can be resolved through the proposed global scheme, balancing the interests of all parties. The cap-and-charge instrument described is flexible and avoids emission allocation issues. It is politically compelling, providing both a quantitative emission reduction goal and a differentiation of responsibilities. It combines mitigation of emissions, adaptation to climate change and technology development in a single maritime scheme. By being global, the scheme is efficient and cheaper than proposed alternatives. Additional effort will however be required to generate the necessary momentum to achieve the deal in time for the Copenhagen climate change negotiations in 2009. The UK has an opportunity to take a lead here and make a lasting contribution to the resolution of the emission problem from international maritime transport.

15 September 2008