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COP24 Side Event Report
Achieving the IMO GHG Reduction objectives: fossil fuels, climate change and economic development

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This is a report of a side event held at 24th Session of the e Conference of the Parties to the UNFCCC (COP24) from December 2nd to 16th 2016, in Katowice, Poland.

- Title: Achieving the IMO GHG Reduction objectives: fossil fuels, climate change and economic development
- Date: 3 December 2018, Monday, 18:30–20:00
- Organizers: University College London (UCL), IPIECA Limited (IPIECA)
- Venue: Room Pieniny
- Panel: Dr. Edmund Hughes (IMO secretariat), Mr. Jim Herbertson (IPIECA), Mr. Kohei Iwaki (MLIT, Japan), Dr. Tristan Smith (UCL)
- Moderator: Nicola Adrien, Ministry of Ecological and Inclusive Transition, France /Negotiator for GHG emissions in ships in IMO

Abstract

IMO adopted the 'Initial IMO Strategy on Reduction of GHG Emissions from Ships (Resolution MEPC.304(72))' last April. Achieving the Paris Agreement and the IMO Initial Strategy Objectives will require a rapid shift away from fossil fuel use. In order to achieve GHG emissions reduction targets set by the Initial Strategy, it is necessary to design technology pathways with technological innovations in fields of alternative fuels, electrification and wind systems of ships. Market Based Measures (MBMs) such as carbon pricing on fossil fuel are under consideration as one of options for midterm measures which is adopted by 2030 and implemented afterwards.

Session summary

1. Nicola Adrien (Ministry of Ecological and Inclusive Transition, France): Introduction of the session

✓ IMO adopted the 'Initial Strategy' on reduction of GHG emissions from ships last April. Most important point of the strategy is the target of at least 50% reduction of global GHG emissions in 2050 compared to 2008 level.

- ✓ Because of nature of the international shipping sector, meaning linkage between nations and ships is very complex, it had been decided that this sector should set its own goal and IMO is responsible for that.
- ✓ In order to achieve this goal, it is needed to define mid-term and long-term measures by adopting revised strategy in 2024.
- ✓ Key questions for this session are; 1) What did lead de-carbonization of IMO by adopting the Initial Strategy, 2) What are de-carbonization pathways, technologies and options achieving the strategy? 3) What might specific policies and measures to achieve the strategy? 4) Could shipping de-carbonization increase cost and create economic impacts of states and what could it be done to address this issue?

2. Dr. Edmund Hughes (IMO secretariat, responsible in GHG reduction)

- ✓ The reason why GHG emissions from international shipping is important is that over 80% of traded goods by volume are transported by international shipping.
- ✓ In terms of achieving SDGs 2030, this is important sector to help achieve these goals.
- ✓ Also, trading volume in future is projected to be grown because of increase of global wealth of international community. Actually, we saw 4% grow last year.
- ✓ IMO agreed on a roadmap in 2016 which included development of the initial strategy by 2018. MPEC: 304(72)
- ✓ International shipping accounts for appx. 2.2% (800 million tCO2) of global GHG emission and projected to increase.

[Excerpt from the Initial Strategy]

- ✓ “2 Vision: IMO remains committed to reducing GHG emissions from international shipping, and as a matter of urgency, aims to phase them out as soon as possible in this century.” When you think of lifetime of ship is generally 30 years, this is very ambitious target.
- ✓ “3 Levels of ambition and guiding principles”: Identifying preconditions of achieving the goal such as need for alternative fuels and technological innovations. 1) Reducing carbon intensity of ships: This can be achieved by strengthening implementation of Energy Efficiency Design Index (EEDI) for new ships, 2) Reducing Carbon intensity of international shipping (global fleet): Reduction targets are 40% by 2030 and 70% by 2050 compared to 2008, 3) Peaking emissions from international shipping as soon as possible and reduce emissions at least 50% by 2050 compared to 2008.
- ✓ For short term, alternative fuel could reduce emissions but for long term, technical innovations are needed for further reduction.
- ✓ Innovative technologies to be developed include air lubrication system, wind system on

ship, electric ship and alternative fuels such as hydrogen, ammonia and biofuels

3. **Jim Herbertson (Technical Director of Climate and Energy, IPIECA)**

- ✓ IPIECA is a global oil and gas association on environmental and social issues formed in 1974 following the launch of UNEP.
- ✓ SDG 7: Access to affordable clean modern reliable energy is particularly relevant to low emission pathway and low emission transport.
- ✓ Sustainable development scenario of IEA is designed to meet both PA and SDGs. IEA projects that demand for natural gas will continue to grow up to 2040 especially in developing countries while demand for oil will decline to a level of 1990 by 2040.
- ✓ According to recent IEA's report, current transport system relies exclusively on oil and gas energy. Most cost efficient way of reducing GHG is saving energy.
- ✓ In the near term, switch from coal to natural gas is a one of the most cost-effective way to reduce GHG emissions. In the longer term, deployment of biomass power and CCS and reduction of GHG intensity of power sector is necessary.
- ✓ Principles for the low emissions transport are: 1) Following whole systems approach (Improved EE, switching to lower carbon fuels, hydrogen vehicles, electrification of the power train and infrastructure modification), 2) Introducing sound public policies incorporating (Well-to-wheels and life-cycle analysis, regulatory certainty, efficient market-oriented approach and support for technology innovation). This can be applied across road, aviation and maritime transports.
- ✓ Biofuels are already available in transport sector, however in the long term availability of conventional biofuels will be limited and need to develop next generation non-food-based biofuels.
- ✓ Natural gas coupled with CCS can provides near-zero carbon electricity. For shipping, LNG in ships provide 10-20% reduction in CO2 emissions compared to Heavy Fuel Oil.
- ✓ Application of digitalization is required for further improvement of energy efficiency of transport such as encouraging shared or alternative modes of transport and optimizing routing patterns for planes and ships.

4. **Kohei Iwaki (Maritime Bureau, MLIT Japan): International approach towards low/zero-carbon shipping**

- ✓ The presentation introduced Japan's approach towards decarbonized shipping.
- ✓ Basic characteristic of international shipping: For example, a ship registered in Panama, operated by seafarers from Philippines, owned by a Japanese shipping company, chartered by a Singapore company and carries commodities from China to Canada. In

such context, it is impossible to allocate responsibility for GHG emissions from the ship to one country.

- ✓ Accordingly, IMO has developed a principal on international regulation, so-called “Non-discrimination and no more favorable treatment”. This principal applies to any regulations under IMO. Based on this, IMO has adopted the global unified GHG strategy in this year.
- ✓ The initial strategy sets 2030 and 2050 targets. There are several options to achieve the first 2030 target such as design and operational improvement and use of LNG fuels.
- ✓ For 2050 target, given the situation that demand for international maritime transport is increasing by more than 200% compared to now by 2050, we need zero carbon fuels and CCS. In addition, some innovative policy measure such as carbon pricing or market based measures will be needed.
- ✓ 3 key elements to achieve the targets: Cooperation, Competition and Innovation. Cooperation is for setting a unified global regulation. Competition is ensured by securing level playing field and necessary to encourage maritime industry to make effort to reduce GHG emissions. Innovation is needed to tackle with technical challenges we are facing.

[Possible options (initial ideas) as short term measures]

- ✓ Ships are generally used for 30 years. As there is no mandatory regulation on existing ships currently, they will emit certain GHG in 2030. Old ships are generally installed bigger engine with bigger power which leads to higher speed and stronger market power, while new ships install smaller engine with limited power which will lead to weaker market power than older ships. This problem need to be addressed to apply measures to existing ships.
- ✓ Technical factors (design of ships and speed, equipment and fuel) is not only primary factors. Operational efficiency of ships fully depends on business activities including sea and weather conditions and market demand etc..
- ✓ Mandatory requirements can be applied to technical factors. However, when it comes to business activities, it is difficult to apply prescriptive relation. It could be more feasible to apply some incentive schemes such as carbon pricing or MBM. Therefore, possible approach will be a combination of mandatory and incentive measures under IMO.
- ✓ IMO has already invited parties to submit specific measures. These issues will be discussed at MPEC 74 (May 2019).

5. Dr. Tristan Smith: UCL

- ✓ He is a leader at UCL Energy Institute and a co-chair of an initiative to progress carbon pricing in maritime activity launched by Carbon Pricing Leadership Coalition (CPLC).

- ✓ Possible scenarios of fuel mix till 2050 for 2C/1.5C targets shows necessity of rapid introduction of synthetic biofuels especially from 2030 onward.[1]
- ✓ According to some studies on carbon pricing measures for shipping, impacts on GDP caused by cost increase and shift from sea mode to road/rail at global scale can be mostly modest. Under the 1.5C scenario, estimates are follows; GDP of individual countries (-0.02 to -1%), Modal shift from sea to land based transport (-0.16%).
- ✓ However, some individual countries might have specific challenges because of different circumstances.[2] Options to address disproportionately negative impacts on states are;
  - Capacity development and technology transfer
  - Exemption of phase in (by route/cargo/ship)
  - Use funds to: reducing negative impacts (incl. increase in transport cost), supporting countries' climate change plans, supporting de-carbonization of maritime industry

Q&A session

Q1. Unknown:

When it would be realistic that any of those possible measures for ships to be implemented? For aviation sector, CORSIA seems to be close to implementation. What is achievable in near future?

A1. Edmund Hughes:

It depends on what measures are. If it's voluntary measures, that can be implemented quickly, but for mandatory measures, there is a formal procedure for adoption. It takes minimum 22 months from approval to enter into force under IMO.

A1. Jim Herbertson:

MBMs tend to be more effective, but a challenge you have with MBMs is more easy to do in national level than global level.

A1. Kohei Iwaki:

Short term measures decided before 2023. MBMs is categorized in midterm measures which will be adopted by 2030. But it doesn't preclude earlier adoption.

Q2. Robert Gibson, Hong Kong:

The IPCC 1.5 report suggests that human society needs to be carbon neutral by 2050. As IMO plans to reduce carbon intensity by half, IMO needs to pay somebody for the other half

[1] Shipping In Changing Climates (Alice Larkin et al. 2017) *Figures can be found in p.2 of [https://unctad.org/meetings/en/Presentation/MyEM6th_day01ppt_Smith_en.pdf]

[2] Study results can be found in p.7 of https://unctad.org/meetings/en/Presentation/MyEM6th_day01ppt_Smith%20et%20al_en.pdf

of emissions, which implies carbon price. Given that ships last 30 years, carbon price need to be into construction of ships

A2. Tristan Smith:

We have looked into potential to offset emissions as a way to achieve emission reduction. However, increasing evidences we get says that won't be necessary. International shipping sector can do it within the sector without offsetting. There are viable technology pathways with developing alternative fuels, electrification and wind systems and there is also a considerable momentum to reduce GHG emissions within the sector. By the time of 2040, there will be mainly new fleets designed to use alternative fuels and smaller number of existing ships. In addition, old ships might be able to use drop-in fuels or biofuels. If it's not possible, probably market will force these ships be scrapped as a result of carbon pricing measures.

A2. Kohei Iwaki:

I'm skeptical for offsetting because we are not sure if enough carbon credits will be supplied as of 2050. Technological innovations are practical way to reduce GHG emissions. There could be some ships remained by 2050, however, for example, existing LNG ships can convert the fuel to biofuels. Currently, we cannot technically ensure that we are possible to be zero-carbon by 2050, so policies including carbon Pricing to incentivize technical innovations are necessary.

Q3. Martin, Germany:

Drop-in fuels and synthetic fuels were mentioned in the session.

Q3-1) What should be specific rules to introduce these alternative fuels?

Q3-2) What should operational measures on existing ships?

Q3-3) What kind of market based policy do you expect besides offsetting?

A3. Edmund Hughes:

A3-1) IMO is a safety regulator as well and we have to ensure alternative fuels are safe to use. We have such a regulation already called "International Code of Safety for Ship Using Gases or Other Low-flashpoint Fuels (IGF Code)".

A3-2) Regarding operational measures, for example, recent statistics shows ships use 15 % of fuel in stationary in ports or anchorages. We are going to improve efficiency of port's ship -interface to reduce ships' carbon footprint. IMO is also working with ports industries to consider this issue under "Global Maritime Energy Efficiency Partnerships (GloMEEP)".

A.3 Kohei Iwaki:

A3-3) MBM without offsetting is possible. If you set an in-sector pigovian tax, you can differentiate rates of tax on fuel. For example, setting highest tax rate on heavy fuel and

gradually lowering rates depending on carbon intensity. Fund revenue can be utilized in sector for supporting measures of GHG reduction. We expect MBM as an incentive scheme to differentiate price of fuels.

Q4. Nick Belinger, Clean technology foundation
How likely do IMO member states introduce actual carbon pricing soon? Is there any specific scheme considered?
A4. Tristan Smith:
We've recently published a Working Paper "Carbon Taxation for International Maritime Fuels: Assessing the Options" (IMF, Nov. 2018) which also discusses a kind of feedback mechanism (revenue use).

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English:
https://www.carbon-markets.go.jp/en_info-2/en_info_event/y_2018/cop24-reports/