INTERNATIONAL MARITIME ORGANIZATION

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SUB-COMMITTEE ON POLLUTION PREVENTION AND RESPONSE
8th session
Agenda item 5

PPR 8/5/4
29 January 2021
Original: ENGLISH
Pre-session public release: ☒

REDUCTION OF THE IMPACT ON THE ARCTIC OF EMISSIONS OF BLACK CARBON FROM INTERNATIONAL SHIPPING

Comments on document PPR 8/5

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SUMMARY

Executive summary:	This document comments on document PPR 8/5. It recommends a way forward with respect to a policy option that does not require a measurement method and urges Member States to commence action to reduce the impact on the Arctic of emissions of Black Carbon from international shipping.
Strategic direction, if applicable:	3
Output:	3.3
Action to be taken:	Paragraph 14
Related documents:	PPR 8/5, PPR 8/INF.3; MEPC 75/7/15, MEPC 75/10/6; PPR 7/8/2 and PPR 7/22

Introduction

1 This document is submitted in accordance with the provisions of paragraph 6.12.5 of the *Organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies* (MSC-MEPC.1/Circ.5/Rev.2), and provides comments on document PPR 8/5 (Canada).

2 Document PPR 8/5 (Canada) summarizes the work of the Correspondence Group including the linkages between Black Carbon (BC) measurement systems and policy options to control BC and concludes in paragraph 9 that "a Black Carbon emissions limit policy of any kind would require a measurement method to confirm compliance, whereas some other BC control policies (e.g. shore power requirements) to control Black Carbon emissions would not. A focused policy of fuel switch only, including a switch to cleaner fuels, together with a fuel specification, would not require Black Carbon measurement but may, inter alia, require fuel samples, inspection of the bunker delivery note, or inspection of the fuel log to confirm that appropriate fuel is being used". This document reflects on trends in BC emissions in the decade since the threat posed by these emissions was first brought to the attention of IMO and its

Members, as well as recent scientific observations and projections of Arctic climate change and its impacts. It recommends a way forward with respect to a policy option that clearly does not require a measurement method and calls on Member States to urgently commence action to reduce the impact on the Arctic of emissions of BC from international shipping.

Trends in Black Carbon emissions from ships

3 Document MEPC 75/7/15 (Secretariat) presents the *Fourth IMO GHG Study 2020*, which for the first time includes estimates of BC emissions. The Study found that total BC emissions have grown approximately 12% from 89kt in 2012 to 100kt in 2018.[1]

4 The rate of BC emissions increase in the Arctic is dramatically faster. The International Council on Clean Transportation (ICCT) found that BC emissions from Arctic shipping increased 85% between 2015 and 2019, a much faster increase over a shorter period.[2] ICCT also concluded that IMO's Arctic HFO ban regulation is expected to reduce BC emissions by only 5% from business as usual (BAU) emissions until exemptions for ships with protected fuel tanks and waivers for ships flagged to Arctic coastal States expire in 2029. In 2029, an Arctic fleet-wide BC reduction of approximately 30% from business as usual is expected by switching HFO-fuelled ships (including those fuelled by so-called "VLSFO") to distillate. That emissions reduction benefit could be realized today, and held at consistently lower levels from business as usual, if ships currently using HFO voluntarily switched to distillate, as has been called for in the proposal for an MEPC resolution set out in document MEPC 75/10/6 (FOEI et al.), and this was quickly followed by a mandatory measure to switch to distillates or alternative cleaner fuels, as called for in document PPR 7/8/2 (FOEI et al.).

5 In addition, the Fourth IMO GHG Study's emission factors show that, when used in the same engine, a switch to distillate reduces BC emissions per kilogram of fuel consumption by up to 79% in 2-stroke engines and by up to 48% in four-stroke engines, as shown in figure 7 of annex B in the Fourth IMO GHG Study. These same emission factors were used in ICCT's analysis of IMO's proposed Arctic HFO ban.[3] That study found that switching from HFO to distillate would reduce BC emissions from the Arctic HFO-fuelled fleet by 44%, accounting for how BC emissions change due to engine type and load.

The Arctic is changing

6 Global heating is most rapid in the Arctic, with dramatic changes recorded in 2020. In June, temperatures north of the Arctic Circle reached 38°C (100.4°F), the highest temperature ever recorded in the Arctic. Arctic sea ice recorded its second-lowest summer extent since records began over 40 years ago,[4] with record lows for the months of July and October.[5] The Northern Sea route along the Russian Federation's Arctic coast opened in July for the first time ever,[6] driven in part by Black Carbon from wildfires in the region.[7]

1 https://theicct.org/news/fourth-imo-ghg-study-finalreport-pr-20200804

2 Comer, B., Osipova, L., Georgeff, E. & Mao, X. (2020). *The International Maritime Organization's proposed Arctic heavy fuel oil ban: Likely impacts and opportunities for improvement*. https://theicct.org/publications/analysis-HFO-ban-IMO-2020

3 https://theicct.org/publications/analysis-HFO-ban-IMO-2020

4 https://nsidc.org/arcticseaicenews/2020/09/arctic-sea-ice-decline-stalls-out-at-second-lowest-minimum/

5 http://nsidc.org/arcticseaicenews/2020/07/

6 July | 2020 | Arctic Sea Ice News and Analysis (nsidc.org)

7 https://www.nature.com/articles/d41586-020-02568-y

The United States' National Snow and Ice Data Center also noted that it took the sea ice longer to reform than usual; with late October coverage significantly lower than in previous years.[8] In August, new research showed that the Greenland ice sheet melt had accelerated further since 2016,[9] contributing to global sea-level rise.

7 These Arctic dynamics have long-term regional and global impacts that will affect all Member States, including accelerated warming due to loss of sea ice reflectivity, weather pattern disturbances, sea-level rise, and tidal and storm surge events.[10] Extreme weather events in the northern hemisphere, from drought that drove wildfires in the Western United States, to extreme rainfall leading to flooding in Great Britain, have been tied to Arctic warming and loss of sea ice. Accelerating permafrost thaw, which currently threatens infrastructure in Russia, Canada and Alaska, and now contributes carbon emissions equal to that of Japan,[11] is also associated with loss of Arctic sea ice. The remaining region of multi-year ice west of Greenland, on which many Arctic species depend, has deteriorated significantly in the past 2 years. Loss of sea ice and warming waters have led to plankton blooms and regions of low oxygen, that together with growing acidification (which occurs faster in cold Arctic waters than anywhere in the globe) threaten vital fisheries such as cod west of Norway and Icelandic lobster.

8 Reducing BC emissions within the Arctic region is one of the most efficient actions available to slow the loss of sea ice, and the negative regional and global impacts that result. For this reason, Arctic Council members have already committed to an ambitious target to reduce BC emissions by 25 to 33% below 2013 levels by 2025. Because of its close and at times, immediate proximity to sea ice, a large proportion of shipping BC emissions will deposit on ice and snow, and therefore have a 4 to 10 times greater warming impact than BC emissions that remain airborne. Arctic shipping emissions therefore represent a special threat to Arctic sea ice, snow and the Greenland ice sheet, and the Arctic Council has urgently called on Arctic operators to develop measures and best practices to reduce particulate matter and BC emissions.[12] Similarly, the Convention on Long-range Transboundary Air Pollution (LRTAP Convention) is looking at shipping BC emissions in relation to the next revision of the Gothenburg Protocol.

Next steps

9 MEPC 74 invited concrete proposals to the PPR Sub-Committee from Member Governments and international organizations on "how to control Black Carbon emissions to reduce the impact on the Arctic of Black Carbon emissions from international shipping and how to develop a standardized sampling, conditioning and measurement protocol for Black Carbon emissions from international shipping" (MEPC 74/18, paragraph 5.67). Only one concrete proposal for how to control BC emissions was submitted to PPR 7. As a first step towards alternative, non-fossil fuels and propulsion systems, document PPR 7/8/2 (FOEI et al.) called on IMO to mandate an urgent switch to distillates for ships operating in the Arctic, which would immediately reduce BC emissions from ships that use heavy fuel oil. PPR 7 agreed to draft terms of reference for a correspondence group including the following critical explanation of the relationship between the standardized measurement protocol and policy options:

8 https://theconversation.com/wheres-the-sea-ice-3-reasons-the-arctic-freeze-is-unseasonably-late-and-why-it-matters-148918

9 https://www.nature.com/articles/s43247-020-0010-1

10 https://www.nature.com/articles/s43247-020-0001-2

11 Permafrost and the Global Carbon Cycle (noaa.gov)

12 ACMMCA09_Iqaluit_2015_SAO_Report_Annex_4_TFBCM_Framework_Document.pdf (arctic-council.org)

"This measurement system should not preclude consideration and agreement on policy options to avoid or otherwise limit Black Carbon emissions from ships, as its development would in fact benefit from guidance on how possible regulations would be applied" (PPR 7/22, paragraph 8.10.3). PPR 7 also invited further concrete proposals to be submitted to PPR 8 (PPR 7/22, paragraph 8.11).

10 As previously mentioned, in document PPR 8/5, paragraph 9, the correspondence group concludes: "A focused policy of fuel switch only, including a switch to cleaner fuels, together with a fuel specification, would not require Black Carbon measurement…". Based on this conclusion, the co-sponsors reiterate that a switch to cleaner fuels, such as distillates, does not require BC measurement and, therefore, IMO need not delay in agreeing to mandate a switch to cleaner fuels to reduce the impact on the Arctic of BC emissions from international shipping.

11 The co-sponsors have identified three possible regulatory routes for requiring a switch to cleaner fuels:

.1 establish an Arctic Emission Control Area;

.2 amend MARPOL Annex VI, regulation 14 to require the use of fuels with a maximum sulphur content of 0.10% m/m in Arctic waters and include a waiver of regulation 4 to prevent the use of "equivalents" in Arctic waters (the latter because using HFO with a scrubber does not reduce Black Carbon emissions as much as using MGO);[13] or

.3 add a new chapter to MARPOL Annex VI on "Special requirements for the control of emissions from ships operating in polar regions".

12 Taking into account the options in paragraph 11 and recognizing that they can be implemented without a standardized BC measurement protocol, the co-sponsors request that the Sub-Committee ask MEPC 76 to establish without delay a process, perhaps intersessionnally, to draft the MARPOL amendments necessary to bring about a switch to the use of cleaner fuels in the Arctic, with a view to approving the amendments at MEPC 77.

13 In addition to a fuel switch in Arctic waters, it will also be necessary to regulate BC emissions from international shipping more broadly. Noting that Canada has established a technical working group to develop a standardized sampling, conditioning and measurement protocol (PPR 8/INF.3), the co-sponsors further propose that the Sub-Committee invite MEPC to instruct the PPR Sub-Committee to draft amendments to regulation 14 of MARPOL Annex VI to limit Black Carbon emissions from engines installed on a ship, which can be co-developed with the standardized sampling, conditioning and measurement protocol.

Action requested of the Sub-Committee

14 The Sub-Committee is invited to note the information presented in paragraphs 3 to 11 and is urged to take action as outlined in paragraphs 12 and 13.

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[13] Comer, B., Georgeff, E. & Osipova, L. (2020). *Air emissions and water pollution discharges from ships with scrubbers.* Available at the ICCT website: https://theicct.org/publications/air-water-pollution-scrubbers-2020