

SUB-COMMITTEE ON POLLUTION
PREVENTION AND RESPONSE
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Agenda item 6

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

Geographic scope of Black Carbon reduction measures

Submitted by FOEI, WWF, Pacific Environment and CSC

SUMMARY

Executive summary: This document responds to unresolved discussions during the Correspondence Group on Prevention of Air Pollution from Ships on the geographic scope of measures (recommendatory or mandatory) aimed at reducing emissions of Black Carbon impacting the Arctic from international shipping.

Strategic direction, if applicable: 3

Output: 3.3

Action to be taken: Paragraph 14

Related documents: PPR 10/6 and PPR 10/INF.10

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.4) and comments on document PPR 10/6 (Denmark) - the report of the Correspondence Group on Prevention of Air Pollution from Ships.

2 The co-sponsors welcome the report of the Correspondence Group (CG) under Denmark's coordination, and appreciate the work completed under term of reference 3 (ToR 3) on further consideration of regulating or otherwise directly controlling Black Carbon (BC) emissions from marine diesel engines to reduce the impact on the Arctic of BC emissions from international shipping, and in particular the progress made on refining the list of identified candidate control measures to six potential measures.

3 In 2011, IMO agreed to a work plan "for consideration of the impact on the Arctic" of emissions of BC from international shipping (MEPC 62/24, paragraph 4.20). In 2018, a technical workshop on marine BC emissions was hosted by the International Council on Clean Transportation (ICCT) involving leading BC researchers, academics, and representatives from government, industry and civil society. The workshop considered a list of 41 potential control measures focusing on those measures that had been identified as available within the next five years. Eighteen BC control measures were evaluated against a number of considerations including effectiveness, feasibility, availability, applicability, and impact on co-pollutants, resulting in the identification of 13 appropriate BC control measures for international shipping (PPR 6/INF.11). At PPR 6 (see PPR 6/20/Add.1, annex 9) a simplified compilation of identified candidate control measures to reduce the impact on the Arctic of BC emissions from international shipping was prepared (based on documents PPR 6/7 and PPR 6/INF.6 (Canada), PPR 6/7/2 (Finland), PPR 6/INF.15 (Finland), and PPR 6/INF.11 and PPR 6/INF.18 (Clean Shipping Coalition)).

4 The CG's work on ToR 3 and on developing recommendatory guidelines (ToR 1), noted that additional work on potential BC emission threshold(s), should take into account the impact of transboundary BC emission sources related to shipping at a global level (PPR 10/6, paragraph 22). While next steps identified in the report include working on potential measures impacting new builds and retrofits, clarifying "that such measures apply to the geographic area, which has to be defined" (PPR 10/6, paragraph 25), and clarifying the "geographic scope of any Arctic BC regulation" (PPR 10/6, paragraph 26).

Black Carbon - atmospheric warming, loss of albedo effect, and impact

5 BC has an atmospheric lifetime of a few days or weeks and so when airborne it can travel large distances from the source where it was emitted¹. In doing so the particles absorb heat and warm the circulating air thus contributing to global radiative forcing and temperature rise. In addition, if the particles end up deposited on land, especially on snow and ice, or on ice covered waters, atmospheric BC makes these surfaces darker (albedo effect) resulting in additional warming and melting.

6 At the beginning of work on this output, the United Nations Economic Commission for Europe set out the issues clearly (BLG 15/INF.8):

"because of the dual role of BC in Arctic climate — atmospheric warming and its effect of darkening and melting snow and ice — reducing BC offers one pathway towards mitigating these effects...BC deposition decreases the reflectivity of Arctic snow and ice. Arctic albedo also changes when highly reflective sea ice melts and is replaced by dark ocean water, which in turn absorbs more incoming solar energy and exacerbates warming. BC contributes to this process, known as the snow-albedo feedback, and may be altering the global radiative balance"

7 The consequence of BC atmospheric warming and decreased albedo exacerbates the biodiversity crisis. Ice and snow are essential components of Arctic life and serve as habitat for highly adapted Arctic species. Loss of sea ice impacts the health and resilience of wildlife populations as well as the Arctic communities who depend on it for food security, cultural continuity and transportation.

¹ Possible "40 Degrees North" Black Carbon Initiative. Report from November 5-7 Oslo Meeting to Arctic Council Meeting of Senior Arctic Officials. Narvik, November 28-29, 2007. (arctic-council.org)

Geographic scope of measures to reduce impact on the Arctic

8 The IMO work plan agreed in 2011 called "for consideration of the impact on the Arctic" of international shipping BC emissions (MEPC 62/24, paragraph 4.20), so the focus has always been on mitigating the extent of BC emitted into the atmosphere by ships when operating in areas where there will be an appreciable impact "on" the Arctic. The need now is to identify and define the sea areas in which ships operate and contribute BC significantly enough to impact the Arctic. This area should take account of the airborne transportation of BC as well as areas within "the Arctic" where ships operate and emit directly into the Arctic atmosphere.

9 The Arctic Council has recognized that "given BC's atmospheric lifetime of a few days or weeks, models and direct sampling indicate that most of the BC reaching the Arctic comes from Arctic Council member states and Eurasia, at sources located at about 40 degrees North latitude and above"². This means that account needs to be taken – as the CG noted (PPR 10/6, paragraph 22) – of the extent to which BC emitted by ships operating outside "the Arctic" and then carried in the atmosphere to the Arctic. For example, transboundary emissions from ships were a significant driver leading to the introduction of emission control areas (ECAs). In determining a suitable geographic scope for all measures to reduce the impact on the Arctic of BC emissions from international ships it will be important to bear in mind the impacts of airborne emitted BC.

10 The challenge is that there is no one definition of "the Arctic". The Arctic Council uses several definitions, notably the Arctic Human Development Report (AHDR) definition and the Arctic Monitoring and Assessment Programme (AMAP) definition (see figure 1).



Figure 1: The definitions of the Arctic: Arctic Human Development Report (AHDR) in red, the Arctic Monitoring and Assessment Programme (AMAP) in green, the Conservation of Arctic Flora and Fauna (CAFF) in blue. Map produced by Nordregio, 2004³. Cartographer: Johanna Roto.

² Possible "40 Degrees North" Black Carbon Initiative. Report from November 5-7 Oslo Meeting to Arctic Council Meeting of Senior Arctic Officials. Narvik, November 28-29, 2007. (arctic-council.org)

³ <https://archive.nordregio.se/en/Metameny/About-Nordregio/Journal-of-Nordregio/2007/Journal-of-Nordregio-no-4-2007/One-region---multiple-definitions/index.html>

11 During the work of the CG, some participants suggested using the definition of "Arctic waters" defined by SOLAS regulation XIV and MARPOL Annexes I, II, IV and V, introduced for the purposes of providing for safe ship operation in polar waters likely to experience ice conditions and to address shipping discharges in the Arctic (see blue boundary shown in figure 2). This definition excludes the North Atlantic - around Iceland, the Faroe Islands and off the Norwegian west coast - which are influenced by the Gulf Stream and less prone to ice conditions. These waters are however used extensively by ships, which emit significant amounts of BC into the atmosphere (see figure 2) and are clearly encompassed within the principal geographic boundaries recognized by the Arctic Council. "Arctic waters" also excludes some regions of Inuit Nunaat, the Arctic homeland for Inuit, where Indigenous communities rely on marine resources for subsistence, culture, and exercising their rights to self-determination.

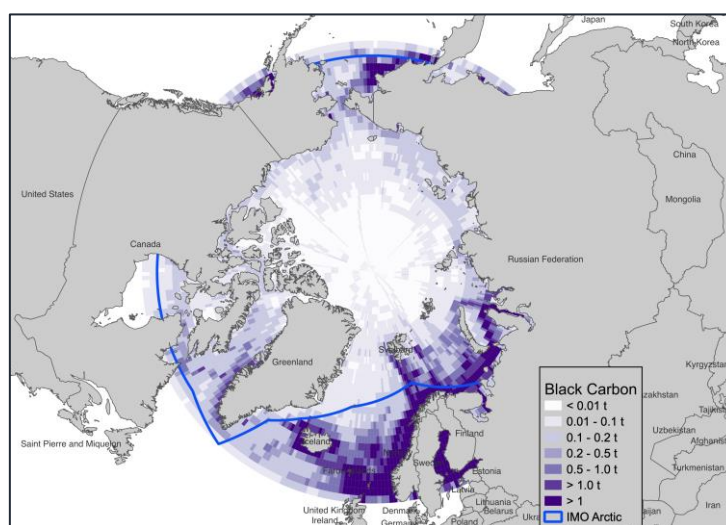


Figure 2: Intensity of Arctic ship BC emissions based on 2021 data. Blue line marks the delineation of Arctic waters as used for purposes of the IMO's Polar Code (ICCT)⁴.

12 Clearly measures aimed at reducing the impact of ships' BC emissions on the Arctic need to address the issue of geographic scope of ship activity taking the above factors into account. A more comprehensive geographic scope which accounts and mitigates air pollutants and emissions also supports Arctic Indigenous communities' rights and survival. In this context it is noted that every fraction of summer sea ice preserved can help the region from reaching a catastrophic tipping point in terms of loss and damage to the Arctic marine environment, as well as global impacts from sea level rise and permafrost thaw.

13 The co-sponsors propose that the geographic scope of measures developed to reduce the impact of ships' BC emissions on the Arctic should at a minimum cover the maritime waters of the AHDR area or alternatively the AMAP area (see figure 1). Alternatively, all waters north of 60° North may be a simpler suitable definition that addresses all the issues and concerns outlined.

Action requested of the Sub-Committee

14 The Sub-Committee is invited to consider the comments in paragraphs 5 to 13 and to request that a working group, if established, make a recommendation on the appropriate geographic scope of any measures developed with the intention of reducing the impacts on the Arctic of Black Carbon emissions from international shipping.

⁴ ICCT analysis for presentation to a PPR 10 side event.