

MARINE ENVIRONMENT PROTECTION  
COMMITTEE  
62nd session  
Agenda item 4

MEPC 62/4/3  
8 April 2011  
Original: ENGLISH

## **PREVENTION OF AIR POLLUTION FROM SHIPS**

### **Reduction of emissions of Black Carbon from shipping in the Arctic**

**Submitted by the Secretariat of the United Nations Economic Commission for Europe  
Convention on Long-Range Transboundary Air Pollution**

#### **SUMMARY**

*Executive summary:* This document presents the views of the Executive Body to the United Nations Economic Commission for Europe (UNECE) Convention on Long-Range Transboundary Air Pollution, and contains proposals for action by IMO to reduce Black Carbon emissions from shipping in the Arctic

*Strategic direction:* 7.3

*High-level action:* 7.3.1

*Planned output:* 7.3.1.3

*Action to be taken:* Paragraph 16

*Related documents:* MEPC 60/4/24; BLG 15/19; and BLG 15/INF.8

#### **Introduction**

1 This document presents the views of the Executive Body of the UNECE Convention on Long Range Transboundary Air Pollution on the emissions of Black Carbon, and highlights the importance and role that IMO and the shipping industry might play in the reduction of Black Carbon. The document recognizes the submission by Norway, Sweden and the United States of America to MEPC 60 in January 2010 (document MEPC 60/4/24), and the subsequent discussion at MEPC 61 and the Sub-Committee on Bulk Liquids and Gases in February 2011 (BLG 15/19, paragraphs 11.57-11.62). BLG 15 invited international organizations to submit documents containing concrete proposals to future meetings of the MEPC.

2 Furthermore, on 11 January 2011, the Chair of the Executive Body of the Convention wrote to IMO to emphasise the important conclusions of the Ad-Hoc Expert Group on Black Carbon under the Convention and to suggest that IMO consider action on BC emissions. The reply of 23 February 2011 invited the Convention to submit proposals to the MEPC, in line with the decisions of BLG 15.

3 First and foremost, this document represents an effort to highlight the important public health benefits that can be achieved by reducing Black Carbon rich particulate matter while also slowing the rate of warming in the critical Arctic region.

### **Expert Group on Black Carbon under the Convention**

4 On 13 December 2010, the Executive Body of the Convention on Long Range Transboundary Air Pollution received the report of the Ad-hoc Expert Group on Black Carbon. This report contains several important findings regarding the impact of Black Carbon in the Arctic and the contribution of shipping emissions to these impacts. Specific findings of the Expert Group include, but are not limited to, the following highlights:

- .1 there is general scientific consensus that mitigation of Black Carbon will lead to positive regional impacts by reducing Black Carbon deposition in areas with snow and ice;
- .2 there is general consensus that reducing primary particulate matter will benefit public health; and
- .3 the Arctic, as well as alpine regions, may benefit more than other regions from reducing emissions of Black Carbon; and climate processes unique to the Arctic have significant effects that extend globally, so action must be taken in the very near term to reduce the rate of Arctic warming.

The full report of the Expert Group, ECE/EB.AIR/2010/7, is available online at <http://www.unece.org/env/documents/2010/eb/eb/ece.eb.air.2010.7.e.pdf>, and was submitted to BLG for information (BLG 15/INF.8).

5 The Executive Body in its meeting in December 2010, acknowledged the need for ambitious reductions in long-lived greenhouse gases, as well as the need to reduce emissions of pollutants that are harmful to human health. At the same time, the Executive Body recognized that international action to reduce long-lived greenhouse gases cannot prevent dramatic changes to the Arctic in the near term. Changes identified in the Expert Group report that are taking place even now include melting of glaciers, sea ice, and permafrost and shifts in patterns of rain and snowfall, freshwater run-off, and forest/tundra growth. The consequences include disrupted wildlife migration patterns, altered fish stocks, modified agricultural zones and increased forest fires.

6 As a result of this report, as well as a complementary report from the Task Force on Hemispheric Transport of Air Pollution ECE/EB.AIR/2010/10, the Executive Body requested subsidiary bodies under the convention to develop technical and policy options during the coming year for including Black Carbon as a component of particulate matter in the upcoming revisions to the Gothenburg Protocol. While this document does not prejudge the outcome of this coming year's efforts, at this time it is the intention of the Executive Body to consider taking action on these revisions in December 2011.

7 Some estimates suggest that Black Carbon and ozone precursor emissions from shipping in the Arctic may increase by a factor of two to three by 2050. With Black Carbon constituting between 5%-15% of shipping particulate emissions, this is a source category that merits more attention. The Convention's Executive Body recognizes that the IMO is the appropriate body to address emissions from shipping, and therefore urges the Organization to consider the findings of the Expert Group as it further deliberates on mitigation activities with the potential to reduce Black Carbon emissions that impact the Arctic.

---

**Submission from Norway, Sweden and the United States (MEPC 60/4/24)**

8 This document also noted the importance to the Arctic of emissions of Black Carbon, noting that:

- .1 the Arctic is warming faster than the rest of the planet;
- .2 rapid melting of Arctic land and sea ice is accelerating this warming;
- .3 Black Carbon emissions, especially when deposited on land- and sea-ice are a significant contributor to this warming;
- .4 reductions in Black Carbon, first and foremost, will lead to important benefits for human health; and
- .5 Black Carbon emissions are short-lived in the atmosphere; thus, emission reductions also can help reduce warming and provide climate benefits in the near-term.

9 The submission noted further that shipping is an important contributor to Black Carbon emissions, particularly in the Arctic and that shipping traffic in that region is expected to grow substantially as the process of sea-ice melting opens up potential shipping lanes.

10 The submission suggested a series of widely available and proven measures which could be undertaken by the shipping sector to reduce Black Carbon emissions. One group of measures, which improve fuel consumption will reduce a range of other air pollutants in addition to Black Carbon. These measures will not be discussed in detail in this document, but in summary they are:

- .1 speed reductions;
- .2 modifications to vessels and propeller design to improve fuel efficiency;
- .3 alternate power technologies (wind-sails, kites); and
- .4 improved ship routing and logistics.

11 The measures involving technological options were:

- .1 in-engine measures such as improved fuel injection, modified turbochargers, etc.;
- .2 diesel particulate filters;
- .3 water-in-fuel emulsification to reduce both Black Carbon and NO<sub>x</sub>; and
- .4 use of slide valves.

12 All of these measures and techniques are widely available so there are no technological barriers in principle to their being adopted. It is recognized that some will be more efficient than others, and that some, such as diesel particulate filters, will require other measures such as low sulphur fuels for their successful implementation. However, the fuel economy measures have the added benefit that they are potentially profitable.

Implementation of these measures could provide beneficial reductions in Black Carbon from shipping. Furthermore, if targeted at the Arctic they could generate an important short-term climate response in one of the world's more sensitive areas.

### **Suggested Action**

13 In view of the importance of reducing Black Carbon emissions for improving public health, particularly for indigenous Arctic populations and slowing the rate of warming, particularly for sensitive regions like the Arctic, the Convention urges the IMO to take active steps to reduce emissions of Black Carbon in this region. This action could take the form of an agreement to implement an action plan drawing on the proposals presented in January 2010 by Norway, Sweden and the United States to the IMO Marine Environment Protection Committee, and outlined in section 3 of this document, further elaborated in document MEPC 60/4/24.

14 This implementation could take the form of a performance-based approach, leaving the measures unspecified but requiring a specific emission reduction say, or a technology-based approach, requiring for example low-sulphur fuel and diesel particulate filters in the Arctic. The technological approach is probably easier to verify, although periodic performance testing would be required.

15 The Convention on Long-range Transboundary Air Pollution recognizes that any action must be verifiable and that the measurement of Black Carbon in the atmosphere is not widely conducted. The Convention incorporates considerable scientific expertise in this area and is prepared to co-operate with IMO in addressing issues of measurement and verification of abatement measures for Black Carbon.

### **Action requested of the Committee**

16 The Committee is invited to consider the proposals presented in January 2010 by Norway, Sweden and the United States to MEPC 60 and take action as appropriate.

---