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Sectors and solutions – Shipping

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Near-term (up to 2030) priorities and recommendations for ship air pollution reductions:

- SECA/NECA in all European sea areas and in the Arctic (countries; EU; IMO; Arctic Council)
- Ensure monitoring/compliance/enforcement of global S-standards and SECA/NECA-standards. Evaluate the introduction of mandatory CEMS. (Countries; EU; IMO)
- NOx-reduction schemes for existing ships, for example by economic instruments such as a Levy & Fund system - use example from Norway (EU, HELCOM/OSPARCOM/REMPEC, countries)
- Mandatory speed reduction schemes (IMO; EU; national/local)
- PM/BC emission standard (IMO; EU)
- Economic instruments for PM/BC-reduction measures (EU; countries; ports)
- Strengthen energy efficiency requirements (EEDI) (IMO)
- Ensure availability in ports of cleaner/alternative fuels (and fuel quality) as well as of on-shore power supply (e.g. bigger ports in California have minimum requirements to provide on-shore power)

Background
International shipping contributes significantly to air pollution damage to health and the environment. While emissions from most land-based emission sources have come down in EU and North America, and are expected to continue to decline, those from shipping have been steadily increasing. The global ship-fuel sulphur limit of 0.5% from 2020 should result in significant reductions in ship SO_2 emissions. Regionally, the establishment of Sulphur Emission Control Areas (SECA) in the Baltic Sea and the North Sea also reduces SO_2 emissions.

However, emissions of NOx from international shipping in sea areas around Europe are estimated to at best stabilise or even increase over the next few decades. The recent establishment of the Baltic Sea and the North Sea as NOx Emission Control Areas (NECA)

will help to reduce NOx emissions, but as the stricter emission standards apply only to newly built ships and while they are within the NECAs, emissions will only slowly decline over several decades.

Even if there is an increasing concern over shipping emissions as a significant contributor to health and environmental impacts, and there are cost-effective techniques to reduce emissions, there are obstacles on the policy side due to difficulties in reaching agreements within the main international regulatory body, the International Maritime Organisation (IMO).

For shipping, the international dimension of the sector is an important factor, which means that national or EU actions may have wider impacts. Air pollution from ships is not only a concern in Europe, but also in other parts of the world, such as North America, China and South-East Asia. It should be noted that the ocean-going ship fleet is rather homogenous, while fleets in regional sea areas are more segmented. This means that more targeted instruments for specific ship types could be applied at regional levels. Furthermore, as ships have a life-length of 25-30 years, regulations – or other types of emission abatement measures – may need to differentiate between new and existing ships.

Conclusions

- Shipping is contributing to air pollution on local (e.g. in port areas), regional, and global scales and also has an impact on climate. All scales are important and impacts should be considered together in order to set the right priorities for abatement.

- Historic developments in IMO have been slow, and measures agreed so far are not sufficient to resolve the problem. Therefore, action at other levels (for example by the EU, countries, or ports) is needed to push – but not replace – action in the IMO.

- As agreements on and introduction of new or stricter legally binding emission requirements usually take time to develop and implement, economic instruments can be used to promote faster emission reductions. Such instruments can also be used as a complement to binding standards, to promote additional emission reductions beyond the minimum requirements. The role of financing institutions for making investments in cleaner ships possible is important, especially regarding retrofit/reconstruction of existing ships.

- A wide variety of technical emission abatement options are readily available (see list of examples in the annex below). As different technologies may be suitable for different types of ships, it may be effective to combine different technical options.

Annex: Discussion on measures and instruments to reduce ship emissions

Examples of readily available technical options

Cleaner energy sources
Distillate low-sulphur fuel oil (usually referred to as marine gas oil, MGO); low-sulphur blended fuels; liquefied natural gas (LNG); methanol; biofuels; battery-electric

Exhaust gas cleaning/engine modifications
Scrubbers (closed-loop; open-loop; hybrids); selective catalytic reduction (SCR) (note that SCR may be difficult to combine with scrubbers); low-NOx-engines (for example using exhaust gas recirculation (EGR)); diesel particle filters (DPF)

Alternatives:
Energy efficiency; wind-assistance; solar-assistance; on-shore power (OSP).

Stimulation of non-technical measures
Examples include among others reduced speed, improved efficiency, environmental ship indices, and economic instruments. Some specific examples:

1) Speed reduction scheme with economic incentives (used in California);
2) Norwegian NOx Tax & Fund;
3) Ports using ship indices, such as Environmental Ship Index (ESI) or Clean Shipping Index (CSI);
4) Tax reduction on electricity used for on-shore power supply;
5) Ports applying environmentally differentiated port dues;
6) Public information/visibility on environmental impacts of cruise ships.