

EUA-BCA Policy landscape report

Summary



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Black carbon is a significant short-lived climate forcer that also adversely affects human health. Addressing emissions of black carbon can therefore form an important element of strategies aiming to mitigate both climate change and air pollution. International action is required to achieve effective mitigation.

More than half of all global black carbon emissions originate from residential combustion and road transport with the remainder emitted from industry, agriculture, non-road transport, oil and gas exploration, and forest and savannah fires. Past policies and improved technology have already led to substantial emission reductions in several sectors including transport and industry, and solutions are available to cut emissions further. Such emission reductions would be in line with long-term targets of several multilateral environmental agreements, and many of the objectives of the European Green Deal,¹ including a transition to clean energy and less polluting transport solutions.

The Arctic is one of the regions for which the goals to reduce emissions of black carbon have been given prominence.² The Arctic is warming faster than other regions of the world and black carbon emissions contribute in a variety of ways; e.g. direct deposition of particles on snow and ice, and impact on formation and lifetime of clouds and heat transfer from mid latitudes. The Arctic Council has recognised the importance of reducing emissions of black carbon within the Arctic, and globally. Full implementation of currently available technologies could reduce global anthropogenic black carbon emissions by 70% from 2010 levels by 2030.³ If full action were to be taken by only Arctic Council member countries, the corresponding reduction would be approximately 15%.

The EU-funded Action on Black Carbon in the Arctic seeks to contribute to the development of collective responses that reduce black carbon emissions affecting the Arctic.⁴ The project, carried out by a group of expert organisations, has engaged in interaction with a broad group of stakeholders and countries to identify feasible ways of taking action. Alignment with activities in international fora, including the Arctic Council and the UNECE Convention on Long-range Transboundary Air Pollution (the Air Convention) has guided mapping of

the policy landscape for actions that can reduce emissions of black carbon with impact on the Arctic, often benefitting from enhanced cooperation between stakeholders and fora. There are many types of possible cooperations which could reduce emissions, specific for each response. Some of the responses would benefit from multinational cooperation, other regional or bilateral cooperation between countries and organisations: all of which are examples of international cooperation.

This document summarises the key messages of the EUA-BCA Policy landscape report.

1 The European Green Deal, Brussels, 11.12.2019, COM(2019) 640 final

2 IQALUIT 2015 SAO Report to Ministers: Enhanced Black Carbon and Methane Emissions Reductions – An Arctic Council Framework for Action

3 Kühn et al. 2020. Effects of black carbon mitigation on Arctic climate. *Atmos. Chem. Phys.*, 20, 5527–5546, <https://doi.org/10.5194/acp-20-5527-2020>, page 5532

4 <https://eua-bca.amap.no/>

The areas of action

Supporting the build-up of capacity to monitor effectiveness of Arctic black carbon policy responses, this policy landscape for action outlines paths for further cooperation on monitoring northern hemisphere black carbon emissions, as well as ambient air black carbon concentrations and black carbon deposition in the Arctic environment.

In support of engagement to action against emissions, the policy landscape report focuses on the following sources of emissions, which are especially relevant for the Arctic.

Gas Flaring






Shipping

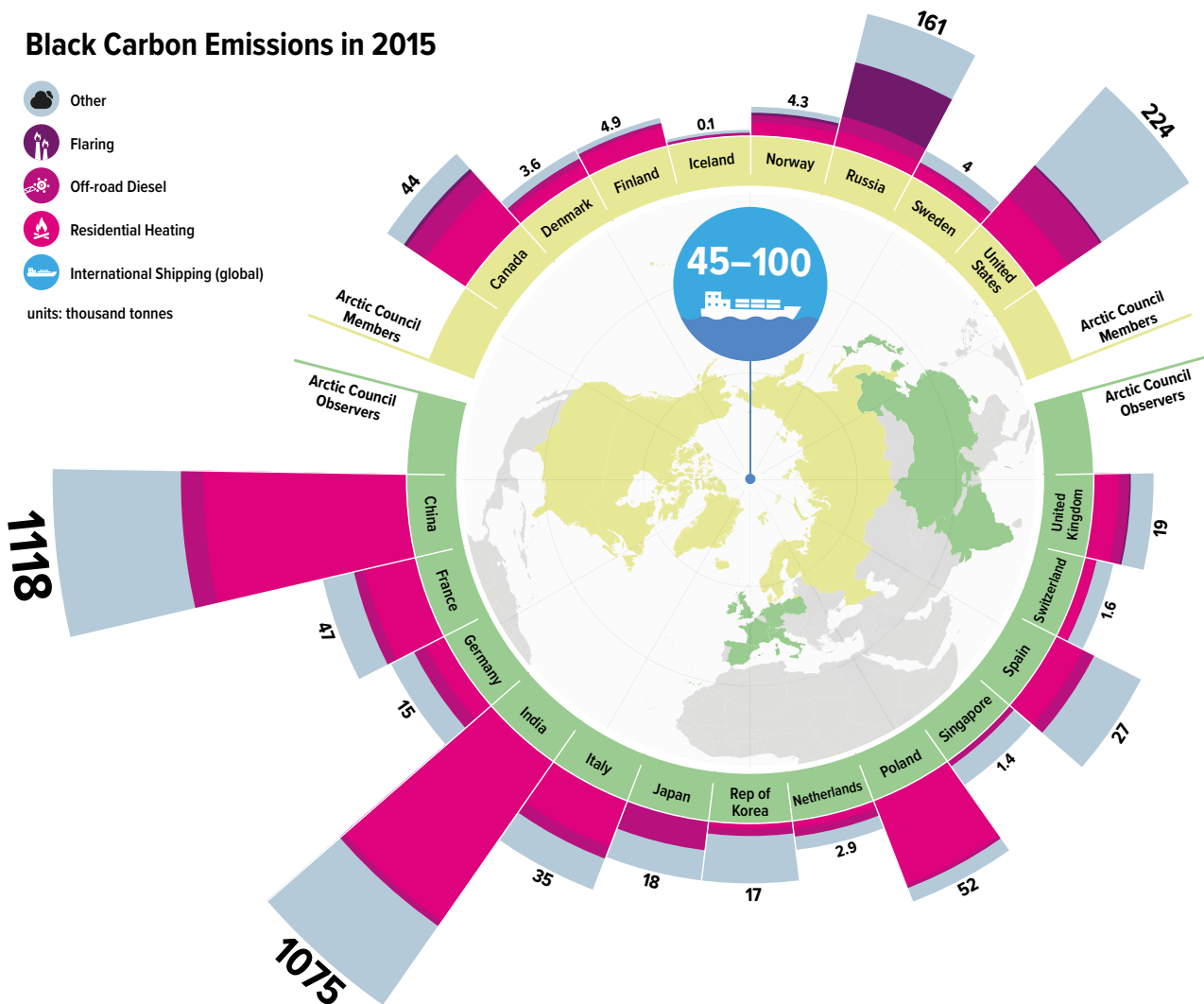
Open Burning

Domestic Heating

Diesel/On and Off-Road

Black Carbon Emissions in 2015

-  Other
 -  Flaring
 -  Off-road Diesel
 -  Residential Heating
 -  International Shipping (global)
- units: thousand tonnes



Paths toward enhanced monitoring of black carbon that affects the Arctic

Effective cooperation aiming to curb black carbon impacts in the Arctic depends heavily on systems that monitor Arctic black carbon at source and in situ. By adequately monitoring northern hemispheric black carbon emissions, together with measurements of ambient air black carbon concentrations and deposition at remote Arctic locations, it is possible to track progress on reducing Arctic-relevant black carbon emissions and the subsequent Arctic black carbon burden.

Black carbon emissions reporting

Nation states that are Parties to the Air Convention and/or members or observers of the Arctic Council are formally encouraged to report their national black carbon emissions inventories under these fora. Member States of the EU are in fact required to report black carbon emissions under the National Emission Reduction Commitments (NEC) Directive, if such inventories are available.⁵ Despite a large proportion of countries regularly submitting black carbon emissions inventories, the non-reporting countries represent a substantial monitoring gap, particularly from an Arctic perspective. Furthermore, issues have been raised with regards to the transparency, consistency, comparability, completeness and accuracy of reported black carbon emissions inventories.

TO IMPROVE BOTH THE EXTENT AND QUALITY OF NATIONAL BLACK CARBON INVENTORY REPORTING, THE POLICY LANDSCAPE REPORT IDENTIFIES OPTIONS FOR ENHANCED COOPERATION THAT INCLUDE:

- Intensifying the sharing of best practises on black carbon inventory compilation through e.g. bilateral initiatives and regional capacity building instruments,
- Increasing the attention to reported black carbon emissions as part of the in-depth inventory reviews under the Air Convention, and
- Active cooperation between the Air Convention and the IPCC to elaborate improved- and globally applicable inventory methodologies for black carbon.

Monitoring black carbon in the Arctic

The Arctic Council Member countries are all Parties to the Air Convention and members of the World Meteorological Organization. Within these fora, the programmes EMEP and Global Atmospheric Watch, respectively, coordinate and synthesise in situ monitoring of aerosols including black carbon. However, given the broad geographical- and multi-pollutant scope of these programmes, enhanced cooperation, particularly between the Arctic Council Member countries, is considered necessary to improve the extent and sustainability of in situ black carbon monitoring in the Arctic.

OPTIONS FOR ENHANCED COOPERATION ON IN SITU BLACK CARBON MONITORING IN THE ARCTIC INCLUDE:

- Strengthening of the in situ monitoring component under the Arctic Council Framework for Action on Enhanced Black Carbon and Methane Emissions Reductions, and
- Extension of existing Arctic Monitoring and Assessment Programme activities to, inter alia, coordinate black carbon monitoring at Arctic stations and promote data sharing as part of more regularly updated assessments of Arctic black carbon monitoring.

⁵ Directive (EU) 2016/2284

Specific areas of cooperation and action

Each of the action areas focused on emission reductions has its specific features. For example, a significant part of the emissions arises in activities dependent on fossil fuels, which in the long run will be phased out, but which in the short and medium term will be regulated through policies for the protection of air quality and climate action. In reducing emissions from biomass stoves, product design is of particular importance. Open agricultural burning can be addressed through pollution control and agricultural policies that affect practices. Based on the extent to which cooperation or alignment of initiatives would be beneficial, selections of important actions are highlighted below for each area. Detailed elaborations of these and other actions are available on the project's website: <https://eua-bca.amap.no>

Gas flaring

Gas flaring from the oil and gas sector could, considering current technology standards and assumed oil and gas sector development, become the largest black carbon emission source in the Arctic Council countries by 2030. There is an urgent need to improve monitoring of flaring activities and gas composition as well as to perform further measurements to improve estimates of emission rates. There are also several steps of international cooperation that may support the reduction of emissions.

ACTIONS THAT WOULD BENEFIT FROM ENHANCED COOPERATION INCLUDE:

- Promotion of R&D into field measurement data on actual black carbon emission rates for a diverse range of flares relevant for the Arctic region,
- Close monitoring and reporting of progress within the World Bank Zero Routine Flaring by 2030 initiative, and
- Defining internationally common environmental standards for black carbon emitted in oil and gas production.

Small-scale domestic heating

Small-scale domestic heating is one of the most important sources of black carbon emissions within the Arctic region. In contrast to several other key sectors, emissions from small-scale heating are diffuse and caused by private households, or in the case of small-scale district heating, local operators. The control of these emissions is challenging. There is limited direct regulation and control, and cost-effectiveness in terms of emission reduction is not a central driver of decisions by individual households or local producers of heat. What matters more is access to affordable fuels and assurance of comfortable use. The actions are mainly national, or even sub-national, but international exchange can support wider implementation of particularly effective policies.

ACTIONS THAT WOULD BENEFIT FROM ENHANCED COOPERATION INCLUDE:

- Enhancing the international exchange of experience in providing economic incentives to replace old heating equipment and disseminating information on the benefits and techniques of 'Correct Burning',
- Incentivising energy efficiency improvements in buildings, and
- Encouraging countries to set higher emission requirements on stoves and boilers as well as to phase out old ones still in use.

Shipping

Emissions from shipping have been projected to increase in the Arctic due to ever longer ice-free periods and new Arctic shipping routes. To avoid an increase of direct black carbon emissions in the Arctic, actions under the International Maritime Organization (IMO) are essential, but also national or sub-national actions can be important for addressing emissions in specific sea areas.

ACTIONS THAT WOULD BENEFIT FROM ENHANCED COOPERATION INCLUDE:

- To further develop a standardised black carbon sampling, conditioning, and measurement protocol within IMO,
- Advancing international regulations to reduce black carbon emissions from shipping, and
- Progressing with emission reductions through national and sub-national actions, mainly through regulations for ports and specific shipping routes or areas and R&D support.

On and off-road transport and stationary engines

Black carbon emissions from internal combustion engines used in on- and off-road transport and in electricity generation can increase in the Arctic with expanding economic activity. Internationally significant reductions from these engines have already been achieved through emission standards: engines that comply with the most recent standards emit only a fraction of black carbon per unit of fuel used compared with older vehicles and machinery. However, additional progress can still be achieved by scrapping old vehicles, strengthening legislation and its enforcement, and by developing technologies further, including electric engines.

ACTIONS THAT WOULD BENEFIT FROM ENHANCED COOPERATION INCLUDE:

- Ensuring annual engine exhaust maintenance testing,
- Stricter regulation of international trade of second-hand vehicles,
- Encourage countries to control the use of AdBlue emulators and chip engine tuning equipment, and
- Harmonisation and enforcement of engine emission standards in the Arctic region.

Open biomass burning

Open biomass burning, both through wildfires and field burning of agricultural residues, is globally a significant source of black carbon emissions, and exposure to smoke from open burning is a serious health concern. The most extensive wildfires in the northern hemisphere occur in Russia and Canada, but many other countries have also experienced serious problems. Open field-burning of agricultural residues is unlikely to expand in the regions with significant contribution of black carbon emissions reaching the Arctic, but climate change may increase the risk of wildfires in these regions.

ACTIONS THAT WOULD BENEFIT FROM ENHANCED COOPERATION INCLUDE:

- Further development of agriculture practices and extension services for farmers to minimize open burning of agricultural residues,
- Sharing of information systems and campaigns for raising awareness to prevent wildfires,
- Further develop and exchange of good practice in monitoring and surveillance systems of wildfires, and
- International development of capacities and skills to fight wildfires as part of disaster risk management.

Conclusions

Reducing black carbon emissions would improve air quality across the region and avoid some of the expected warming of the Arctic in the coming decades. The health benefits are well documented, but there are, however, still significant uncertainties with respect to the effects on radiative forcing. Some of the particles co-emitted with the black carbon may also have a cooling effect through cloud formation.

There are numerous ways to reduce emissions of black carbon. Those with the highest priority provide multiple benefits in terms of reducing air pollution, increasing resource efficiency and reducing the rate of climate change. Developing the knowledge-base and strengthening systematic monitoring and reporting is of high priority to ensure effective policies.

Several actions that strengthen the ability to reduce emissions of black carbon will benefit from supporting activities that bridge policy organisations and areas. Further bridging is beneficial within the Arctic Council and its working and expert groups, between the Arctic Council and the Air Convention, and between numerous national and international policy initiatives.

Website

<https://eua-bca.amap.no/>

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