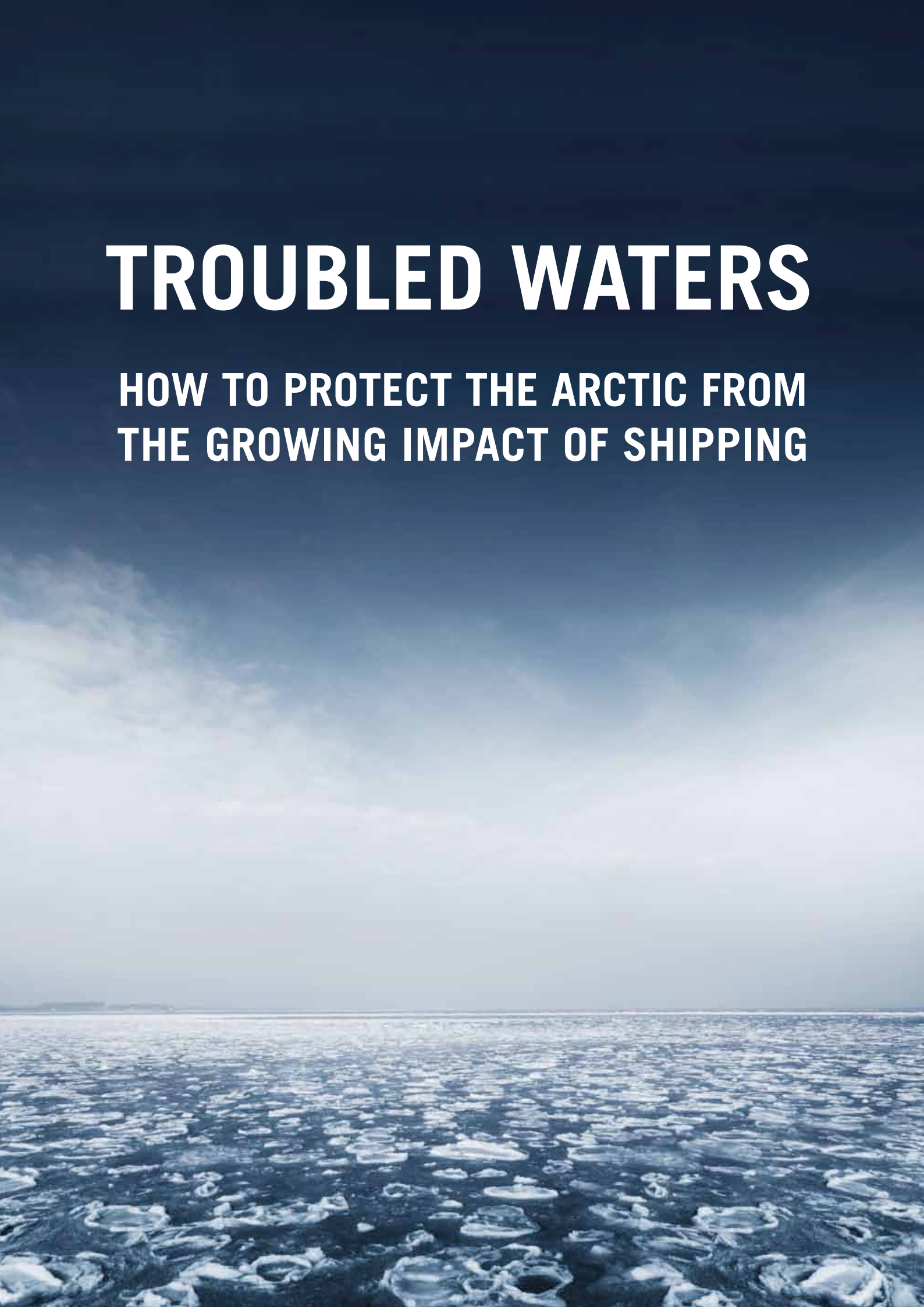
TROUBLED WATERS

HOW TO PROTECT THE ARCTIC FROM THE GROWING IMPACT OF SHIPPING



Troubled waters: How to protect the Arctic from the growing impact of shipping

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SUMMARY

As the decline of Arctic sea-ice continues, the prospect of an ice-free Arctic ocean in the near future draws closer. Arctic melting is seen by industry and some governments as an opportunity to develop human and exploitative activities in the region (oil and gas production, mining, shipping, tourism). But while Arctic melting is surely an effect of climate change, it is imperative that it does not become another cause of climate change. This vicious circle threating the Arctic and the global ecosystems needs to be broken.

Unless action is taken, the increase in human activities in this particularly sensitive and unique ecosystem will predictably cause an increase of harmful emissions; the Arctic region is already warming twice as rapidly as the rest of the planet and this trend is expected to accelerate as global warming intensifies.

Recognising the potential threats that an increase in shipping activities will pose to the Arctic, the international community decided in 2008 to adopt specific regulations for ships sailing in polar waters through the development of the mandatory code for ships operating in polar waters (the so-called

[1] European Commission (2012), JOIN(2012) 19 final, Developing a European Policy towards the Arctic region: progress since 2008 and next steps

Most import recommendations:

- Black carbon is one particular compound of the pollutants emitted by ships during their operations. It is a strong climate-forcing agent that particularly impacts the Arctic, when the dark particles land on pristine snow or ice and thus increase the warming and melting of these surfaces. The shipping community needs to recognise the potentially devastating effects of this pollutant as shipping develops in the Arctic and adopt a set of regulations to properly address these emissions.
- Shipping currently uses the dirtiest fuel of any transport sector. The combustion of heavy fuel oil results in high emissions of air pollutants and its release can have catastrophic effects on ecosystems in the case of an oil spill or a ship accident. The use and the carriage of heavy fuel oil has been already banned in the Antarctic for environmental reasons; this regulation should also apply in the Arctic.
- As the Arctic sea ice melts, we can expect non ice-class vessels to engage in Arctic sea routes. Minimising the risk of accidents for these ships that were not specifically designed for ice operations (i.e. without hull strengthening, etc.) will therefore be crucial to ensure both safe and environmentally sound activities. Regulating ship speed can be an important element in this by reducing risks all round.
- The EU is a major player in Arctic shipping as most ships active in the area will arrive or depart from an EU port. The EU says it wishes to play a commensurate role in protecting the Arctic but is yet to translate words into deeds. Should international efforts to protect the Arctic environment from the effects of increased shipping fail, the EU will need to muster the political will to match its legal rights and ensure an appropriate and effective level of environmental protection.

Polar Code). The code focuses mainly on safety issues but is also due to contain an environmental chapter. Safety aspects are well advanced but for reasons that remain unclear, work on the code's environmental chapter was delayed until at least 2013. This is regrettable and sends the worrying signal that environmental provisions may be of secondary importance.

The European Commission supports the EU playing a greater role in Arctic policies and sets out its views in a June 2012 communication on developing an EU policy towards the Arctic region[1]. The Commission confirmed its interest in the development of the Polar Code and explicitly recognised the need to manage the Arctic's fragile environment with the utmost care; "economic opportunities do not come at the expense of the highest environmental standards and the preservation of the unique Arctic environment". However, the document does not say how these words will be reflected in deeds and the overall message lacks a clear vision of the EU's objectives to deal with the growing challenges of in-Arctic shipping.

This paper zooms in on three issues related to the potential impact of an increase in shipping in the Arctic region: increase of emissions of black carbon, the risks of carrying and burning heavy fuel oil, and the potential for regulated ship speeds. It also examines in detail protective measures that could be adopted as part of future regulations and it explores different ways that could be followed to ensure a sufficient level of protection to the vulnerable Arctic environment.

INTRODUCTION

the risk of a tipping point in the Arctic

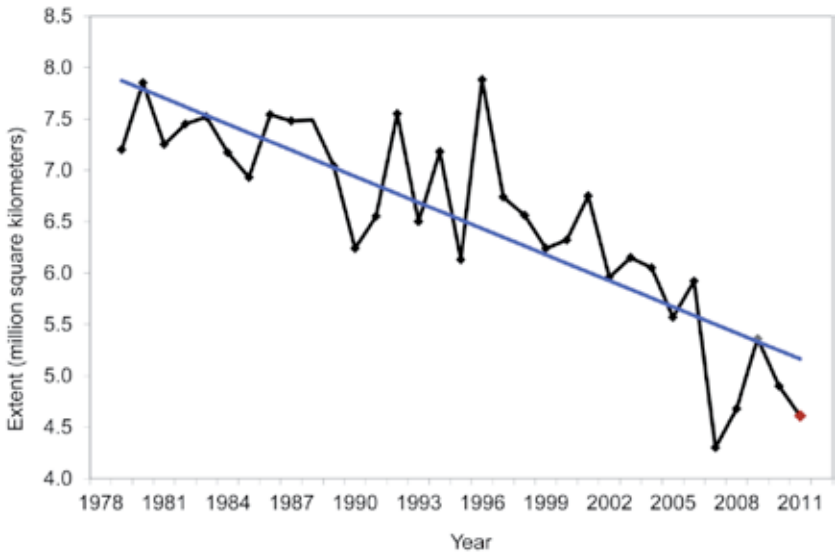
The decline of the extent and thickness of Arctic sea ice is projected to continue. The prospect of a mainly ice-free Arctic Ocean during the summer period is likely at some point in the next 30 to 40 years.

Climate change has profound implications for the Arctic environment, with rapid warming having severe impacts at a local and regional level as well as globally. The melting of Arctic ice will cause fundamental changes in the ecosystem and contribute dramatically to global sea-level rise. Over the past decades, the Arctic has warmed twice as rapidly as the rest of the globe. Accelerated loss of Arctic sea ice is recognised to be a tipping point which threatens life on the planet and constitutes an urgent common challenge for the international community.

In 2007, the extent of Arctic sea ice cover dropped to the lowest level observed since satellite measurements began in 1979. The sea-ice level in 2011 was the second lowest on satellite record and the latest figures from the US National Snow and Ice Data Center show that 2012 will set a new record of the lowest extent (even below the 2007 ice cover). This decline of the extent and thickness of Arctic sea ice is projected to continue with the possibility of a mainly ice-free Arctic Ocean during summer at some point in the next 30 to 40 years.[2]

Average monthly artic sea ice extent (September 1979 to 2011)

Source: NSDIC (2011) National Snow and Ice Data Center



[2] AMAP (2011): Snow, Water, Ice and Permafrost in the Arctic (SWIPA) 2011, Executive Summary

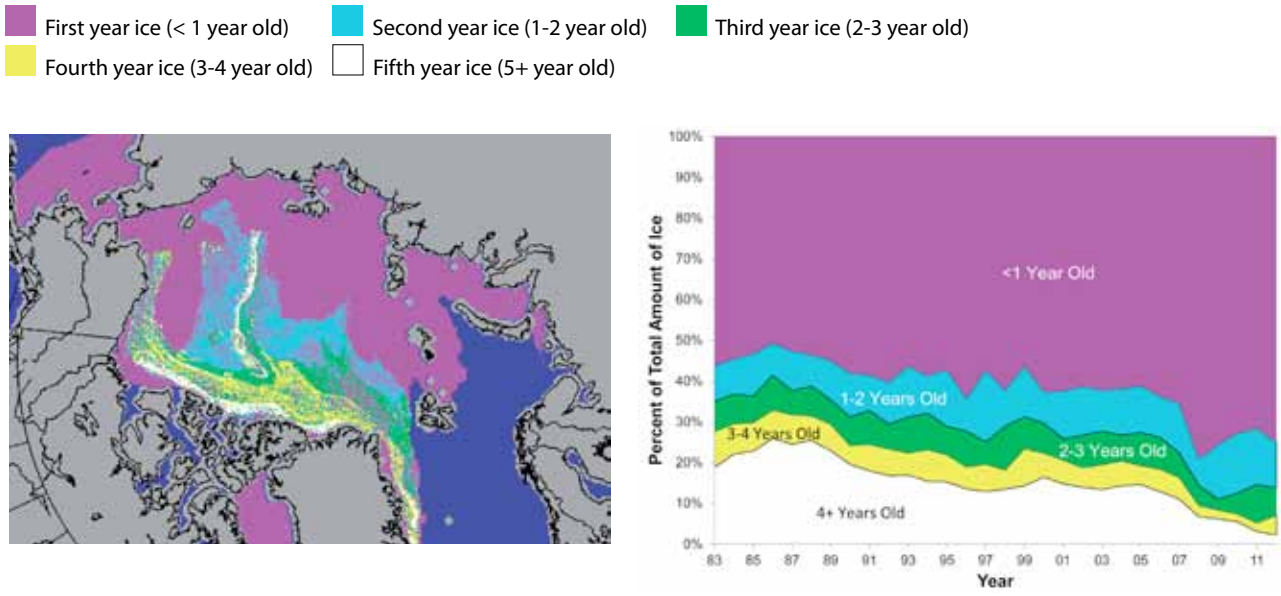
Over the period 2003-2008, the melting of Arctic ice contributed to over 40% of global sea level rise.

The melting of the Arctic ice sheets has major consequences for the regional ecosystem and represents a serious threat to a number of species. However, the environmental implications of Arctic warming are not limited to the polar region; over the period 2003-2008, the melting of Arctic non-sea ice – primarily from Greenland and mountain glaciers - contributed to over 40% of the global sea level rise. Global sea levels are projected to rise by 0.9–1.6m by 2100. Arctic ice loss will make a substantial contribution to this.[3] The Greenland ice sheet alone constitutes the second biggest potential for sea-level rise; it contains enough ice to cause a 7m rise in global sea levels.[4]

The melting of Arctic sea-ice has been accompanied by a steep decrease in the average age of the ice formed. While in the early 80s multi-annual ice represented around 50% of the Arctic sea ice, the percentage of multi-year ice has fallen since 2010 to around 30%.[5] Ice older than four years used to make up about a quarter of the winter sea ice cover in the 80s, but constitutes only 2% of the 2012 Arctic sea ice cover. So not only is the sea-ice extent in the Arctic declining, but cover is also now dominated by younger, thinner ice.

Artic sea ice age March 2012

Source: NSIDC courtesy J. Maslanik and M. Tschudi, University of Colorado (2012)



These dramatic changes in the Arctic ecosystem are likely to affect the world well beyond the confines of the Arctic. Researchers suggest that the changes to the Arctic climate are expected to alter weather patterns in mid-latitudes as well, mainly because of changes in sea currents. Likely consequences include more heat waves, cold spells, flooding, heavy snows, and droughts.

[3] AMAP (2011): Snow, Water, Ice and Permafrost in the Arctic (SWIPA) 2011, Executive Summary
[4] UNEP (2007): Global Snow and Ice Outlook
[5] Extracted from NSDIC data available at http://nsidc.org/

ARCTIC SHIPPING

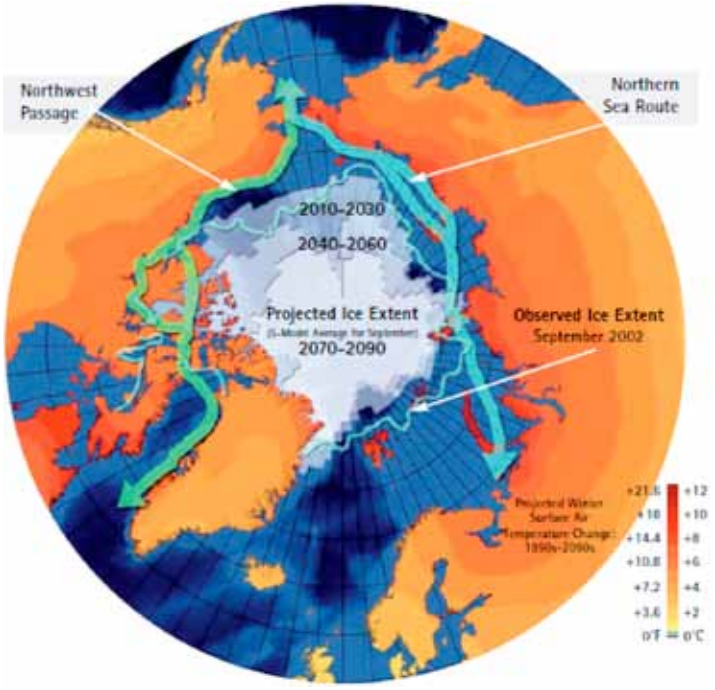
Potential and threats

By 2050, Arctic sea routes could attract around 10% of the total container trade between Asia and Europe. Unless action is taken, this increase has the potential to cause devastating effects on the Arctic ecosystem.

"The opening up of the northern sea route could shorten journey times between the Atlantic and Pacific by about one third. These developments will be of significant benefit for the regional, EU and global economy, but will require all parties to proceed with care in order to maintain and protect the Arctic's vulnerable environment. Economic activities will have to observe the highest environmental standards."[6]

Catherine Ashton, Vice-President of the European Commission

The melting of the Arctic ice cap is also likely to impact the global economy; human activities in the Arctic region including the exploitation of natural resources (mainly oil and gas) as well as related shipping activities are expected to dramatically increase. The possible opening of transpolar shipping routes is very significant. In 2007, the satellite record from the US National Snow and Ice Data Center observed for the first time a complete opening of the Northwest Passage (over Canada) and, in 2008, the opening of the Northern Sea Route (over Russia).



Source: ACIA (2004) Arctic Climate Impact Assessment, Highlights, Cambridge University Press

[6] http://www.theparliament.com/latest-news/article/newsarticle/eu-arctic-strategy-catherine-ashton

Because of the potential to significantly shorten trips from Europe to the North Pacific, these newly opened Arctic sea routes could attract a significant amount of international shipping traffic. Recent models have estimated that by 2050, Arctic sea routes could attract around 10% of the total container trade between Asia and Europe. By 2050, this would represent 850 transit voyages annually carrying about 2.5 million TEU (Twenty-foot equivalent units – a way of measuring container capacity in international shipping).[7]

Aside from the reduction in distance, the expected uptake of the Arctic sea routes will also depend on additional factors; rising insurance costs due to use of the Arctic sea route, potential additional costs linked with the use of these routes (e.g. ice-breaker escort), crew training to operate in polar conditions, reduced ship speeds required in Arctic waters that would diminish the economic incentive of the shortened distance, etc.

Even with the current low shipping activity in the Arctic, nearly 300 accidents and incidents occurred in the region from 1995 to 2004. If safety and environmental concerns are not properly addressed, environmental impacts and risks will multiply dangerously.

Without additional policies, environmental impacts will rise with rising traffic. Environmental risks fall in three categories.

- First, through safety failures such as accidents, collisions and sinkings. Due to the nature of the Arctic environment and the remoteness of the region, the environmental impacts of accidents, collisions and sinkings on the ecosystem could be disastrous. Even given current shipping levels, accidents are relatively frequent in the Arctic; from 1995 to 2004, nearly 300 accidents and incidents occurred in the region.[8]
- Second, legally permissible, intentional routine vessel discharges of oil and chemicals and of sewage, grey water, sewage sludge, and garbage threaten vulnerable polar waters, as low light and temperature slows down the decomposition process and Arctic ecosystems are less able to tolerate rapid changes in the nutrient balance.
- Third, the normal operation of a ship will also cause diverse impacts on the Arctic ecosystem, including noise disturbances affecting marine mammals and emissions of air pollutants that could potentially further increase Arctic warming. For instance emissions of black carbon from shipping will be magnified in the polar regions as direct deposition on the ice will increase the absorption of energy from sunlight and thus the melting of the Arctic sea ice and the warming of the region.

The general assumption today underlying support for the development of new Arctic sea routes is that they will reduce CO_2 emissions because of the shorter distances between the major European, Asian and North American ports. Whilst it is true that distances are shortened for certain specific routes, the net impact of overall fuel consumption and CO_2 is uncertain because of rebound effects – if sea transport becomes cheaper, more of it becomes economically viable.

The perceived economic benefits of shorter journeys need to be weighed against the significant additional environmental impacts and hazards that increased levels of shipping pose to the particularly vulnerable Arctic ecosystem.

Because EU Member States collectively own the world's largest merchant fleet and because most trans-Arctic shipping voyages will originate from or be destined for EU ports, the EU has a special responsibility concerning increased Arctic shipping and should therefore be closely involved in developing future Arctic shipping regulations.

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[7] Peters et al.(2011): "Future emission from shipping and petroleum activities in the Arctic", 11 Atmos. Chem. Phys. 5305-5320
[8] AMSA (2009): Arctic Marine Shipping Assessment Report, p. 86

REDUCING BLACK CARBON EMISSIONS FROM SHIPS

Slowing down Arctic melting

Black carbon is estimated to account for up to half of all Arctic warming and the growth in Arctic shipping operations could result in a twenty-fold increase of Arctic black carbon emissions. This will inevitably further accelerate Arctic warming.

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Black carbon (BC) is emitted during the normal operation of a ship as a result of the incomplete combustion of the fuel in the engine. Being dark in colour, this aerosol has the capacity to absorb short and long-wave solar radiation, producing significant warming effects. The warming induced by BC emissions is magnified in cryospheric (ice-covered) regions, where BC lands on pristine snow or ice, increasing warming and thus melting these surfaces. Given their considerable impact on Arctic warming (potentially half of the Arctic warming), regulating future BC emissions will be crucial to limit the harmful impact of shipping activities in polar waters.

[9] European Parliament (2011), Resolution (2009/2214(INI)) on a sustainable EU policy for the High North

[10] Estimate calculated by the International Council for Clean Transportation (ICCT) using the formula provided in the IPCC 4th assessment report. See: ICCT (2009): "A policy-relevant summary of black carbon climate science and appropriate emission control strategies", page 7

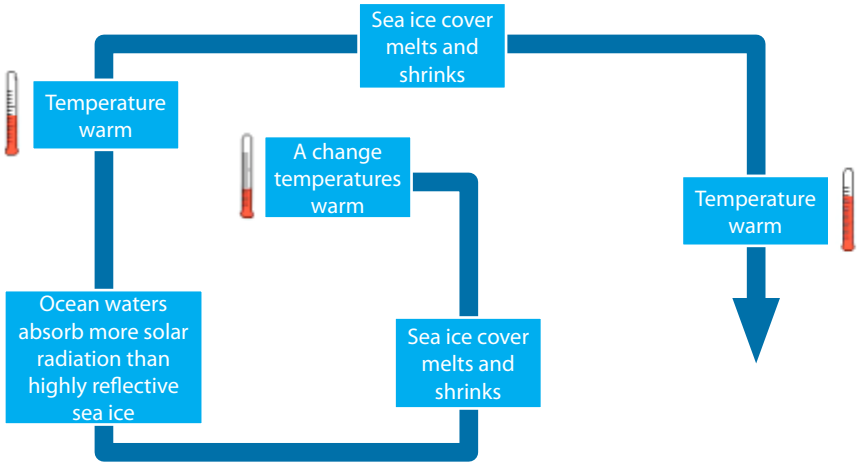
[11] Shindell and Faluvegi (2009): "Climate response to regional radiative forcing during the twentieth century", in Nature Geoscience, Vol 2, April 2009, pp 294-300

In its 2011 resolution on the Arctic, the European Parliament recognised "the disproportionately large Arctic warming impact caused by black carbon emissions from the EU and other regions in the northern hemisphere"[9]. With a global warming potential (GWP) estimated at 1,600 times higher than that of CO_2 at 20 years, and 460 times higher over a period of 100 years, black carbon is now widely considered to be a significant short-lived climate forcer.[10] In fact, at least one study indicates that BC may account for up to half of all Arctic warming.[11]

Black carbon emissions also illustrate perfectly the vicious circle that is likely to occur with an increase of ship activities and thus of emissions in the Arctic; the melting of sea-ice will lead to increased shipping activities in the regions, which could have the potential to further exacerbate the melting, etc. In addition, as sea ice melts, the overall reflectivity of the Arctic is reduced (ocean water absorbs more energy from sunlight than sea ice), which also affects the temperature increase and the rate of sea-ice melting. Reducing the black carbon emissions that impact the Arctic (and thus containing any increase in shipping BC emissions) is therefore crucial as part of an overall strategy to slow down Arctic warming and melting.

Artic monitoring and assessment programme

Source: AMAP Assessment Report: Arctic Pollution issues



A recent study drew up various Arctic emissions inventories for black carbon, taking into account the predicted growth of regional shipping and the potential diversion of global traffic to the emerging Arctic sea routes.[12] The report concluded that without control measures, BC emissions in the Arctic could increase (under a high-growth scenario) from 0.9kt per year in 2004 to 4.6kt per year by 2030 and 17.0kt per year by 2050, i.e. an almost twenty-fold increase. Such an increase in BC emissions will inevitably exacerbate Arctic warming.

Different technical options are available to reduce shipping BC emissions[13] including slide valves, water-in-fuel emulsion, diesel particulate filters, low-sulphur fuel, emulsified fuels, liquified natural gas (LNG), etc. Besides technical options like engine tuning or the fitting of particle filters, operational measures

[12] Corbett et al. (2010): "Arctic shipping emissions inventories and future scenarios", 10 Atmos. Chem. And Phys. 9689-9704
[13] Corbett et al. (2011): "An assessment of technologies for reducing regional short-lived climate forcers emitted by ships with implications for Arctic shipping", Carbon Management (2010) 1(2), 207–225

such as speed reduction would also be practical and effective. As most of the ships operating in the trans-Arctic routes will originate from or be destined for EU ports, the EU should lead the way in promoting the uptake of these measures.

The way forward

Integrate black carbon as a specific pollutant into MARPOL Annex VI

The most obvious solution to regulate black carbon emissions from international shipping would be the introduction of a specific regulation in the IMO's MARPOL Annex VI setting an engine emission standard for black carbon (and thus primary emitted particulate matter). The EU and its Member States should make clear it fully supports this initiative and press for early agreement on a standard.

After some hesitation, the IMO's Marine Environment Protection Committee (MEPC) adopted a work-plan in July 2011 to examine the issue of black carbon emissions from international shipping. The aim is to develop a definition and a measurement method for these emissions that impact the Arctic environment. On the basis of this analysis, we expect the IMO to decide on potential policy options to reduce BC emissions from international shipping at the earliest during the 65th session of the MEPC Committee (in 2013).

In parallel, the IMO's work to develop a Polar Code, which started in 2010, needs to recognise the growing concern surrounding BC emissions in the Arctic and set out the need for more ambitious standards for trans-polar activities. The EU and its Member States should promote the establishment of an environmental chapter in the Polar Code that would recognise the particular impact of BC emissions in the Arctic on the climate and specify a policy instrument to reduce ships BC emissions. Such an instrument would be implemented via the relevant IMO treaty or convention.

Finally, switching fuel and reducing speeds can deliver very significant cuts in black carbon emissions. The next two case studies examine the wider merits of these policy options.

DIRTY FUEL IN THE ARCTIC

Replicating Antarctic good practice?

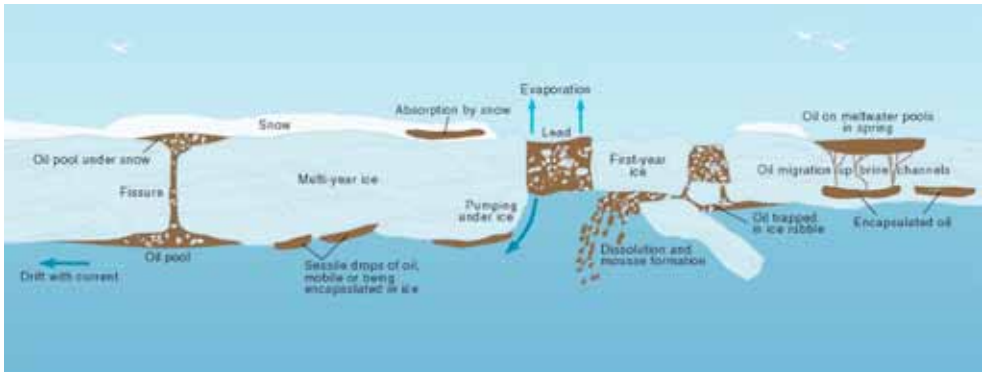
The 'heavy fuel oil' currently used for shipping is the dirtiest used in any transport sector. The best way to protect the Arctic against the risks linked to heavy fuel oil is to mandate vessels to use lighter distillate fuels as has been done for the Antarctic.

The fuel currently used for shipping is the dirtiest used in any transport sector. Ships use heavy fuel oil (HFO) which consists of the residues of the refinery process. Its combustion is very polluting, resulting in high emissions of sulphur oxides (SOx), volatile organic compounds, heavy metals as well as emissions of black carbon particles. Black carbon emissions could be considerably reduced by the use of low-sulphur fuels by ships as such a requirement would effectively dictate the use of distillate fuels which generate significantly lower BC emissions.[14]

The environmental impact of HFO is not limited to air pollution. The discharge of HFO into the world's oceans due to oil spills has had well-documented and quite devastating effects on ecosystems and the marine environment. The consequences of such spills in the Arctic would be many times more serious due to the remoteness of the region, the particularly extreme temperatures and the weather, the ice conditions and darkness, all of which could seriously hinder search and rescue and conventional clean-up operations for up to six months of the year. Moreover the damage from an oil spill in the Arctic is likely to be far more persistent and extensive than in other waters, because oil spilt in the Arctic will evaporate at a much slower rate than in warmer waters; oil present in temperate seas behaves quite homogeneously, but oil released in ice-covered waters will interact differently with sea ice.

Possible interactions between HFO and Arctic Sea Ice in the event of an oil-spill

Source: AMAP Assessment report: Arctic Pollution Issues (after original figure by Bobra and Fingas)



[14] Lack and Corbett (2012): Black carbon from ships: a review of the effects of ship speed, fuel quality and exhaust gas scrubbing, 12 Atmos. Chem. And Phys. 3985-4000

The growth of Arctic offshore oil drilling operations serviced by shipping fleets poses clear additional hazards.

The way forward

Replicate the Antarctic ban of HFO in the Arctic

The best way to protect the Arctic against the risks linked to HFO is to apply the precautionary principle and mandate vessels to use lighter distillate fuels. Such a ban has already been adopted in the Antarctic by the parties to the Antarctic Treaty System and was confirmed by the IMO in 2010.

At the initiative of Norway, parties to the Antarctic Treaty System began to consider a ban on the use and carriage of heavy fuel oil for the Antarctic in 2005. A study on the use of HFO in the Antarctic indicated that the vast majority of ships sailing in this region (with the exception of one cruise ship) were already using lighter fuels. The Antarctic Treaty Contracting Parties subsequently agreed by consensus that it was necessary to ban the use and carriage of HFO within Antarctic waters particularly as it was also practicable, and requested that the issue be brought to the IMO to secure global application. The IMO agreed in 2010 and the ban on the use and carriage of HFO in the Antarctic sea area entered into force on 1st August 2011 as a chapter of MARPOL Annex I.

In its 2011 resolution on the Arctic, the European Parliament proposed to align the HFO provisions in the Arctic and the Antarctic:

"Welcomes the ban on the use and carriage of heavy fuel oil on vessels operating in the Antarctic Area, approved by the IMO's Marine Environment Protection Committee (MEPC), which is due to enter into force on 1 August 2011; stresses that a similar ban might be appropriate in Arctic waters to reduce risks to the environment in case of accidents".

In a study commissioned by the Arctic Council's Working Group on the Protection of the Arctic Marine Environment (PAME), experts from Det Norske Veritas (DNV) found out that currently the vast majority of vessels operating in the Arctic "are of a type and size that can be expected to run on distillate fuel rather than HFO".[15] In the same report, DNV also recommended the use of lighter fuels and concluded that:

"Relevant risk mitigating strategies should therefore focus on preventing accidents and spill of oil, particularly of HFO and other emulsifying oils. In light of the particular HFO properties, significant risk reduction will be achieved if the onboard oil type is of distillate type rather than HFO."

Replicating the Antarctic regulation in the Arctic is technically feasible, but its adoption will depend on political viability as the situations are somewhat different. Unlike the Antarctic, the Arctic is not covered by an international treaty that regulates human activities in the region. Decisions therefore will have to be taken by the Arctic nations individually or at the IMO. The Arctic situation is also quite different to Antarctic given the presence of local populations with transport needs, the rapid development of oil drilling there, the prospect of new sea routes opening up and not the least the vast potential that the area is believed to hold for the exploitation of natural resources.

While the most appropriate international body to develop an HFO ban is not yet clear, the EU and its Member States should take action in all appropriate forums (IMO and Arctic Council) to promote this approach. In parallel, in the context of the development of the Polar Code at the IMO, the EU and its Member States should press for the establishment of a ban on the use and possibly the carriage of HFO as a provision in the Polar Code.

[15] DNV (2011), op.cit.

ADDRESSING SAFETY AND EMISSIONS TOGETHER

The potential of slow steaming

Ice class vessels with strengthened hulls have specified maximum speeds while unregulated non ice class vessels will increasingly operate in the Arctic as the ice continues melting. Managing the risk of accidents for these ships, which were not initially designed for Arctic operations, will be crucial.

Ship speed in Arctic seas is already limited due to ice, to weather and to poor and dangerous sea conditions. Ships wishing to operate in ice-covered waters are accorded ice-class certificates by classification societies, which set varying operating conditions including safe ice speeds defined in relation to ice-thickness. As the sea ice melts, we can expect that non ice-class ships will also attempt to use Arctic sea routes. Minimising the risk of accidents for these ships that were not specifically designed for ice operations (i.e. without hull strengthening, etc.) will therefore be crucial to address both safe and environmentally sound activities.

Ship speed is a basic element in ensuring ship safety as well as being an important factor governing ships' manoeuvrability. As a result, classification societies set a maximum speed for ice-class ships.

"It is widely acknowledged that the risk of damage to the hull of a ship that is operating in ice is principally a factor of the ice thickness and the speed of the ship in the ice; and that, in general, possible ship structural damage from ship-ice interaction accidents can be avoided if an appropriately safe speed is considered and the ship structure is accordingly strengthened."

International Association of Classification Societies, in IMO document DE 55/12/11

For operation in ice-covered waters, speed is defined, among other factors, in relation to the ice-thickness. As a result, ship speeds in Arctic waters are already limited by weather and environmental circumstances and by ice. Ice class vessels with strengthened hulls have specified maximum speeds while non ice class vessels are limited to operating in "ice-free" polar waters. As the sea ice melts, the areas where non ice class vessels will be free to operate will presumably increase.

Furthermore, "ice-free" operations are expected to be available for progressively longer periods throughout the year and we will see an increasing number of ships active in such waters to take advantage of new transit routes, to service exploration and development activities in the region and to exploit the region's tourism potential. Unlike ice class vessels which are designed specifically for operation in polar waters, "ice-free" vessels will at best have to rely on a pilot or some additional training or procedures to cope with Arctic conditions. They will not have any hull strengthening or other structural enhancements to help cope with conditions which are far harsher than in temperate climates. The additional dangers of such operations in the Arctic need little explanation. Moreover the recent Costa Concordia accident has drawn the specific attention of Coastal States to the potentially catastrophic consequences of a large cruise ship accident in remote or polar waters.

In addition to the safety element, ship speed can also have a significant environmental impact. Because fuel consumption and ship emissions are a direct function of speed, slower ship speeds have the potential to reduce all air emissions including black carbon (provided that engine load stays above 25% to ensure complete combustion). Reducing ship speed will therefore not only increase the safe operation of ships in the Arctic but would also provide additional environmental benefits. It would also considerably reduce the impact of underwater noise on wildlife.

The way forward

Capping ship speed as part of the Polar Code

Slow steaming has important safety and environmental benefits and the Polar Code presents a unique opportunity to link them. Slower speeds would lower the risk of accidents and their severity e.g. minimising the severity of hull breaches or collisions with other ships or fauna or with ice.

Regulated speed does already exist for ice-class vessels and slow steaming is already current practice in the Arctic to cope with ice and weather conditions. Capping ship speeds at current levels in the Arctic has therefore been proposed in the Polar Code as a means of minimising risk from both a safety and environmental point of view. Any speed regime for polar operations should not be limited to ice-class vessels in ice-covered conditions but also include general speed provisions for all vessels in polar waters. Non-ice class vessels visiting sporadically or infrequently are likely to be at most risk operating in so called "ice-free" waters in the Arctic and these are just the type of operations that new "ice-free" sea lanes are likely to attract. Such a speed regime could be adopted as part of the Polar Code.

TRANSLATING AMBITIONS INTO DEEDS

From voluntary instruments…

There is scant legal framework governing Arctic shipping: the only international legal instrument specifically tailored to navigation in the Arctic essentially consists of a set of voluntary measures.

The various international forums (the IMO, the Arctic Council, etc.) considering Arctic issues now face the challenge of translating these discussions into concrete policies. It is clear that the international legal regime for Arctic shipping needs to be further developed to establish the appropriate level of environmental protection. In its analysis of the legal aspects of Arctic shipping the EU recognised the lack of sufficient regulation to govern shipping activities in polar waters.

"An analysis of the global component of the legal regime for Arctic marine shipping reveals that this framework is not sufficiently tailored to the special nature and risks of marine shipping in the Arctic."
European Commission, DG MARE

Arctic shipping is subject to existing international instruments of global reach such as the UN Convention on the Law of the Sea (UNCLOS), the Safety of Life at Sea Convention (SOLAS 1974) and the International Convention for the Prevention of Pollution from Ships (MARPOL 1973/1978). However the only international instrument specifically tailored to navigation in the Arctic consists essentially of a set of voluntary measures, namely the IMO's Guidelines for ships operating in Arctic ice-covered waters, adopted in 2002.

These guidelines were developed to reflect the different challenges and unique risks that ships operating in the Arctic face; remoteness of the region, cold temperatures, severe weather conditions and relative lack of good charts, etc. Specific Arctic conditions can also seriously influence the functioning of a ship: Arctic temperatures may affect the functioning of on-board machinery and equipment, while ice building up can impose additional loads on the hull and superstructure. The guidelines were therefore designed to complement the provisions of the SOLAS Convention and provide enhanced safety standards. Construction, equipment and operations constitute the bulk of the guidelines. The environmental provisions are rather superficial.

Following the 2009 revision of the Guidelines to include the Antarctic, the IMO agreed to proposals from Denmark, Norway and the United States, to use the voluntary Guidelines as the basis for the development of a Mandatory Code for ships operating in Polar Waters (known as the 'Polar Code').

… to mandatory action: IMO progress on the mandatory Polar Code

The Polar Code represents a unique opportunity to address the most important concerns related to shipping's impact on the Arctic environment. Although the key issues relating to an environmental chapter have already been identified, the IMO inexplicably decided to postpone consideration of these matters.

Work at the IMO on the development of the mandatory Polar Code began in February 2010, with an original target completion date set for 2012. Slow progress has however pushed the expected completion date to 2014-2015. The Polar Code is being developed to address a full range of issues relevant to ship operations in polar waters. These relate to safety aspects (construction, search and rescue, navigation, life-saving, etc) and marine pollution prevention (including hull coatings, anti-fouling systems, ballast water, on-board incineration, sewage related discharges, etc), in addition to certification of seafarers on ships operating in the Antarctic and Arctic.

The Polar Code therefore represents a unique opportunity to address the most important concerns relating to shipping's growing impact on the Arctic environment. Discussions so far have largely focused on the safety aspects of the code and work is now proceeding on a distinct negotiating track to codify these provisions. This has led to the impression that environmental provisions are of secondary importance to the objectives of the Polar Code. The key issues relating to an environmental chapter have already been identified, however the IMO subcommittee charged with the development of the code (DE Sub Committee) decided in February 2012, for reasons which remain unclear, to postpone further consideration of the environmental chapter of the Polar Code until 2013. This decision is deeply regrettable.

A thorough consideration of the Code's environmental provisions by the international community remains critical to the development of an effective and binding instrument for mitigating the potentially harmful impacts from increased shipping activities within the sensitive polar regions. In this context, the European Union, its Member States and the European Commission should, as stated in its Arctic communication, "support the development of a mandatory 'Polar Code' at the IMO"[16] and press accordingly for an early resumption of work on the environmental aspects which should be adopted in conjunction with the safety elements.

[16] European Commission (2012), JOIN(2012) 19 final, Developing a European Policy towards the Arctic region: progress since 2008 and next steps


MALİK I

THE POTENTIAL FOR REGIONAL REGULATION

Where no agreement is reached at an international level, regional measures must be considered a priority.

EU to serve as driving force for Arctic coastal States

The EU could introduce specific regulations for ships flying EU flags or for ships calling at EU ports. In addition to this, Article 234 of UNCLOS provides coastal States prescriptive jurisdiction over ice-covered areas:

"Coastal States have the right to adopt and enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels in ice-covered areas within the limits of the exclusive economic zone, where particularly severe climatic conditions and the presence of ice covering such areas for most of the year create obstructions or exceptional hazards to navigation, and pollution of the marine environment could cause major harm to or irreversible disturbance of the ecological balance. Such laws and regulations shall have due regard to navigation and the protection and preservation of the marine environment based on the best available scientific evidence."

A number of questions still remain regarding the application of Article 234 from UNCLOS. In particular, the Convention does not clarify how Article 234 relates to the regime of transit passage. Despite the uncertainties over its application, Article 234 seems to provide opportunities for regional agreements covering international shipping by some or all Arctic coastal States. A number of Arctic coastal states already set special conditions for ships sailing in the High North.

Unlike the Antarctic, the Arctic is not covered by an international treaty that regulates human activities in the region. However, the Arctic Council aims at enhancing the cooperation between Arctic States on a number of issues, such as the involvement of indigenous communities, environmental protection, etc. Within the Council, the Protection of the Arctic Marine Environment Working Group (PAME) has been particularly active on maritime issues.

While the EU's application to become a permanent observer to the Arctic Council remains pending, its Member States should play a leading role in this forum by initiating studies into the potential impact of increased shipping traffic in the Arctic Ocean and into which protective measures for the environment might best apply in the Arctic. As an example of its scientific role, the PAME commissioned a study in 2010 to identify the extent of the use and carriage of heavy fuel oil (HFO) by ships operating in the Arctic. In addition to its effort in developing science and knowledge, the Arctic Council could also play a more active role in the design of strategies and policies to limit the potentially negative impact of Arctic shipping on the ecosystem.

Developing regional regulations via port state control

The example of the HFO ban is particularly interesting in this context. Indeed, as part of its Resolution 'on a sustainable policy for the High North'[17], the European Parliament called for the active involvement of EU Member States in the IMO development of the Polar Code and in addition urged Member States to adopt entry into port requirements for ships from Arctic waters calling at EU ports if no agreement on the Polar Code can be reached:

"Requests the EU and its Member States to propose, as part of the ongoing IMO work on a mandatory Polar Code for shipping, that soot emissions and heavy fuel oil be regulated specifically; in the event that such negotiations do not bear fruit, requests the Commission to put forward proposals on rules for vessels calling at EU ports subsequent to, or prior to, journeys through Arctic waters, with a view to imposing a strict regime limiting soot emissions and the use and carriage of heavy fuel oil."

The European Parliament thus does therefore rule out the possibility of the EU adopting a regional scheme covering ships sailing in the Arctic. Given the importance of the EU for Arctic shipping, the impact of any EU regional scheme has the potential to be significant as any EU measures would likely be exercised through port state control and the risk of avoidance or "leakage" will be relatively limited. In practice all ships calling at EU ports would have to respect a number of criteria as a pre-condition for entry into these ports.

[17] European Parliament (2011), Resolution (2009/2214(INI)) on a sustainable EU policy for the High North

In conclusion, both in international forums (at the IMO or in the Arctic Council), or as a regional entity, the EU and its Member States have the opportunity to play a pivotal role in the development of sustainable policies to regulate Arctic shipping.

> Black carbon emissions have devastating effects on the Arctic environment as they strongly increase warming and melting of the Arctic ice. The introduction of a specific regulation in MARPOL Annex VI setting an engine emission standard for black carbon (and thus primary emitted particulate matter) is probably the best way to address BC emissions impacting the Arctic environment. The EU and its Member States should make clear it fully supports this initiative and press for early agreement on a standard.

> The best way to protect the Arctic against the risks linked to HFO is to apply the precautionary principle and mandate vessels to use lighter distillate fuels. Such a ban has already been adopted in the Antarctic by the parties to the Antarctic Treaty System and was confirmed by the IMO in 2010. The EU and its Member States should ensure that this discussion becomes a priority in the Polar Code. In case no agreement can be found at the IMO, we call upon the EU to adopt a regional regulation mandating the use of distillate fuels for ships sailing the Arctic as a condition for entry into EU ports.

> Slow steaming has important safety and environmental benefits and the Polar Code presents a unique opportunity to link them. Slower speeds would lower the risk of accidents and their severity. Capping ship speeds at current levels in the Arctic has therefore been proposed in the Polar Code as a means of minimising risk from both a safety and environmental point of view. The EU and its Member States should promote this option in the upcoming Polar Code discussions.

For more information, please contact

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