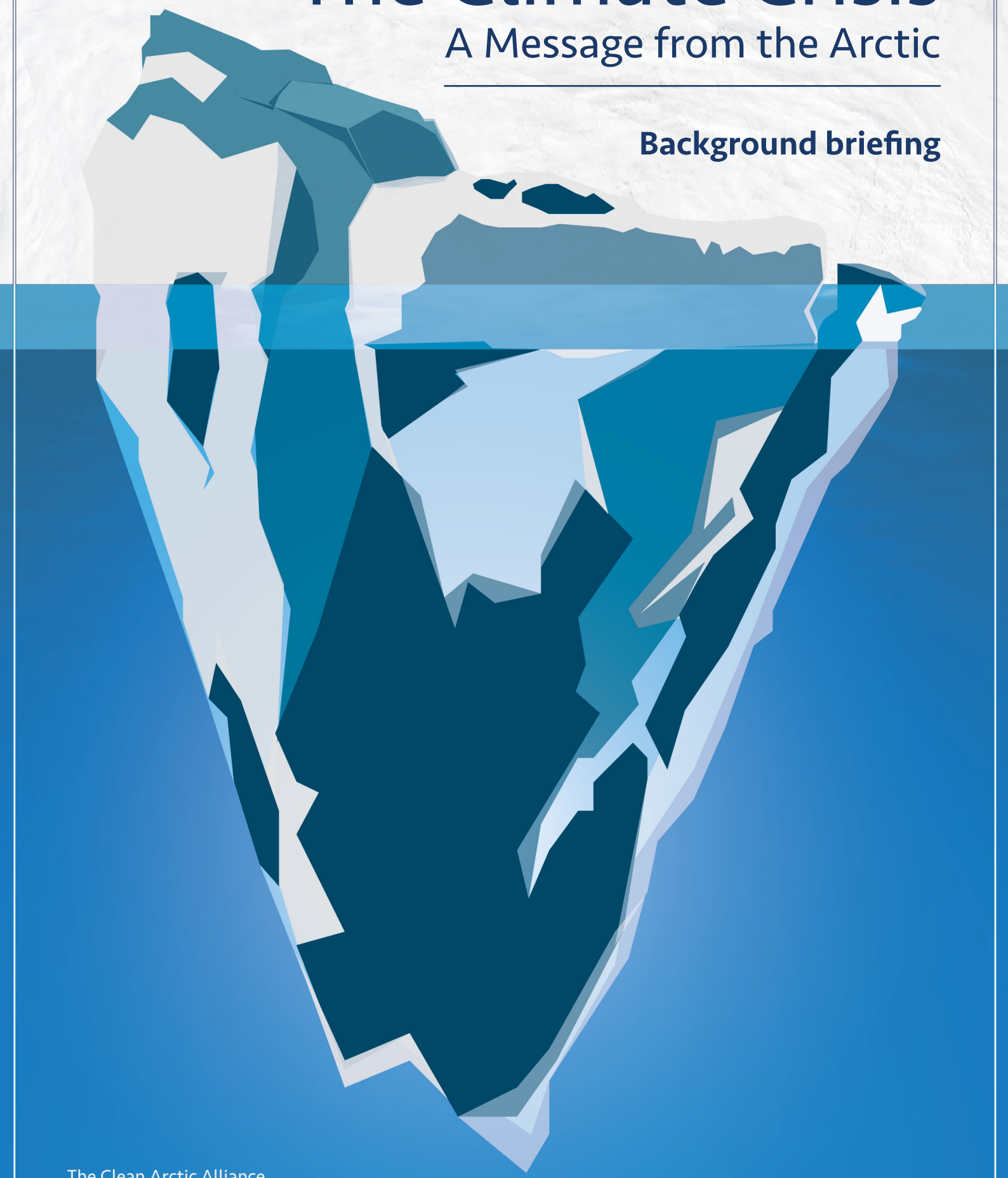
The Climate Crisis

A Message from the Arctic

Background briefing



The Clean Arctic Alliance
April 2018

1 Arctic Climate Change

For the fourth winter in a row, temperatures over the Arctic Ocean soared, and in February 2018 temperatures 20 degrees Celsius higher than normal were recorded in some parts of the Arctic[1]. Scientists and villagers gazed in astonishment at the open water in the Bering Sea and off northern Greenland. Scientists considered the above freezing temperatures as occurring with "scary strength and persistence"[2].

> ***The Arctic can be considered as the most important early warning system for climate changes on our planet. Any major shifts in climate occur more strongly and proceed faster at high latitudes than at mid-latitudes.***
>
> ***This is also true for the ongoing global warming. The massive ice sheet in Greenland is melting and contributes to rising sea levels. The permafrost is thawing, high latitude snow cover is dwindling, and temperatures across the Arctic are rising two to three times as quickly as the global mean temperature.***
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> ***Most dramatic, however, are the changes in the sea-ice cover of the Arctic Ocean. The sea-ice cover in summer is only about half as large today as it used to be a few decades ago, and the remaining ice is only about half as thick. In combination, about three quarters of Arctic summer sea ice has disappeared since the 1970s, with the remaining quarter projected to disappear before 2050 if the world community fails to fulfill the request of the Paris Climate Agreement to limit global mean warming to substantially less than 2 degrees Celsius."***

> ***The observed changes in the Arctic can be clearly linked to human activities. In a recent study, we showed that about three square metres of Arctic summer sea ice disappear for each metric ton of anthropogenic CO_2 emissions. It is therefore possible to calculate the impact of reducing CO_2 emissions from shipping on the disappearing sea ice cover."***

Dr. Dirk Notz,
Max Planck Institute for Meteorology

In 2018:

The Bering Sea lost roughly half of its sea ice cover in just two weeks in February and had more open water than ever measured this time of year[3].

The northernmost weather station in the world in Greenland, experienced more than 60 hours of temperatures above freezing before the end of February[4] (the previous high was 16 hours by the end of April which occurred in 2011).

A commercial ship was able to cross the Northern Sea Route in winter, unassisted by an icebreaker for the first time in January[5].

2 Arctic Impacts

Indigenous and coastal communities are on the frontline of a changing Arctic. Remote communities have a lot at stake since their subsistence and way of life depend on healthy oceans.

> ***The Arctic has been subjected to the most dramatic environmental effects of globalization. From persistent organic pollutants to our weakened ozone, and, most recently, to the huge changes to our lands and ice from climate change, we have borne the brunt of development far from home, and have been compelled to reach out to the world.***
>
> ***When one is out on the land one becomes very focused, learns to control impulses, learns to withstand stress, learns to gain sound judgment and ultimately wisdom. This is why, for us, climate change is an issue of our right and ability to exist as an Indigenous people. But precisely that right is now being challenged and minimized by the unpredictability of our climate."***

Global warming is making the Northern Sea Route and the Northwest Passage more accessible, allowing for an influx in a variety of commercial and pleasure vessels in a region previously largely inaccessible to international shipping.

> ***As the Northwest Passage gradually opens, commercial shipping and soon fishing, will have greater and greater access to our fragile coastal waters. As well, heavy resource extraction, both on and off shore, will soon compete with and threaten our traditional uses for our lands in the Canadian Arctic."***

> ***Only drastically lowering greenhouse emissions with a strong climate change plan from all countries of the world will be enough to protect the human rights of vulnerable peoples around the world, and to preserve the safety of our Arctic ocean, waters, and lands."***

Sheila Watt-Cloutier, Environmental, Cultural and Human Rights Advocate

Climatic changes are rapidly affecting communities, livelihoods and wildlife. Decreasing ice coverage and thickness with prolonged open water is changing wildlife distribution patterns and food availability.

The rate of seawater warming in the Arctic is more than four and a half times the pace of warming in the global ocean. In August 2017, the surface waters in the Chukchi Sea were 11 degrees Celsius warmer than average[6]. Warmer seas delays winter ice formation, which increases the vulnerability of coastal areas to flooding and erosion during winter storms.

The Native Alaskan village of Kivalina, in the United States, will soon need to relocate due to immense coastal erosion[7].

The impacts of increased shipping in the Arctic add to the problems already faced by communities. There are few response assets in the Arctic, and any response to accidents and oil spills is likely to be very difficult if not impossible to carry out due to the extreme conditions, remoteness of sites, and limited availability of resources.

3 Global Consequences

The decline in Arctic sea ice extent also has profound global climate consequences. In particular, the loss of sea ice creates a number of feedback loops that have the capacity to destabilize the global environment.

The Arctic has traditionally served as a global "air conditioner" as light-coloured sea ice reflects solar radiation and its corresponding warmth back into space. However, as the Arctic warms and sea ice melts, darker-coloured land or water below is revealed resulting in more of the sun's energy being absorbed. This cycle leads to more warming, which in turn leads to more ice melting – and so on.

The continental shelves of the Arctic currently trap a significant quality of solid methane hydrates. As Arctic sea ice diminishes and the Arctic Ocean warms, the offshore permafrost that has been in place since the last Ice Age thaws. This thawing allows the solid methane hydrates to turn into gaseous methane, which is in turn released to the atmosphere. As a potent greenhouse gas, methane can trap heat 23 times more efficiently per molecule than carbon dioxide. The warming caused by the release of methane will in turn result in more sea ice loss – and so on.

Overall, these two feedback loops, and others, have the capacity to drive climate change just as much as the world continuing to emit of billions of tons of carbon dioxide annually.

One of the most serious consequences is sea level rise, which threatens nations and hundreds of millions of people living in low lying areas globally. According to the Intergovernmental Panel on Climate Change, sea levels have risen 3.1mm per year since 1993. And the United Nations Environment Program predicts that by 2010 some 80 percent of people will live within 62 miles of the coast, with about 40 percent living within 37 miles of a coastline. If the entire Greenland Ice Sheet thawed it would raise sea levels by an average of seven meters, which would significantly flood coastal megacities such as Mumbai and Hong Kong. Where defence and adaptation is possible, there will be large costs.

It is for this reason that addressing change in the Arctic is so critical and why there is an urgent need for international climate leaders to shine a spotlight on the IMO and the need for emissions reductions.

> ***We tend to think of climate change in isolation from the Arctic. The Arctic is both the first victim of global temperature increase, and a major contributor to the rise of sea levels caused by these temperature changes. What happens in the Arctic doesn't stay in the Arctic, but affects us all. That's why Arctic policy must be part of any climate change action."***

Faig Abbasov, Clean Shipping Coalition

Profound changes within the Arctic affect global climate systems including weather patterns, atmospheric circulation, extreme weather events, and sea level rise.

Melting of the Greenland ice sheet is the largest single contributor to global sea level rise, the melting ice cap is adding 300km^3 of water per year to the ocean. Estimates of sea level rise are being revised with serious implications for the defence of low-lying cities like Miami, New Orleans, London, Venice and Shanghai, or of defenceless coastlines like Bangladesh[8].

Climate change affects all regions from remote Arctic villages to the world's largest economies. The exorbitant costs of sea level rise, estimated at over a trillion dollars, will be felt from small island states to global port cities[9].

4 The Challenge for Shipping

Although there may be some economic benefits to the dramatic loss of sea ice extent, including increased Arctic shipping, it will have devastating consequences for indigenous communities and the planet as a whole. For this reason, warming in the Arctic should be not be viewed as a positive for the shipping industry, but instead a global crisis.

International shipping is a significant source of carbon dioxide (CO_2) and other pollutants including black carbon, sulphur oxides (SOx) and nitrogen oxides (NOx). According to a recent scientific study, shipping could be responsible for 17% of global CO_2 emissions in 2050 if left unregulated[10]. A further study by the International Council on Clean Transportation (ICCT) indicates that black carbon, which is a critical contributor to human-induced climate warming, accounts for 21% of the CO_2 equivalent emissions from shipping. The use of HFO by ships produces higher black carbon emissions than other marine fuels[11].

The shipping sector must contribute to both immediate and intermediate term global action to address the crisis by taking ambitious steps to reduce the sector's significant and increasing greenhouse gas and black carbon emissions.

> ***Black carbon on white snow, polar bears denied access to sea ice to hunt on, and seabirds finding inedible warm water species in the High Arctic are consequences we are seeing every day during our travels. This is why we'd like to see international and domestic regulations banning the use and carriage of heavy fuel, not only in the Arctic, but also on the Norwegian coast."***

Jørn Henriksen, Director of Environment, Hurtigruten

Given the shipping sector's critical role in addressing climate change it must take ambitious steps to reduce its emissions. In Norway companies have collaborated to construct a coastal, all electric container ship – that could eliminate 40,000 diesel truck trips annually, while an offshore firm has converted a supply vessel to operate on batteries, diesel and LNG.

> ***By the end of 2021, Hurtigruten is committed to reducing its own CO_2 footprint for the Norwegian coastal route by 25% compared with 2015 emissions."***

Left unregulated, shipping could be responsible for 17% of global CO_2 emissions by 2050. Continued use of HFO will produce higher black carbon emissions than other marine fuels.

Failure to reduce shipping emissions could undermine other efforts to meet the Paris Agreement's goal.

To meet the 1.5˚C target of the Paris Agreement, zero-emission vessels (ZEVs) need to enter the global fleet by 2030, and be a significant share of new-builds from then on.

5 Time for IMO Action

Making progress is challenging. Improved understanding and awareness of the climate changes happening and the consequences for the local communities, economies and the environment is essential. Given the severe changes already occurring in the Arctic, there is an urgent need by all sectors, including the shipping sector, to develop ambitious short-term and long-term actions to dramatically reduce climate change emissions. Immediate action from the IMO is essential if Arctic climate change is to be slowed, halted or even reversed.

In order to play an appropriate role within the global community to address climate change, the IMO must:

- Adopt an ambitious **GHG strategy**, **compatible with the Paris Agreement's 1.5 degree limit**. In order to be aligned with the 1.5˚C goal, shipping will need to reduce its absolute emissions by 100% by 2050. The GHG strategy must include an action plan that:

a. prioritises **immediate measures** to reduce emissions (i.e. before 2023), such as operational efficiency measures including speed reduction and more stringent design standards, to keep the door open to limiting temperature increase to 1.5 degrees Celsius, and

b. includes work to develop **mid- and long- term measures**, such as market-based measures, development of new fuels, propulsion technologies and market-based measures, before the adoption of the revised strategy in 2023.

- Support a **ban on the use of heavy fuel oil (HFO) and carriage as fuel in the Arctic by 2021**, which will not only eliminate the risks associated with an HFO spill but will also reduce black carbon emissions by on average 33%.

- **Reduce black carbon emissions** throughout the Arctic and sub-Arctic (and beyond) by banning HFO use and requiring use of particulate filters with distillate fuels which will reduce black carbon emissions by more than 99%.

Decision opportunities at the IMO

Adopting an ambitious GHG Strategy in 2018 is arguably the most important climate decision of the year.

References

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The Clean Arctic Alliance is made up of 18 not-for-profit organisations committed to phasing out the use of HFO as marine fuel in the Arctic: Alaska Wilderness League | Bellona | Clean Air Task Force | Danish Ecological Council | ECODES | Environmental Investigation Agency | European Climate Foundation | Friends of the Earth US | Greenpeace | Iceland Nature Conservation Association | Nature and Biodiversity Conservation Union | Ocean Conservancy | Pacific Environment | Seas At Risk | Stand.earth | Surfrider Foundation Europe | Transport & Environment | WWF

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