

The IMO's proposed Arctic HFO ban: Likely impacts and opportunities for improvement

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The ICCT white paper on the Arctic HFO ban is available at:
<https://theicct.org/publications/analysis-HFO-ban-IMO-2020>

Introduction

- In 2018, Finland, Germany, Iceland, the Netherlands, New Zealand, Norway, Sweden, and the United States proposed that the IMO ban the use and carriage for use of HFO in Arctic waters. Their proposal stated that:

“A single HFO spill could have devastating and lasting effects on fragile Arctic marine and coastal environments. In addition, Arctic shipping is projected to continue to rise, thus increasing the risk of a spill. For these reasons, the ban on HFO should be implemented as soon as possible, and any delay in implementation of the ban by eligible ships should be short-lived” (MEPC 72/11/1, p. 2).

- In February 2020, delegates at PPR 7 agreed on the draft text of the Arctic HFO ban, which would start to apply in July 2024 but would include exemptions and waivers that would allow some ships to continue to use HFO until July 2029.

Methods

Using Arctic shipping data from 2019, and methods consistent with the Fourth IMO GHG Study, the ICCT analyzed the how effective the ban would be in reducing HFO carriage, HFO use, and black carbon emissions, taking into account the proposed exemptions and waivers.

Exemptions:

1. Ships subject to Regulation 12A of MARPOL Annex I, which requires ships delivered on or after August 1, 2010 that also have a combined oil fuel capacity greater than 600 m³ to protect their fuel tanks by ensuring there is a gap of at least 76 cm between the fuel tank and the outer hull of the ship. (**modeled**)
2. Ships subject to Regulation 1.2.1 of Polar Code Part II-A, chapter 1, which requires ships constructed on or after January 1, 2017 that also have a combined oil fuel capacity of less than 600 m³ and are designed to operate in ice conditions to protect their fuel tanks with at least a 76 cm gap between the tank and hull. (**not modeled**; too new & applies to smaller ships that may not use HFO)

Waivers:

- Ships flying Russian, Canadian, Norwegian, Danish, or American flags while operating in Arctic waters subject to the “sovereignty or jurisdiction” of that flag state (**modeled**)

Assumptions

- ICCT assumed that all ships eligible for exemptions and waivers would use them, and that ships would not reflag or alter their routes to take advantage of the waivers clause.
- ICCT assumed that 0.50% VLSFO would meet the IMO's definition of HFO by viscosity, density, or both and would be banned.
 - In a statement to PPR 7, IBIA (2020) stated that tests by three fuel testing agencies in January and February of 2020 showed that 93% to 95% of VLSFOs met the definition of HFO. Therefore, we assume ships using HFO or VLSFO would be required to switch to distillate fuels like MGO under the ban.

Results

Arctic HFO use increased 75% and BC emissions from the Arctic fleet grew 85% from 2015 to 2019

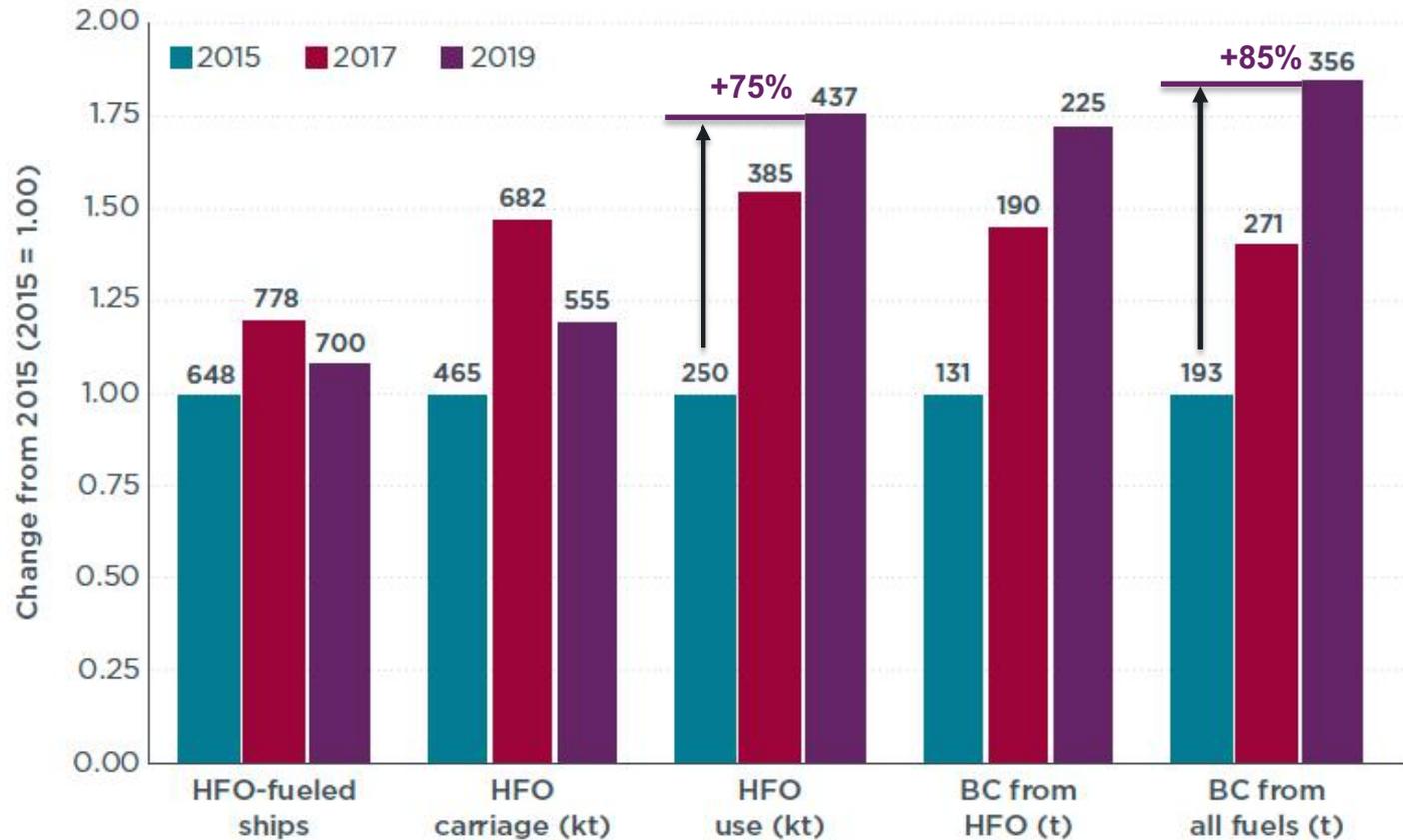


Figure 2. Trends in HFO and black carbon for 2015, 2017, and 2019.

Due to exemptions and waivers, the proposed ban would only eliminate 30% of HFO carriage and 16% of HFO used in the Arctic, reducing BC emissions by just 5%

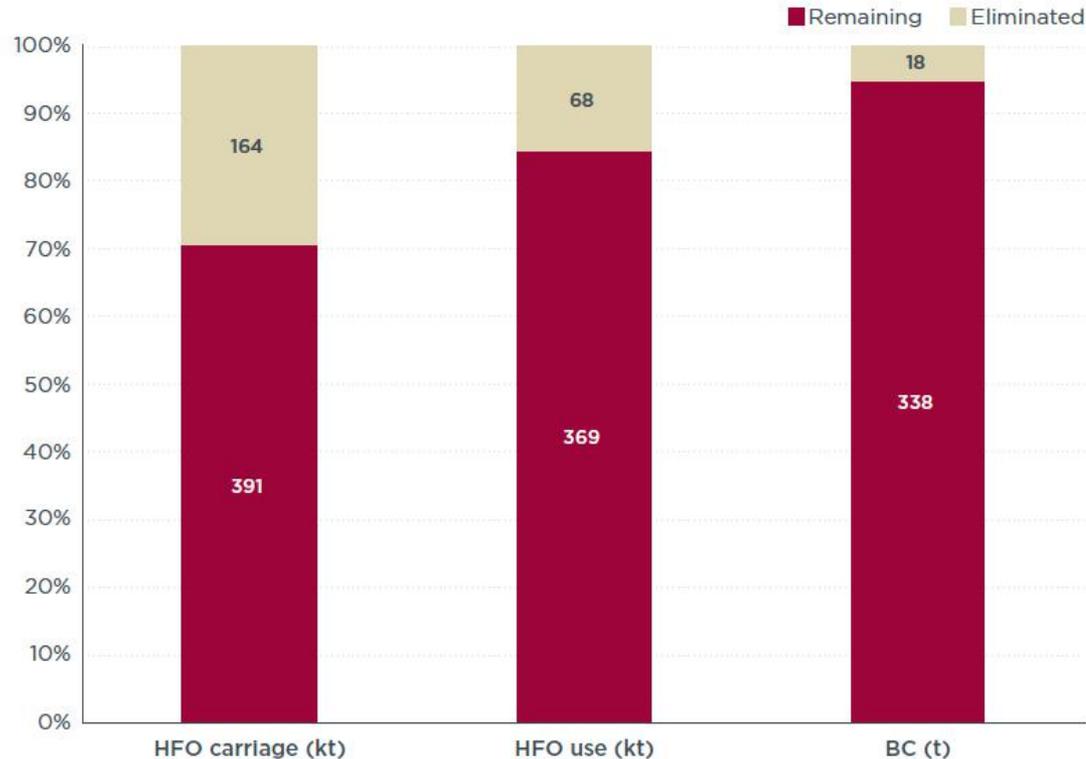


Figure 8. Amount of HFO carriage, HFO use, and BC emissions remaining or eliminated as a consequence of the proposed HFO ban.

2019 Arctic HFO use

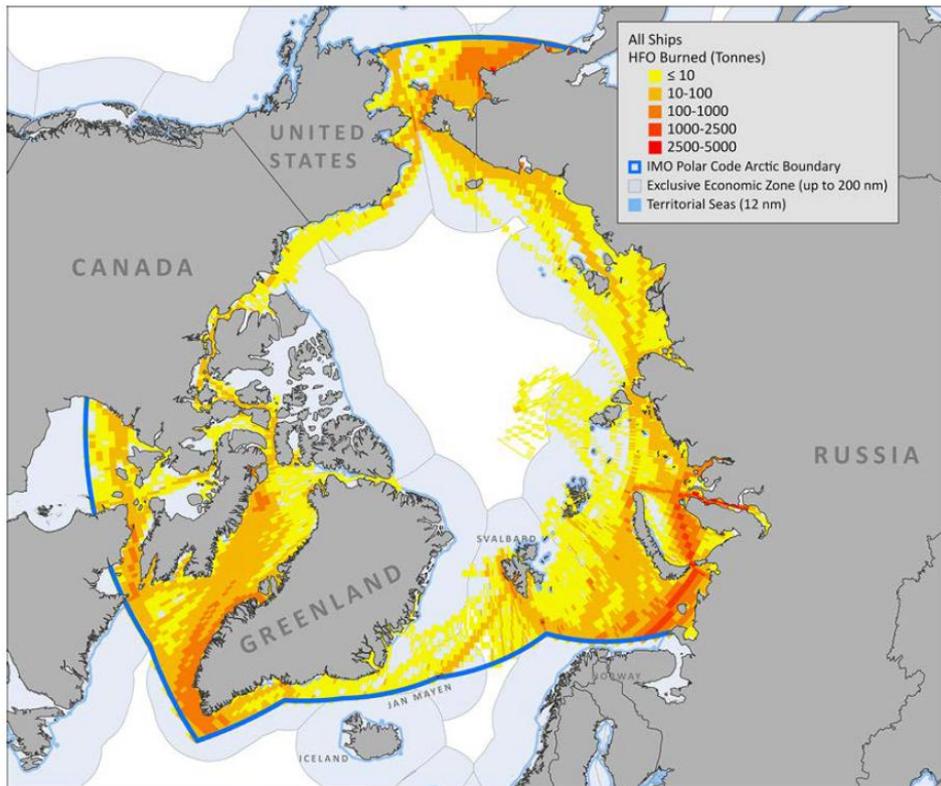


Figure 6. HFO used by ships in the Arctic in 2019

Arctic HFO use remaining under the ban: Due to exemptions and waivers, only 16% of HFO use is banned

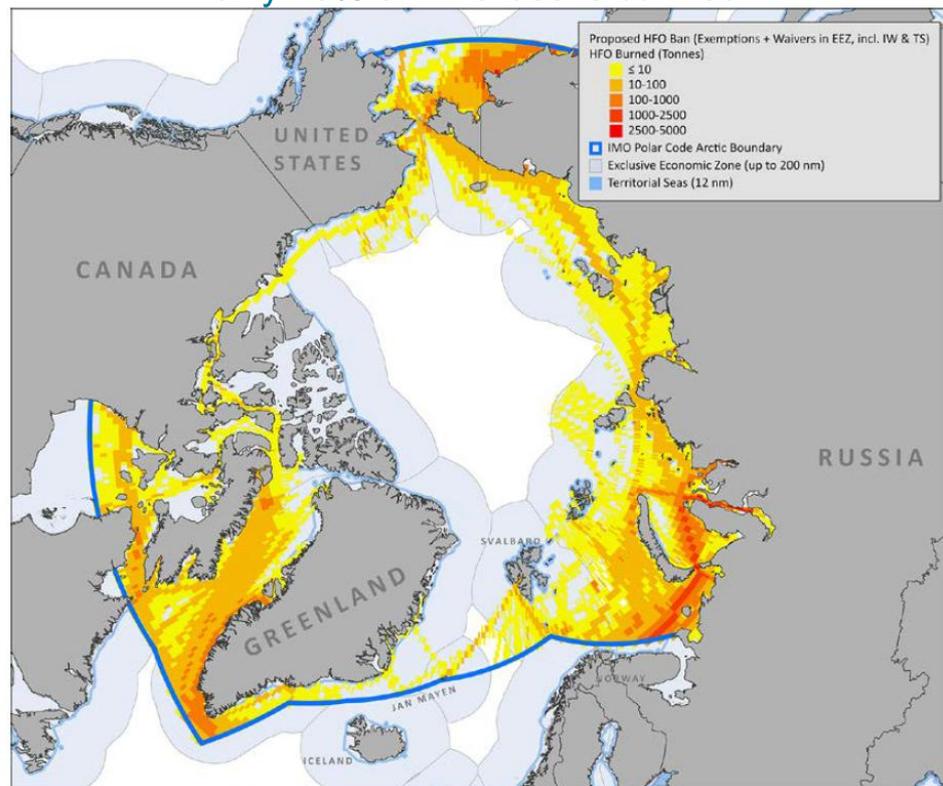


Figure 19. HFO use that would have been allowed under the proposed ban, had it been in place in 2019.

Russian-flagged ships account for two-thirds of Arctic HFO use: < 3% would be banned, with the rest exempt or waived

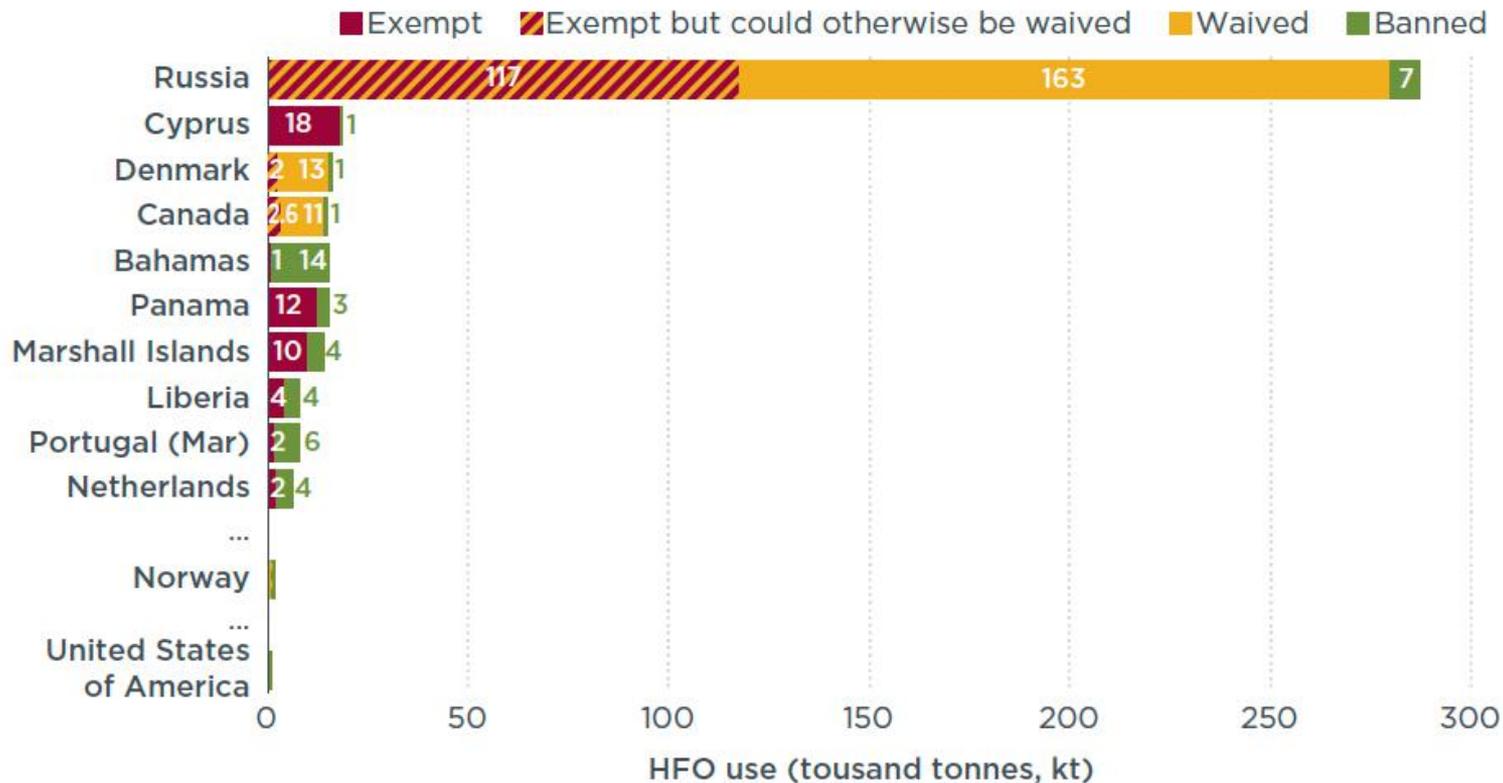


Figure 14. HFO use that would have been exempt, waived, or banned in the Arctic under the IMO's proposed HFO ban had it been implemented in 2019, by flag state.

Oil tankers (mostly Russian-flagged) account for 40% of Arctic HFO use: < 2% would be banned, with the rest exempt or waived

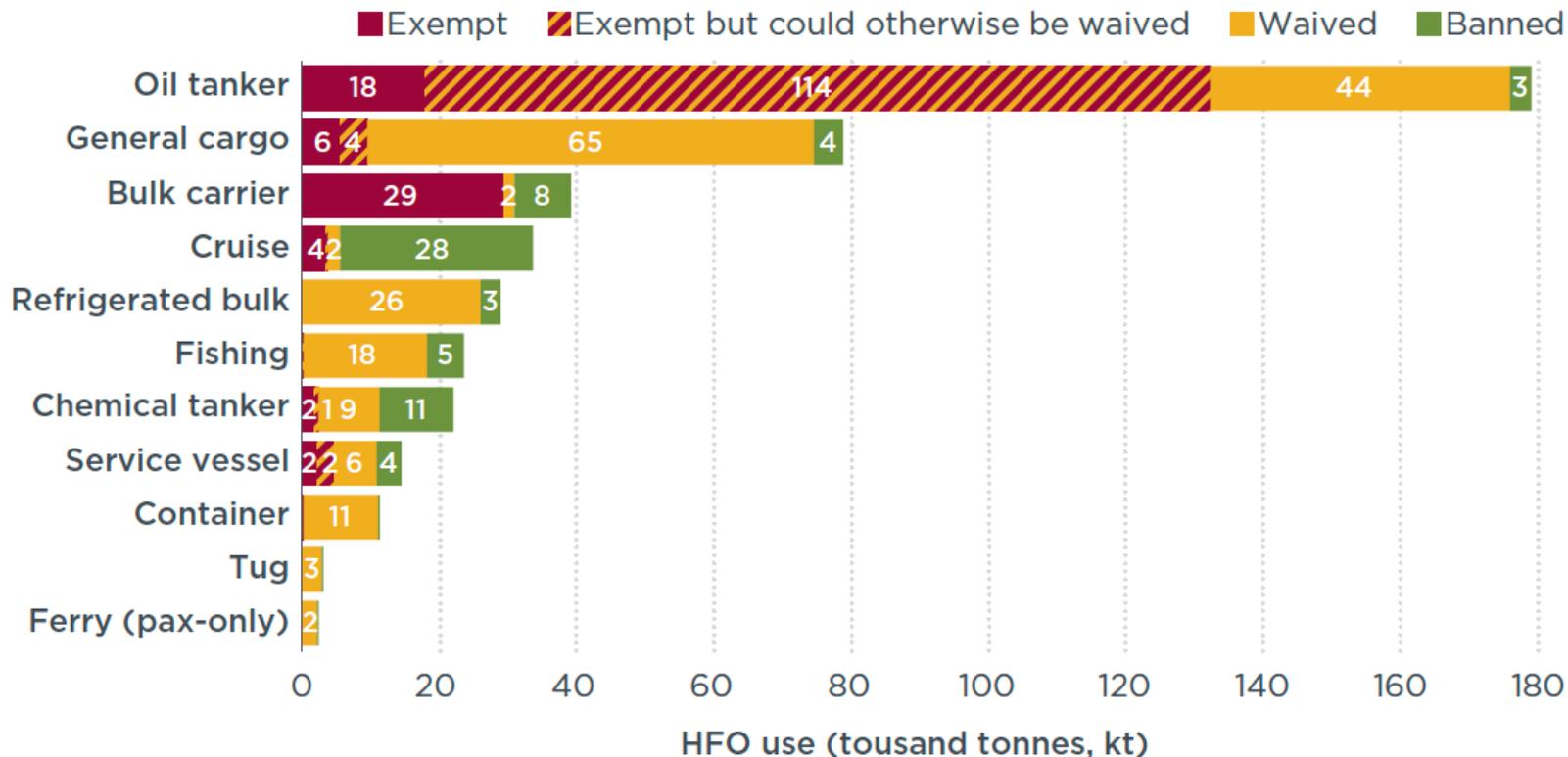


Figure 11. HFO use that would have been exempt, waived, or banned in the Arctic under the IMO's proposed HFO ban had it been implemented in 2019, by ship type.

Oil tanker HFO use grew >300% from 2015 to 2019; bulk carrier HFO use grew 70% during that time

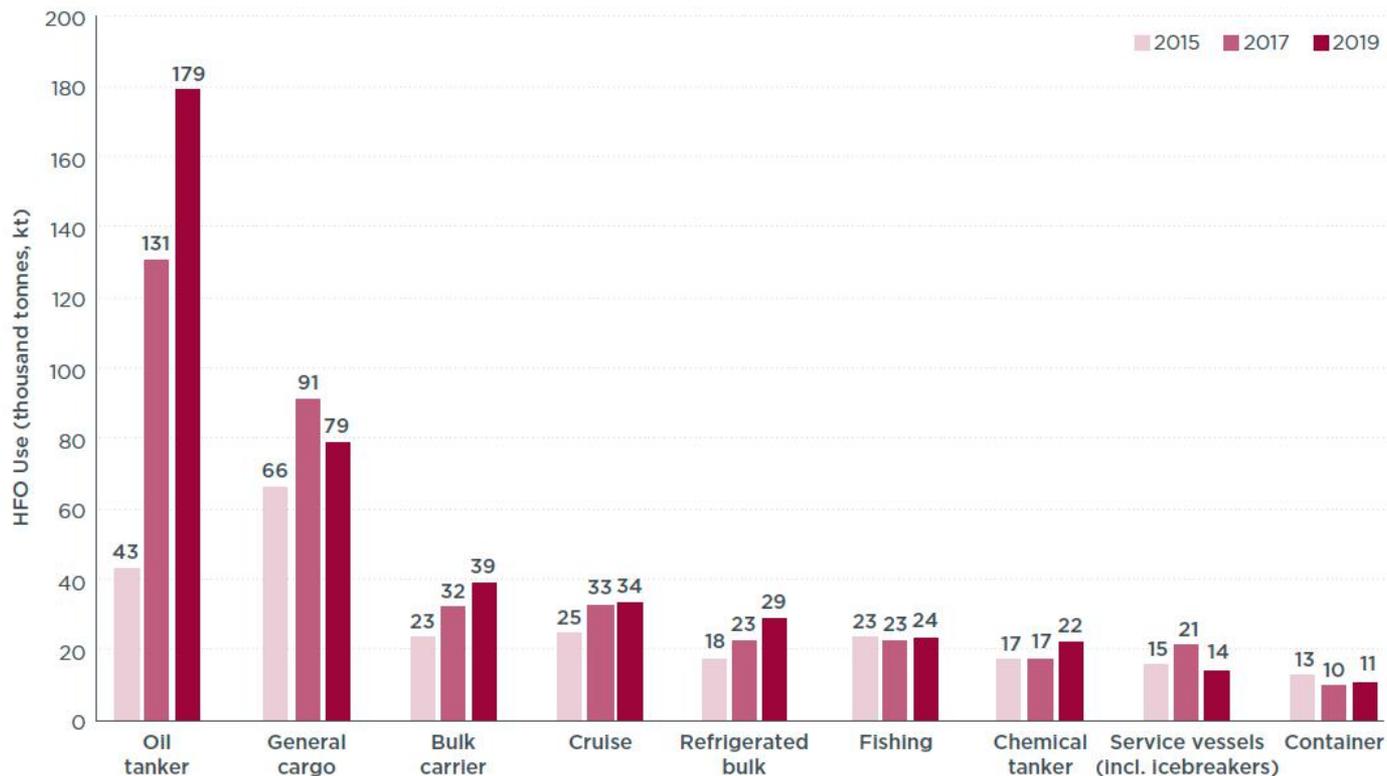


Figure 5. HFO use by ship type in 2015, 2017, and 2019 in the Arctic for ships that used more than 10 thousand tonnes.

The proposed HFO ban is the least protective option: it bans 30% of HFO carriage and 16% of HFO use, reducing BC by 5%

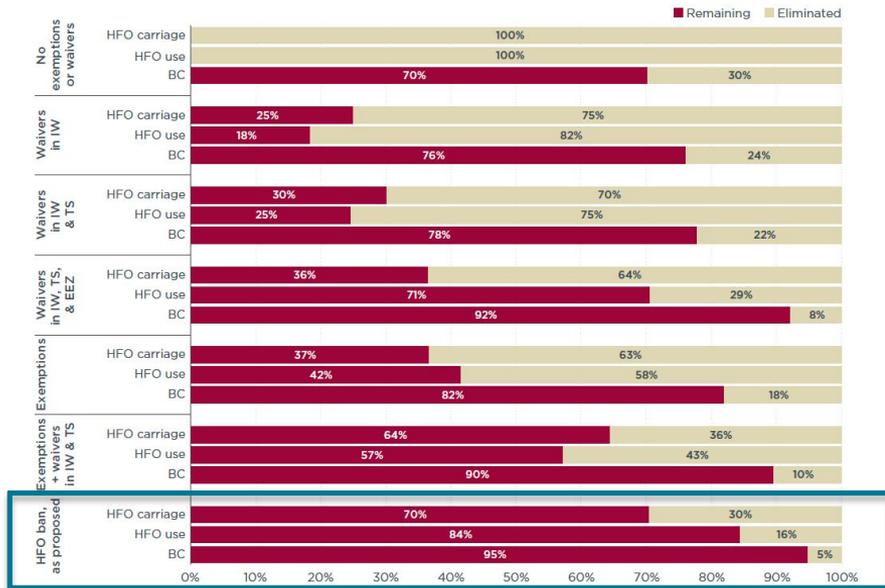
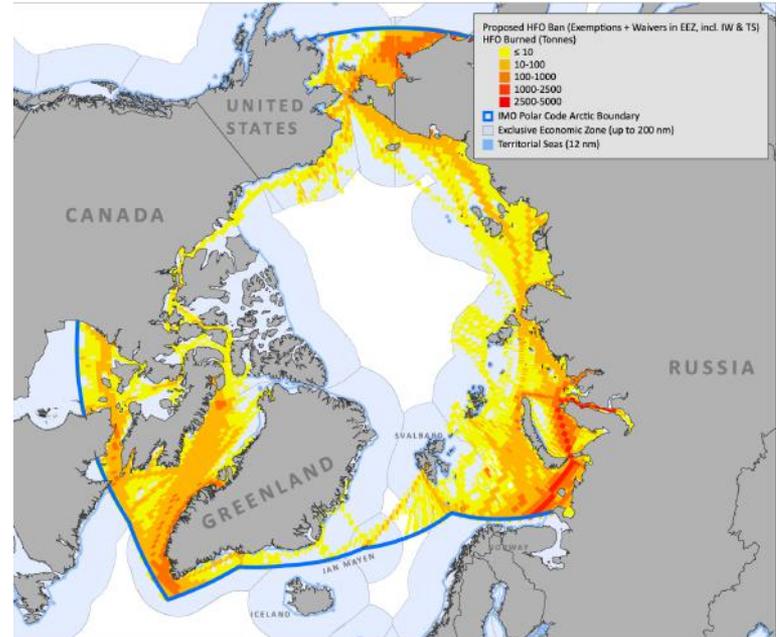


Figure ES1. How different combinations of exemptions and waivers affect HFO carriage, HFO use, and BC emissions in the Arctic.



Eliminating exemptions but keeping the waivers clause reduces HFO carriage 64% but only reduces HFO use 29% since ships eligible for waivers (such as Russian oil tankers) are also very active, consuming large amounts of fuel

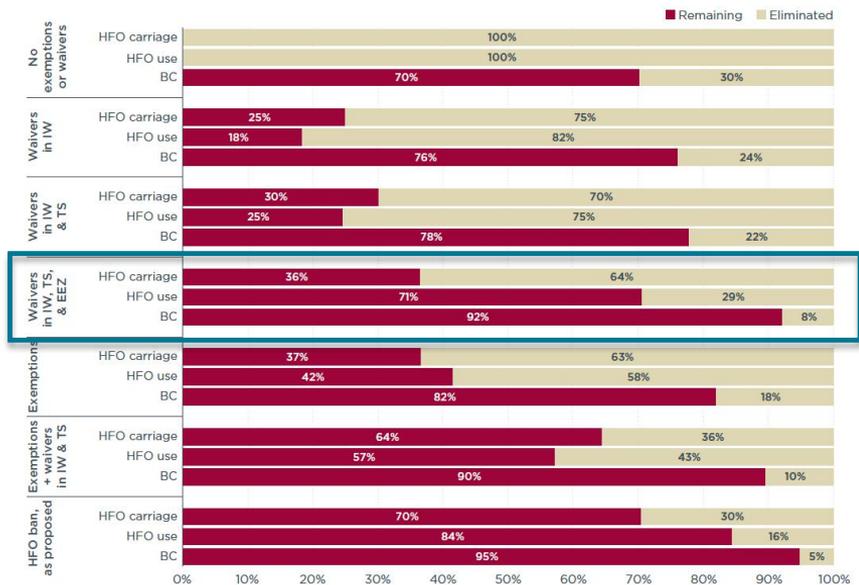
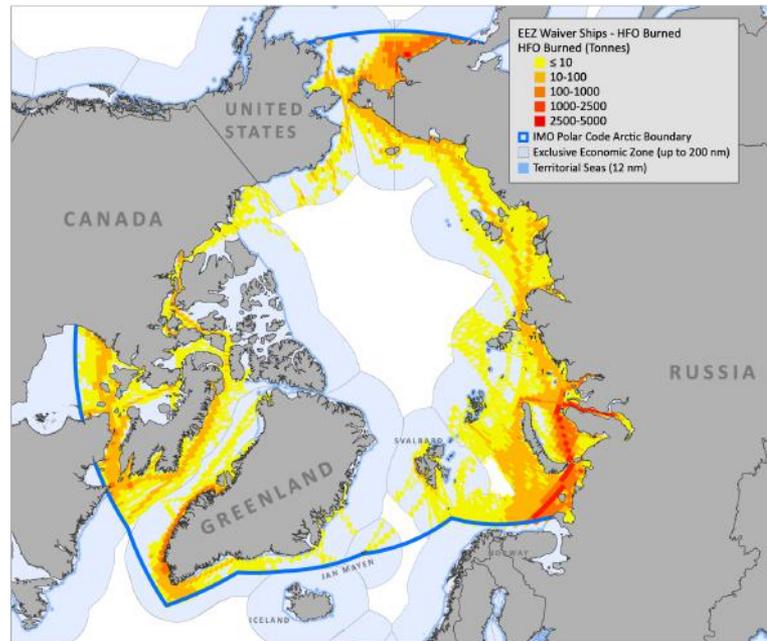


Figure ES1. How different combinations of exemptions and waivers affect HFO carriage, HFO use, and BC emissions in the Arctic.



Eliminating exemptions and limiting waivers to internal waters and territorial seas reduces HFO carriage 70% and HFO use 75%, but a spill close to shore would have larger direct impacts to Arctic coastlines and communities

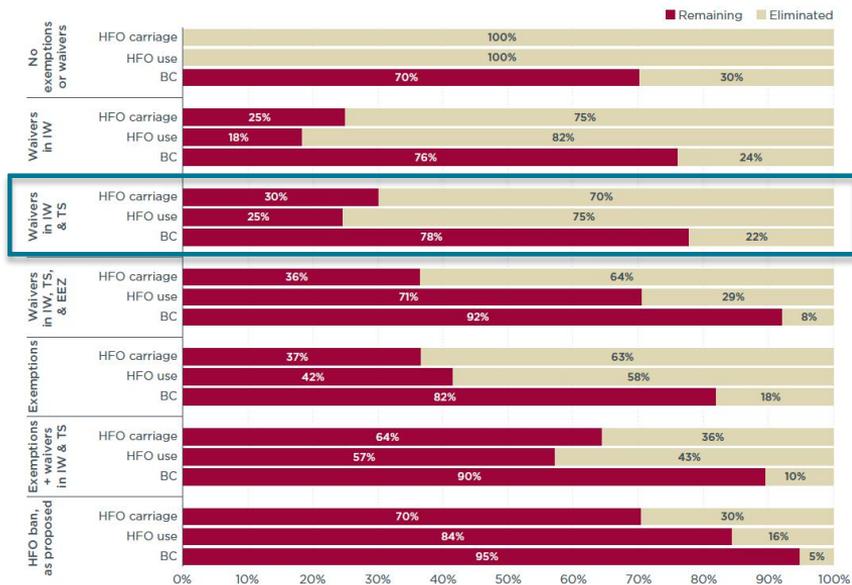
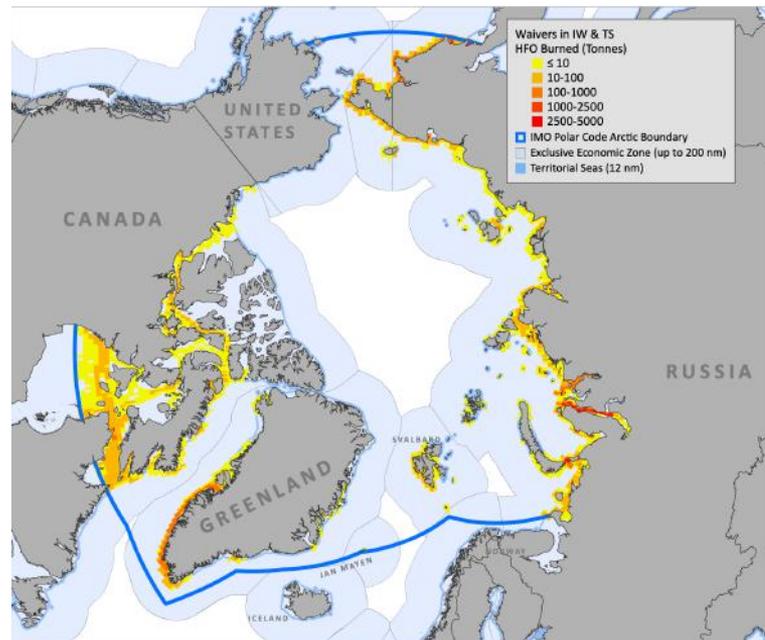


Figure ES1. How different combinations of exemptions and waivers affect HFO carriage, HFO use, and BC emissions in the Arctic.



An HFO ban with no exemptions and no waivers is most protective

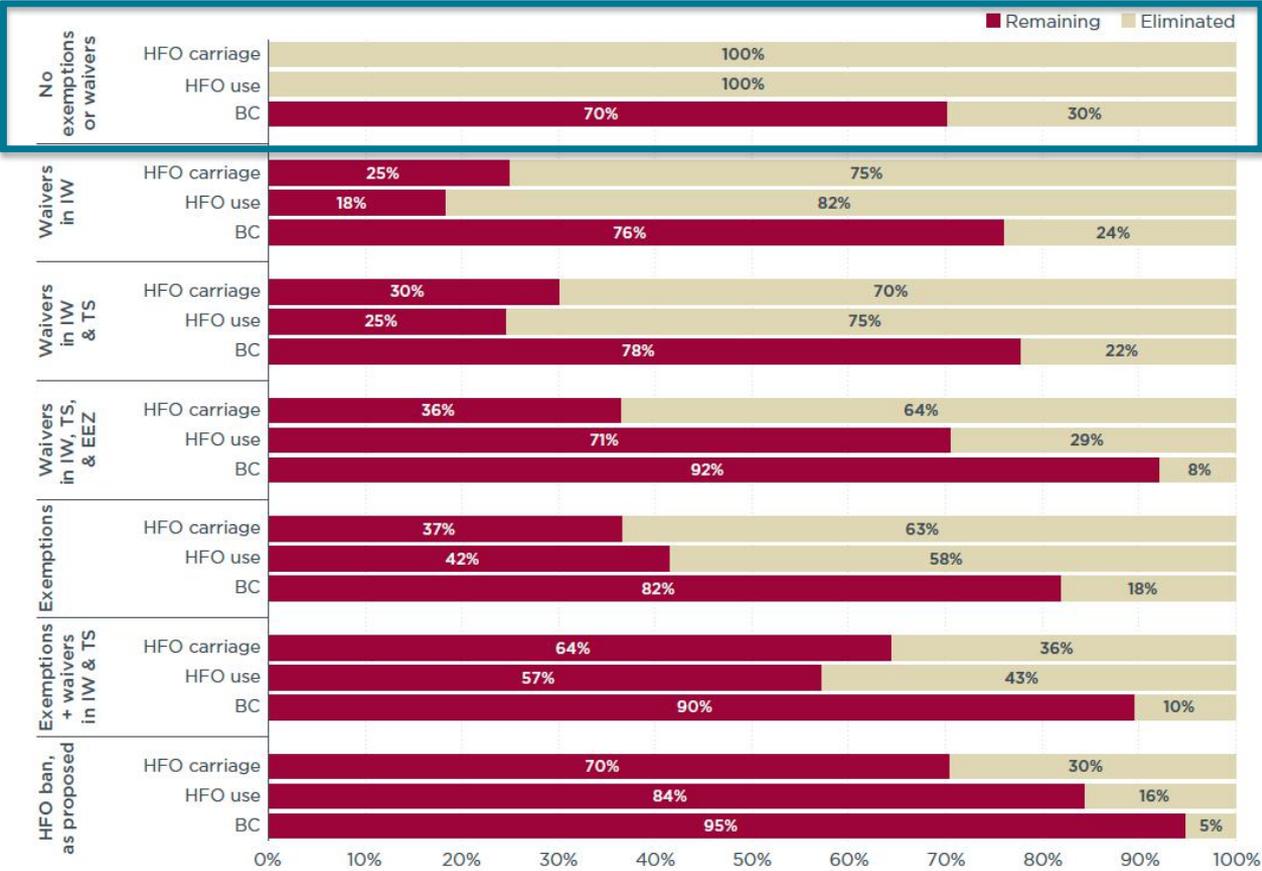


Figure ES1. How different combinations of exemptions and waivers affect HFO carriage, HFO use, and BC emissions in the Arctic.

Conclusions

- The proposed Arctic HFO ban, as written, bans only 30% of HFO carriage and 16% of HFO use, reducing BC emissions by only 5%.
- Exemptions and waivers in the proposed ban undermine its ability to substantially reduce the risks of carrying and using HFO in the Arctic.
 - As newer ships enter the fleet, especially oil tankers and bulk carriers, more ships will qualify for exemptions.
 - If ships reflag to Arctic states, more could qualify for waivers, and the effectiveness of the ban would be further eroded.
- A ban with no exemptions or waivers is most protective.
- Limiting the scope of exemptions and waivers would reduce the risks of using and carrying HFO in the Arctic and would be consistent with the original proposal for the HFO ban, which stated that it should be implemented as soon as possible and that any delay should be short-lived.

Recommendations

- **Eliminate or limit exemptions**
 - If exemptions are included, they should expire well before 2029, perhaps 2027, or even earlier.
 - In the HFO ban proposal, the co-sponsors proposed the ban be implemented no later than the end of 2021 (MEPC 72/11/1, para 4) with a delay of up to five years for ships with fuel tank protections (para 5). This suggests exemptions should expire no later than the end of 2026.
- **Eliminate or limit waivers**
 - If waivers are included, they should be limited geographically or reserved for ships that are directly engaged in community resupply. They should also expire well before 2029, ideally at the same time as the exemptions expire, or earlier. This prevents formerly exempt ships that are now subject to the ban from reflagging to Arctic countries to get a waiver to continue using HFO after the exemptions expire.
- **Implement the ban ASAP**
 - The ban should be implemented before July 2024.

Questions or comments?
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Acknowledgements

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Supplemental Slides

HFO carriage and use and BC emissions under each alternative

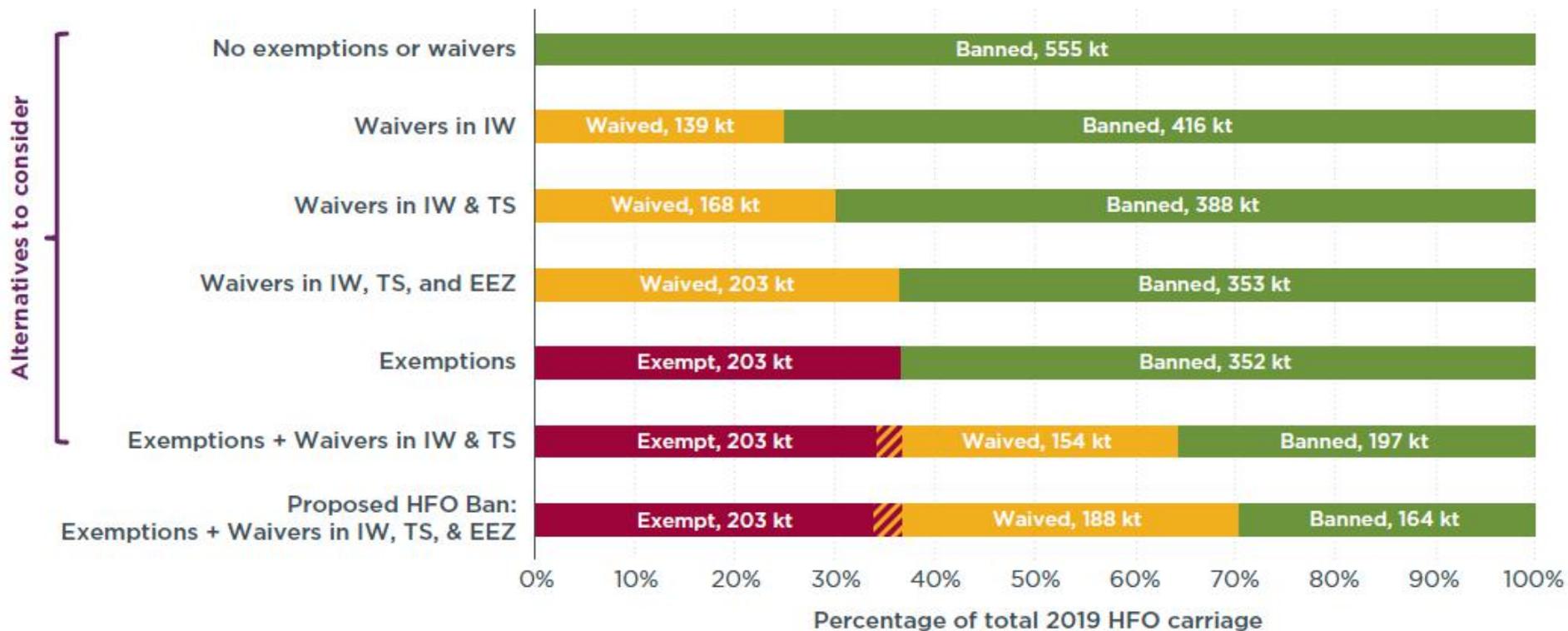


Figure 15. Heavy fuel oil carriage that would be exempt, waived, or banned in the Arctic under the IMO's proposed HFO ban compared to alternatives.

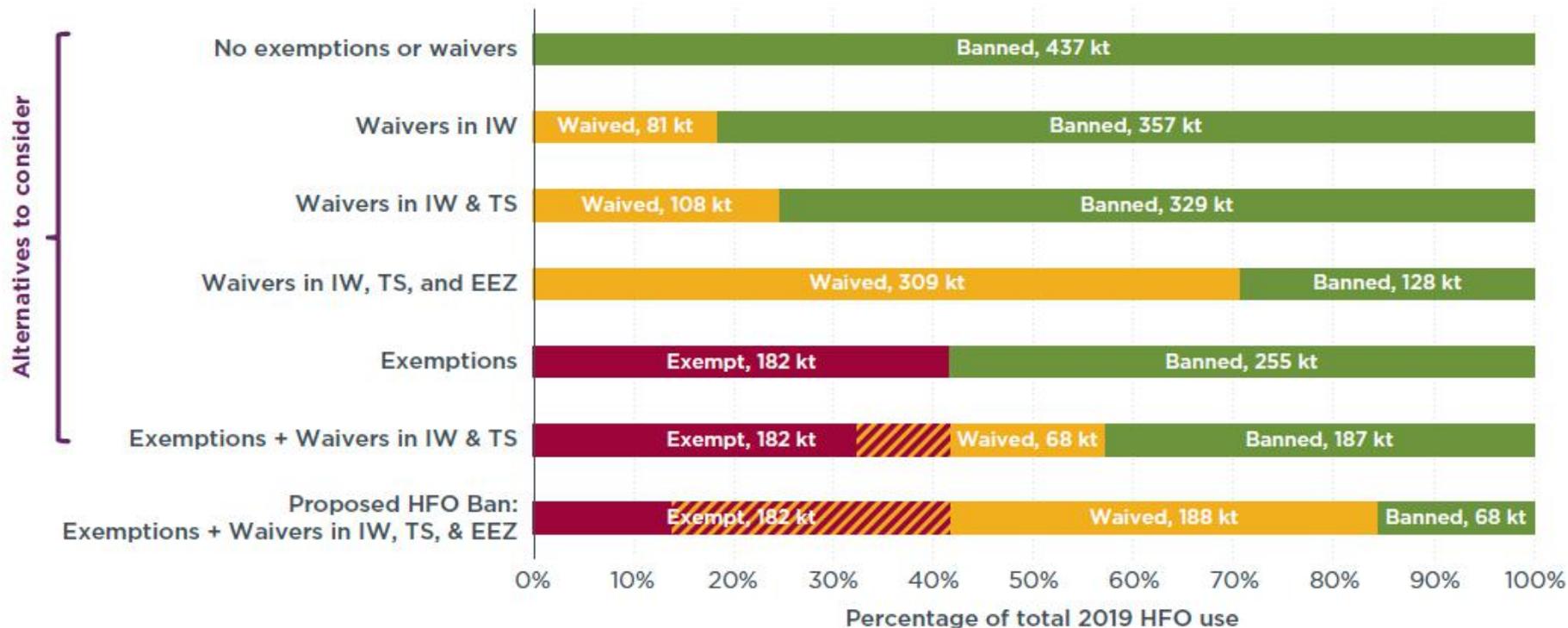


Figure 16. Heavy fuel oil use that would be exempt, waived, or banned in the Arctic under the IMO's proposed HFO ban compared to alternatives.

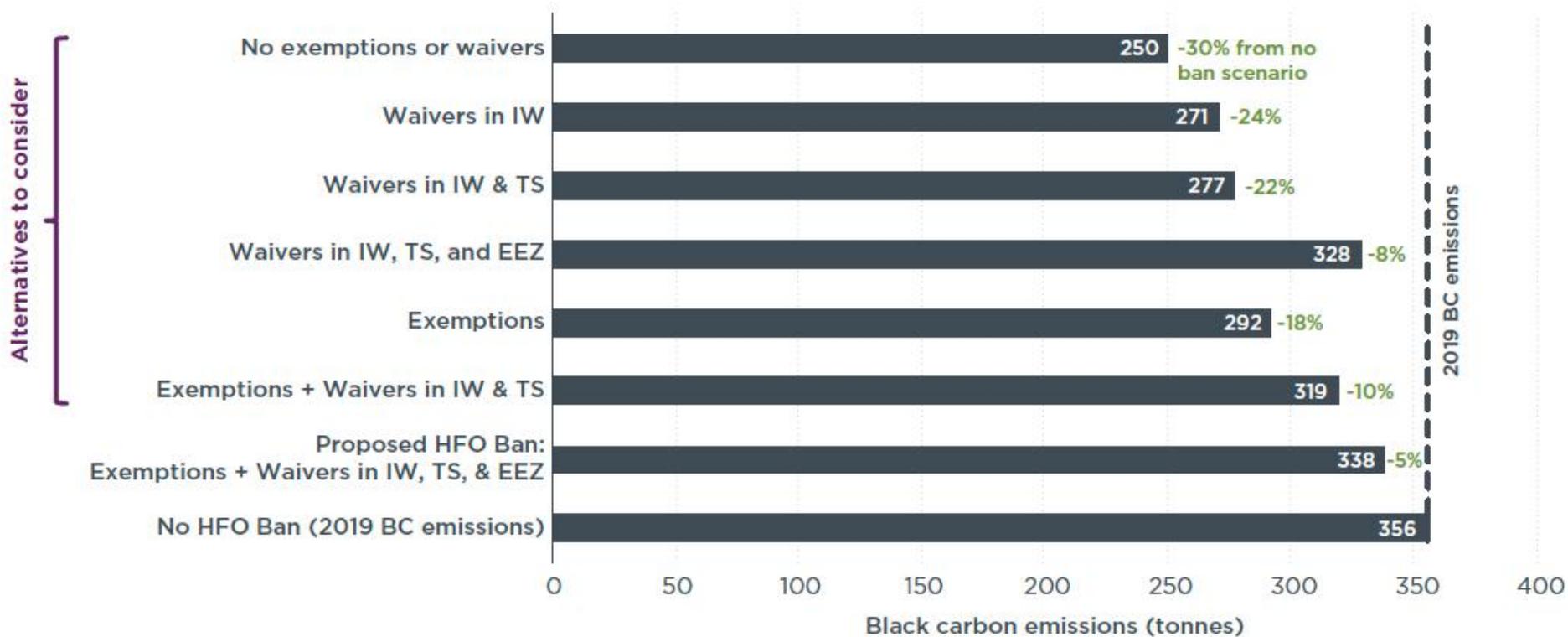


Figure 17. Potential BC reductions under the proposed HFO ban compared to the alternatives, based on 2019 Arctic BC emissions.

Maps of HFO use by ship type

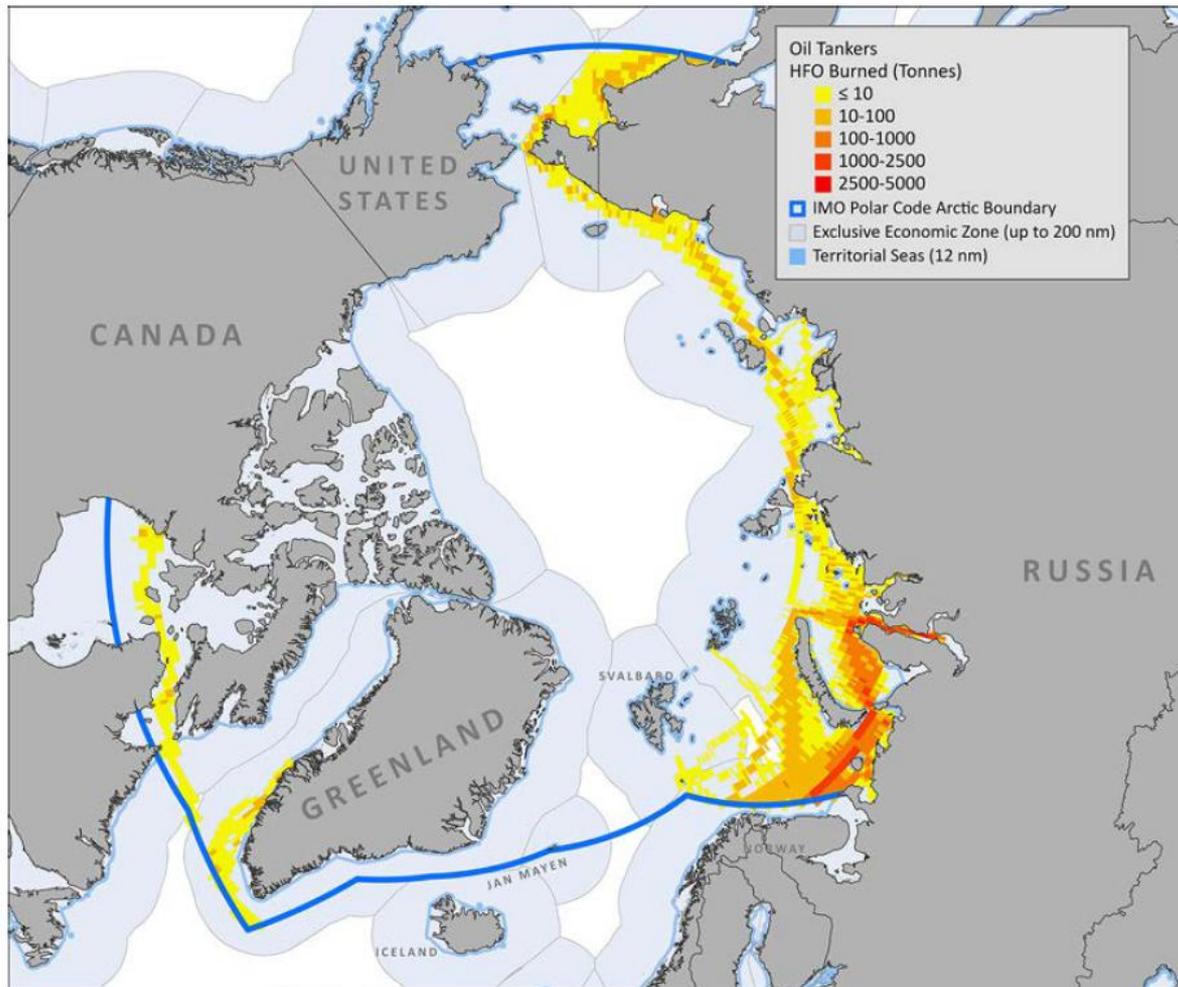


Figure D1. Oil tanker HFO use in the Arctic in 2019.

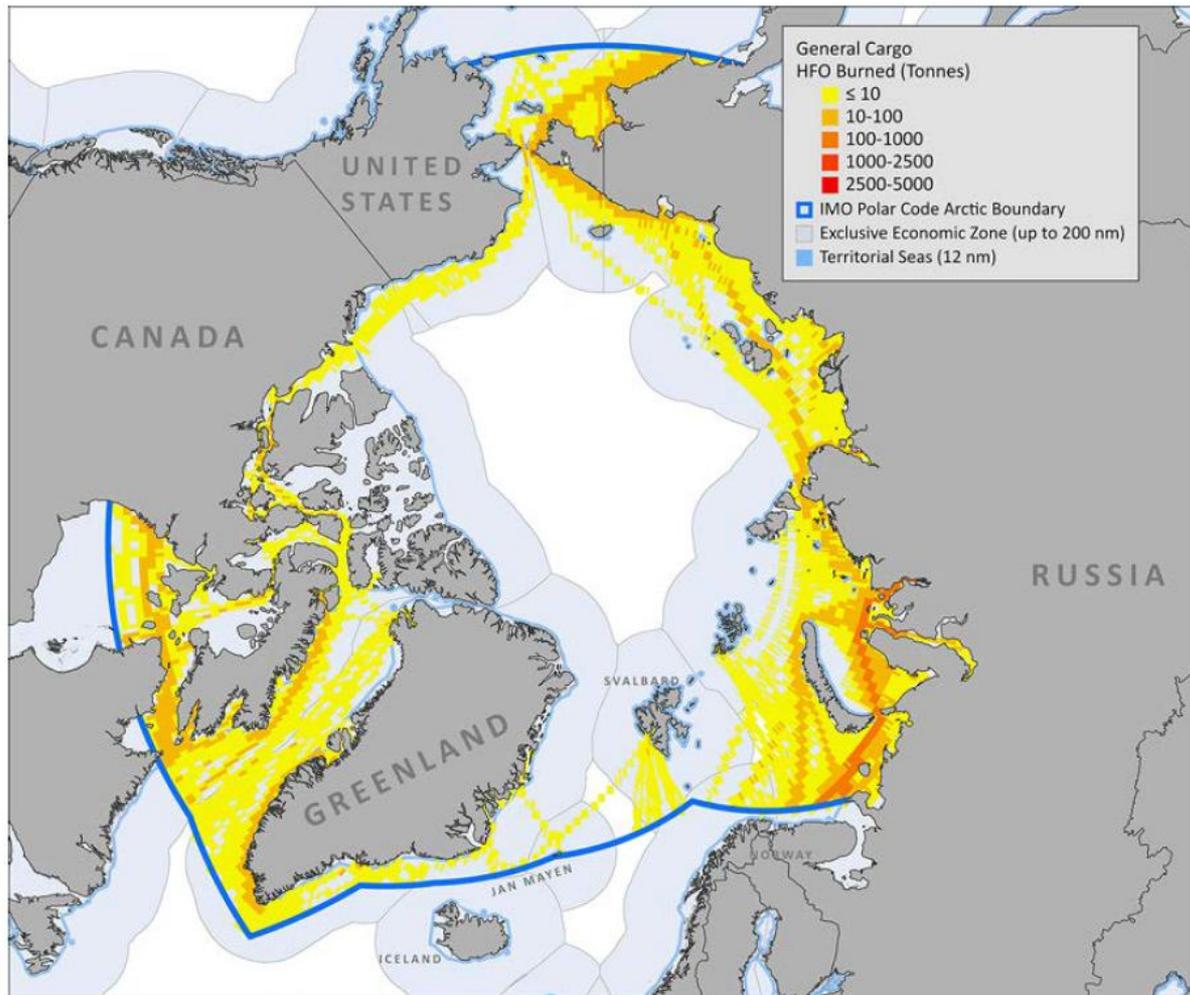


Figure D2. General cargo HFO use in the Arctic in 2019.

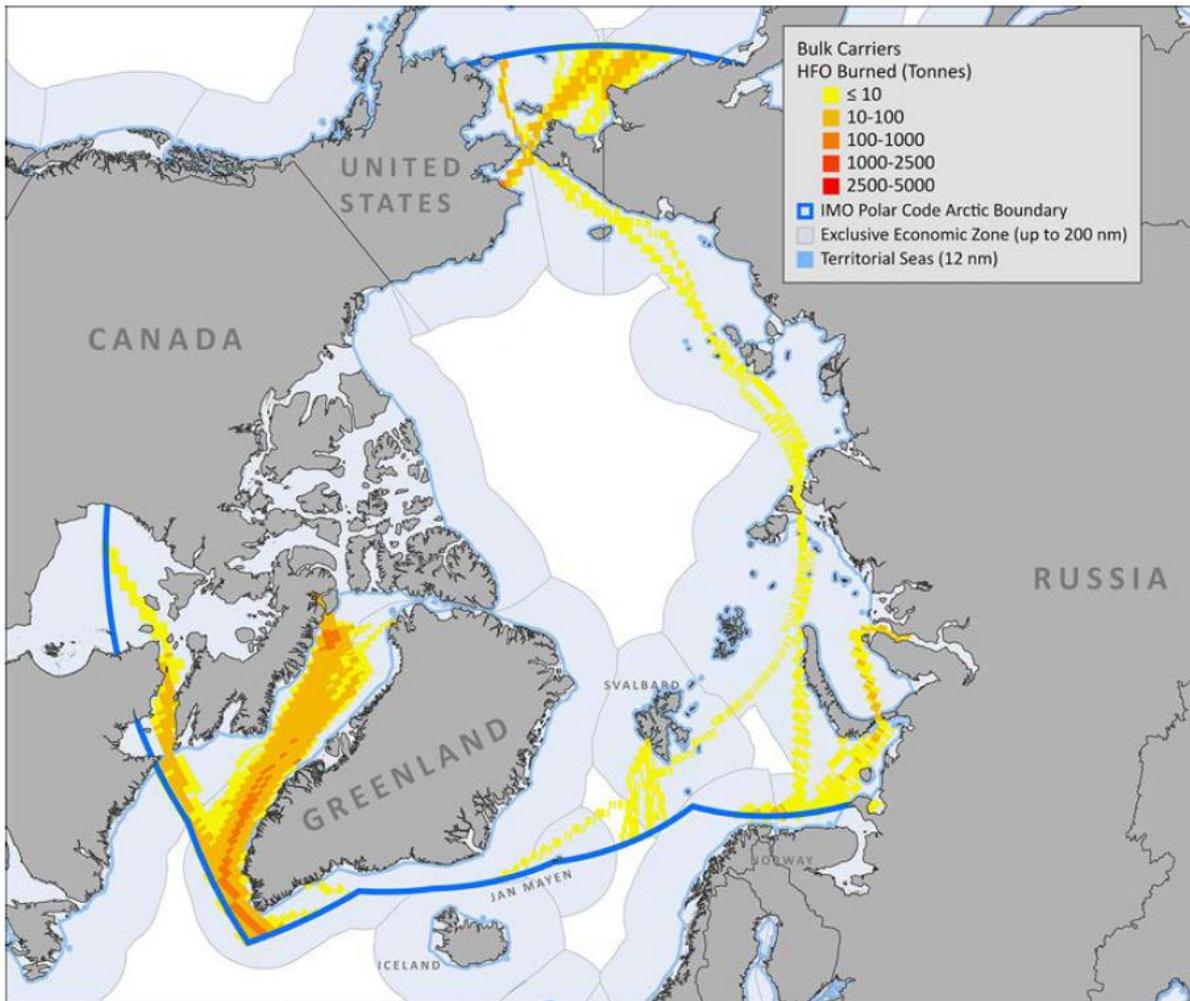


Figure D3. Bulk carrier HFO use in the Arctic in 2019.

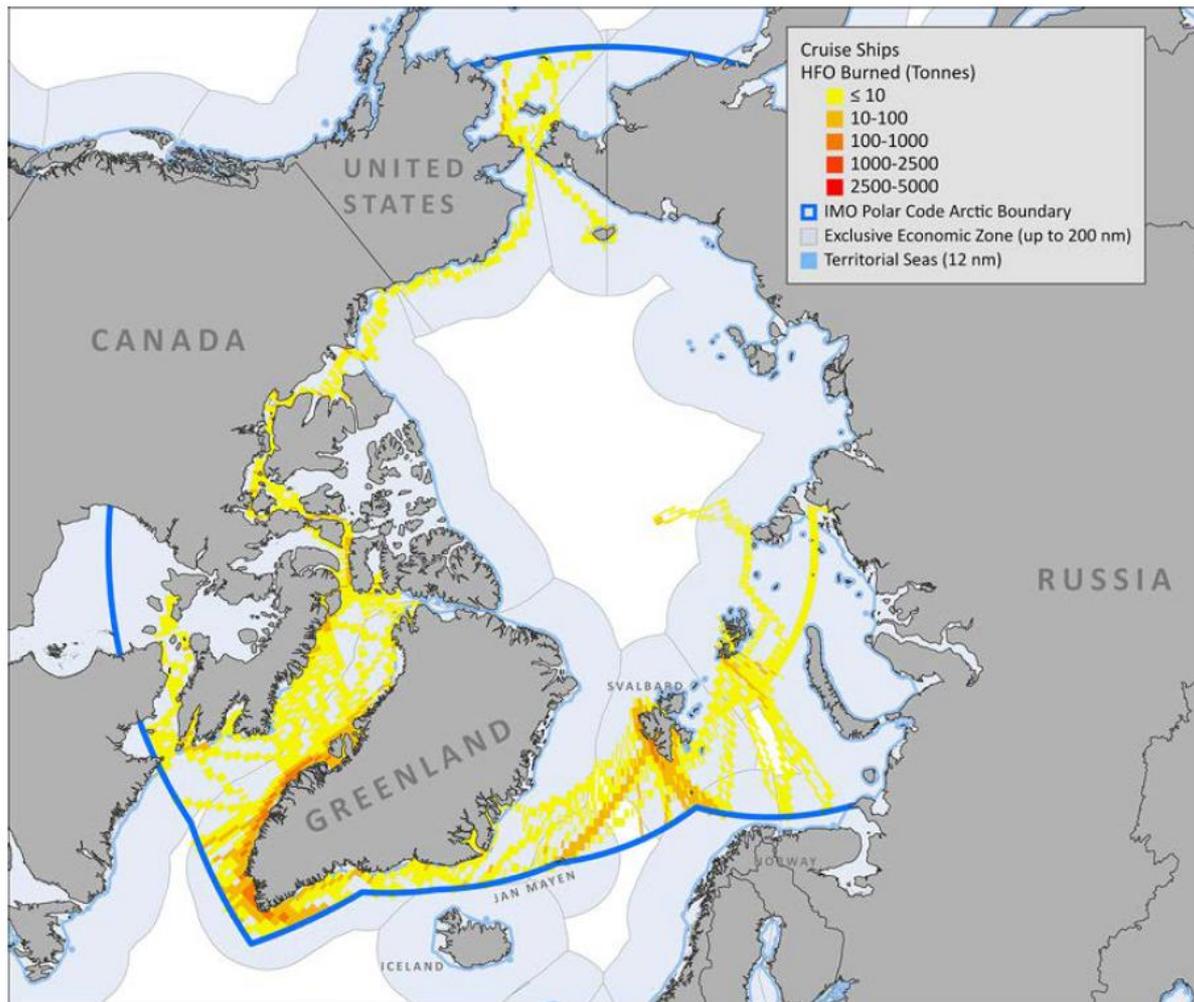


Figure D4. Cruise ship HFO use in the Arctic in 2019.