THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

International Council on Clean Transportation response to the "Call for submission, SR toxics and human rights Impact analysis of the International Maritime Organization (IMO)"

The International Council on Clean Transportation (ICCT)[1] is an independent, non-profit research organization with offices in Washington DC, San Francisco, Berlin, Beijing, São Paulo and a staff of nearly one hundred transportation experts. ICCT's mission is to improve the environmental performance and energy efficiency of road, marine, and air transportation, in order to mitigate climate change and benefit public health.

The ICCT marine program is dedicated to providing policymakers with the data and analysis they need to avoid, reduce, and eliminate pollution from the global shipping sector. We work with policymakers at the international, regional, national, and local (port) levels. In this response on the SR toxics and human rights impact analysis of the International Maritime Organization (IMO), ICCT intends to communicate weaknesses found in current IMO policy in hopes to implement more protective measures.

Emissions of greenhouse gases and climate change

Overall GHG emissions: Emissions of greenhouse gases from shipping has been growing steadily. If the shipping industry were a country, it would have ranked 6th in terms of total CO_2 emissions in 2015 by country, just below Germany and well above the Republic of Korea[2]. The Fourth IMO GHG study[3] finds that total GHG emissions from maritime shipping rose about 10% from 2012 to 2018. Most striking were the increases in short-lived climate pollutants, including a 12% increase in black carbon emissions and a 150% increase in methane emissions. However, currently only CO_2 emissions are regulated by the IMO, and only for new ships. The Fourth IMO GHG study highlights that much work lies ahead if the sector is to meet IMO's goal of cutting GHG emissions from international shipping by at least 50% from 2008 levels by 2050[4]. Otherwise, it will not be aligned with the Paris Agreement temperature goals.

[1] https://theicct.org
[2] https://theicct.org/publications/GHG-emissions-global-shipping-2013-2015
[3] https://docs.imo.org *(an account is needed for download.)*
[4] https://theicct.org/publications/IMO-initial-GHG-strategy

Black carbon: Black carbon (BC) is a climate pollutant and represents 7%-21% of global shipping's CO_2-eq emissions[5]. It is particularly harmful for the Arctic region as it accelerates warming and the melting of Arctic ice. Shipping is responsible for 1% of global anthropogenic BC emissions as of 2015[6] and emissions are constantly growing, as shown in the Fourth IMO GHG Study. According to our black carbon inventory, residual fuels such as HFO accounted for an estimated 83% of BC from ships in 2015, while ships powered with 2-stroke slow speed diesel main engines were responsible for two-thirds of global BC emissions. Yet, black carbon is not currently regulated by IMO despite the long-term discussion on possible ways of reducing black carbon emissions by PPR subcommittee which began in 2011. There are many options available to the IMO to control black carbon emissions, as described by the participants of the ICCT's 6th workshop on marine black carbon emissions, including emissions limits for ships, limiting access to the Arctic to modern ships with lower emissions, mandating the use of shore power in port, and banning the use of heavy fuel oil (HFO), with a switch to distillate or other cleaner fuels[7].

Methane: Methane is a climate pollutant that traps 86 times more heat in the atmosphere than the same amount of CO_2 over a 20-year time period. This pollutant represents a small but rapidly growing share of GHG emissions from shipping. The Fourth IMO GHG study shows that methane emissions from ships grew by 150% from 2012 to 2018[8]. This growth was largely due to a surge in the number of ships fueled by liquefied natural gas (LNG), many of which have engines that allow unburned methane to escape into the atmosphere. From a life-cycle GHG emissions point of view, using LNG as a marine fuel yields no climate benefit compared with existing petroleum-based fuels[9]. This is due to methane leakage during extraction, processing and transport and that when burned, the most popular LNG marine engine is also the leakiest, resulting in methane slip. However, methane is not yet regulated by the IMO. We have urged IMO to include all greenhouse gases, including methane, in the next phase of the EEDI to limit emissions from new LNG-fueled ships[10]. The IMO will consider this proposal at MEPC 76 in June 2021.

Prevention and response to marine pollution, including oil pollution

Arctic HFO ban: The Arctic's dwindling sea ice from global warming is opening lucrative shipping routes between Europe, Asia, and North America. With this increased shipping activity there has been increased carriage of HFO, or the leftover residues from the crude oil refining process, which is the most commonly used fuel in the Arctic[11]. Continued HFO use and carriage in the Arctic waters is a direct threat to marine life and Arctic communities because of hazardous HFO spills, with devastating consequences on aquatic ecosystems and an Indigenous community food security. HFO spills are extremely difficult and costly to remove, especially in the Arctic[12].

HFO has been banned in the Antarctic since 2011, while the Earth's other pole is not afforded the same level of protection. On November 16th, 2020, the IMO accepted an HFO ban in the Arctic, but it does not

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[5] *https://theicct.org/publications/GHG-emissions-global-shipping-2013-2015*
[6] https://theicct.org/publications/black-carbon-emissions-global-shipping-2015
[7] https://theicct.org/events/6th-workshop-marine-black-carbon-emissions
[8] *https://docs.imo.org (an account is needed for download.)*
[9] *https://theicct.org/publications/climate-impacts-LNG-marine-fuel-2020*
[10] *https://theicct.org/news/fourth-imo-ghg-study-finalreport-pr-20200804*
[11] https://theicct.org/publications/analysis-HFO-ban-IMO-2020
[12] *https://theicct.org/publications/transitioning-away-heavy-fuel-oil-arctic-shipping*

enter into force until July 1, 2024, and includes exemptions and waivers that actually ensure that HFO will continue to be used in the Arctic until the middle of 2029 when they expire. ICCT's detailed analysis[13] of the ban shows that loopholes intentionally added to the regulation through exemptions for ships with protected fuel tanks, and waivers for ships flying the flags of the five Arctic coastal states (Russia, USA, Norway, Denmark, Canada). This loophole will allow 74% of the Arctic HFO-fueled fleet to continue to use HFO in the Arctic. As a consequence, the HFO ban is expected to eliminate only 30% of HFO carriage (as fuel) and 16% of HFO use, reducing black carbon emissions by only 5%. Besides, the regulation will only actually ban HFO when the exemptions expire on July 1, 2029.

We should note that IMO procedures would allow the ban to enter into force in 2023, but IMO member states have agreed to delay the start of the regulation until the middle of 2024, with exemptions and waivers for five years afterwards, despite being well aware of the consequences of these exemptions and delays. The ICCT research on the potential impacts of the regulations were published more than two months before MEPC 75 and the ICCT briefed several member delegations ahead of the meeting.

Chemical pollution, including hazardous substances, garbage, and sewage

Scrubbers: More than 4,000 ships are currently equipped with scrubbers to comply with IMO 2020 global sulfur cap, and this number is constantly growing[14]. Scrubbers release large amounts of discharge water –conservatively estimated by the ICCT at 10 billion tonnes per year globally *(ICCT upcoming report).* The discharge water is significantly more acidic than sea water and contains nitrates, carcinogenic polycyclic aromatic hydrocarbons (PAHs), and toxic heavy metals[15]. Water acidification contributes to coral reef bleaching events[16]. PAHs and heavy metals accumulate over time in marine food webs and have been linked to cancer and reproductive dysfunction in marine mammals[17]. As we explain in our recent study[18] on scrubber discharges, the IMO guidelines for scrubber discharges have not been strengthened since 2008, despite being reviewed in 2009, 2015, and 2020, and the guidelines ignore the cumulative effects of many ships operating and discharging in heavily trafficked areas. Such cumulative effects are to be expected given the rapid increase in the number of ships with scrubbers.

In a 2019 study, the ICCT estimated that 3.3 million tonnes of discharge water was emitted in 2017, mostly by cruise ships, in the critical habitats of endangered and threatened pods of resident killer whales in Canada[19]. This adds more pollution to an area that already has high PAH and heavy metal concentrations[20]. Globally, other ecologically vulnerable areas are also affected, as scrubber discharges are not prohibited in the marine protected areas (MPAs) or particularly sensitive sea areas (PSSAs). For instance, the 15 PSSAs designated by IMO, mainly for protecting endangered marine species and threatened coral reefs, are polluted with at least 665 million tonnes of discharge water each calendar year according to our estimates *(ICCT upcoming report).*

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[13] *https://theicct.org/publications/analysis-HFO-ban-IMO-2020*
[14] *https://theicct.org/blog/staff/scrubbers-open-loophole-062020*
[15] *https://theicct.org/publications/air-water-pollution-scrubbers-2020*
[16] *https://pacific-data.sprep.org/dataset/impacts-ocean-acidification-coral-reefs-and-other-marine-calcifiers-guide-future-research*
[17] *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1240769/*
[18] https://theicct.org/publications/air-water-pollution-scrubbers-2020
[19] *https://theicct.org/publications/hfo-killer-whale-habitat*
[20] *https://theicct.org/blog/staff/killer-whale-tale-scrubbers-062020*

IMO regulations that focus on one pollutant at a time – sulfur oxides in this case – incentivize installing scrubbers instead of switching to cleaner alternative fuels like marine gasoil (MGO). The ICCT estimated that using scrubbers with HFO is less effective than MGO in reducing carbon dioxide, particulate matter, and black carbon emissions[21]. Increasing numbers of scrubber installations impede decarbonization of the shipping sector. This path does not require marine engines modernization, supports the fossil fuel industry, and slows down the transition to zero-emission shipping.

Gaps in, and effectiveness of, international maritime anti-pollution conventions

Efficiency: Ships made efficiency gains over the years, however that is not enough to offset the growth of transport work which is driving the emission trends upward. The Energy Efficiency Design Index (EEDI), which regulates the carbon intensity of new ships, needs to be strengthened, and other short-term measures are needed to control the climate impact of the existing fleet. There is a greater than 50% chance of achieving IMO's minimum 2050 emissions target if the 2025 EEDI standards are implemented in 2022, new and increasingly stringent technical efficiency standards are implemented in 2025, and ships slow down at least 10%[22]. So far, IMO has moved up some of the "EEDI phase 3" 2025 standards to 2022 and is working on new "phase 4" standards, which could begin for some ships in 2025. There is no requirement to slow ships down (e.g., a global speed limit), which would immediately reduce emissions from the global maritime transportation sector. For existing ships, Japan has proposed the Energy Efficiency Existing Ship index (EEXI) that, as currently written, is too weak to yield tangible real-world CO_2 reductions[23]. IMO can improve the EEXI by setting its requirements in line with achieving the Paris Agreement temperature goals.

Emission Control Areas: Emission Control Areas (ECA) are an effective way to reduce air pollution exposures in near-shore communities. However, there are currently only four ECAs around the world, covering roughly 8% of global ship fuel consumption[24]. ECAs have direct benefits on air quality, preventing premature death from ship emissions especially for countries with heavy shipping activities[25, 26, 27].

LNG and methane slip: ICCT research[28] has shown that IMO's decision to regulate carbon dioxide and nitrogen oxides without regulating methane has led to perverse incentives to tune LNG-fuelled engines for low-NOx emissions. This results in large amounts of unburned and unregulated methane escaping from the engine, called "methane slip". Methane slip makes using LNG worse for the climate than conventional fuels. While LNG emits approximately 25% less carbon dioxide than conventional marine fuels, LNG is mostly methane, a potent GHG that traps 86 times more heat in the atmosphere than the same amount of CO_2 over a 20-year time period. The most popular LNG engine technology emits 70% to 82% more life-cycle GHGs (20 year GWP) than the cleanest oil-based fuel (MGO). IMO can rectify this

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[21] *https://theicct.org/publications/air-water-pollution-scrubbers-2020*
[22] *https://theicct.org/publications/short-term-measures-IMO-emissions*
[23] *https://theicct.org/publications/marine-eexi-nov2020*
[24] *https://theicct.org/publications/GHG-emissions-global-shipping-2013-2015 (estimated for this document using internal ICCT data used to generate the report linked here)*
[25] *https://theicct.org/publications/health-impacts-transport-emissions-2010-2015*
[26] *https://theicct.org/blog/staff/silent-deadly-case-shipping-emissions*
[27] *https://theicct.org/publications/pearl-river-delta-eca-201907*
[28] *https://theicct.org/publications/climate-impacts-LNG-marine-fuel-2020*

problem by taking a wholistic approach to regulating ships, including regulating carbon dioxide-equivalent emissions, rather than carbon dioxide.

“Tailpipe” emissions focus: IMO currently regulates emissions from the ship, but it should regulate it based on the life-cycle emissions of marine fuels, with a particular focus on the 20-year global warming potential of marine fuels, given the urgency of the climate crisis. Some zero-carbon fuels, such as hydrogen and ammonia, will have low or zero “tailpipe” emissions but high upstream emissions if they are made with fossil fuels rather than renewable energy. Biofuels may have tailpipe emissions, but they may be partially or wholly counterbalanced by carbon dioxide absorption upstream, or their upstream emissions could be even worse than fossil fuels.[29]

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[29] *https://theicct.org/publications/marine-biofuels-sept2020*