

January 9, 2025

RE: Let's Talk Transportation: Vessels using scrubber systems in Canadian Waters

Dear Transport Canada:

The International Council on Clean Transportation (ICCT) welcomes the opportunity to comment on the discussion questions posed by Transport Canada in its "[Let's Talk Transportation: Vessels using scrubber systems in Canadian Waters](#)" issued November 19, 2024, and closing January 19, 2025.

The ICCT is an independent, nonprofit research organization founded to provide exceptional, objective, and timely research and technical analysis to environmental regulators. Our work empowers policymakers and others worldwide to improve the environmental performance of road, marine, and air transportation, benefiting public health and mitigating climate change.

The ICCT supports the introduction of restrictions on scrubber discharges from vessels in Canadian waters. In a recent submission to the International Maritime Organization (PPR 12/INF.15), Canada estimates that the use of scrubbers causes up to \$41 million CAD annually in health damages.

A four-step process could be followed to phase out the use of scrubbers in Canadian waters, as outlined in our response:

Step 1. Immediately stop permitting new scrubber installations.

Step 2. Immediately prohibit all scrubber discharges in the Great Lakes, the Arctic, Marine Protected Areas, Critical Habitat for Aquatic Species, nearshore areas, and internal waters.

Step 3. Ban open-loop discharges in all Canadian waters as soon as possible.

Step 4. Ban closed-loop discharges in all Canadian waters no more than three years later.

Additional details can be found in **ICCT's response to Transport Canada's key questions for discussion**, appended to this letter. Please contact me with any questions or if further clarification is needed.

Respectfully,



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ICCT's response to Transport Canada's key questions for discussion

Transport Canada asked respondents to consider the following questions:

1. Do you think Transport Canada should implement restrictions on scrubber system discharge from vessels in Canadian waters? Why or why not?
2. What factors should be considered when exploring a timeline for the introduction of potential restrictions on scrubber discharge from vessels and why?
3. Is there anything else that Transport Canada should consider about vessels using scrubber systems, including when exploring potential restrictions?

1. Do you think Transport Canada should implement restrictions on scrubber system discharge from vessels in Canadian waters? Why or why not?

Yes, we recommend that Transport Canada implement restrictions on scrubber system discharges in Canadian waters.

Many countries have taken similar steps. As of February 2023, the ICCT has identified 93 measures restricting or banning the use of scrubbers in 45 countries.¹ More recently, Denmark and Sweden have agreed to phase out the use of scrubbers, with both countries banning open-loop scrubber discharges starting July 1, 2025, followed by bans on closed-loop discharges in 2029.²

In a 2021 study of global scrubber use, the ICCT found that ships are expected to emit 64 million tonnes (Mt) of scrubber washwater in Canadian waters (territorial sea and internal waters) each year, ranking it 7th globally.³ Denmark ranks 6th and Sweden ranks 10th. In that same study, Vancouver was ranked 4th globally among ports, with 5 million tonnes of washwater expected to be emitted within one nautical mile of the port annually. Vancouver has already imposed a ban on scrubber discharges while ships are at berth or at anchor in the port since March 2022, citing a scientific study it commissioned that “showed that the discharge of scrubber wash

¹ Camilla Carraro, *Global update on scrubber bans and restrictions* (ICCT, 2023), <https://theicct.org/publication/marine-scrubber-bans-and-restrictions-jun23/>.

² Denmark: <https://mim.dk/nyheder/pressemeddelelser/2024/april/bred-politisk-aftale-danmark-forbyder-udledning-af-scrubbervand-fra-skibe-til-havmiljoet>; Sweden: <https://www.sjofartstidningen.se/sverige-infor-forbud-mot-skrubberutslapp/>

³ Liudmila Osipova, Elise Georgeff, and Bryan Comer, *Global scrubber washwater discharges under IMO's 2020 fuel sulfur limit* (ICCT, 2021), <https://theicct.org/publication/global-scrubber-washwater-discharges-under-imos-2020-fuel-sulfur-limit/>.

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water could result in levels of certain contaminants – such as cadmium, copper, mercury, and nickel and of polycyclic aromatic hydrocarbons (PAHs) – that exceed thresholds set for the protection of aquatic life within our jurisdiction.”⁴

The use of scrubbers continues to grow in Canada, with 20% of ships in Canadian waters fitted with scrubbers, up from only 2.4% in 2018, as reported in a recent submission by Canada to the International Maritime Organization’s Pollution Prevention and Response Subcommittee.⁵ In that submission, Canada estimates that the use of scrubbers in Canadian waters contributes to up to \$41 million (2024 CAD) in annual monetized health burdens.

Scrubber discharges, from both open-loop systems (washwater) and closed-loop systems (bleed-off water), release harmful substances into marine environments, including heavy metals, polycyclic aromatic hydrocarbons, nitrates, nitrites, acids, and other pollutants, as quantified in the ICCT’s 2020 consulting report for Environment and Climate Change Canada.⁶ These pollutants can degrade water quality, and harm marine life. In that same study, the ICCT found that ships with scrubbers have higher air emissions of carbon dioxide, particulate matter, and black carbon than those using low-sulfur distillate fuels.

ICCT’s research underscores the risks of scrubber washwater contamination to sensitive marine environments. In a 2019 study, the ICCT found that 30 scrubber-equipped ships emitted nearly 35 million tonnes of scrubber washwater in the waters off British Columbia in 2017.⁷ Approximately 10% of scrubber washwater was discharged within critical habitat for resident killer whales (RKWs), even though these habitats represented only 0.6% of the study area. In 2018, Canada more than doubled the size of RKW critical habitat, which increased the expected amount of scrubber discharges in these areas from 3.3 Mt per year to 5.5 Mt per year.⁸

⁴ Bryan Comer, “Vancouver’s new scrubber restrictions mean cleaner waters” (ICCT, 2022), blog post, <https://theicct.org/vancouver-can-scrubbers-marine-mar22/>.

⁵ Canada, “Air quality and health impacts of using EGCS (scrubbers) in Canadian waters” (IMO, 2024), submitted as document PPR 12/INF.15.

⁶ Bryan Comer, Elise Georgeff, and Liudmila Osipova, *Air emissions and water pollution discharges from ships with scrubbers* (Prepared for Environment and Climate Change Canada. Prepared by the ICCT, 2020), <https://theicct.org/publication/air-emissions-and-water-pollution-discharges-from-ships-with-scrubbers/>.

⁷ Elise Georgeff, Xiaoli Mao, and Bryan Comer, *A whale of a problem? Heavy fuel oil, exhaust gas cleaning systems, and British Columbia’s resident killer whales* (ICCT, 2019), <https://theicct.org/publication/a-whale-of-a-problem-heavy-fuel-oil-exhaust-gas-cleaning-systems-and-british-columbias-resident-killer-whales/>.

⁸ Elise Georgeff, “A killer whale’s tale: Protect critical habitats by addressing scrubber washwater from ships” (ICCT, 2020), blog post, <https://theicct.org/a-killer-whales-tale-protect-critical-habitats-by-addressing-scrubber-washwater-from-ships/>.

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A four-step process could be followed to phase out the use of scrubbers in Canadian waters:

Step 1. Immediately stop permitting new scrubber installations.

Step 2. Immediately prohibit all scrubber discharges in the Great Lakes, the Arctic, Marine Protected Areas, Critical Habitat for Aquatic Species, nearshore areas, and internal waters.

Step 3. Ban open-loop discharges in Canadian waters as soon as possible.

Step 4. Ban closed-loop discharges in Canadian waters no more than three years later.

2. What factors should be considered when exploring a timeline for the introduction of potential restrictions on scrubber discharge from vessels and why?

We recommend that the environmental sensitivity of affected areas and fuel availability be considered when exploring a timeline for the introduction of potential restrictions on scrubber discharges.

Environmental sensitivity of affected areas: We recommend that areas like the Great Lakes, the Arctic, Marine Protected Areas, Critical Habitat for Aquatic Species, nearshore areas, and internal waters be prioritized for swift action due to their ecological sensitivity.

Fuel availability: Ship owners and operators can immediately switch to compliant low-sulfur fuels, but Transport Canada may wish to provide a short transition period, such as one year, to allow for winding down the use of high-sulfur heavy fuel oil and to ensure the supply of low-sulfur fuels. However, we expect the impacts on demand for marine distillate fuels to be small. We estimate that replacing all high-sulfur heavy fuel oil (HFO) consumed by scrubber-equipped ships in Canadian waters with low-sulfur distillate fuel would represent 0.7% of Canada's annual domestic distillate fuel oil production, as explained next.

In our 2021 study on scrubber use and associated discharges, the ICCT estimated that ships emit 64 Mt of scrubber washwater in Canadian waters each year, assuming that ships emit 45 tonnes of washwater per megawatt-hour (MWh) of energy used by ships.⁹ This can be converted to fuel consumption by assuming that scrubber-equipped ships consume approximately 178 grams of heavy fuel oil per kilowatt-hour (kWh).¹⁰ Doing

⁹ Osipova et al (2021), <https://theicct.org/publication/global-scrubber-washwater-discharges-under-imos-2020-fuel-sulfur-limit/>.

¹⁰ Comer et al. (2020), <https://theicct.org/publication/air-emissions-and-water-pollution-discharges-from-ships-with-scrubbers/>.

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the conversions, we estimate that scrubber-equipped ships consume approximately 250,000 tonnes of HFO each year in Canadian waters. Because distillate fuels, such as marine gas oil (MGO) have a higher energy density than HFO (42.7 MJ/kg for MGO versus 40.2 MJ/kg for HFO), replacing 250,000 tonnes of HFO with distillate would require about 240,000 tonnes of low-sulfur distillate fuel, equivalent to 270,000 cubic meters (m³), assuming a density of 890 kg/m³. In 2023, Canada produced more than 40 million cubic meters of distillate fuel oil according to Statistics Canada.¹¹ Therefore, the amount of distillate fuel needed to replace all HFO consumed by scrubber-equipped ships in Canadian waters represents 0.7% of Canada's annual domestic distillate fuel oil production. Given that many ships refuel in countries other than Canada, the actual amount of additional low-sulfur distillate fuel Canada would need to supply would be less than this.

3. Is there anything else that Transport Canada should consider about vessels using scrubber systems, including when exploring potential restrictions?

Yes, we recommend that Transport Canada also consider the following points when exploring potential restrictions on scrubber systems:

Discharge monitoring and enforcement: Effective monitoring and enforcement mechanisms are critical for ensuring compliance with any restrictions on scrubber discharge. If scrubber discharges are merely restricted and not completely banned, Canada may consider requiring the use of real-time monitoring systems on vessels and regular inspections to detect violations of discharge regulations. The enforcement of standards could be coupled with clear penalties for non-compliance to ensure the protection of Canadian waters.

Health benefits of a ban: Banning the use of scrubbers in Canadian waters is expected to improve air quality. In a recent submission to the International Maritime Organization (PPR 12/INF.15), Canada estimates that the use of scrubbers causes up to \$41 million CAD annually in health damages.

Benefits to marine ecosystems: The long-term accumulation of pollutants from scrubber discharges, such as heavy metals and polycyclic aromatic hydrocarbons, can result in significant ecosystem degradation. The potential for bioaccumulation of these toxins in the food chain could impact marine life, human health, and the economy, especially in regions that rely on fishing and tourism. Restricting scrubber discharges would mitigate these risks and contribute to long-term environmental sustainability.

¹¹Statistics Canada, "Canadian petroleum product refining returns to pre-pandemic levels: Refined petroleum products year in review 2023, (March 12, 2024), <https://www.statcan.gc.ca/o1/en/plus/5812-canadian-petroleum-product-refining-returns-pre-pandemic-levels-refined-petroleum>

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