Green Marine Environmental Program

2025

Performance Indicators for Ship owners

Table of contents

AIR EMISSIONS - GREENHOUSE GASES

OBJECTIVE: Reduce greenhouse gas (GHG) emissions.

LEVEL 1
Monitoring of regulations
LEVEL 2
2.1 Conduct internal audits of equipment or energy loads that could be more efficient with smart controls, variable loads, or other means (e.g., HVAC in unoccupied spaces, air compressor, or cooling pump) and/or from survey findings, make progress right-sizing or upgrading equipment, balancing loads, or similar. 2.2 Use climatology and weather forecasting to take advantage of tidal currents and avoid storms. Plan voyages to reduce running hours and idling time. 2.3 Optimize trim for energy efficiency when loading cargo and managing ballast, if carried. 2.4 Follow voluntary slow speed measures for a majority of transits in specific zones, as identified by a port, governmental authority, or regional coalition. 2.5 Implement a preventive engine maintenance system to optimize performance. 2.6 Identify optimal engine speed or engine load for energy efficiency. Inform crew and ensure awareness of this optimal 'economic' speed. Transit at this speed to the extent practicable. 2.7 Implement a replacement program for LED or other energy efficiency light upgrades. Pilot Boats and Tugs Only: 2.8 Reduce idling with dispatch scheduling and/or providing tie-up locations where awaiting tow or escort.
LEVEL 3
3.1 Complete an annual GHG emissions inventory (totals and intensity) for the company's entire fleet, owned and chartered. Note: See Annex 3-A. 3.2 Adopt a Decarbonization Plan that has quantifiable objectives towards net-zero and that formally incorporates the best practices required for achievement of level 2. Note: See Annex 3-B. AND fulfill two of the following 3 criteria 3.3 On at least 1 vessel, conduct a shipboard energy audit or implement near real-time measurement and actionable analytics of fuel consumption. 3.4 Support scientific research on energy efficiency and decarbonization by providing access to ships by government, academic, or other research groups or by participating on an expert working group. 3.5 Publicly disclose GHG reduction target as defined in the Decarbonization Plan.
LEVEL 4
4.1 Achieve an annual average reduction in GHG intensity (GHG emissions per tonne-nautical mile or per hour for tugs, passenger vessels, or other non-cargo ships) since 2008 of 1.X% - where in 2025, 1.X = 1.3% and for each additional year, the target increases a tenth up to 1.8% for a cumulative 40% reduction by 2030. Note: See Annex 3-A for the methodology. **AND** fulfill one of the following 2 criteria 4.2 Actively participate in research and development on reducing GHG, for example – alternative and renewable fuels, alternative propulsion, infrastructure development, or abatement technologies. Note: Active participation in R&D is defined as the provision of support by the participant, whether through financial means, human resources, equipment, and/or experimental shipboard trials; in partnership with an academic institution, technology developer, innovation accelerator, or government agency. **OR** 4.3 On the majority of vessels, conduct a shipboard energy audit or implement near real-time measurement and actionable analytics of fuel consumption or vessel efficiency.

LEVEL 5
Fulfill one of the following 2 criteria: 5.1 Achieve an annual average reduction in GHG of 2.4% since 2008. Note: See Annex 3-A for the methodology. **OR** 5.2 Aboard at least one vessel for every 20 vessels in the fleet consume at least 40% of annual energy use from sources that are zero-carbon or produced from renewable energy, such as: battery power, shore power, 2nd+ generation advanced biofuels, green methanol, e-ammonia, and e-hydrogen.

AIR EMISSIONS - NOx

OBJECTIVE: Reduce pollutant air emissions of nitrogen oxides (NOx).

LEVEL 1
Monitoring of regulations
LEVEL 2
2.1 Conduct internal audits of equipment or energy loads that could be more efficient with smart controls, variable loads, or other means, ex. HVAC in unoccupied spaces, air compressor, or cooling pump; and/or from survey findings, make progress right-sizing or upgrading equipment, balancing loads, or similar. 2.2 Use climatology and weather forecasting to take advantage of tidal currents and avoid storms. Plan voyages to reduce running hours and idling time. 2.3 Optimize trim for energy efficiency when loading cargo and managing ballast, if carried. 2.4 Follow voluntary slow speed measures for a majority of transits in specific zones, as identified by a port, governmental authority, or regional coalition. 2.5 Implement a preventive engine maintenance system to optimize performance. 2.6 Identify optimal engine speed or engine load for energy efficiency. Inform crew and ensure awareness of this optimal 'economic' speed. Transit at this speed to the extent practicable. 2.7 Implement a replacement program for LED or other energy efficiency light upgrades. Pilot Boats and Tugs Only: 2.8 Reduce idling with dispatch scheduling and/or providing tie-up locations where awaiting tow or escort.
LEVEL 3
3.1 Complete an annual inventory of NOx emissions for the company's entire fleet, owned and chartered. Note: See Annexes 2-C and 2-D.

LEVEL 4

Fulfill two of the following 3 criteria:

4.1 Conduct sampling of NOx emissions on at least one of the company's ships within the last five (5) years. The sampling test plan must be consistent within the fleet, comparable with prior tests, and a recognized methodology, such as ISO 8178 or IMO NOx Technical Code 2008.

4.2 On board one or more of the company's owned ships, install a higher tier engine than required or use and maintain on-engine or after-treatment NOx emission reduction technologies, like selective catalytic reduction (SCR) or exhaust gas recirculation (EGR), or methods that result in a 15% reduction of NOx emissions below the permitted limits.
Note: Permitted limits are published in the document 'NOx emission permitted limits' in the Members section of the Green Marine website.

4.3 Actively participate in research and development on reducing NOx emissions, for example – introduction of new non-combustion technologies, such as fuel cells and batteries, or new fuels; and on minimizing trade-offs between NOx reduction and other increased emissions, like CO2, N2O, or ammonia slip.
Note: Active participation in R&D is defined as the provision of support by the participant, whether through financial means, human resources, equipment, and/or experimental shipboard trials; in partnership with an academic institution, technology developer, innovation accelerator, or government agency.

LEVEL 5

Fulfill one of the following 2 criteria:

5.1 On board the majority (50%+1) of the company's owned ships, install a higher tier engine than required or use and maintain on-engine or after-treatment NO_X emission reduction technologies or methods that result in a 15 % reduction of NO_X emissions per ship below the permitted limits.
Note: Permitted limits are published in the document 'NOx emission permitted limits' in the Members section of the Green Marine website.

OR
5.2 On board one or more of the company's owned ships, achieve a 50% or greater reduction of NO_X emissions per ship below the permitted limits by installing a higher tier engine than required or by using and maintaining NO_X emission reduction technologies.

AIR EMISSIONS - SOx AND PM

OBJECTIVE: Reduce pollutant air emissions of sulphur oxides (SOx) and particulate matter (PM).

<table>
<tr><th colspan="3">LEVEL 1</th></tr>
<tr><td colspan="3">Monitoring of regulations</td></tr>
<tr><th colspan="3">LEVEL 2</th></tr>
<tr><td colspan="3">2.1 Conduct internal audits of equipment or energy loads that could be more efficient with smart controls, variable loads, or other means, ex. HVAC in unoccupied spaces, air compressor, or cooling pump; and/or from survey findings, make progress right-sizing or upgrading equipment, balancing loads, or similar.

2.2 Use climatology and weather forecasting to take advantage of tidal currents and avoid storms. Plan voyages to reduce running hours and idling time.

2.3 Optimize trim for energy efficiency when loading cargo and managing ballast, if carried.

2.4 Follow voluntary slow speed measures for a majority of transits in specific zones, as identified by a port, governmental authority, or regional coalition.

2.5 Implement a preventive engine maintenance system to optimize performance.

2.6 Identify optimal engine speed or engine load for ~~ful~~ energy efficiency. Inform crew and ensure awareness of this optimal ‘economic’ speed. Transit at this speed to the extent practicable.

2.7 Implement a replacement program for LED or other energy efficiency light upgrades.

<u>Pilot Boats and Tugs Only</u>:
2.8 Reduce idling with dispatch scheduling and/or providing tie-up locations where awaiting tow or escort.</td></tr>
<tr><th colspan="3">LEVEL 3</th></tr>
<tr><td colspan="3">3.1 Complete an annual inventory of SOx and particulate matter (PM) emissions for the company's entire fleet, owned and chartered.
<u>Note</u>: See Annexes 2-A, 2-B, and 2-D.

AND, fulfill one of the following 3 criteria:</td></tr>
<tr><td><u>International ship owners</u>
3.2 The average sulphur content by mass of the total amount of fuel consumed annually by all of the company’s vessels is less than 0.45 %.
<u>Note</u>: Fuel sulphur limit is 0.1 % within an ECA and 0.5 % outside ECAs.</td><td>OR
<u>Domestics subject to the Canadian Vessel Pollution and Dangerous Chemicals (VPDCR) regulations or to the US EPA ‘Act to Prevent Pollution from Ships’ (APPS) limiting fuel sulphur content to 0.1 % (equivalent to IMO MARPOL Annex VI – Emission Control Area (ECA))</u>
3.3 The average sulphur content by mass of the total amount of fuel oil consumed annually by all of the company’s vessels is 0.01 % below permitted levels.</td><td>OR
<u>Domestics subject to Canadian Sulphur in Diesel Fuel Regulations or US EPA regulations limiting fuel sulphur content to 0.0015% (ULSD) (e.g., harbour craft)</u>
3.4 Plug one or more vessels into shore power at one or more docks.</td></tr>
</table>

<table>
<tr><th colspan="4">LEVEL 4</th></tr>
<tr><td colspan="4">Fulfill one of the following 4 criteria:</td></tr>
<tr><td>International ship owners
4.1 The average sulphur content by mass of the total amount of fuel consumed annually by all of the company's vessels is less than 0.35 %.</td><td>OR
Domestics subject to the Canadian Vessel Pollution and Dangerous Chemicals (VPDCR) regulations or to the US EPA 'Act to Prevent Pollution from Ships' (APPS) limiting fuel sulphur content to 0.1 % (equivalent to IMO MARPOL Annex VI – Emission Control Area (ECA))
4.2 The average sulphur content by mass of the total annual amount of fuel oil consumed annually by all of the company's vessels is 0.03 % below permitted levels.</td><td>OR
Domestics subject to Canadian Sulphur in Diesel Fuel Regulations or US EPA regulations limiting fuel sulphur content to 0.0015 % (ULSD)
4.3 Plug majority of vessels into shore power at majority of docks.</td><td>OR
All ship owners
4.4 Use of equipment or alternative fuel allowing for the attainment of the same level of sulphur emissions as above.</td></tr>
<tr><td colspan="4">AND (all ship owners), fulfill one of the following 2 criteria:
4.5 Sample PM emissions for one of the fleet's main engine types (slow-speed, medium-speed, high-speed, gas or steam turbine).
Note: Sampling must be repeated every five (5) years. The sampling test plan must be consistent within the fleet, comparable with prior tests, and a recognized methodology, such as ISO 8178 or 40 CFR 51 Appendix M and 40 CFR 60 Appendix A.
OR
4.6 Actively participate in research and development on reducing the impact of SOx and PM emissions (e.g., piloting hybrid or blended fuels, addressing black carbon, researching arctic impacts, or conducting a pilot project on emission reduction technologies).
Note: Active participation in R&D is defined as the provision of support by the participant, whether through financial means, human resources, equipment, and/or experimental shipboard trials; in partnership with an academic institution, technology developer, innovation accelerator, or government agency.</td></tr>
<tr><th colspan="4">LEVEL 5</th></tr>
<tr><td colspan="4">All ship owners, fulfill the following criterion:

5.1 On board one or more of the company's owned ships, compared to no treatment, achieve a 75 % or greater reduction of PM emissions per ship by (i) applying pre-treatment and on-engine measures, (ii) applying after-treatment measures, such as a diesel particulate filter (DPF), diesel oxidation catalysts (DOCs), or other exhaust gas cleaning system (EGSC), or by (iii) burning ultralow or zero sulphur fuels, such as LNG or biofuels..</td></tr>
<tr><td colspan="4">AND, fulfill one of the following 4 criteria:</td></tr>
<tr><td>International ship owners
5.2 The average sulphur content by mass of the total amount of fuel consumed annually by all of the company's vessels is less than 0.25 %.</td><td>OR
Domestics subject to the Canadian Vessel Pollution and Dangerous Chemicals (VPDCR) regulations or to the US EPA 'Act to Prevent Pollution from Ships' (APPS) limiting fuel sulphur content to 0.1 % (equivalent to IMO MARPOL Annex VI – Emission Control Area (ECA))
5.3 The average sulphur content by mass of the total amount of fuel oil consumed annually by all of the company's vessels is 0.05 % below permitted levels.</td><td>OR
Domestics subject to Canadian Sulphur in Diesel Fuel Regulations or US EPA regulations limiting fuel sulphur content to 0.0015 % (ULSD)
5.4 Plug all vessels into shore power at all docks.</td><td>OR
All ship owners
5.5 Use of equipment or alternative fuel allowing for the attainment of the same level of sulphur emissions as above.</td></tr>
</table>

AQUATIC INVASIVE SPECIES

A - DOMESTIC SHIP OWNERS

OBJECTIVE: Reduce the risk of introducing and propagating aquatic invasive organisms and pathogens associated with ballast water discharges and biofouling.

APPLICABILITY: This indicator is only applicable for fleets that regularly manage ballast water.

REFERENCES: This indicator references the documents listed below, which can be found on the Members' Section of Green Marine's website.

- 2011 IMO Biofouling Guidelines Sections 1.4, 7.2, 7.3, and 7.4 (criterion 2.1)
- Biofouling record book template (criterion 2.3)
- Biofouling management plan template (criterion 3.1)
- Transport Canada's Voluntary Guidance for Relevant Authorities on In-Water Cleaning (criterion 4.3)
- MEPC Circular 70 (BWM.2/Circ.70/Rev.1) (criterion 5.1)

LEVEL 1
Monitoring of regulations
LEVEL 2
2.1 Periodically inspect vessels' hulls including niche areas, such as sea chests, propeller thrusters, keels, rudders, and dry dock support strips. 2.2 If needed, remove biofouling organisms from the hull, propellers, stern tube, sea chests, and other wetted portions of a vessel. Note: Cleaning with capture is suggested if non-local macrofouling is present. 2.3 For each vessel, keep a record book on details of all inspections and biofouling management measures undertaken on the ship going back to the last drydock or delivery, whichever is more recent. Domestic ship owners operating in the St. Lawrence and the Great Lakes: 2.4 If feasible and safe, conduct salt water ballast exchange during coastal trades prior to re-entering the lakes. Note: Coastal trade is defined as "Movement of cargo and passengers between inland waterways and coastal ports, and within EEZ waters".
LEVEL 3
3.1 Maintain a Biofouling Management plan for each vessel which includes all the best practices required to achieve Level 2. 3.2 Support scientific research on ballast water or biofouling by providing access to ships for sampling by governmental and research groups or by participating on an expert working group. Note: It is not necessary to actively participate in the research program in order to fulfill this criterion. 3.3 Complete and maintain an annual inventory to evaluate the amount of ballast water taken and discharged by the company's ships by origin/destination. Note: See Annex 1-A. **OR** as an alternative to 3.3 for vessels with a ballast water management system: 3.4 Produce an internal annual log showing any cases of ballast water management system malfunctioning. For such cases include root cause(s) and preventive action(s) taken.

LEVEL 4

Fulfill one of the following 2 criteria:

4.1 Actively participate in research and development on reducing the risk of AIS introduction and spread associated with ballast water operations and discharges, for example – partner with an academic institution, technology developer, innovation accelerator, or government agency.

OR

4.2 Actively participate in research and development on reducing the risk of AIS via biofouling, for example - coatings, autonomous underwater cleaning, or underwater cleaning capture technologies.

Note: Active participation is defined as the provision of support by the company, whether through financial means, human resources or equipment and can include an experimental shipboard trial.

Optional:

4.3 Ensure all in-water cleaning activities are conducted in accordance with Canada's Voluntary Guidance for Relevant Authorities on In-Water Cleaning of Vessels.

LEVEL 5

Fulfill one of the following 2 criteria:

5.1 Use a ballast water management system (BWMS) on one or several of the company's vessels. And, for each installed and in-use BWMS, adopt contingency measures, as per MEPC 71/WP.9 Annex 4. For each new BWMS installation, conduct a ballast water management system commissioning test for biological efficacy using detailed analysis methods. Use the International Maritime Organization (IMO) Marine Environment Protection Committee (MEPC) Circular 70 (BWM.2/Circ.70/Rev.1) as the basis for sampling and analysis.

OR

For a vessel that does not already require a type-approved BWMS:

5.2 Use an experimental BWMS for research and development (R&D) purposes in partnership with an academic institution, technology developer, innovation accelerator, or government agency.

AND fulfill one of the following 2 criteria:

5.3 Conduct annual compliance self-monitoring of ballast water discharge for each installed BWMS that is not for R&D purposes.

OR

5.4 Participate in a longitudinal biofouling or ballast water study, with onboard data collection over a minimum period of two operating seasons. Studies must be in collaboration with a formal research group and can include the sampling of biofouling, testing the application of in-development anti-fouling systems, marine growth prevention systems, grooming technologies, or in-water cleaning technologies.

AQUATIC INVASIVE SPECIES

B - INTERNATIONAL SHIP OWNERS

OBJECTIVE: Reduce the risk of introducing and propagating aquatic invasive organisms and pathogens associated with ballast water discharges and biofouling.

APPLICABILITY: This indicator is only applicable for fleets that regularly manage ballast water.

REFERENCES: This indicator references the documents listed below, all of which can be found on the Members' Section of Green Marine's website.

- 2011 IMO Biofouling Guidelines Sections 1.4, 7.2, 7.3, and 7.4 (criterion 2.1)
- Biofouling record book template (criterion 2.3)
- Biofouling management plan template (criterion 3.1)
- Transport Canada's Voluntary Guidance for Relevant Authorities on In-Water Cleaning (criterion 4.3)
- MEPC Circular 70 (BWM.2/Circ.70/Rev.1) (criterion 5.1)

LEVEL 1
Monitoring of regulations
LEVEL 2
2.1 Periodically perform in-water inspections of the vessel's hulls including niche areas, such as: sea chests, propeller thrusters, keels, rudders, and dry dock support strips. 2.2 If needed, remove biofouling organisms from the hull, propellers, stern tube, sea chests, and other wetted portions of a vessel. Note: Cleaning with capture is suggested if non-local macrofouling is present. 2.3 For each vessel, keep a record book on details of all inspections and biofouling management measures undertaken on the ship going back to the last drydock or delivery, whichever is more recent.
LEVEL 3
3.1 Maintain a Biofouling Management plan for each vessel which includes all the best practices required to achieve Level 2. 3.2 Support scientific research on ballast water or biofouling by providing access to ships for sampling by governmental and research groups or by participating on an expert working group. Note: It is not necessary to actively participate in the research program in order to fulfill this criterion. 3.3 Produce an internal annual log showing any cases of ballast water management system malfunctioning. For such cases include root cause(s) and preventive action(s) taken. For vessels with antifouling or fouling release coating: 3.4 Within dry-docking specifications, select coating with effective coating lifespan in line with the schedule for next dry-docking and anticipate operational wear, such as contact with lock walls or abrasive cleaning. Note: The effective coating lifespan is determined by the manufacturer based on the vessel-specific application scheme (e.g., coating thickness); it is the age of an anti-fouling coating after which the coating is no longer expected to satisfactorily prevent or deter the attachment and growth of biofouling organisms.

LEVEL 4
Fulfill one of the following 2 criteria: 4.1 Actively participate in research and development on reducing the risk of AIS introduction and spread associated with ballast water operations and discharges, for example – partner with an academic institution, technology developer, innovation accelerator, or government agency. **OR** 4.2 Actively participate in research and development on reducing the risk of AIS via biofouling, for example - coatings, autonomous underwater cleaning, or underwater cleaning capture technologies. Note: Active participation is defined as the provision of support by the company, whether through financial means, human resources or equipment and can include an experimental shipboard trial. **Optional:** 4.3 Ensure all in-water cleaning activities are conducted in accordance with Canada's Voluntary Guidance for Relevant Authorities on In-Water Cleaning of Vessels when contracting cleaning activities in the United States and Canada.
LEVEL 5
5.1 For each and installed and in-use ballast water management system (BWMS) adopt contingency measures, as per MEPC 71/WP.9 Annex 4. For each new BWMS installation, conduct a ballast water management system commissioning test for biological efficacy using detailed analysis methods. Use the International Maritime Organization (IMO) Marine Environment Protection Committee (MEPC) Circular 70 (BWM.2/Circ.70/Rev.1) as the basis for sampling and analysis. **AND fulfill one of the following 2 criteria:** 5.2 Participate in a longitudinal biofouling or ballast water study, with onboard data collection over a minimum period of two operating seasons. Studies must be in collaboration with a formal research group and can include the sampling of biofouling, testing the application of in-development anti-fouling systems, marine growth prevention systems, grooming technologies, or in-water cleaning technologies. **OR** 5.3 Purchase or install a compliance monitoring device and conduct annual self-monitoring of ballast water discharges for each installed BWMS.

OILY DISCHARGE

OBJECTIVE: Minimize risk of oily discharges incidental to the normal operation of the vessel.

<table>
<tr><th colspan="2">LEVEL 1</th></tr>
<tr><td colspan="2">Monitoring of regulations</td></tr>
<tr><th colspan="2">LEVEL 2</th></tr>
<tr><td>Vessels using an Oily Water Separator (OWS) on board:
Implementation of 6 of the following 10 best practices on all company vessels:

2.1 Give staff proper training on bilge water management.

2.2 Monitor compliance of the oily water discharge by:
a) Conduct annual calibration of the oil content meter; or
b) Sample treated water monthly and have it analyzed by an accredited lab; or
c) Use a secondary monitoring unit (e.g., white box).

2.3 Periodically test oil content alarm prior to operating the oily water separator.

2.4 Use seals or locks on all overboard discharge valves.

2.5 Post signs in the vicinity to clearly indicate who is responsible for opening any of the OWS overboard discharge valves, for operating oily water separation equipment and for oil transfer procedures.

2.6 Lock out or seal the oil content meter so that the calibration cannot be tampered with.

2.7 Maintain proper coordination with the navigation bridge when opening the overboard discharge valve so the bridge can also record the activity and the vessel's position.

2.8 When feasible, only operate the oily water separator during the daytime.

2.9 Regularly clean the applicable bilges and remove any solid material that may reduce the performance of the OWS.

2.10 Reduce as much as possible the use of emulsifying cleaners and agents that can degrade the performance of the OWS.</td><td>Vessels NOT using Oily Water Separator (OWS) on board (even if installed):
Implementation of the majority of applicable best practices on all company's vessels:

2.11 Regularly inspect and perform preventative maintenance of equipment using oil (e.g., engines, burners, pumps, pipes, heaters, filters) or water (e.g., condensers, boilers, pumps, pipes) to prevent leaks.

2.12 Regularly assess condition and maintain stern tube seals and bearings to prevent water from entering.

2.13 Stop leaks of oil or water in the engine room as soon as possible.

2.14 Clean up oil and water spills as soon as possible after maintenance and repair operations.

2.15 Maintain clean, dry bilges.

2.16 Post signs in the vicinity to clearly indicate who is responsible for bilge water transfer procedures.

2.17 Give staff proper training on bilge water management.

2.18 Keep available on board oil absorption pads to intervene in case of minor oil spills.</td></tr>
<tr><th colspan="2">LEVEL 3</th></tr>
<tr><td colspan="2">3.1 Adopt an Oily Water Management plan that formally incorporates all the best practices itemized in level 2.
Note: See Annex 4-A.

3.2 Complete an annual inventory of bilge water (produced, treated, discharged to sea, and off-loaded to shore, as applicable) and of oil residue (sludge) on a vessel-by-vessel basis and for the fleet as a whole.
Note: See Annex 4-B.

3.3 Develop and adhere to environmental procurement guideline for cleaning products to be used within the engine room, considering third party certifications* and product content** and packaging (see Waste Management performance indicator).
*Such as USDA BioPreferred and Centre for Environment, Fisheries and Aquaculture Science (Cefas).
**Chlorine, phosphate free, readily biodegradable, minimally toxic, etc.</td></tr>
</table>

<table>
<tr><th colspan="2">LEVEL 4</th></tr>
<tr><td>Vessels using an Oily Water Separator (OWS) on board:</td><td>Vessels NOT using Oily Water Separator (OWS) on board (even if installed):</td></tr>
<tr><td>4.1 Adopt a modernization program for oily water separators and all related control and verification equipment. Systematic application of this policy on all new buildings and all ships undergoing major modifications.
Note: See Annex 4-C.

For the majority of New Builds:
4.2 Implement an integrated bilge treatment system such as that defined in the IMO's revised guidelines (MEPC.1/Circ.642, 12 November 2008).
OR
On at least one existing vessel:
4.3 Demonstrate an integrated bilge treatment system approach by respecting the requirements defined in Annex 4-D.</td><td>4.4 Set reduction or maximum targets (for the fleet as a whole or by vessel category) for bilge water produced.

4.5 Implement effective measures to reduce the quantity of bilge water and sludge produced on 50 % of the company's vessels (e.g., separate drainage systems for water and oil drains, installation of drip trays or coamings under equipment, use less water for maintenance and cleaning, replacement and repair of stern tube seals).</td></tr>
<tr><th colspan="2">LEVEL 5</th></tr>
<tr><td colspan="2">5.1 On all new build vessels fitted with conventional horizontal stern tubes, eliminate the oil-to-water interface by use of seawater lubricated bearings or an alternative sealing arrangement. For non-conventional propulsion arrangements, demonstrate best efforts to utilize technologies as they advance to eliminate or reduce the impact of an oil-to-water interface.</td></tr>
<tr><td>Vessels using an Oily Water Separator (OWS) on board:</td><td>Vessels NOT using Oily Water Separator (OWS) on board (even if installed):</td></tr>
<tr><td>5.2 Do not discharge treated bilge water in sensitive areas.
Note: In addition to where already prohibited, such as in the Arctic by the IMO Polar Code and in areas specified by Appendix G of the US EPA Vessel General Permit; sensitive areas are to include Canadian federal, territorial, or provincial Marine Protected Areas and Indigenous Protected and Conserved Areas (IPCAs). See the 'Treated bilge water discharge in sensitive areas' document in the Members section of the Green Marine website.

For all New Builds:
5.3 Implement an integrated bilge treatment system such as that defined in the IMO's revised guidelines (MEPC.1/Circ.642, 12 November 2008).
OR
On the majority of the company's existing vessels:
5.4 Demonstrate an integrated bilge treatment system approach by respecting the requirements defined in Annex 4-D.</td><td>5.5 Implement effective measures to reduce the quantity of bilge water and sludge produced on 75 % of the company's vessels.

5.6 Demonstrate an annual reduction or negligible amount in the quantity of bilge water and/or sludge produced (intensity unit is to be determined by the company, e.g., tonnes/hour of operation).</td></tr>
</table>

SHIP RECYCLING

OBJECTIVE: Reduce the effects of ship recycling on human health, safety and the environment.

APPLICABILITY: This indicator applies to all vessels, regardless of vessel size or tonnage.

LEVEL1
Monitoring of regulations
LEVEL 2
ALL ship owners: 2.1 The participant has a written Policy (or Procedure within a management plan that has been approved by senior management) detailing how their written/documented commitment will assure that all ships at the end of their economic lives will be recycled in a sustainable, safe, responsible, and environmentally sound manner. This Policy or Procedure must be applicable to all of the participants' vessels at the end of their economic life that are not sold for onward trading and are thus sent for recycling. Note: At level 2, the policy/procedure does not need to be made public. 2.2 Promote the use of less hazardous or non-hazardous materials for newbuilds and for existing ships during repairs and refits. 2.3 Adopt a formal plan to develop Part 1 of an IHM for all existing vessels. Ship owners who sold a vessel for recycling during the reporting year only: 2.4 If towing a vessel to a recycling facility, review tow plan and towing company before making final selection.
LEVEL 3
ALL ship owners: 3.1 Develop Part 1 of an Inventory of Hazardous Materials (IHM) for all new builds that meets the requirements set out in the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships and is certified as such by a third party. Note: If the participant has no new builds on order, they must have at minimum an internal written policy/procedure stating their intentions to develop an IHMs for all new builds, should any vessels be ordered in the future. 3.2 In accordance with the plan adopted for criterion 2.3, at least one of the existing vessels must have Part 1 of an IHM onboard that meets the requirements set out in the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships. 3.3 Develop a hazardous material removal plan that promotes the substitution of hazardous materials during the maintenance of ships (during layup, repair, dry dock, or as other opportunities present themselves) by less hazardous, or preferably, non-hazardous materials. Note: A risk-based approach must be taken to ensure that the substitution of hazardous materials does not pose a higher risk than leaving in situ. Ship owners who sold a vessel for recycling during the reporting year only: 3.4 When seeking to recycle a vessel, the participant will only tender to (or via Cash Buyer warranting to use) Ship Recycling Facilities that: a) Are currently (and expected to be for the duration of the dismantling) fully certified by a recognized organization as having valid and verified accreditation against the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships; b) Are capable and commit to provide a Certificate of Completion of Recycling.

LEVEL 4
ALL ship owners: 4.1 In accordance with the plan adopted for criterion 2.3, at least **50%** of the existing vessels must have Part 1 of an IHM onboard. 4.2 Implement the hazardous material removal plan adopted in level 3. 4.3 Make the ship recycling Policy publicly available; or make public the written/documented commitment (Procedures within management plans) demonstrating your company's ship recycling management practices and accountability. Ship owners who sold a vessel for recycling during the reporting year only: 4.4 Require the ship recycling facility, through a contractual clause, to provide regular recycling progress reports, from the time of vessel arrival to the time of receiving a Certificate of Completion of Recycling. Note: See Annex 7-A for minimum progress report content requirements.
LEVEL 5
ALL ship owners: 5.1 In accordance with the plan adopted for criterion 2.3, all vessels must have Part 1 of an IHM onboard. 5.2 Have all IHMs certified by a third party and renew certificates at least every 5 years. Ship owners who sold a vessel for recycling during the reporting year only: 5.3 Remove all hazardous materials not essential to the classification, certification, or operation of the vessel as part of pre-cleaning procedures prior to departure for the recycling facility. 5.4 Hire a third-party auditor to undertake announced and unannounced visits to the recycling facility during the dismantling. The frequency to be agreed between the participant and the recycling facility. The "Audit During Recycling" (ADR) will be undertaken on site involving the participant (or third-party auditor representing the participant) and the recycling facility senior management team. Each ADR report will be shared with the participant and recycling facility. Note: See Annex 7-B for minimum audit report content requirements.

UNDERWATER NOISE

OBJECTIVE: Reduce underwater noise made by ship operations to reduce impacts to marine mammals.

APPLICABILITY: Applicable only for vessels transiting in salt water.

NOTES:

- Green Marine recognizes that underwater noise may potentially impact a broader range of aquatic species other than just marine mammals. While the initial objective of this indicator covers marine mammals, future development of this Performance Indicator may expand its scope.
- Green Marine recognizes that for most ships, under most operational conditions, cavitation is the main source of underwater noise.

LEVEL1
Monitoring of regulations
LEVEL 2
2.1 Conduct regular hull cleaning and propeller blade maintenance. The participant must keep a record of these actions for each vessel in their fleet. Note: Hull cleaning and propeller maintenance should at least be done during dry dock. 2.2 Review the list of sensitive areas in Canadian and US waters to determine whether the participant's vessels transit through or have operations in such areas. Ensure that this information is communicated to each vessel. Note: See Annex 6-A. 2.3 Participate in voluntary traffic measures, like a slow-down or lateral displacement, in specific zones as identified by port, governmental authority, or regional coalition.
LEVEL 3
3.1 Actively participate in collecting and providing whale sighting data (in Canadian and US waters) through a logbook or a recognized application (e.g., Whale Alert, Whale Report, and Vigie marine). Note: Sightings recorded in a logbook should be shared with a recognized central database. 3.2 Develop and adopt a Marine Mammal Management plan (MMMP) in order to reduce the potential adverse effects of vessels, especially within known sensitive marine areas, as identified in Criterion 2.2. Note: See Annex 6-B. OR as an alternative to 3.2 for pilotage organizations: 3.3. Aboard a majority of piloted ship transits, when it is safe and operationally feasible, meet criteria 3.1 and 2.3.
LEVEL 4
4.1 Incorporate applicable vessel quieting technologies during retrofits and new vessel construction. Note: Refer to published documents like the IMO and the SNAME MVEP Guidelines, available in the Members section of the Green Marine website. This criterion is applicable only for ship owners ordering/designing new vessels (keel laid after Jan 2018) or conducting retrofits of propulsion systems or other equipment that contributes significantly to underwater noise. **AND, fulfill one of the following 3 criteria:** 4.2 Work with ports to estimate relative ship noise levels for at least one vessel in their fleet. **OR** 4.3 Estimate relative ship noise levels of at least one vessel in their fleet by using a dedicated hydrophone. Note: Collaboration with a bioacoustician is essential to obtain reliable data. **OR** 4.4 Support/collaborate on scientific research on underwater noise allowing the estimation of relative ship noise levels for at least one vessel in their fleet.

LEVEL 5
5.1 Proceed to an in-depth analysis of vessel noise footprint on at least one ship in order to identify main noise sources. Solutions to be identified and implemented to reduce noise output. Note: ANSI/ASA S12.64-2009 or ISO 17208-1:2016 underwater noise standard measurement methodology should be used where at all possible. **AND, fulfill one of the following 3 criteria:** 5.2 Work with ports to estimate relative ship noise levels for 15% of the vessels in their fleet, with a minimum of 3 vessels measured. **OR** 5.3 Estimate relative ship noise levels of 15% of the vessels in their fleet, with a minimum of 3 vessels measured, using a dedicated hydrophone. Note: Collaboration with a bioacoustician is essential to obtain reliable data. **OR** 5.4 Support / collaborate on scientific research on underwater noise allowing the estimation of relative ship noise levels for 15% of the vessels in their fleet with a minimum of 3 vessels measured.

WASTE MANAGEMENT

OBJECTIVE: Reduce ship generated garbage and increase recycling.

APPLICABILITY: This performance indicator only applies to the company's owned vessels.

LEVEL 1
Monitoring of regulations
LEVEL 2
2.1 Equip all of the company's ships with recycling bins and give staff proper training on established user procedures and the waste management hierarchy (reduce, reuse, recycle, recovery, disposal). 2.2 Favor suppliers that use less packaging. 2.3 Encourage the use of reusable, biodegradable and/or recyclable supplies. 2.4 No shipboard incineration at port. Domestic ship owners only: 2.5 Reuse as much as possible dunnage, lining and packaging material.
LEVEL 3
3.1 Produce an annual inventory of different types of garbage generated in the company's entire fleet and indicate the company's actual garbage management practices. Note: Garbage types refer to the categories defined in MARPOL Annex V, but each company can include additional categories. **Optional criteria for ships calling at European ports (referring to Regulation (EU) 2022/91, Article 1(1)):** 3.2 Implement on-board segregation of waste in accordance with the IMO's guidelines (MEPC.295(71)) and ensure delivery to adequate port reception facilities that comply with the European regulation (Article 4(2)(d) of Directive (EU) 2019/883). 3.3 Adopt an environmentally sustainable purchasing policy aiming at reducing the use of packaging materials and avoiding single-use plastics.
LEVEL 4
4.1 Develop and implement a garbage management strategy defining targets, tools, and measures for reducing garbage generated, reducing discharge at sea, and increasing recycling. Note: See Annex 5-A.
LEVEL 5
5.1 Demonstrate continual improvement by achieving targets defined in the garbage management strategy.