MARINE ENVIRONMENTAL MANAGEMENT REPORT 2025

DIRECTORATE GENERAL OF SHIPPING
नौवहन महानिदेशालय
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सागराः सुपन्थानः सन्तु

MARINE ENVIRONMENTAL MANAGEMENT REPORT 2025

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Directorate General of Shipping wants to convey its regard for the invaluable support of the Indian Register of Shipping and the Institute of Marine Engineers (India) in compiling this report.

MARINE ENVIRONMENTAL MANAGEMENT REPORT 2025

Message from the Director General of Shipping

Sustainable development has become a key priority of global policy following the 2015 United Nations Declaration on Sustainable Development, which emphasizes economic growth, social inclusion, and environmental sustainability. As a committed participant in the Sustainable Development Goals (SDGs), India has advanced this vision through initiatives such as Digital India, promoting digitization and data-driven governance across sectors, including maritime administration.

In the maritime sector, the Directorate General of Shipping (DGS) has developed a digital and regulatory framework to support sustainable shipping. The “Swachh Sagar” platform, launched in 2018 to monitor port reception facilities and ship-generated waste, has evolved into the Indian Maritime Environmental Information Management Portal, integrating modules on waste management, fuel consumption and emissions reporting, ballast water, bunker suppliers, recognized organization audits, and single-use plastics. This platform supports India’s implementation of MARPOL regulations, IMO climate measures, and national decarbonization initiatives.

Data from the portal indicates steady progress, including improved utilization of port reception facilities, reduction of single-use plastics on ships visiting Indian ports, and enhanced monitoring of carbon emissions from Indian shipping. These insights support initiatives such as the Harit Sagar – Green Port Guidelines, Maritime India Vision 2030, and the emerging Maritime Vision 2047, while also informing India’s contributions to the International Maritime Organization (IMO) on future regulatory developments.

This Maritime Environmental Management Report presents, for the first time in a consolidated format, key environmental and sustainability indicators for the maritime sector based on data from the Swachh Sagar portal. It is hoped that the report will assist ports, shipowners, seafarers, service providers, and regulators in identifying opportunities for improvement and collectively advancing a cleaner, safer, and more sustainable maritime future for India.

Shri. Shyam Jagannathan, IAS
Director General of Shipping &
Additional Secretary to the Government of India

MARINE ENVIRONMENTAL MANAGEMENT REPORT 2025

Message from the Chief Surveyor

The year 2025 marks a significant milestone in our journey toward a Sustainable Maritime Transportation System. Guided by the Digital India programme and the United Nations Sustainable Development Goals, the Indian Maritime Administration has evolved the "Swachh Sagar" portal into a comprehensive Indian Maritime Environmental Information Management Portal. This report, the first of its kind, provides a data-driven analysis of our environmental performance, covering carbon emissions, waste management, and global regulatory contributions.

Our efforts to monitor and reduce the environmental footprint of shipping are yielding measurable results. Key highlights from this year's report include:

- Decarbonization and Energy Efficiency: Between 2019 and 2024, we have seen a 3.3% reduction in carbon emissions per GT and a 9.5% reduction per deadweight tonne. The implementation of the IMO Data Collection System (DCS) and the upcoming Carbon Intensity Indicator (CII) ratings (A to E) will further drive operational efficiency across the Indian fleet.
- Green Policy Initiatives: We are aggressively pursuing the National Green Hydrogen Mission, aiming to make India a global hub for green fuels. Our Green Tug Transition Program sets an ambitious target to convert 50% of all tugs in major ports to green propulsion by 2030. Furthermore, the Harit Sagar Green Port Guidelines are accelerating the provision of shore power at all major ports, with a target for universal availability by 2025.
- Pollution Prevention: The proactive prohibition of Single Use Plastics (SUP) since 2019 has been highly effective, with over 70% of stakeholders reporting a successful reduction in plastic usage on board ships. Our portal now tracks the voluntary replacement of SUP items with sustainable alternatives like glass, steel, and biodegradable materials.
- Port Infrastructure: We continue to enhance Port Reception Facilities (PRF) through digital advance notifications (ANF). While the current conversion rate of ANFs to waste delivery stands at approximately 38%, we have identified top-performing ports, such as the Port Management Board of Andaman and Nicobar Islands and the Visakhapatnam Port Authority, as benchmarks for others to follow.

- Global Leadership: India's contribution to international regulations remains strong. Our proposal for a new Ballast Water Record Book format was unanimously adopted at IMO MEPC 80, standardizing record-keeping for seafarers worldwide.

While these achievements are commendable, the report also identifies critical areas for improvement, particularly in reducing emissions from coastal shipping, which currently accounts for 47.2% of total emissions from Indian ships. There is a significant opportunity to lower these figures through Just-In-Time (JIT) arrivals and the expanded use of shore power supply.

I urge all stakeholders—port authorities, ship owners, seafarers, and Recognized Organizations—to utilize the insights in this report to implement procedural changes. Our collective commitment to environmental stewardship will ensure that the Indian maritime sector remains a leader in sustainable global trade.

Shri. Ajithkumar Sukumaran
Chief Surveyor-cum-Addl. DG of Shipping (Engineering)
Directorate General of Shipping
Government of India

CO_2 Emissions from Indian Shipping and Initiatives for Green Shipping

Preface

Carbon Emission from Indian Ships

In order to have develop policies and regulations for CO2 emissions from international shipping, it was imperative to have an inventory of CO2 emissions from ships (which directly depends on the fuel consumption) and with this intention the IMO Data Collection System was started.

1. The data collection for IMO's fuel data collection system (DCS) started on 1 January 2019. DCS aggregates data such as fuel consumption, distance travelled and hours underway for individual ships of 5,000 GT and above.
2. To ensure compliance with IMO DCS:
    i. Ships of 5,000 GT and above have to submit annual reports on fuel consumption, distance travelled and hours underway to their Administration, according to the Methodology set out in Part II of the Ship Energy Efficiency Monitoring Plan (SEEMP).
    ii. Aggregated data will be reported to a ship's flag State after the end of each calendar year, which will need to verify that the data has been reported in accordance with the requirements before issuing a Statement of Compliance to the ship.
    iii. Administrations will submit aggregated data to IMO for anonymized publication.
3. To ensure that data from all ships are collected at one place, the Directorate has ensured the following:
    i. Ships of 5,000 GT & above (except those Certified as RSV/ICV) can report annual aggregated data to any Recognized Organization, which after verification can issue a Statement of Compliance, but the reporting of data to IMO is only delegated to IRS.
    ii. Ships of 5,000 GT & above and certified as RSV/ICV and ships of less than 5000 GT are required to report their annual aggregated fuel consumption data to IRS without any need for verification and issuance of any statement of compliance.
4. The Directorate reviews the aggregated data and publishes the annual fuel consumption data analysis report and in that series, this is the fourth review based on data collected for the calendar year 2024.

Key Statistics of CO2 emissions from Indian Shipping:

5. The information gathered demonstrates the following key information about carbon emissions from Indian Shipping:
    i. There is consistently about 20% of total emissions from ships less than 5,000 GT and those of 5,000 GT & above and certified as RSV or ICV.
    ii. Considering that: (a) all Ships of less than 5,000 GT on Coastal Run, (b) all Ships certified as RSV or ICV on Coastal Run and (c) Only 135 Ships of 5,000 GT and above on Foreign

Run, the emissions from Coastal run contributes to about 27.5% + 19.7% = 47.2% of total emissions from Indian Ships.

iii. The total emissions from Indian shipping is less than 5 Million MT and that from those on International voyages is about 2.56 Million MT. In 2018, as per the IMO 4th GHG Study, International shipping emitted 740 MT of CO_2 emissions and based on this data, Indian international shipping contribution is about 0.3%.

Size based analysis

6. The review of data based per GT and per deadweight provides following information:

i. CO_2 Emission per Ship (Million Tonnes/Ship) has remained at about 0.0056.

ii. Annual carbon emissions in Metric-Tons/GT has remained same at about 0.495 in 2022 and 2021 and when compared to 2019 (leaving 2020 due to impact of COVID-19) have reduced from 0.512 to 0.495, that is, about 3.3%.

iii. The Annual Carbon Emissions per Deadweight (Tons of Carbon Emissions /Deadweight) remained about 0.3 in 2022 and 2021 and when compared to 2019 (leaving 2020 due to impact of COVID-19) has reduced from 0.308 to 0.297, that is, about 9.5%.

7. The above all indicates that there is no much change in design energy efficiency, usage of alternate fuels or shore power supply to ships or shore power after 2020 and a small decrease is due to a very small number of ships using biofuels and being supplied by shore power supply.

Ships of 5000 GT & above except those Certified as RSV or ICV

8. These sizes of ships contribute to about 80% of total emissions from Indian ships. Further differentiation based on voyages, it is noted that only about 135 ships are on international voyages out of 236 total ships of 5,000 GT and above.

9. Out of 135 ships on international voyages, only about 49, that is 36.3% are underway for more than 50% of their operating time in a calendar year. Compared to these, there are about 101 vessels on coastal run and about 33, i.e. 32.6% are underway for more than 50% of their operational time. This indicates a huge possibility of reducing emissions through JIT & Shore Power supply.

10. Though tankers and bulk carriers contribute to about 46.5% and 23.5% of total carbon emissions from Ships of 5,000 GT & above respectively, their efficiency can be gauged from the fact that they emit on an average about 0.2 Tons carbon per deadweight compared to 0.61 by container, 0.46 by gas carriers and 0.35 by general cargo ships.

11. Operational Carbon Intensity

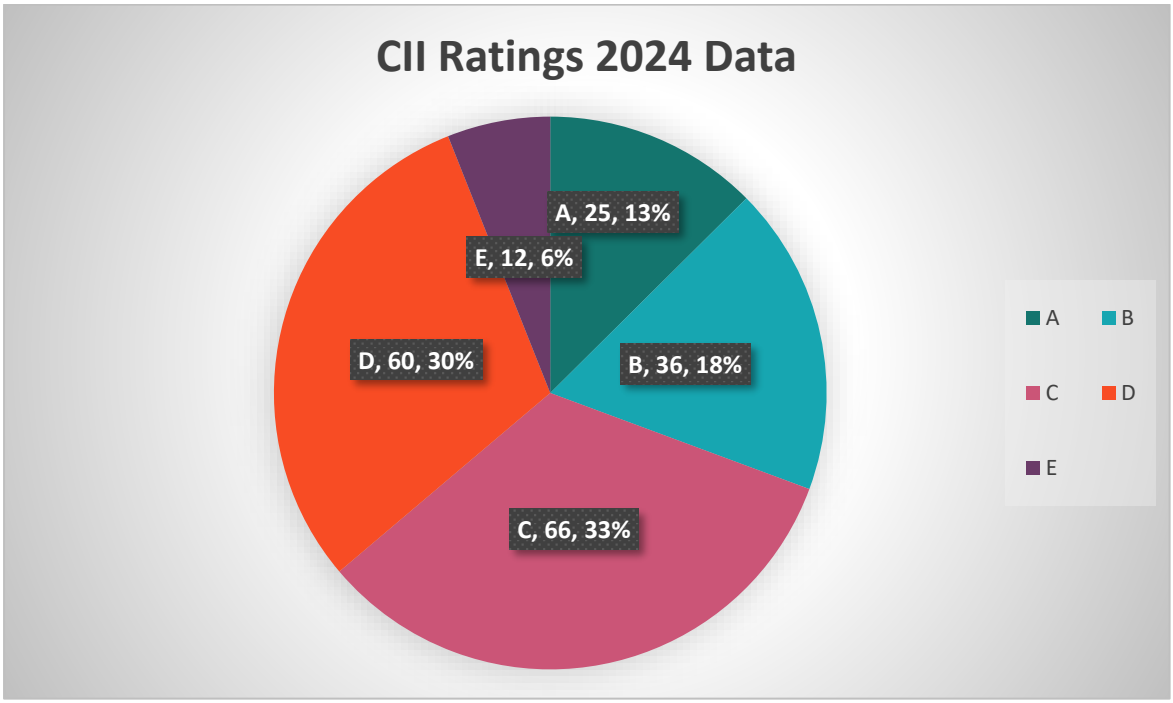
i. Starting in 2024, the Annual Attained CII must be reported based on the DCS data of the previous year to the DCS verifier. The CII rating (A to E) will then be assigned and mentioned on the Statement of Compliance (SoC) - Ship Fuel Oil Consumption Reporting and Operational CII Rating. While the rating will be assigned annually based

on the preceding year's fuel consumption data, the SOC is required to be kept on board for five years.

ii. A comparison between the Average AER of various ship types as detailed in IMO 4th GHG Study and that achieved by Indian Ships in 2022 demonstrates lower operational carbon intensity of Indian ships as can be seen below:

Ship Type	Vessel-based Average AER in 2018 from IMO 4th GHG Study	Vessel-based AER of Indian Ships
Bulk Carrier	3.8	5.27
Tanker	4.5	6.69
Container	9.5	9.48
General Cargo	14.4	16.51
Gas Carrier	11.5	9.01

An assessment has been done based on the data reported for 2024 and the projected CII Ratings are below-



Ships less than 5000 GT

12. Out of a total 867 Indian ships, these sizes of ship are about 612, i.e. 70.6% of total ships under the Indian registry. These sizes of ships emit about 19% of total emissions from Indian ships.

13. Compared to ships of 5,000 GT & above, Carbon Emission Tons per GT & Tons per deadweight is more than one, that is, about 1.52 & 1.6 respectively, indicating a composition comprising of a higher number of service vessels.

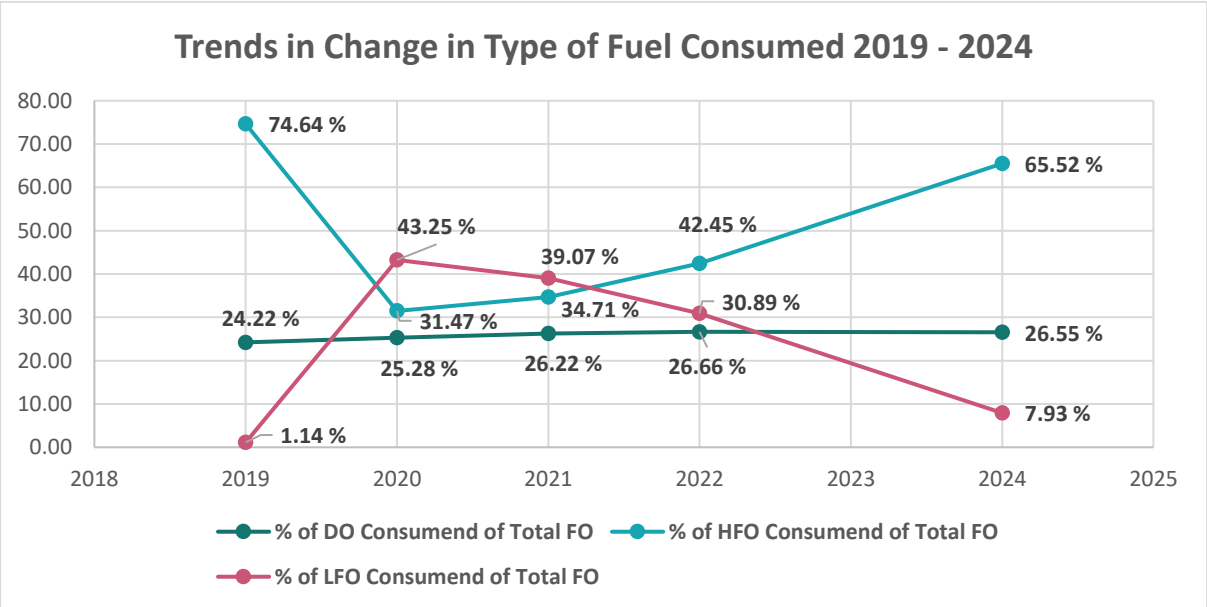
14. Compared to other types, Tugs & Offshore Supply vessels form a large part of this fleet and comprises about 274 and 87 vessels respectively, that is, about 45% and 14% respectively and about 59% in total.

15. Tugs emit about 0.201 Million Tons of Carbon per year and Offshore supply vessels about 0.3432 Million Tons of Carbon per year, that is, about 22% and 37.5% of all carbon emissions respectively from ships less than 5,000 GT and together they emit about 59.5%.

Fuel Consumption Data for 2024 Calendar Year

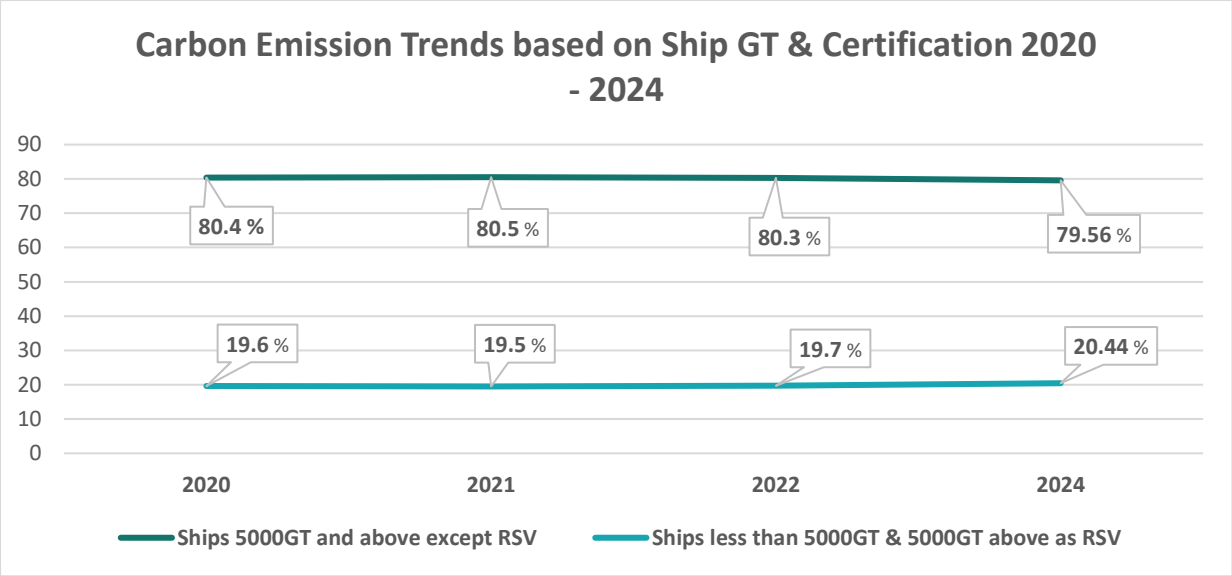
Comparative Carbon Emissions and Fuel Consumption: 2019-2024

Calendar Year	Gross Carbon Emissions (MT)	Gross Diesel Oil Consumption (MT)	Gross Heavy Fuel Oil Consumption (MT)	Gross Light Fuel Oil Consumption (MT)	Gross Total DO + HFO + LFO Consumption (MT)	Gross LNG Consumption (MT)
2024	4.95501	0.41871 (26.55%)	1.03355 (65.52%)	0.12509 (7.93%)	1.57735	0
2022	4.84659	0.41026 (26.7%)	0.65309 (42.4%)	0.47527 (30.9%)	1.53862	0
2021	4.96108	0.41231 (26.2%)	0.54576 (34.7%)	0.6143 (39.1%)	1.57237	0.00147
2020	4.62146	0.36908 (25.3%)	0.45948 (31.4%)	0.63151 (43.3%)	1.46007	0.006358
2019	5.14155	0.397025 (24.2%)	1.223486 (74.7%)	0.018 (1.1%)	1.63851	0



Carbon Emissions and Ship Categories: Calendar Year 2024

Ship Category	Carbon Emissions (Million Tones)	Percentage total Carbon Emissions
Ships of 5,000 GT & Above except RSV & ICV	3.94217	79.56%
RSV & ICV Ships of 5,000 GT & Above	0.032476	0.655%
Ships of less than 5,000 GT except RSV & ICV	0.820958	16.57%
RSV & ICV Ships of less than 5,000 GT	0.15941	3.22%
Total	4.955013	100%



*** Detailed data and analysis are presented in the Annexure to this section**

Efforts by Government of India to Reduce Emissions from Indian Ships

There are a number of Policy initiatives undertaken by GOI to transit Indian Shipping and Ports towards a greener regime. These include:

National Green Hydrogen Mission.

The overarching objective of the Mission is to make India the Global Hub for production, usage and export of Green Hydrogen and its derivatives. This will contribute to India's aim to become Aatmanirbhar (self-reliant) through clean energy and serve as an inspiration for the global Clean Energy Transition. The Mission will lead to significant decarbonisation of the economy, reduced dependence on fossil fuel imports, and enable India to assume technology and market leadership in Green Hydrogen.

Under the Mission, the Ministry of Ports, Shipping and Waterways (MoPSW) has been assigned a crucial role in establishing India's export capabilities for green hydrogen and its derivatives. MoPSW is required to facilitate development of the required infrastructure including storage bunkers, port operations equipment, and refuelling facilities. MoPSW is to also drive the adoption of hydrogen/derivatives (ammonia/methanol) as propulsion fuel for ships. The Ministry will also work towards making India as a green hydrogen/derivative refuelling hub.

The MoPSW is given the following targets:

"To build/retrofit two Indian ships to be powered by Green Hydrogen or its derivative fuels (Green Ammonia, green methanol etc.) by 2027, followed by annual addition of at least two ships powered by green fuels thereafter".

"To emerge as a green refuelling hub for maritime transport by establishing green refuelling bunkers connected to Green Hydrogen/Ammonia production facilities at all major ports".

The following target has already been completed:

i. Issuance of requirements for ships carrying liquefied hydrogen as Merchant Shipping Notice 6 of 2023.

ii. Three ports have been identified to develop as Hydrogen Hubs to accelerate the National Green Hydrogen Mission by providing logistical support for building hydrogen storage bunkers at three Indian ports in east, north, and south India by 2030, which will be scaled up to 12 Indian ports in the near future. The three key hydrogen storage hubs identified are Paradip Port in the east, Deendayal Port in Kandla, and V. O. Chidambaranar Port, formerly Tuticorin Port in Thoothukudi, Tamil Nadu.

Green Tug Transition Program

In terms of numbers, tugs constitute the biggest chunk of Indian Registered vessels with almost 32% of all Indian registered vessels being Tugs. They emit about 4% of emissions from Indian Ships and about 22% of emissions from all Indian ships less than 5,000 GT.

This policy initiative has set target-aims to ensure Green Tugs are working in all major ports by 2025, and 50% of all Tugs converted into Green Tugs by 2030. Green Hybrid Tugs are defined as ones which are initially powered by Green Hybrid Propulsion systems, and subsequently adopting non-fossil fuel solutions like (Methanol, Ammonia, Hydrogen).

Harit Sagar of Green Port Guidelines

The Maritime Vision 2030 has detailed sustainability initiatives to be undertaken by Indian ports and include initiatives such as supplying shore power to visiting ships in a three-phased manner by 2030, conversion of port vehicles and cargo handling equipment to greener fuels and shore power in a phased manner by 2030, establishing LNG bunkering stations at select ports in line with fuel adoption trends by shipping liners, increase usage of efficiency enhancements techniques such as ship-tracking and smart-lighting at ports to move towards CO2 and to build infrastructure (sewage treatment plant) in a 2-phase manner and develop oil spill response plans.

The Harit Sagar of Green Port guidelines issued in 2023 has brought forward the target date of all the above initiatives in order to reduce carbon emissions in port operations faster and create sustainable ports. It aims to:

i. Supply shore power at all major ports to all ships including EXIM by 2025.
ii. Explore the possibility of installation of “Desalination Plants” if not installed as an alternative of ground/surface water. This will enable the production of Green Hydrogen.
iii. Green Ammonia bunkers and refuelling facilities shall be established at all Major Ports by 2035.
iv. Ports shall make efforts to retrofit Port Crafts (including Tugs, Pilot Boats, Mooring Boats, Survey Boats etc.) with available technology for propulsion on cleaner and greener fuel viz., Green Ammonia, Green Hydrogen (through Fuel Cell), Green Methanol etc in phased manner.
v. Ships calling to the Port shall compulsorily declare type (as per MARPOL) and approximate quantity of waste on board and seek the Port’s assistance in disposing the same. All Ports shall provide shore reception facility, with approved vendors, for discharging the waste by ships calling at ports as per the Indian Rules.

vi. All future procurements of Port vehicles and cargo handling & other equipments shall preferably be electrically driven / electrically powered or should be compatible with low carbon greener fuels viz., CNG, Methanol, Ethanol, Ammonia, Hydrogen Fuel Cell etc.

Regulatory Efforts by Directorate to Facilitate Green Shipping

- The new amendments to MARPOL Annex VI related to EEXI and operational CII has been implemented on all ships including coastal ships.
- The Directorate has granted permission to Indian ships to operate on biofuels and its blends subject to being certified for sustainability. This will help ship owners to achieve desired CII reductions and shipping conglomerates to demonstrate their efforts towards sustainability.
- The Directorate has devised procedures for supply of shore power to ships with shore power requirements up to 150 KW. The Maritime Vision 2030 has set a target for all major trade to supply shore power to all ships in a three-phase manner by 2030. This has paved way to reduce GHG emissions in ports, while working towards a strategy to supply shore power to all visiting ships.
- Facilitating operation of a Green Coastal Shipping Corridor between Muldwarka and Surat/Navi Mumbai with ship operated on 30% biofuel blended diesel with shore power at both ends and just in time arrival.

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Annexure – Detailed Data on CO2 Emissions from Indian Shipping

Distribution and Size of Indian Shipping

Different Types and Numbers of Ships in Indian Flag only for the Purpose of Carbon Emissions

The Indian Ships are divided into following three categories for the purpose of fuel consumption data:

i. Ships of 5,000 GT and above Certified under MS Act: These ships are further sub-divided as to whether have been undertaking coastal or International voyages during the calendar year 2024.
ii. Ships less than 5,000 GT and Certified under MS Act.
iii. Ships registered as ICV or RSV

Category	Total Numbers	Average Age (Years)	Total GT	Total DWT
Ships of 5,000 GT and above Certified under MS Act	237	17.54	9332838	15830502
Ships of less than 5,000 GT and Certified under the MS Act	461	19.89	509883.1	484932.77
Ships of less than 5,000 GT registered as RSV	133	12.73	75827	66691.82
Ships of less than 5,000 GT registered as ICV	18	15.50	14817	15611.923
Ships of 5,000 GT and above are Certified as ICV	7	15.57	39323	57837.66
Gross Total	856	16.25	9.973 Million	16.456 Million

Ships of 5,000 GT and above Certified under MS Act:

Data based on coastal or foreign-run

Break-up of Ships of 5000 GT and above Certified under MS Act				
Based on Area of Operation	Total Numbers	Average Age	Total GT	Total DWT
Total	237	17.54	9332838	15830501.8
On Coastal Run	78	20.22	1972938	2963377.90
On International Run	159	16.23	7359900	12867123.94

Data based on Type and Area of Operation

Break-up of Ships of 5000 GT and above Certified under MS Act					
Type	Area of Operation	Total Numbers	Average Age	Total GT	Total DWT
Bulk Carrier	All	64	14.64	2514334	4639614.72
	International	59	14.46	2411688	4453286
	Coastal	5	16.8	102646	186329
Container	All	21	21.29	624510	809823.9
	International	10	19.4	338141	434553
	Coastal	11	23	286369	375271
Gas Carriers	All	22	17.59	903855	1068010
	International	16	18	618612	722228
	Coastal	6	16.5	285243	345782
General Cargo	All	1	21	12993	17477
	International	0	0	0	0
	Coastal	1	21	12993	17477
LNG Carrier	All	0	0	0	0
Tankers	All	102	18.22	5023835	9059967.2
	International	68	17.12	3912362	7187738
	Coastal	34	20.41	1111473	1872229
Passenger	All	7	11.14	56938	12765
	International	2	2.5	13657	2187
	Coastal	5	14.6	43281	10578
Dredgers (Other Cargo Ships)	All	13	21.85	105718	139072
	International	2	23.5	18710	25869
	Coastal	11	21.55	87008	113203
Cement Carriers (Other Cargo Ships)	All	2	16	33790	52747
	International	1	15	16102	25953
	Coastal	1	17	17688	26794
Heavy Lift Pipe Laying/Research Vessel/Transshipment Barge (Other Cargo Vessel)	All	3	12.33	42701	22474.18
	International	1	14	30628	15310.38
	Coastal	2	11.5	12073	7163.8

Ships less than 5000 GT and Certified under MS Act

Type	Further Designation	Total Numbers	Average Age	Total GT	Total DWT
Container	-	2	26.5	7470	9278.7
Gas Carrier	-	3	32.67	8727	6941
Passenger	All	42	21.95	40883	11344.57
	High Speed	12	19.33	3640	387.48
	Passenger Cum General Cargo	9	28	17827	6869.9
	Ferries	20	18.65	7487	1705
	Other	9	28	17827	6869.9
General Cargo	-	40	22.25	58728	86673.31
Tanker	-	5	17.20	7325	11115.66
Other	All	369	19.31	387072.1	359727.9
	Anchor Handling Tug (AHT)/AHT Cum Supply Vessels (AHTS)	41	17.37	74706	70576.47
	Tug/Tug cum Supply Vessel	209	19.51	134386	105643.2
	Dredgers	4	19.75	12032	14119.54
	Offshore Supply Vessel/Supply Vessel/Platform Supply Vessel	76	19.43	175485	195885.3
	Crew Boat/Utility Vessels/Work Boat	35	33.00	10037	6008.158
	Pilot Launch/Survey Launch	8	16.45	1568	999.452
	Mini Bulk Carrier	3	31	2214	2880
	Well Stimulation Vessel	1	38	2995	2189
	Cement Carrier	10	24.13	23834	31019.48
	Deck Loading Barge/Dumb Barge	2	48.5	1727.1	1595.94
	Research Vessel	3	17	5360	2359.96
	Diving Support Vessel	4	39.75	15249	8247
	Lighthouse Tender Vessel	1	22	2466	1347

Ships Certified under ICV Notification

Type	Further Designation	Total Numbers	Average Age	Total GT	Total DWT
Ships less than 5,000 GT Certified as ICV					
Total	-	18	15.5	14817.00	15611.92
Other Cargo	Tug	12	13.67	4026	2230.47
	Dredger	1	27	482	191.45
	General Cargo	3	13.33	8522	11087.80
Tanker	-	1	35	1609	2021.30
Ships of 5,000 GT & above Certified as ICV					
Total	-	7	15.57	39323.00	57837.66
Other Cargo	General Cargo	4	3.25	21058	31730.30
	-	3	32	18265	26107
Passenger	-	0	-	-	-
Ships less than 5,000 GT Certified as RSV					
Total	-	133	12.73	75827.00	66691.82
Other Cargo Ships	Crew Boat	1	15	18	2.88
	Pilot Launch/Security & Patrol Boat	5	19.67	424	65.85
	Tugs	96	11.65	35162	18488.32
	Diving Support/Offshore Support	2	15.5	2422	1624.68
	General Cargo	11	19	20948	27070.14
Tankers	Tanker	7	18.42857143	5873	7850.43

Definitions of Ships of less than 5,000 GT only for the purpose of Carbon Emissions and Trading Pattern assumptions

Sr. No	Ship Type	Remarks
1	Bulk Carrier	A ship which is intended primarily to carry dry cargo in bulk, including such types as ore carriers as defined in regulation 1 of chapter XII of the International Convention for the Safety of Life at Sea (SOLAS), 1974, (as amended) but excluding combination carriers.
2	Gas Carrier	A cargo ship, other than an LNG carrier, constructed or adapted and used for the carriage in bulk of any liquefied gas.
3	Tanker	An oil tanker as defined in regulation MARPOL Annexure I or a chemical tanker or an NLS tanker as defined in regulation 1 MARPOL Annexure II
4	Container	Ship designed exclusively for the carriage of containers in holds and on deck.
5	General cargo	Ship with a multi-deck or single-deck hull designed primarily for the carriage of general cargo.
6	Passenger Ship	A ship which carries more than 12 passengers.
7	High Speed Passenger Craft	Passenger ships complying with HSC Code

Sr. No	Ship Type	Remarks
8	Dredgers	Ship engaged in Dredging operation
9	Tug	Ships which aid the mooring or berthing operation of a ship by either towing or pushing a vessel towards the port.
10	Anchor Handling Tug Supply Vessel	Tugs which are also involved in anchor handling operation and to supply essentials to other vessel/platform.
11	Offshore Support / Supply Vessel	Vessels intended for several roles/services related to offshore support
12	Utility Vessel	Vessels used for multipurpose activities such as towing, other miscellaneous works, etc.
13	Launch	Typically, a small (L < 24m) self-propelled vessel which can be used for various purposes such as mooring, hydrographic surveys, transporting marine pilots, and carrying not more than 12 passengers. Such vessels may be of the open, partially open or closed type.
14	Crew Boat	Vessels used for transporting crew of other vessels etc. with number of transported crew limited to 12. Alternatively, the requirements specified by the Administration (IP/SPS).
15	Others	Includes: Research vessels, Floating crane, Lighthouse tender, Buoy tender vessel, Security & Patrol Boat, Pipe-Laying/hook-up barge

Voyage based distribution of Carbon Emissions from Ships of 5,000 GT & above excluding RSV & ICV

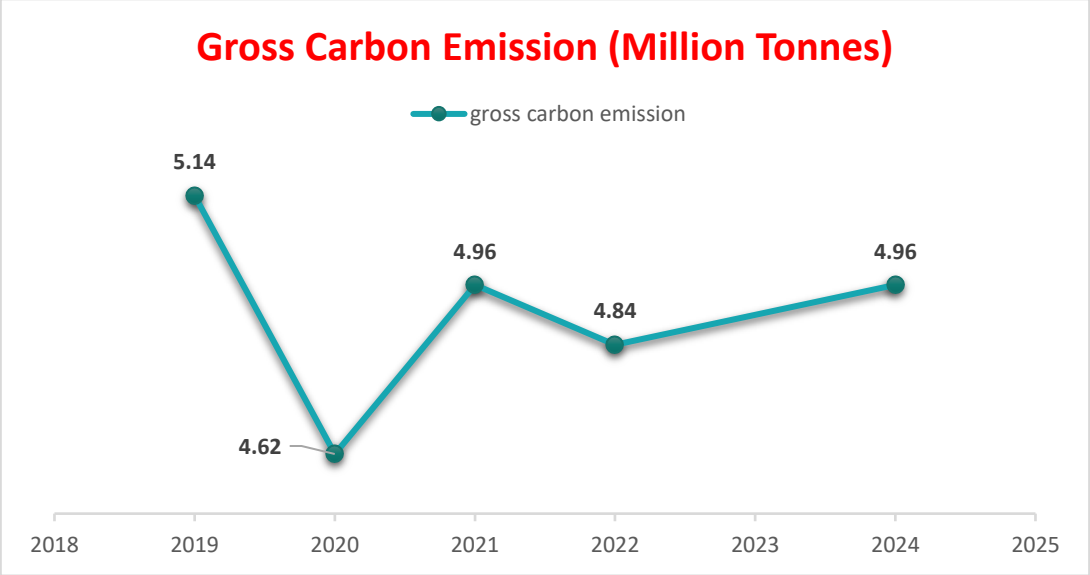
Operations	Total Number of Ships	Carbon Emissions in Million Tons	Percentage of total carbon emissions from Indian ships	Percentage of total carbon emission from ships of 5000 GT & above, except RSV & ICV
2022 (Coastal)	101	1.332515	27.5%	34.2%
2022 (International)	135	2.557853	52.8%	65.8%
2024 (Coastal)	78	1.059629	21.99%	26.88%
2024 (International)	159	2.882540	58.17%	73.12%

Considering the following:

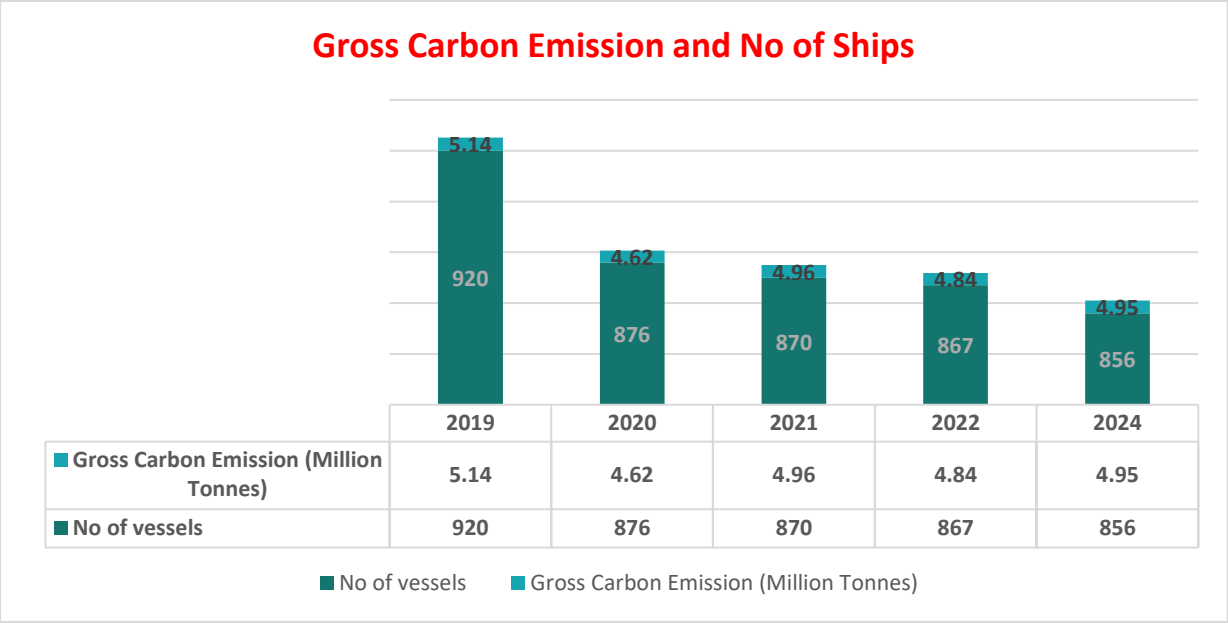
i. All Ships of less than 5,000 GT on Coastal Run.
ii. All Ships certified as RSV or ICV on Coastal Run.
iii. Only 135 Ships of 5,000 GT and above on Foreign Run

The emissions from Coastal run contributes to about 27.5% + 19.7% = 47.2% of total emissions from Indian ships.

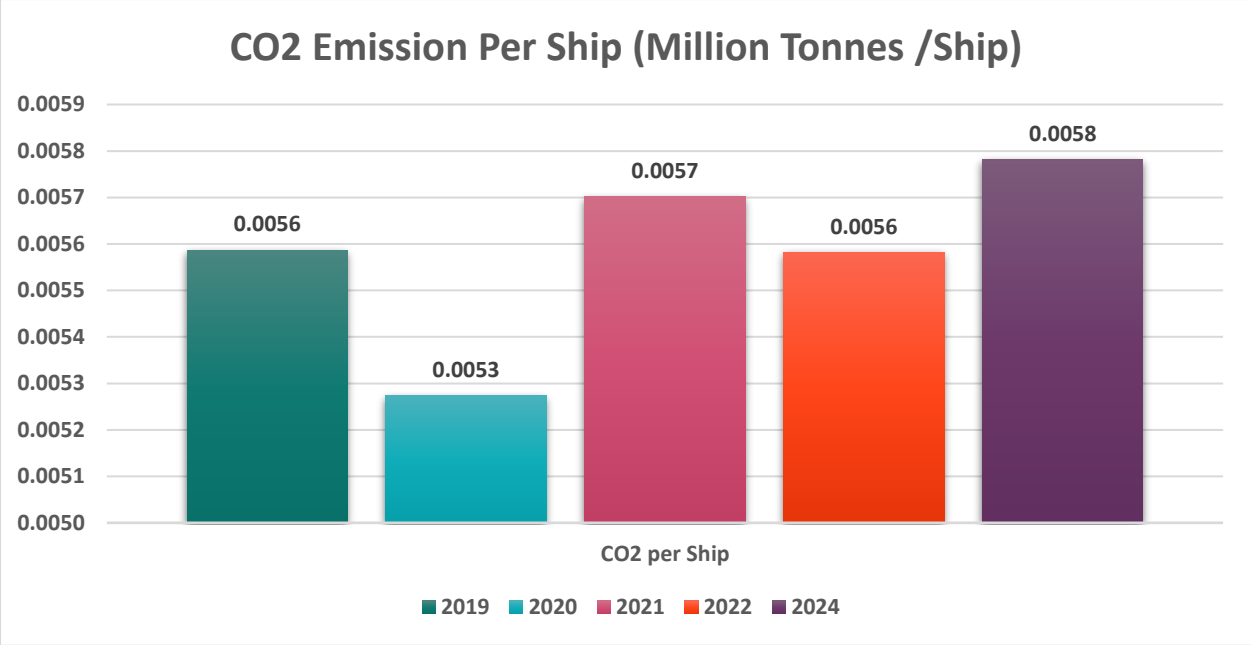
Carbon Emission from Indian Ships

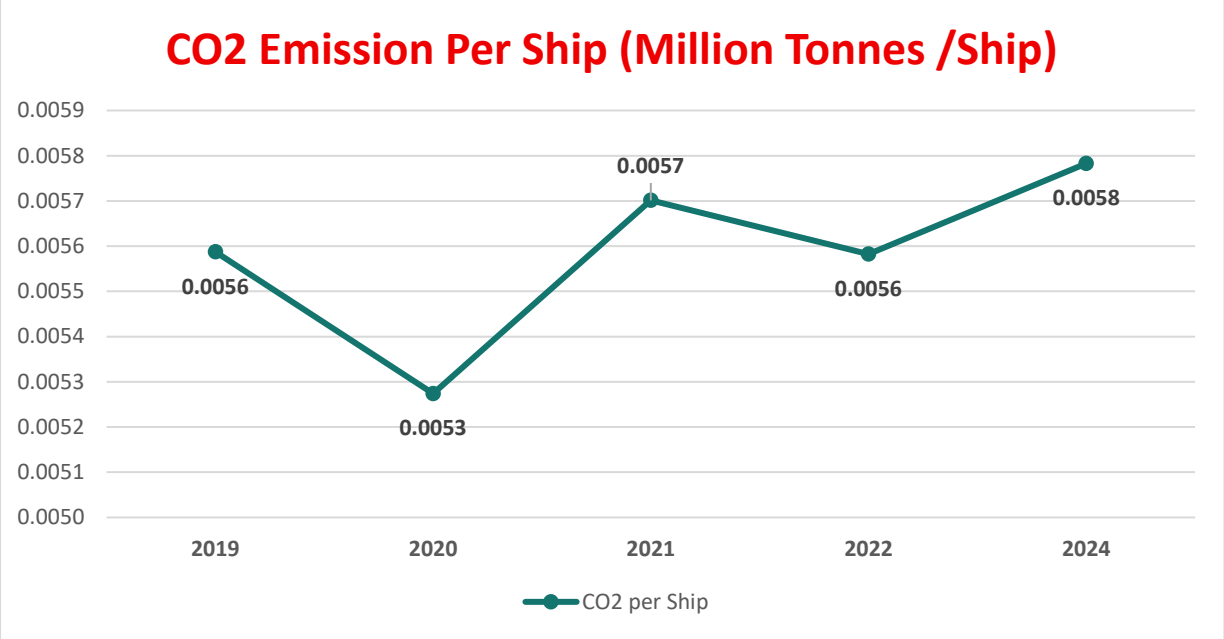


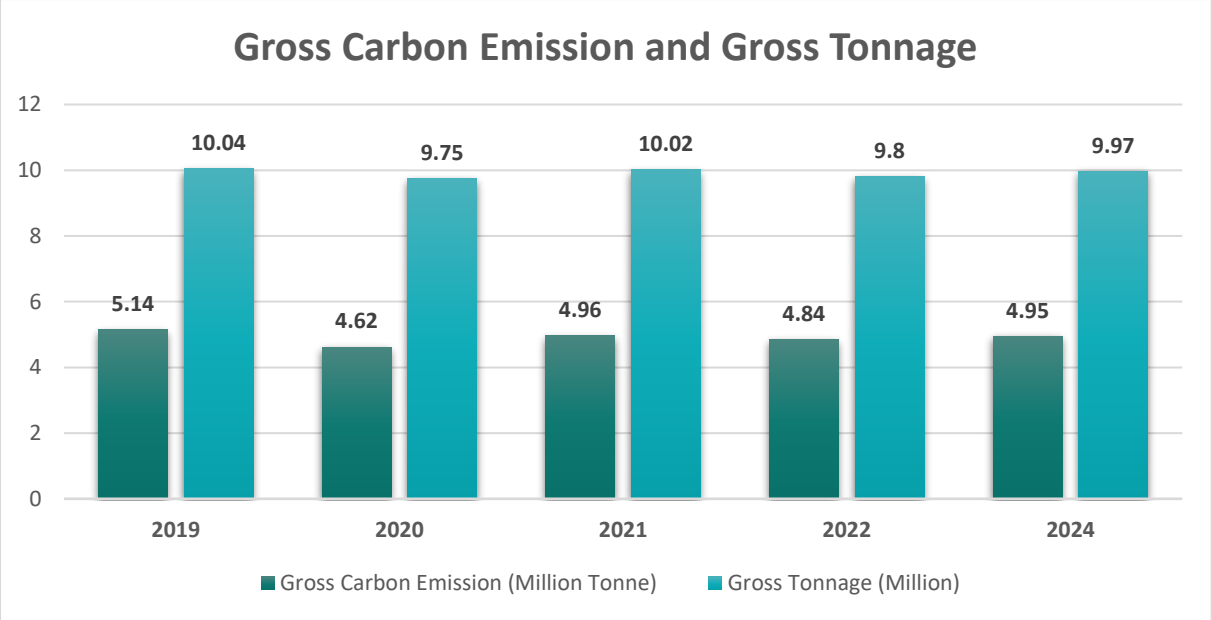
Carbon Emission Vs Number of Ships

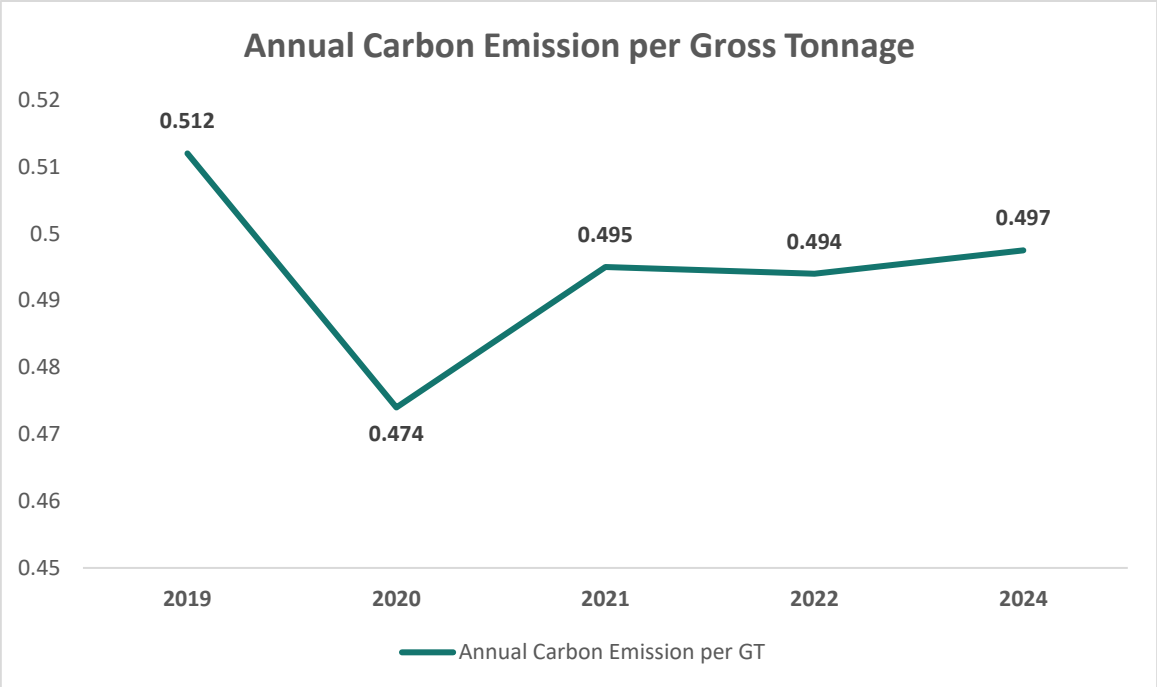


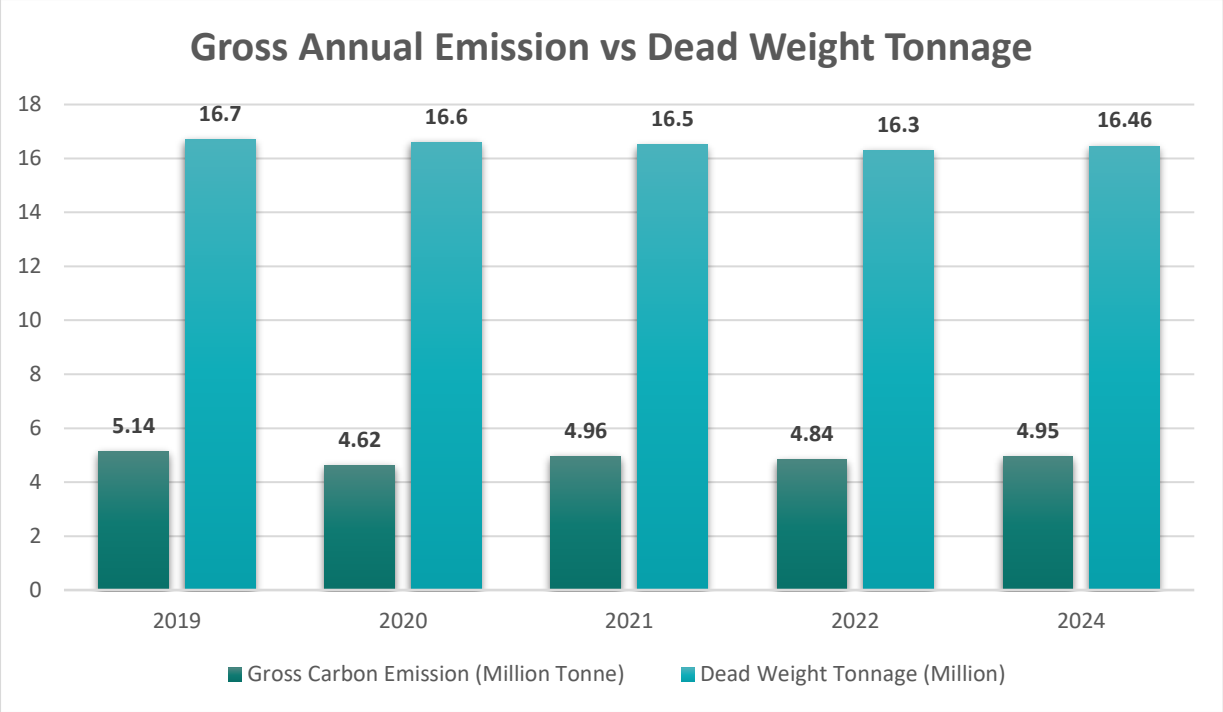
	2019	2020	2021	2022	2024
Gross Carbon Emission (Million Tonnes)	5.14	4.62	4.96	4.84	4.95
No of vessels	920	876	870	867	856

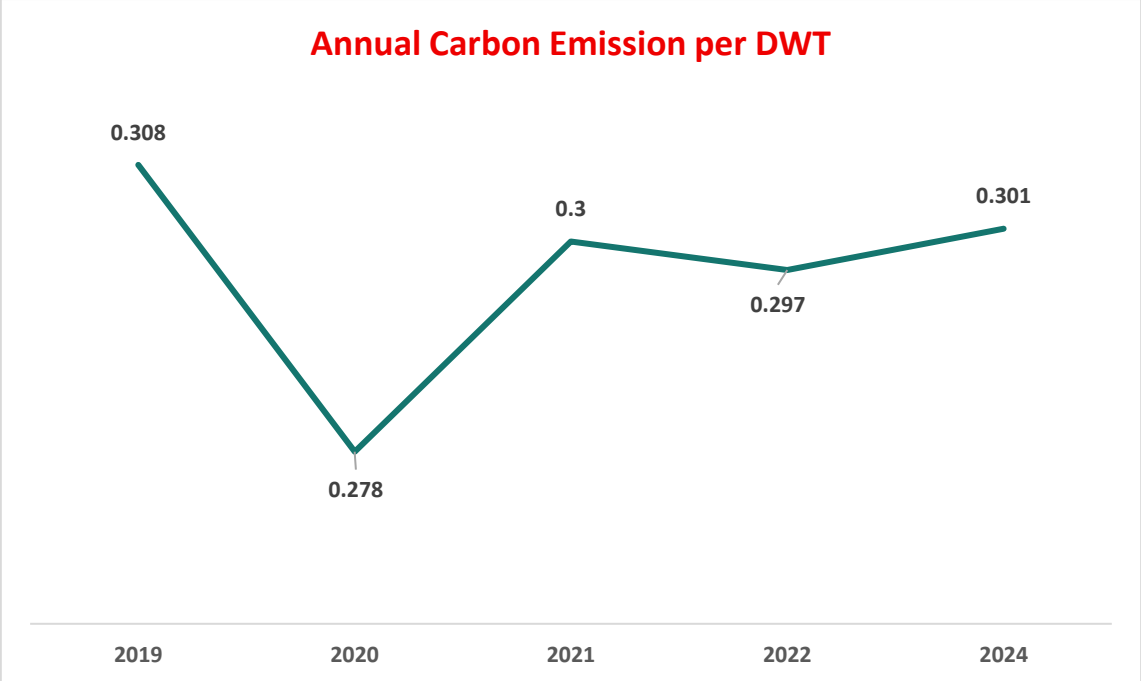

CO2 Emission Per Ship (Million Tonnes /Ship)
0.0059
0.0058
0.0057
0.0056
0.0055
0.0054
0.0053
0.0052
0.0051
0.0050
0.0056
0.0053
0.0057
0.0056
0.0058
CO2 per Ship
2019
2020
2021
2022
2024


CO2 Emission Per Ship (Million Tonnes /Ship)
0.0059
0.0058
0.0057
0.0056
0.0055
0.0054
0.0053
0.0052
0.0051
0.0050
0.0056
0.0053
0.0057
0.0056
0.0058
2019
2020
2021
2022
2024
CO2 per Ship


Gross Carbon Emission and Gross Tonnage
12
10
8
6
4
2
0
10.04
9.75
10.02
9.8
9.97
5.14
4.62
4.96
4.84
4.95
2019
2020
2021
2022
2024
Gross Carbon Emission (Million Tonne)
Gross Tonnage (Million)


Annual Carbon Emission per Gross Tonnage
0.52
0.51
0.5
0.49
0.48
0.47
0.46
0.45
0.512
0.474
0.495
0.494
0.497
2019
2020
2021
2022
2024
Annual Carbon Emission per GT


Gross Annual Emission vs Dead Weight Tonnage
18
16
14
12
10
8
6
4
2
0
16.7
16.6
16.5
16.3
16.46
5.14
4.62
4.96
4.84
4.95
2019
2020
2021
2022
2024
Gross Carbon Emission (Million Tonne)
Dead Weight Tonnage (Million)


Annual Carbon Emission per DWT
0.308
0.278
0.3
0.297
0.301
2019
2020
2021
2022
2024

Carbon Emissions from Ships of 5000 GT & above except RSV & ICV

Basic Values of Fuel Consumption and Carbon Emissions

Calendar Year	Gross Carbon Emissions (MT)	Gross Diesel Oil Consumption (MT)	Gross Heavy Fuel Oil Consumption (MT)	Gross Light Fuel Oil Consumption (MT)	Gross Total DO + HFO + LFO	Total Number of Ships
2024 (All)	3.94216925	0.113924	1.024619	0.122585	1.261128	237
2024 (Coastal)	1.05962916	0.054724	0.24516	0.038323	0.338207	78
2024 (International)	2.88254009	0.0592	0.779459	0.084262	0.922921	159
2022 (All)	3.8903	0.122377	0.646436	0.471286	1.240099	236
2021 (All)	3.994991	0.120764	0.539505	0.610521	1.27079	242
2022 (Coastal)	1.332515	0.061231	0.196999	0.165901	0.424131	101
2021 (Coastal)	1.48556	0.080808	0.267322	0.125063	0.473193	113
2022 (International)	2.557853	0.055984	0.449437	0.305385	0.76042	135
2021 (International)	2.509405	0.039956	0.272182	0.485458	0.797596	129

Data based on Ship Type

Ship Type	No. of Ships	DO Consumption	HFO Consumption	LFO Consumption	LNG Consumption	CO2 Emissions (Million Tones)
Tanker	102	43964	543276	15858	0	1.882679
Bulk Carrier	64	12386	208341	58508	0	0.872842
Container	21	1774	100965	36506	0	0.435123
Gas Carrier	22	1971	139993	11618	0	0.478866
General cargo	1	55	2620	0	0	0.008335
Passenger Vessels	7	19456	2579	0	0	0.070407
LNG Carrier	0	0	0	0	0	0.000000
Others	20	34318	26845	95	0	0.193918
Total	**237**	**113924**	**1024619**	**122585**	**0**	**3.942169245**

Data based on Ship Age Profile

Age of the ship	No. of Ships	DO Consumption (tones)	HFO Consumption (tones)	LFO Consumption (tones)	LNG consumption (tones)	CO2 Emissions (million tons)
0-5 years	3	6041	2155	0	0	0.026078116
5-10 years	10	9453	37902	8475	0	0.175037871
10-15 years	64	36827	302871	17143	0	1.115225249
15-20	79	23084	405578	43111	0	1.472819957
20-25 years	53	15419	208847	24892	0	0.778217564
25 and above	28	23100	67266	28964	0	0.374790488
Total	**237**	**113924**	**1024619**	**122585**	**0**	**3.942169245**

Important Gross Data

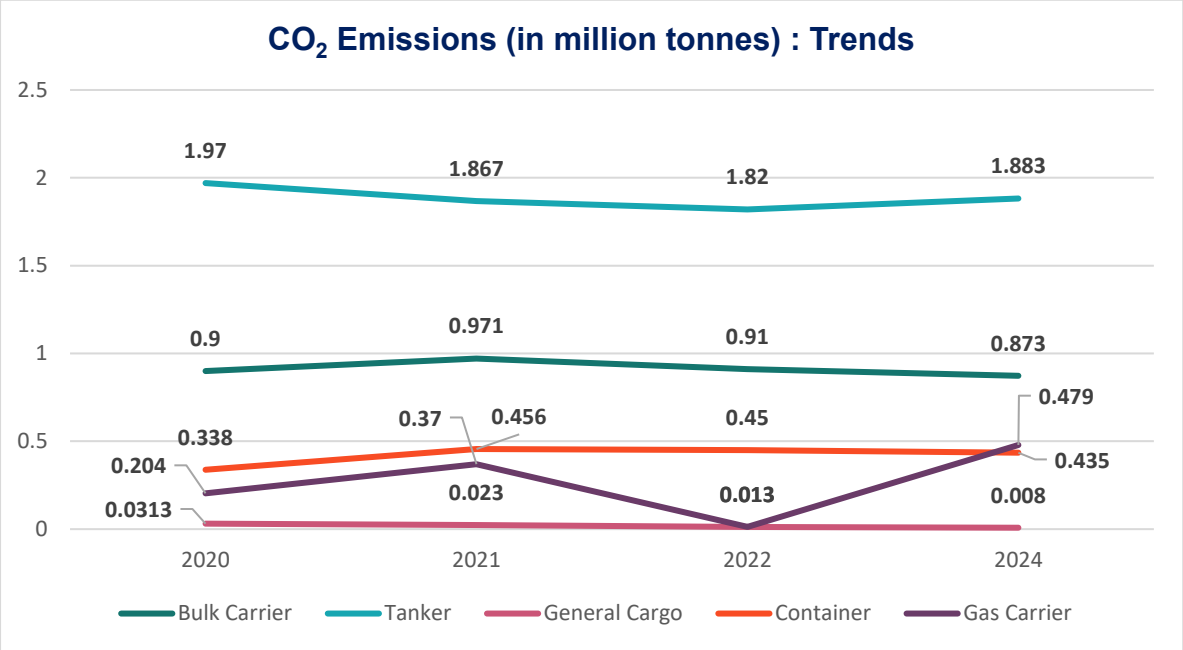
Data (Vessels of > = 5,000 GT)	2020	2021	2022	2024
Numbers	233	242	236	237
Total GT in Millions	9.06	9.3	9.21	9.33
Total Deadweight in Millions	15.52	15.77	15.56	15.83
Average Age	15	15	16	17.54
Hours Underway	861419	872356.7	878224.08	954266
Percentage of hours underway of total hours in the calendar year	42.20%	41.10%	42.48%	108.93
Total CO2 Emissions in Million Tonnes	3.71	3.99	3.89	3.94
CO_2 Emissions/GT	0.41	0.43	0.42	0.42
CO_2 Emissions/Deadweight	0.24	0.253	0.250	0.249
CO_2 Emissions/Hours Underway in Carbon Emissions in tons/hr underway	4.306	4.57	4.43	4.13
Average gm-CO_2/DWT-NM for ship types Bulk Carrier, General Cargo, Tanker, Container, Gas Carrier, LNG Carrier				
Average gm-CO_2/DWT-NM (numbers)	8.0 (205)	8.73 (214)	8.04 (210)	78.99 (237)
Average gm-CO_2/DWT-NM (numbers) underway for less than 1000 Hrs.	13.3 (15)	13.6 (15)	20.93 (13)	1232.79 (13)
Average gm-CO_2/DWT-NM (numbers) underway between 1000 – 2000 Hrs	9.61 (10)	10.5 (16)	10.61(5)	27.82 (17)
Average gm-CO_2/DWT-NM (numbers) underway between 2000 – 3000 Hrs	10.79 (26)	9.45 (44)	7.13(41)	16.26 (30)
Average gm-CO_2/DWT-NM (numbers) underway between 3000 – 4000 Hrs	8.38 (54)	9.85 (46)	7.56 (63)	9.17 (51)
Average gm-CO_2/DWT-NM (numbers) underway between 4000 – 5000 Hrs	6.55 (65)	7.05 (49)	6.91(48)	7.22 (57)
Average gm-CO_2/DWT-NM (numbers) underway more than 5000 Hrs	5.29 (35)	6.39 (44)	6.60(40)	12.40 (69)

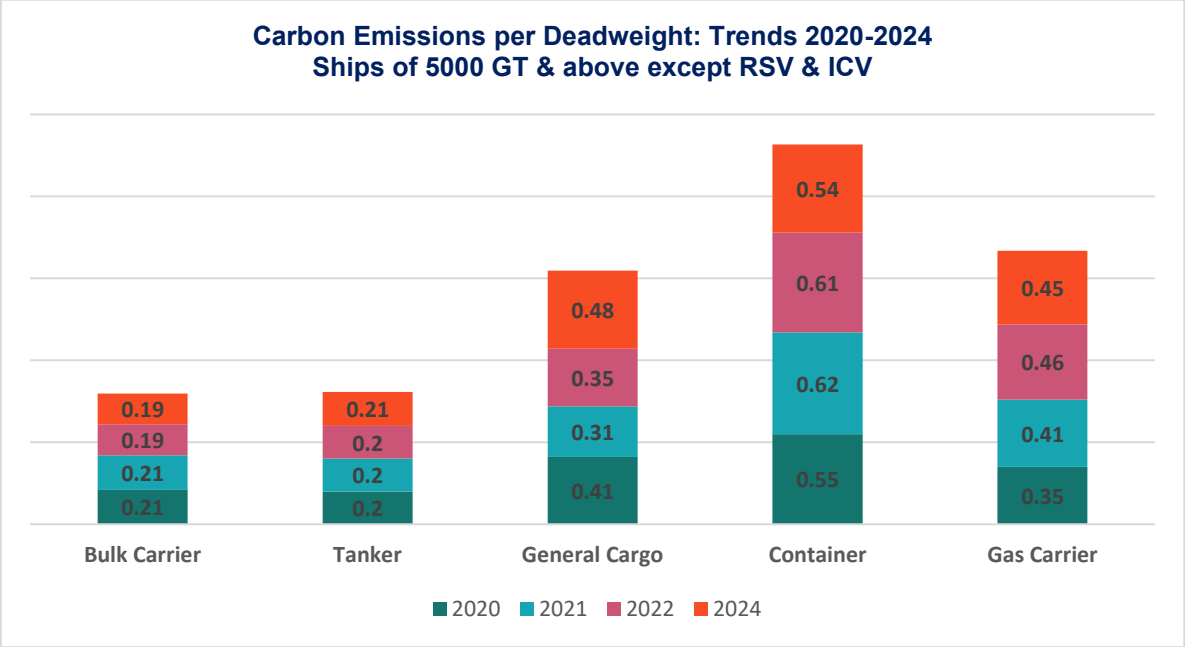
Hours underway ships > = 5,000 GT	International			Coastal			Total		
	2021	2022	2024	2021	2022	2024	2021	2022	2024
Underway for less than 10% of total hours in a calendar year	5	8	6	16	9	5	21	17	11
Underway for 10-20% of total hours in a calendar year	8	7	7	9	2	2	17	9	9
Underway for 20-30% of total hours in a calendar year	13	10	12	12	12	15	25	22	27
Underway for 30-40% of total hours in a calendar year	24	33	23	21	25	17	45	58	40
Underway for 40-50% of total hours in a calendar year	24	28	35	19	20	12	43	48	47
Underway for 50-60% of total hours in a calendar year	37	26	35	14	16	10	51	42	45
Underway for 60-70% of total hours in a calendar year	16	21	27	10	9	9	26	30	36
Underway for more than 70% of the total hours in a calendar year	2	2	13	11	8	8	13	10	21
Gross Total	129	135	158	113	101	78	242	236	236

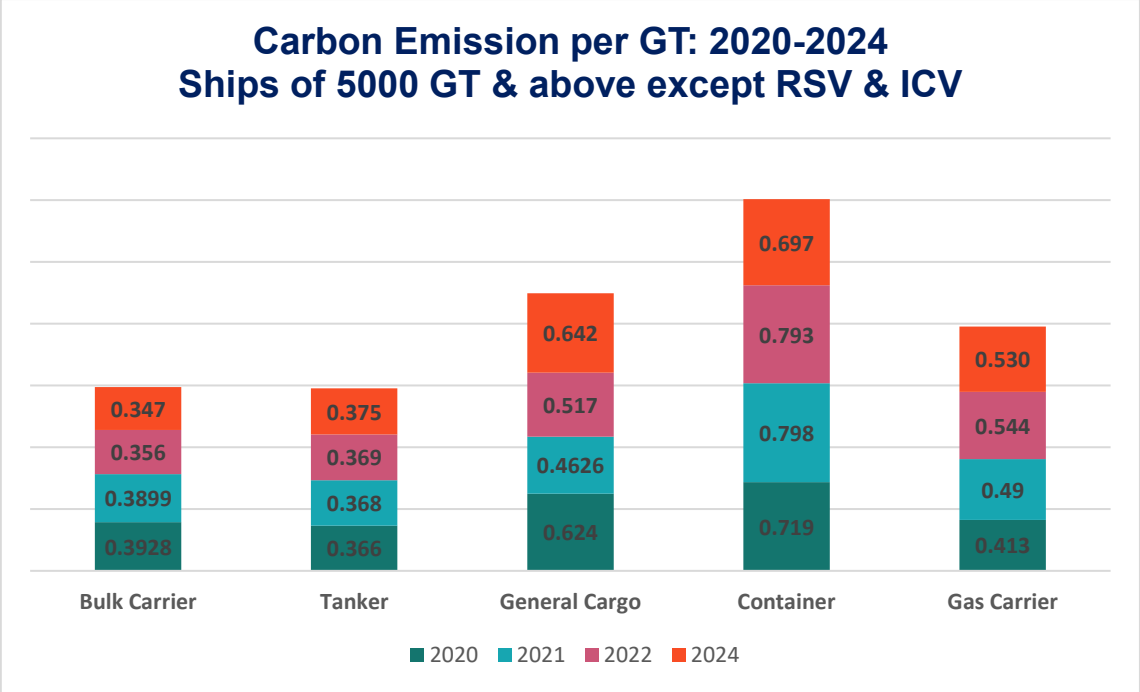
Ships of 5000 GT & Above Except RSV & ICV					
Ship Type	**Total Numbers**	**Run**	**Average Percentage of time underway out of total available time**	**Average CO_2 Emissions Per DWT-NM**	**Total Carbon Emissions/% Carbon Emission as total emissions from ships of 5000 GT & above**
Bulk Carrier	64	Coastal + International	46.07%	5.272	872842.098 / 22.14%
	59	International	47.66%	4.744	840829.671 / 21.33%
	5	Coastal	27.65%	11.399	32012.427 / 0.81%

Container	21	Coastal + International	59.48%	9.477	435122.86 /11.04%
	10	International	57.99%	9.662	231734.148 / 5.88%
	11	Coastal	60.83%	9.309	203388.712 / 5.16%
Gas Carrier	22	Coastal + International	53.18%	9.013	478865.546 / 12.15%
	6	Coastal	53.81%	7.495	321442.056 / 8.15%
	16	International	51.48%	9.583	157423.49 / 3.99%
Note: The poor figures of International going Gas Carriers is due to one vessel that was operational only for about 9.8% of its total operational time in the year.					
Tankers	102	Coastal + International	38.60%	6.693	1882678.606 / 47.76%
	34	Coastal	32.80%	8.508	1448632.096 / 36.75%
	68	International	43.05%	5.785	434046.51 / 11.01%
Note: One Coastal tanker was non-operational during 2022 and removing the same, the Average CO_2 Emissions Per DWT-NM for tankers shall increase from 7.72 to 7.8053 and for coastal tankers from 9.88 to 10.11.					

Trends


CO_2 Emissions (in million tonnes) : Trends
2.5
2
1.5
1
0.5
0
1.97
1.867
1.82
1.883
0.9
0.971
0.91
0.873
0.338
0.37
0.456
0.45
0.479
0.204
0.435
0.0313
0.023
0.013
0.008
2020
2021
2022
2024
Bulk Carrier
Tanker
General Cargo
Container
Gas Carrier


Carbon Emissions per Deadweight: Trends 2020-2024
Ships of 5000 GT & above except RSV & ICV
0.19
0.19
0.21
0.21
0.21
0.2
0.2
0.2
0.48
0.35
0.31
0.41
0.54
0.61
0.62
0.55
0.45
0.46
0.41
0.35
Bulk Carrier
Tanker
General Cargo
Container
Gas Carrier
2020
2021
2022
2024



Bulk Carriers of 5000 GT and Above

Bulk carriers >= 5000 GT	ALL		International		Coastal	
	2022	2024	2022	2024	2022	2024
Numbers	67	64	53	59	14	5
Total GT in Millions	2.544	2.514	2.15	2.412	0.385	0.103
Total Deadweight in Millions	4.65	4.640	3.955	4.453	0.702	0.186
Average Age	13	14.64	12	14.46	18	16.8
Hours underway	255629	254261	203864	242150	51765	12111
Percentage of hours underway of total hours in the calendar year	43.55%	45.35%	43.91%	46.85%	42.21%	27.65%
Total CO_2 Emissions (Million Tonnes)	0.906	0.873	0.750	0.841	0.157	0.032
Average CII (t-CO_2/DWT-NM)	5.85	5.272	5.14	4.744	8.57	11.399

Data (Bulk Carriers > = 5000 GT): 2022& 2024	All		International		Coastal	
	2022	2024	2022	2024	2022	2024
All (gm-CO_2/DWT-NM)	5.85(67 Nos.)	5.27 (64)	5.13 (53 Nos.)	4.74 (59)	8.57 (14Nos)	5.27 (5)
gm-CO_2/DWT-NM for vessels underway for less than 1000 Hrs.	4.64 (1)	3.85 (3)	4.64 (1)	3.85 (3)	0	0
gm-CO_2/DWT-NM for vessels underway between 1000 – 2000 Hrs	6.61 (1)	8.19 (4)	6.61 (1)	6.16 (3)	0	14.26 (1)
gm-CO_2/DWT-NM for vessels underway between 2000 – 3000 Hrs	6.32 (18)	9.18 (7)	6.057(14)	6.50 (4)	7.23(4)	12.74 (3)
gm-CO_2/DWT-NM for vessels underway between 3000 – 4000 Hrs	5.36(21)	4.86 (13)	5.30(16)	4.91 (12)	5.568(5)	4.51 (1)
gm-CO_2/DWT-NM for vessels underway between 4000 – 5000 Hrs	6.80(11)	4.95 (19)	5.887(8)	4.95 (19)	9.246(3)	0
gm-CO_2/DWT-NM for vessels underway more than 5000 Hrs	5.31(15)	3.89 (17)	3.39(13)	3.89 (17)	17.77(2)	0

Tankers of 5,000 GT and Above

Tankers >= 5.000 GT	All		International Run		Coastal Run	
	2022	2024	2022	2024	2022	2024
Numbers	100	102	57	68	43	34
Total GT in Millions	4.91	5.024	3.55	3.912	1.36	1.111
Total Deadweight in Millions	8.88	9.060	6.60	7.188	2.27	1.872
Average Age	16	18.22	14	17.12	19	20.41
Hours underway	338680	389347	215004	280364	123676	108983
Percentage of hours underway of total hours in calendar year	38.66%	43.57%	43.06%	47.07%	32.83%	36.56%
Total CO_2 Emissions (Million Tonnes)	1.815	1.883	1.299	1.449	0.516	0.434
Average CII (t-CO_2/DWT-NM)	7.72	6.693	6.101	5.785	9.88	8.508

Data (Tankers > = 5,000 GT):	All		International		Coastal	
	2022	2024	2022	2024	2022	2024
All	7.727 (100)	6.70 (102)	6.101 (57)	5.79 (68)	9.88 (43)	6.70 (34)
gm-CO2/DWT-NM for vessels underway for less than 1000 Hrs.	16.06 (11)	14.20 (2)	13.41 (6)	17.97 (1)	19.24 (5)	10.42 (1)
gm-CO2/DWT-NM for vessels underway between 1000 – 2000 Hrs	8.45 (2)	8.21 (10)	7.47 (1)	6.65 (6)	9.42 (1)	10.56 (4)
gm-CO2/DWT-NM for vessels underway between 2000 – 3000 Hrs	9.41 (19)	7.92 (17)	6.50 (6)	7.84 (10)	7.83 (13)	8.04 (7)
gm-CO2/DWT-NM for vessels underway between 3000 – 4000 Hrs	7.71 (34)	7.26 (28)	5.385 (16)	5.60 (13)	9.78 (18)	8.70 (15)
gm-CO2/DWT-NM for vessels underway between 4000 – 5000 Hrs	5.88 (23)	6.03 (21)	5.53 (17)	5.60 (15)	6.88 (6)	7.11 (6)
gm-CO2/DWT-NM for vessels underway more than 5000 Hrs	3.68 (11)	4.48 (24)	3.68 (11)	4.36 (23)	0	7.23 (1)

Containers of 5,000 GT and Above

Containers >= 5,000 GT	All		International		Coastal	
	2022	2024	2022	2024	2022	2024
Numbers	21	21	6	10	15	11
Total GT in Millions	0.571	0.625	0.214	0.338	0.357	0.286
Total Deadweight in Millions	0.737	0.810	0.272	0.435	0.465	0.375
Average Age	20.67	21.29	19	19.4	21	23
Hours underway	103548	109417	32956	50797	70592	58620
Percentage of hours underway of total hours in the calendar year	59.10%	59.48	62.70%	57.99%	53.72%	60.83%
Total CO_2 Emissions (Million Tonnes)	0.453	0.435	0.203	0.232	0.250	0.203
Average CII (t-CO_2/DWT-NM)	10.80	9.48	11.31	9.66	10.59	9.31

Data (Containers > = 5,000 GT)	All		International		Coastal	
	2022	2024	2022	2024	2022	2024
All	10.80(21)	9.48 (21)	11.31(6)	9.66 (10)	10.59(15)	9.48 (11)
gm-CO_2/DWT-NM for vessels underway for less than 1000 Hrs.	0	0	0	0	0	0
gm-CO_2/DWT-NM for vessels underway between 1000 – 2000 Hrs	0	0	0	0	0	0
gm-CO_2/DWT-NM for vessels underway between 2000 – 3000 Hrs	0	0	0	0	0	0

gm-CO_2/DWT-NM for vessels underway between 3000 – 4000 Hrs	12.469 (3)	7.30 (4)	0	7.29 (2)	12.469 (3)	7.30 (2)
gm-CO_2/DWT-NM for vessels underway between 4000 – 5000 Hrs	9.96 (6)	11.39 (4)	0	10.72 (2)	9.96 (6)	12.05 (2)
gm-CO_2/DWT-NM for vessels underway more than 5000 Hrs	10.80 (12)	9.56 (13)	11.31 (6)	10.01 (6)	10.29 (6)	9.1 (7)

Gas Carriers of 5,000 GT and Above

Gas Carriers >= 5,000 GT	All		International Run		Coastal Run	
	2022	2024	2022	2024	2022	2024
Numbers	19	22	13	16	6	6
Total GT in Millions	0.787	0.904	0.502	0.619	0.285	0.285
Total Deadweight in Millions	0.926	1.068	0.581	0.722	0.345	0.346
Average Age	17	17.59	17.61	18	14.5	16.5
Hours underway	70130	102479	42593	75421	27537	27058
Percentage of hours underway of total hours in the calendar year	42.14%	53.17%	37.40%	53.81%	52.39%	51.48%
Total CO_2 Emissions (Million Tonnes)	0.429	0.479	0.262	0.321	0.167	0.157
Average CII (t-CO_2/DWT-NM)	13.56	8.58	16.25	9.58	7.71	7.50

Data (Gas Carrier > = 5,000 GT):	All		International		Coastal	
	2022	2024	2022	2024	2022	2024
All	13.56 (19)	9.01 (22)	16.25(13)	5.79 (16)	7.71(6)	9.01 (6)
gm-CO_2/DWT-NM for vessels underway for less than 1000 Hrs.	90.84 (1)	8.5 (1)	90.84 (1)	8.5 (1)	0	0
gm-CO_2/DWT-NM for vessels underway between 1000 – 2000 Hrs	15.084(1)	0.00	15.084(1)	0	0	0
gm-CO_2/DWT-NM for vessels underway between 2000 – 3000 Hrs	8.85(3)	0.00	8.85(3)	0	0	0
gm-CO_2/DWT-NM for vessels underway between 3000 – 4000 Hrs	12.28(4)	12.63 (3)	12.28(4)	14.79 (2)	0	8.31 (1)
gm-CO_2/DWT-NM for vessels underway between 4000 – 5000 Hrs	7.73(8)	7.55 (12)	7.62(3)	7.61 (8)	7.80(5)	7.44 (4)
gm-CO_2/DWT-NM for vessels underway more than 5000 Hrs	7.069(2)	10.21 (6)	6.85(1)	10.87 (5)	7.28(1)	6.91(1)

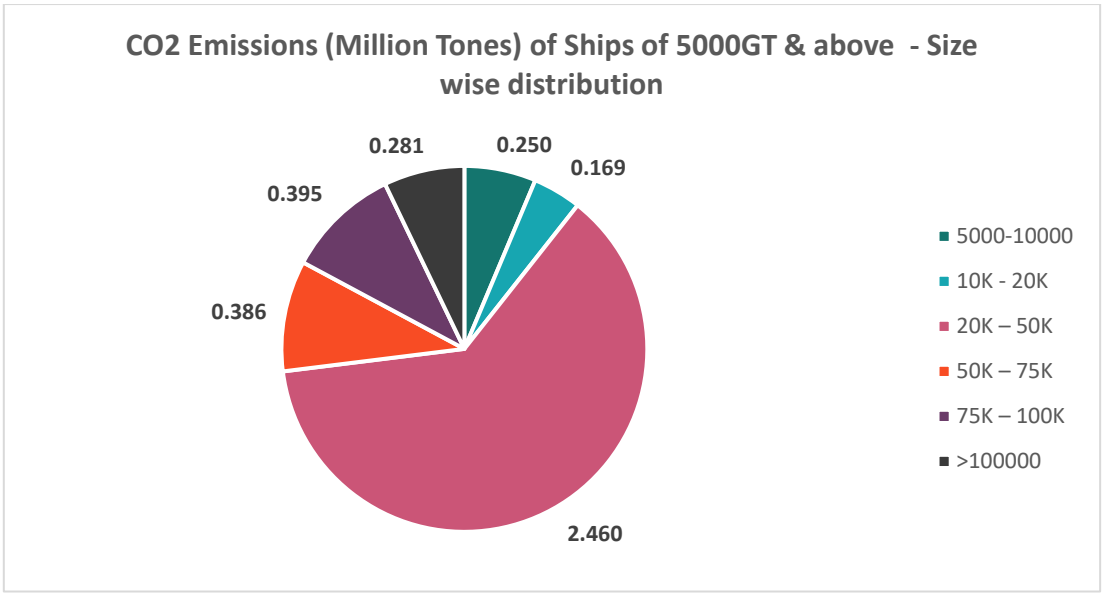
General Cargo of 5,000 GT and Above

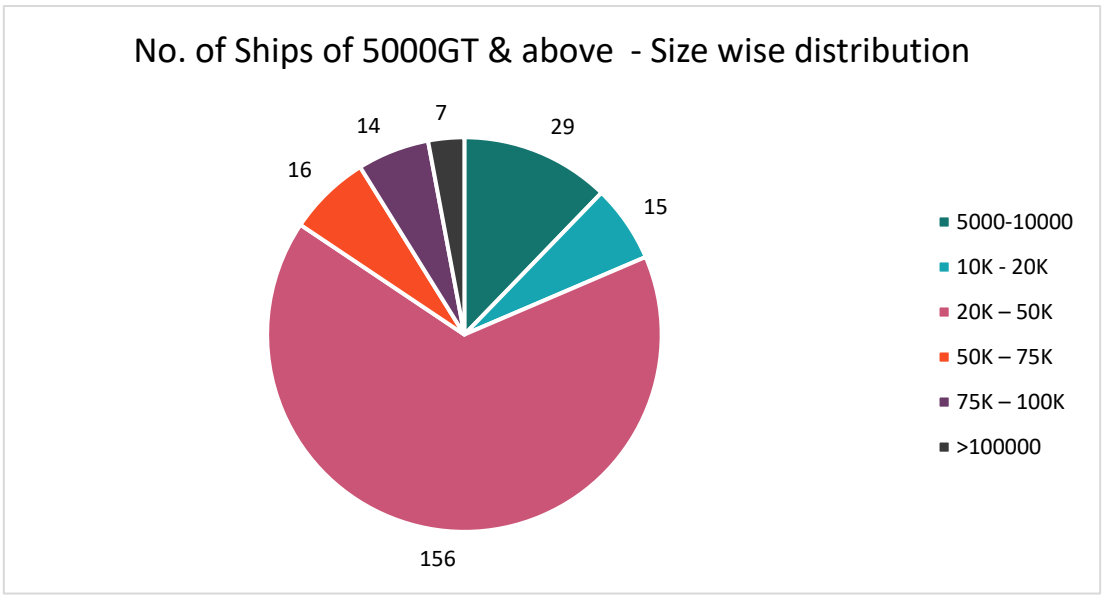
General Cargo >= 5,000 GT	All		International Run		Coastal Run	
	2022	2024	2022	2024	2022	2024
Numbers	2	1	1	0	1	1
Total GT in Millions	0.0260	0.013	0.01306	0	0.012993	0.013
Total Deadweight in Millions	0.03804	0.017	0.02056	0	0.01747	0.017
Average Age	21	21	23	0	19	21
Hours underway	5477	2756	2207	0	3270	2756
Percentage of hours underway of total hours in the calendar year	31.26%	31.46%	25.19%	0	37.33%	31.46%
Total CO_2 Emissions (Million Tonnes)	0.013	0.008	0.005	0	0.008	0.008
Average CII (t-CO_2/DWT-NM)	13.11	16.51	11.37	0	14.86	16.51

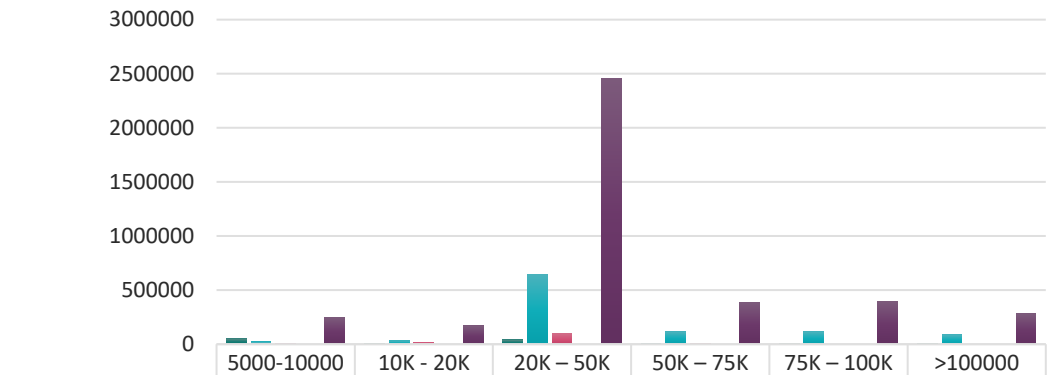
Data (General Cargo > = 5,000 GT)	All		International		Coastal	
	2022	2024	2022	2024	2022	2024
All	13.11(2)	16.51 (1)	11.37(1)	0	14.86(1)	16.51 (1)
gm-CO_2/DWT-NM for vessels underway for less than 1000 Hrs.	0	0	0	0	0	0
gm-CO_2/DWT-NM for vessels underway between 1000 – 2000 Hrs	0	0	0	0	0	0
gm-CO_2/DWT-NM for vessels underway between 2000 – 3000 Hrs	11.37(1)	16.51 (1)	11.37(1)	0	0	16.51 (1)
gm-CO_2/DWT-NM for vessels underway between 3000 – 4000 Hrs	14.86(1)	0	0	0	14.86(1)	0
gm-CO_2/DWT-NM for vessels underway between 4000 – 5000 Hrs	0	0	0	0	0	0
gm-CO_2/DWT-NM for vessels underway more than 5000 Hrs	0	0	0	0	0	0

Data based on Ship Size

Size (GT)	No. of Ships	DO Consumption	HFO Consumption	LFO Consumption	LNG Consumption	CO_2 Emissions (Million Tons)
5000-10000	29	49901	22610	6242	0	0.250
10K - 20K	15	4576	34466	14950	0	0.169
20K – 50K	156	39968	647269	100318	0	2.460
50K – 75K	16	7163	115645	1075	0	0.386
75K – 100K	14	10513	116101	0	0	0.395
>100000	7	1803	88528	0	0	0.281
Total	**237**	**113924**	**1024619**	**122585**	**0**	**3.942**


CO2 Emissions (Million Tones) of Ships of 5000GT & above - Size wise distribution
0.281
0.250
0.169
0.395
0.386
2.460
5000-10000
10K - 20K
20K – 50K
50K – 75K
75K – 100K
>100000


No. of Ships of 5000GT & above - Size wise distribution
7
14
29
16
15
156
5000-10000
10K - 20K
20K – 50K
50K – 75K
75K – 100K
>100000



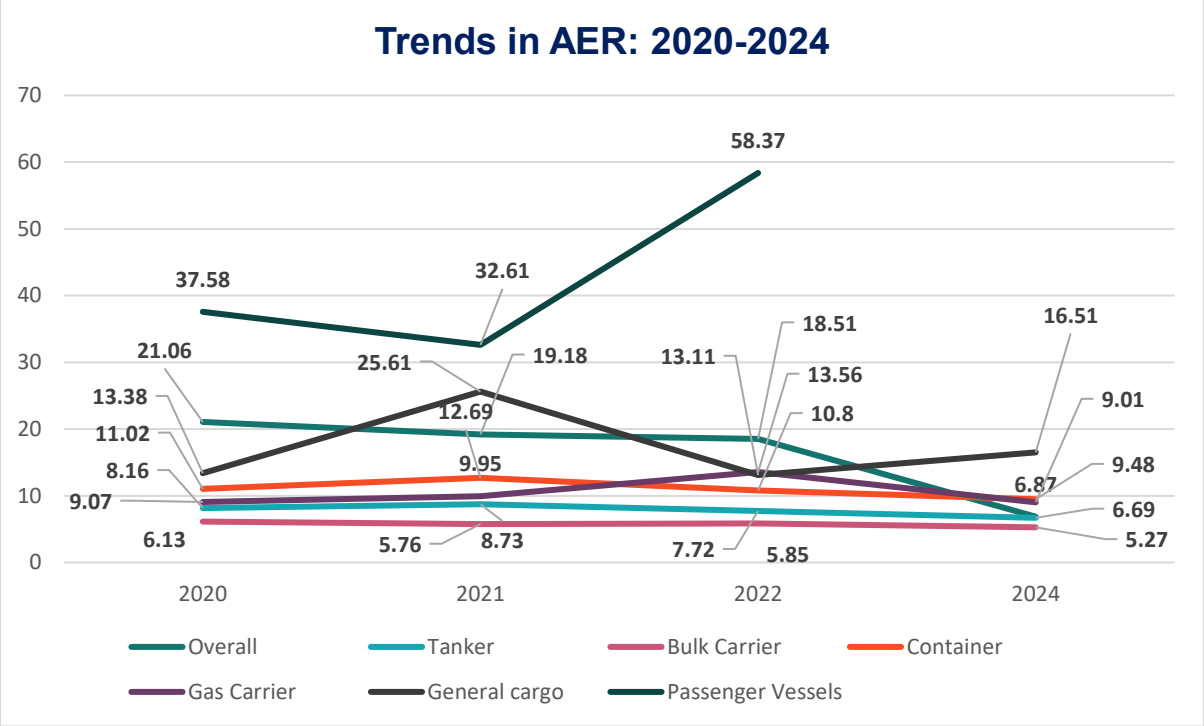
	5000-10000	10K - 20K	20K – 50K	50K – 75K	75K – 100K	>100000
DO Consumption	49901	4576	39968	7163	10513	1803
HFO Consumption	22610	34466	647269	115645	116101	88528
LFO Consumption	6242	14950	100318	1075	0	0
LNG Consumption	0	0	0	0	0	0
Emissions	250058.688	169105.23	2459835.092	386470.433	395243.192	281456.61

Anticipated Operational Carbon Intensity and CII Ratings

Carbon Intensity – Annual Efficiency Ratio (AER)

The carbon intensity has been determined in terms of AER i.e. Grams of CO/ DWT-Nm for Cargo ships and Grams of CO2/GT-Nm for Passenger Ships and the comparison with 2020, 2021, 2022 &2024 data is tabulated below. The overall AER has decreased from 18.51 to 6.87.

	2020 average AER	2021 average AER	2022 average AER	2024 average AER
Overall	21.06	19.18	18.51	6.87
Tanker	8.16	8.73	7.72	6.69
Bulk Carrier	6.13	5.76	5.85	5.27
Container	11.02	12.69	10.80	9.48
Gas Carrier	9.07	9.95	13.56	9.01
General cargo	13.38	25.61	13.11	16.51
Passenger Vessels	37.58	32.61	58.37	



Carbon Intensity Indicator (CII) Ratings:

Based on Regulation 28 of MARPOL Annexure VI, ships are required to report Attained Annual Carbon Intensity from 2024 based on data collected in 2023 and every year thereafter. This is compared against the Required CII for that ship type and the ships are rated into A,B,C,D,E based on their CII performance. Although the actual requirement of rating is applicable from next year, an assessment has been done based on the data reported for 2022 and the results are below:

	Total Ships	No. of Ships in A Rating	No. of Ships in B Rating	No. of Ships in C Rating	No. of Ships in D Rating	No. of Ships in E Rating
Total ships where CII is applicable	199	25	36	66	60	12
Tanker	102	9	22	34	27	4
Bulk Carrier	64	6	3	21	22	6
Container	21	10	7	3	1	0
Gas Carrier	22	0	4	8	10	0
General cargo	1	0	0	0	0	1
LNG Carrier	0	0	0	0	0	0

Ships of less than 5,000 GT

Carbon Emission in 2024

Total Carbon Emission from Indian Vessels (Million-Tons)	Total Carbon Emissions from Indian Vessels less than 5000 GT (Million-Tons)	Percentage of total emissions from Indian Vessels
4.95501	0.980368	19.79%

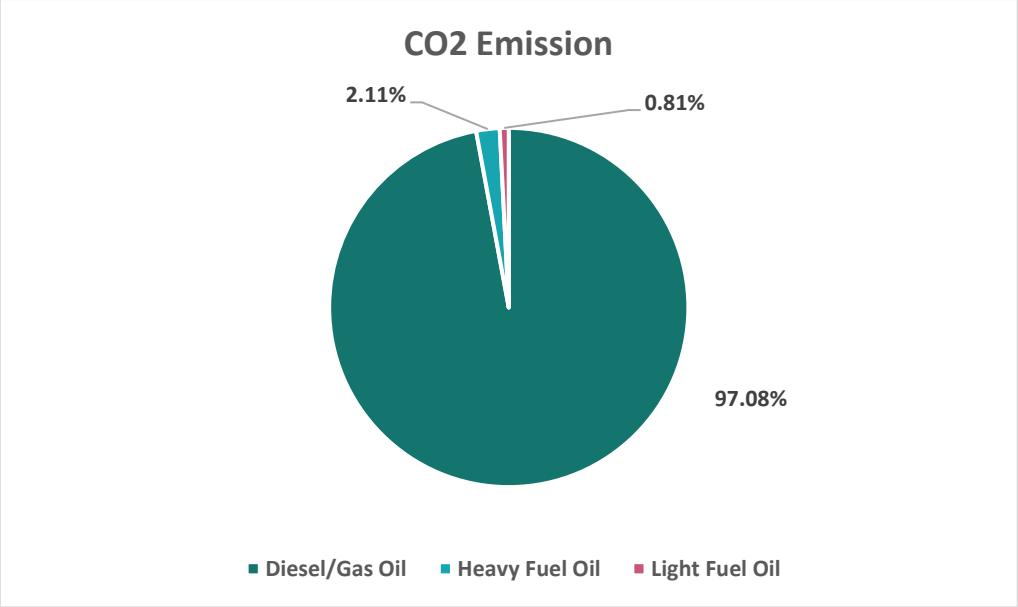
Ships Certification	Total Carbon Emissions in Million Tons	Total Number	Total Deadweight (Million)	Total Million GT	Carbon Emission in Tons Per GT	Carbon Emissions in Tons per DWT
Ships other than RSV & ICV	0.820957835	461	0.484933	0.509883	1.610090	1.69293125
RSV Ships	0.14520941	133	0.066692	0.075827	1.915009	2.177320
ICV Ships	14200.60	18	0.015612	0.014817	0.958399	0.909599

Trends in Basic Data

Data (Vessels of < 5,000 GT)	2020	2021	2022	2024
Numbers	631	609	612	612
Total GT in Millions	0.63	0.607	0.600	0.6005271
Total Deadweight in Millions	0.6	0.579	0.567	0.567236507
Average Age (Years)	15	15	17	18.20
Total CO_2 Emissions in Million Tonnes	0.861	0.93	0.915	0.9804
CO_2 Emissions/GT	1.37	1.53	1.525	1.6325
CO_2 Emissions/Deadweight	1.43	1.61	1.61	1.7283

Fuel Consumption & Trends in Fuel Consumption Data

Fuel Type	Consumption (MT)	Consumption (MT)	Consumption (MT)	CO2 emission (Tonnes)	CO2 emission (Tonnes)	CO2 emission (Tonnes)
	2021	2022	2024	2021	2022	2024
Diesel/Gas Oil	283104	278909	296870.75	907631	894182.3	951767.631
Heavy Fuel Oil	3547	2777	6648.44	11044	8647.578	20703.239
Light Fuel Oil	3780	3984	2506.18	11911	12553.58	7896.97003
Total	290431	285670	306025.37	930587	915383.4	980367.840



Ship Type: Carbon Emissions

Ship Type	DO (Tonnes)	HFO (Tonnes)	LFO (Tonnes)	CO2 (Million Tonnes)
Bulk Carrier	1724.639	0	0	0.0055
Gas Carrier	431.727	0	0	0.0014
Tanker	1214.078	1148.3	59.92	0.0077
Container	1161.800	3871.53	1983.596	0.0220
General cargo	15145.054	1628.609	435.463	0.0550
Passenger Ship	11565.637	0	0	0.0371
Tug	73622.561	0	27.2	0.2361
Offshore Support / Supply Vessel	102197.980	0	0	0.3276
AHTS	51393.708	0	0	0.1648
Multipurpose Utility Vessel	3456.451	0	0	0.0111
Launch	6082.592	0	0	0.0195
Crew Boat	2378.326	0	0	0.0076
Others	14402.790	0	0	0.0462
Total	284777.343	6648.439	2506.179	0.9416

Ship Type Basis Analysis

Data (Vessels of < 5,000 GT)		
Tug	**2022**	**2024**
Numbers	274	274
Total GT in Millions	0.094	0.0951
Total Deadweight in Millions	0.0512	0.0514
Average Age (Years)	15	15.6934
Total DO Consumption in Million Tonnes	0.0627	0.0736
Total HFO Consumption in Million Tonnes	0	0.0000
Total LFO Consumption in Million Tonnes	0.00003	0.0000
Total CO_2 Emissions in Million Tonnes	0.201	0.2361
CO_2 Emissions/GT	2.1203	2.4826
CO_2 Emissions/Deadweight	3.9224	4.5977

Data (Vessels of < 5,000 GT)		
Anchor Handling Tug Supply Vessel	**2022**	**2024**
Numbers	41	41
Total GT in Millions	0.07470	0.0747
Total Deadweight in Millions	0.0705	0.0706
Average Age (Years)	13	17.3659
Total DO Consumption in Million Tonnes	0.0582	0.0514
Total HFO Consumption in Million Tonnes	0	0.0000
Total LFO Consumption in Million Tonnes	0	0.0000
Total CO_2 Emissions in Million Tonnes	0.186	0.1648
CO_2 Emissions/GT	2.499	2.2056
CO_2 Emissions/Deadweight	2.645	2.3346

Data (Vessels of < 5,000 GT)		
Offshore Support / Supply Vessel	**2022**	**2024**
Numbers	87	85
Total GT in Millions	0.1822	0.1780
Total Deadweight in Millions	0.1927	0.1861
Average Age (Years)	17	19.0706
Total DO Consumption in Million Tonnes	0.1070	0.1022
Total HFO Consumption in Million Tonnes	0	0.0000
Total LFO Consumption in Million Tonnes	0	0.0000
Total CO_2 Emissions in Million Tonnes	0.3432	0.3276
CO_2 Emissions/GT	1.8833	1.8411
CO_2 Emissions/Deadweight	1.7811	1.7608

Data (Vessels of < 5,000 GT)		
Passenger Ship	**2022**	**2024**
Numbers	30	30
Total GT in Millions	0.0372	0.0372
Total Deadweight in Millions	0.011	0.0110
Average Age (Years)	21	23.0000
Total DO Consumption in Million Tonnes	0.00925	0.0116
Total HFO Consumption in Million Tonnes	0	0.0000
Total LFO Consumption in Million Tonnes	0	0.0000
Total CO_2 Emissions in Million Tonnes	0.02965	0.0371
CO_2 Emissions/GT	0.7962	0.9956
CO_2 Emissions/Deadweight	2.706	3.3841

Data (Vessels of < 5,000 GT)		
High Speed Passenger Craft	**2022**	**2024**
Numbers	12	12
Total GT in Millions	0.00364	0.0036
Total Deadweight in Millions	0.000387	0.0004
Average Age (Years)	17	19.3333
Total DO Consumption in Million Tonnes	0.004	0.0054
Total HFO Consumption in Million Tonnes	0	0.0000
Total LFO Consumption in Million Tonnes	0	0.0000
Total CO_2 Emissions in Million Tonnes	0.01282	0.0172
CO_2 Emissions/GT	3.5223	4.7258
CO_2 Emissions/Deadweight	33.0882	44.3943

Data (Vessels of < 5,000 GT)		
General cargo	**2022**	**2024**
Numbers	66	66
Total GT in Millions	0.126	0.1127
Total Deadweight in Millions	0.1562	0.1562
Average Age (Years)	20	21.7727
Total DO Consumption in Million Tonnes	0.015	0.0151
Total HFO Consumption in Million Tonnes	0.00163	0.0016
Total LFO Consumption in Million Tonnes	0.00044	0.0004
Total CO_2 Emissions in Million Tonnes	0.05453	0.0550
CO_2 Emissions/GT	0.4839	0.4880
CO_2 Emissions/Deadweight	0.3491	0.3521

Data (Vessels of < 5,000 GT)		
Utility Vessel	**2022**	**2024**
Numbers	24	24
Total GT in Millions	0.00743	0.0077
Total Deadweight in Millions	0.00553	0.0055
Average Age (Years)	13	14.9583
Total DO Consumption in Million Tonnes	0.00397	0.0035
Total HFO Consumption in Million Tonnes	0	0.0000
Total LFO Consumption in Million Tonnes	0	0.0000
Total CO_2 Emissions in Million Tonnes	0.01272	0.0111
CO_2 Emissions/GT	1.64	1.4311
CO_2 Emissions/Deadweight	2.2969	2.0010

Data (Vessels of < 5,000 GT)		
Crew Boat	**2022**	**2024**
Numbers	18	18
Total GT in Millions	0.002794	0.0028
Total Deadweight in Millions	0.000719	0.0007
Average Age (Years)	29	30.7778
Total DO Consumption in Million Tonnes	0.00254	0.0024
Total HFO Consumption in Million Tonnes	0	0.0000
Total LFO Consumption in Million Tonnes	0	0.0000
Total CO_2 Emissions in Million Tonnes	0.00814	0.0076
CO_2 Emissions/GT	2.9145	2.7290
CO_2 Emissions/Deadweight	11.60	10.8626

Data (Vessels of < 5,000 GT)		
Launch	**2022**	**2024**
Numbers	13	13
Total GT in Millions	0.001416	0.0014
Total Deadweight in Millions	0.000635	0.0006
Average Age (Years)	12	13.8462
Total DO Consumption in Million Tonnes	0.00119	0.0061
Total HFO Consumption in Million Tonnes	0	0.0000
Total LFO Consumption in Million Tonnes	0	0.0000
Total CO_2 Emissions in Million Tonnes	0.00380	0.0195
CO_2 Emissions/GT	2.6855	13.7717
CO_2 Emissions/Deadweight	6.2713	32.1612

Data (Vessels of < 5,000 GT)		
Dredgers	**2022**	**2024**
Numbers	7	7
Total GT in Millions	0.0148	0.0148
Total Deadweight in Millions	0.01702	0.0170
Average Age (Years)	16	16.7143
Total DO Consumption in Million Tonnes	0.00391	0.0038
Total HFO Consumption in Million Tonnes	0	0.0000
Total LFO Consumption in Million Tonnes	0	0.0000
Total CO_2 Emissions in Million Tonnes	0.01253	0.0120
CO_2 Emissions/GT	0.8464	0.8136
CO_2 Emissions/Deadweight	0.737	0.7084

Data (Vessels of < 5,000 GT)		
Bulk Carrier	**2022**	**2024**
Numbers	5	5
Total GT in Millions	0.00713	0.0071
Total Deadweight in Millions	0.00887	0.0089
Average Age (Years)	21	21.8000
Total DO Consumption in Million Tonnes	0.00189	0.0017
Total HFO Consumption in Million Tonnes	0	0.0000
Total LFO Consumption in Million Tonnes	0	0.0000
Total CO_2 Emissions in Million Tonnes	0.00605	0.0055
CO_2 Emissions/GT	0.8477	0.7750
CO_2 Emissions/Deadweight	0.6819	0.6234

Data (Vessels of < 5,000 GT)		
Gas Carrier	**2022**	**2024**
Numbers	3	3
Total GT in Millions	0.00872	0.0087
Total Deadweight in Millions	0.00694	0.0069
Average Age (Years)	31	32.6667
Total DO Consumption in Million Tonnes	0.00075	0.0004
Total HFO Consumption in Million Tonnes	0	0.0000
Total LFO Consumption in Million Tonnes	0	0.0000
Total CO_2 Emissions in Million Tonnes	0.0024	0.0014
CO_2 Emissions/GT	0.2751	0.1586
CO_2 Emissions/Deadweight	0.3459	0.1994

Data (Vessels of < 5,000 GT)		
Tanker	**2022**	**2024**
Numbers	13	13
Total GT in Millions	0.0148	0.0148
Total Deadweight in Millions	0.029	0.0210
Average Age (Years)	19	19.2308
Total DO Consumption in Million Tonnes	0.00115	0.0012
Total HFO Consumption in Million Tonnes	0.00115	0.0011
Total LFO Consumption in Million Tonnes	0.00006	0.0001
Total CO_2 Emissions in Million Tonnes	0.00745	0.0077
CO_2 Emissions/GT	0.5029	0.5171
CO_2 Emissions/Deadweight	0.3548	0.3648

Data (Vessels of < 5,000 GT)		
Container	**2022**	**2024**
Numbers	3	3
Total GT in Millions	0.0088	0.0088
Total Deadweight in Millions	0.0108	0.0108
Average Age (Years)	19	20.3333
Total DO Consumption in Million Tonnes	0.0005	0.0012
Total HFO Consumption in Million Tonnes	0	0.0039
Total LFO Consumption in Million Tonnes	0.00346	0.0020
Total CO_2 Emissions in Million Tonnes	0.0125	0.0220
CO_2 Emissions/GT	1.4218	2.5021
CO_2 Emissions/Deadweight	1.1565	2.0353

Data (Vessels of < 5,000 GT)		
Other (Includes: Research vessels, Floating crane, Lighthouse tender, Buoy tender vessel, Security & Patrol Boat **&** Pipe-Laying/hook-up barge)	**2022**	**2024**
Numbers	16	16
Total GT in Millions	0.0286	0.0286
Total Deadweight in Millions	0.0135	0.0160
Average Age (Years)	22	23.56
Total DO Consumption in Million Tonnes	0.00683	0.0167
Total HFO Consumption in Million Tonnes	0	0.0000
Total LFO Consumption in Million Tonnes	0	0.0000
Total CO_2 Emissions in Million Tonnes	0.02189	0.0535
CO_2 Emissions/GT	0.7638	1.8689
CO_2 Emissions/Deadweight	1.6112	3.3364

Vessels Registered as RSV

Data (Vessels of < 5,000 GT)		
RSV	**2022**	**2024**
Numbers	126	133
Total GT in Millions	0.07582	0.0758
Total Deadweight in Millions	0.06691	0.0667
Average Age (Years)	13	12.7293
Total DO Consumption in Million Tonnes	0.03111	0.0452
Total HFO Consumption in Million Tonnes	0.00000	0.0000
Total LFO Consumption in Million Tonnes	0.00006	0.0001
Total CO_2 Emissions in Million Tonnes	0.09994	0.1452
CO_2 Emissions/GT	1.318	1.9150
CO_2 Emissions/Deadweight	1.4985	2.1773

Ship Type Wise Break-up of Vessels registered under RSV

Data (Vessels of < 5000 GT) (RSV)	TYPE 1	TYPE 2	TYPE 3	TYPE 4
Bulk Carrier		**2024**		
Numbers	0	0	0	2
Total GT in Millions	0	0	0	0.00492
Total Deadweight in Millions	0	0	0	0.00599
Average Age (Years)	0	0	0	8.00000
Total DO Consumption in Million Tonnes	0	0	0	0.00136
Total HFO Consumption in Million Tonnes	0	0	0	0.00000
Total LFO Consumption in Million Tonnes	0	0	0	0.00000
Total CO_2 Emissions in Million Tonnes	0	0	0	0.00436
CO_2 Emissions/GT	0	0	0	0.88628
CO_2 Emissions/Deadweight	0	0	0	0.72809

Data (Vessels of < 5000 GT) (RSV)	TYPE 1	TYPE 2	TYPE 3	TYPE 4
Tanker		2024		
Numbers	0	2	0	5
Total GT in Millions	0	0.001917	0	0.003956
Total Deadweight in Millions	0	0.002670437	0	0.00517999
Average Age (Years)	0	4.0000	0	24.2000
Total DO Consumption in Million Tonnes	0	0.0002791	0	0.00042996
Total HFO Consumption in Million Tonnes	0	0	0	0
Total LFO Consumption in Million Tonnes	0	0	0	0.00005992
Total CO_2 Emissions in Million Tonnes	0	0.000894795	0	0.00156726
CO_2 Emissions/GT	0	0.4668	0	0.3962
CO_2 Emissions/Deadweight	0	0.3351	0	0.3026

Data (Vessels of < 5000 GT) (RSV)	TYPE 1	TYPE 2	TYPE 3	TYPE 4
Container		2024		
Numbers	0	0	0	1
Total GT in Millions	0	0	0	0.001335
Total Deadweight in Millions	0	0	0	0.00154556
Average Age (Years)	0	0	0	8.0000
Total DO Consumption in Million Tonnes	0	0	0	0.0000749
Total HFO Consumption in Million Tonnes	0	0	0	0
Total LFO Consumption in Million Tonnes	0	0	0	0
Total CO_2 Emissions in Million Tonnes	0	0	0	0.000240129
CO_2 Emissions/GT	0	0	0	0.1799
CO_2 Emissions/Deadweight	0	0	0	0.1554

	2024			
General cargo	Type 1	Type 2	Type 3	Type 4
Numbers	1	0	0	7
Total GT in Millions	0.00219	0	0	0.013136
Total Deadweight in Millions	0.000937	0	0	0.01751614
Average Age (Years)	15.0000	0	0	15.8571
Total DO Consumption in Million Tonnes	0.000117	0	0	0.003028741
Total HFO Consumption in Million Tonnes	0	0	0	0
Total LFO Consumption in Million Tonnes	0	0	0	0
Total CO_2 Emissions in Million Tonnes	0.000375102	0	0	0.009710143
CO_2 Emissions/GT	0.1713	0	0	0.7392
CO_2 Emissions/Deadweight	0.4003	0	0	0.5544

Data (Vessels of < 5000 GT) (RSV)	TYPE 1	TYPE 2	TYPE 3	TYPE 4
Dredgers		2024		
Numbers	0	1	0	1
Total GT in Millions	0	0.000495	0	0.001796
Total Deadweight in Millions	0	0.000209	0	0.00248291
Average Age (Years)	0	10.0000	0	1.0000
Total DO Consumption in Million Tonnes	0	0.00026113	0	0.00000244
Total HFO Consumption in Million Tonnes	0	0	0	0
Total LFO Consumption in Million Tonnes	0	0	0	0
Total CO_2 Emissions in Million Tonnes	0	0.000837183	0	7.82264E-06
CO_2 Emissions/GT	0	1.6913	0	0.0044
CO_2 Emissions/Deadweight	0	4.0057	0	0.0032

Data (Vessels of < 5000 GT) (RSV)	TYPE 1	TYPE 2	TYPE 3	TYPE 4
Tug	**2024**			
Numbers	43	2	2	49
Total GT in Millions	0.018463	0.000385	0.00057	0.015744
Total Deadweight in Millions	0.009614363	0.0001813	0.0004759	0.008216726
Average Age (Years)	10.2326	11.5000	13.5000	12.8163
Total DO Consumption in Million Tonnes	0.014803957	0.0003132	0.0005154	0.012339907
Total HFO Consumption in Million Tonnes	0	0	0	0
Total LFO Consumption in Million Tonnes	0	0	0	0
Total CO_2 Emissions in Million Tonnes	0.047461485	0.001004119	0.0016524	0.03956174
CO_2 Emissions/GT	2.5706	2.6081	2.8989	2.5128
CO_2 Emissions/Deadweight	4.9365	5.5384	3.4719	4.8148

Data (Vessels of < 5000 GT) (RSV)	TYPE 1	TYPE 2	TYPE 3	TYPE 4
Offshore Support / Supply Vessel	**2024**			
Numbers	0	0	0	2
Total GT in Millions	0	0	0	0.002422
Total Deadweight in Millions	0	0	0	0.00162468
Average Age (Years)	0	0	0	15.5000
Total DO Consumption in Million Tonnes	0	0	0	0.00066103
Total HFO Consumption in Million Tonnes	0	0	0	0
Total LFO Consumption in Million Tonnes	0	0	0	0
Total CO_2 Emissions in Million Tonnes	0	0	0	0.002119262
CO_2 Emissions/GT	0	0	0	0.8750
CO_2 Emissions/Deadweight	0	0	0	1.3044

Data (Vessels of < 5000 GT) (RSV)	TYPE 1	TYPE 2	TYPE 3	TYPE 4
Utility Vessel	**2024**			
Numbers	3	0	0	1
Total GT in Millions	0.000062	0	0	0.000107
Total Deadweight in Millions	0.000011928	0	0	0.000068935
Average Age (Years)	12.0000	0	0	5.0000
Total DO Consumption in Million Tonnes	0.00000816	0	0	0.0000699
Total HFO Consumption in Million Tonnes	0	0	0	0
Total LFO Consumption in Million Tonnes	0	0	0	0
Total CO_2 Emissions in Million Tonnes	0.0000262	0	0	0.000224099
CO_2 Emissions/GT	0.4220	0	0	2.0944
CO_2 Emissions/Deadweight	2.1932	0	0	3.2509

Data (Vessels of < 5000 GT) (RSV)	TYPE 1	TYPE 2	TYPE 3	TYPE 4
Launch	**2024**			
Numbers	3	0	0	1
Total GT in Millions	0.000284	0	0	0.000117
Total Deadweight in Millions	0.000039848	0	0	0.000026605
Average Age (Years)	18.3333	0	0	7.0000
Total DO Consumption in Million Tonnes	0.00510508	0	0	0.000443
Total HFO Consumption in Million Tonnes	0	0	0	0
Total LFO Consumption in Million Tonnes	0	0	0	0
Total CO_2 Emissions in Million Tonnes	0.016366886	0	0	0.001420258
CO_2 Emissions/GT	57.6299	0	0	12.1390
CO_2 Emissions/Deadweight	410.7329	0	0	53.3831

Data (Vessels of < 5000 GT) (RSV)	TYPE 1	TYPE 2	TYPE 3	TYPE 4
Crew Boat	**2024**			
Numbers	1	0	0	0
Total GT in Millions	0.000018	0	0	0
Total Deadweight in Millions	0.000002876	0	0	0
Average Age (Years)	15.0000	0	0	0
Total DO Consumption in Million Tonnes	0.0000624	0	0	0
Total HFO Consumption in Million Tonnes	0	0	0	0
Total LFO Consumption in Million Tonnes	0	0	0	0
Total CO_2 Emissions in Million Tonnes	0.000200054	0	0	0
CO_2 Emissions/GT	11.1141	0	0	0
CO_2 Emissions/Deadweight	69.5599	0	0	0

Data (Vessels of < 5,000 GT) (RSV)	TYPE 1	TYPE 2	TYPE 3	TYPE 4
Other	**2024**			
Numbers	3	0	0	0
Total GT in Millions	0.00229	0	0	0
Total Deadweight in Millions	0.00128	0	0	0
Average Age (Years)	17.670	0	0	0
Total DO Consumption in Million Tonnes	0.005	0	0	0
Total HFO Consumption in Million Tonnes	0	0	0	0
Total LFO Consumption in Million Tonnes	0	0	0	0
Total CO_2 Emissions in Million Tonnes	0.0163	0	0	0
CO_2 Emissions/GT	7.1312	0	0	0
CO_2 Emissions/Deadweight	12.7311	0	0	0

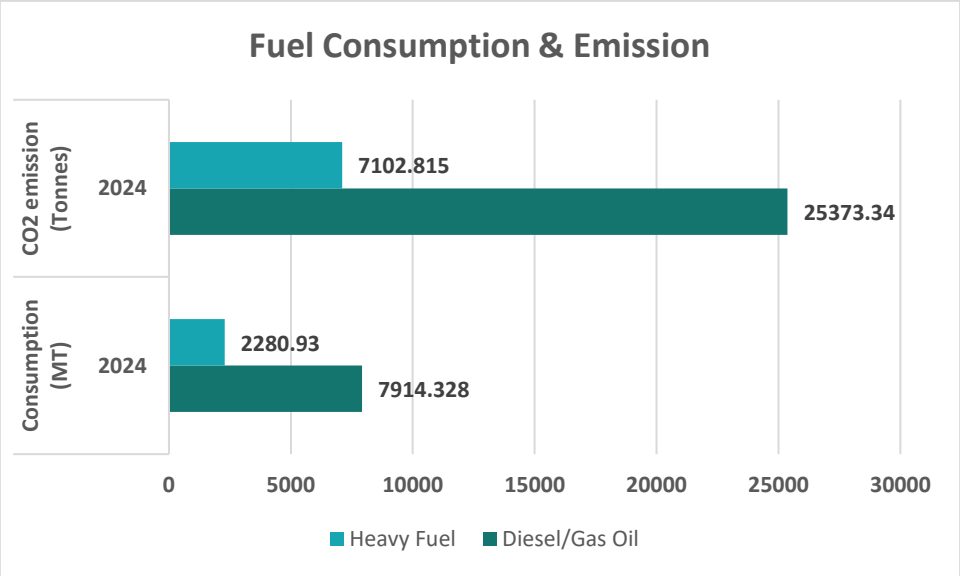
Vessels Registered Under ICV Notification

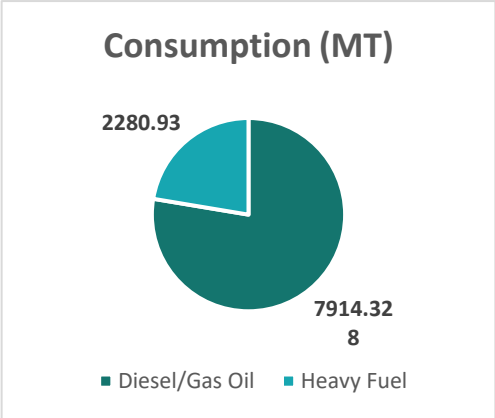
Data (Vessels of < 5,000 GT)		
ICV	**2022**	**2024**
Numbers	18	18
Total GT in Millions	0.01482	0.014817
Total Deadweight in Millions	0.01561	0.015611923
Average Age (Years)	16	15.5000
Total DO Consumption in Million Tonnes	0.00325	0.003496736
Total HFO Consumption in Million Tonnes	0.00096	0.00960199
Total LFO Consumption in Million Tonnes	0.000000	0
Total CO_2 Emissions in Million Tonnes	0.01341	0.014200595
CO_2 Emissions/GT	0.9047	0.9584
CO_2 Emissions/Deadweight	0.8587	0.9096

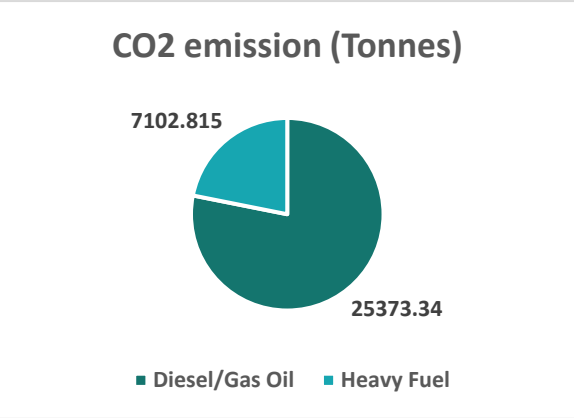
Ships of 5,000 GT & above Certified as RSV or ICV

Data (RSV & ICV)	2021	2022	2024
Numbers	19	19	151
Total GT in Millions	0.11	0.11	0.090644
Total Deadweight in Millions	0.147	0.147	0.082303741
Average Age (Years)	6.8	7.78	13.0600
Total CO_2 Emissions in Million Tonnes	0.0355	0.0408	0.159410005
CO_2 Emissions/GT	0.32	0.36	1.758638245
CO_2 Emissions/Deadweight	0.241	0.276	1.936850052

In the year 2024 there were total 151 ships in this category accounting for approximately 0.159 million tonnes of CO2 emissions

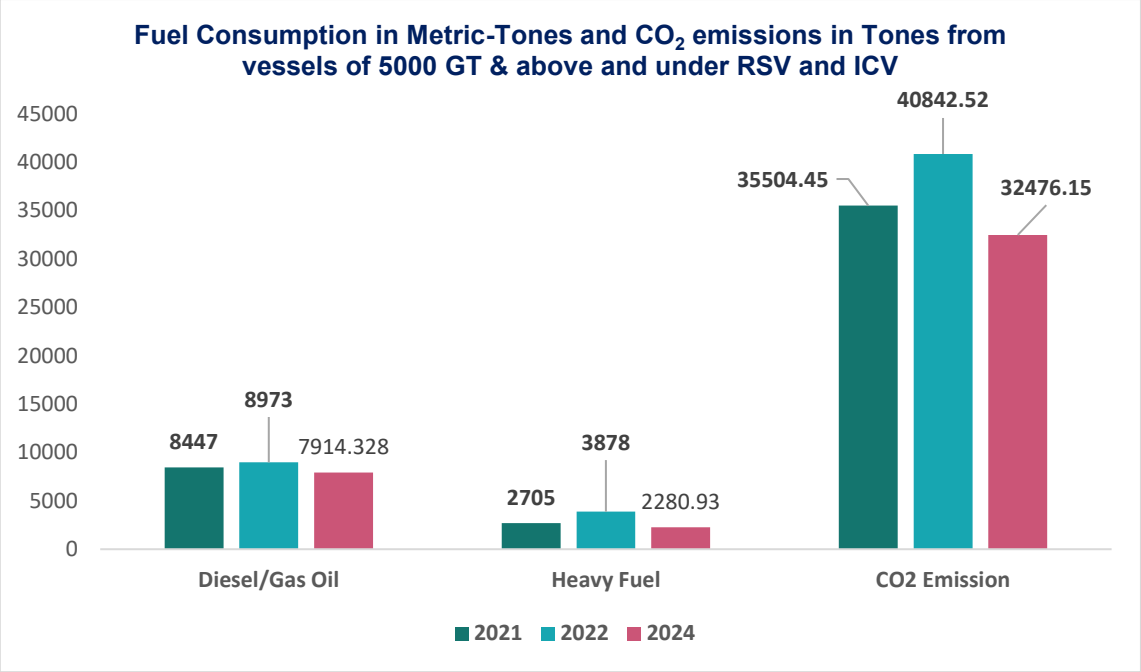






Fuel Type	Consumption (MT)	Consumption (MT)	Consumption (MT)	Consumption (MT)	CO2 emission (Tonnes)	CO2 emission (Tonnes)	CO2 emission (Tonnes)	CO2 emission (Tonnes)
	2020	2021	2022	2024	2020	2021	2022	2024
Diesel/ Gas Oil	6790.6	8447	8973	7914.328	21770.66	27081	28767	25373.34
Heavy Fuel	7441.94	2705	3878	2280.93	23174.2	8423	12076	7102.815
Total	14232.54	11152	12851	10195.26	44944.86	35504	40843	32476.15

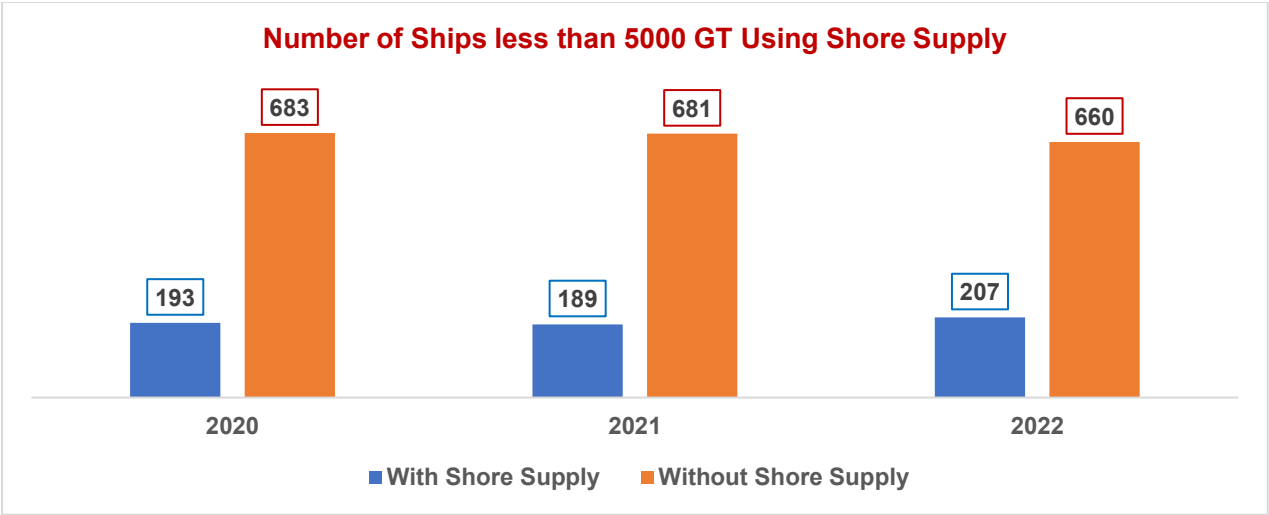
Average age of the vessels in this category was found as 13 years.



Shore Power Supply to Ships

Trends in Shore Power Supply to Ships less than 5,000 GT

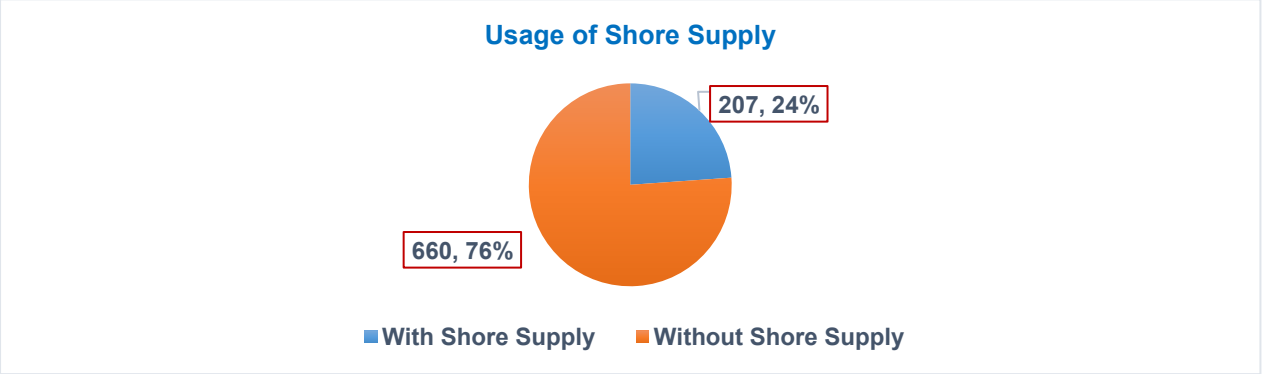
	No. of Ships	DO / MGO Consumption (MT)	HFO Consumption (MT)	LFO Consumption (MT)	Total CO2 (Tones)
With Shore Supply	196	73630.49988	960.199	119.543	239426.12
Without Shore Supply	416	223240.2522	5688.24	2386.636	740941.72



There is a continuously increase in number of ships using shore power with an increase of about 9.5% increase in number of ships in 2022 compared to 2021.

Distribution of Ships reporting use of Shore Power

Category of Ships	Number using Shore Power
Ships of 5,000 GT & above except RSV & ICV	8
RSV & ICV Certified Ships of 5,000 GT & above	2
Ships less than 5,000 GT	196
Total	206



Ports that have reported supply of Shore Power

Port	Ship Type being supplied shore power	Maximum Power which can be supplied	Voltage and Frequency of Supply
Adani Port, Mundra	Tugs, Barges, Pilot Boats etc.	50 KW	440 V, 50 Hz, 3-Phase
Cochin Port Berth	Tugs, Barges, Pilot Boats etc	125 KW	415 V, 50 Hz, 3-Phase
	For small ships, supply at various berths at Ernakulum, Mattancheery	1250 KW & 1000 KW	
UTL own berth at Cochin Port	Own Passenger Vessels	850 KW	415 V, 50 Hz, 3-Phase
GoI Own berth at Cochin Port	Own Vessel	1400 KW	415 V, 50 Hz, 3-Phase
New Mangalore Port Authority	Indian Coast Guard Vessel, Port tugs & Pilot Launches only.	150 KW	415 V, 50 Hz, 3-Phase
Karwar Port	Indian Coast Guard Vessel & Harbour Tugs	20 KVA for Harbor Tugs 65 KVA for IGC	
Gujarat Pipavav Port Ltd	Tugs and pilot boats(Chartered Hire)	125 AMP/70 KW	415 V , 50 Hz , 3 Phase
Adani Port, Muldwarka	Tugs, Coastal ships with power demand at ports less than 200 kW	200 KW	440V, 50 Hz, 3 Phase
Offshore Oil Terminal Deendayal Port Authority	Port Owned/Hired Tugs	200 KW	440V, 50Hz, 3 Phase
Pardip Port Authority	Port Owned/Hired Tugs/Floating Crafts	Sufficient Power for small vessels	415 V , 50 Hz , 3 Phase

VOC Port Authority	Tug, Pilot Launch, Patrol Boat, small crafts and other ships: Shore Power supply provided at all Berths inside VOCPA, but provided on their request	1MVA or 1000 KVA	415 V , 50 Hz , 3 Phase
	All other Commercial Vessels at VOC 2 & 3 Berths: Shore Power supply has been provided to ships on their request since 2017. However, not made mandatory.	500 KVA	415 V , 50 Hz or 60 Hz as required , 3 Phase
Adani Gangavaram Port	Port Tugs	50 KW	415 V , 50 Hz , 3 Phase
Chennai Port Authority	Naval Vessels/Customs vessels and Port Tugs and Launches	150KW	415 V , 50 Hz , 3 Phase
Kamarajar Port Limited	Tugs, Pilot Boats, Mooring Boats	50 KW	415 V , 50 Hz , 3 Phase
Adani Krishnapatnam Port Ltd	Tugs,	50 KW	110V/220V/440V 2 Phase 50 Hz
Mumbai Port Authority	Port Crafts	150kW	415volt, 50Hz
	MbPA is in the process of providing a shore-to-ship power supply facility by June 2025 at BPX mainly for cruise vessels. The facility can be used for other cargo vessels also.	5MVA x 2No. (proposed as on date)	6.6 KV/11 KV, 50/60 Hz
Jawaharlal Nehru Port Authority (JNPA)	All Container Ships and feasible oil Tankers ships	7.5 MW	6.6 KV and 0.415 KV at 50/60 Hz both
Mormugao Port Authority	Tug Boats	(i)Breakwater berth: 200 KVA - 1 No & 500 KVA - 1 No (ii)Mole berth 200 KVA - 1 No. (iii) Berth No.8 - 12 KVA - 3 Nos. (iv) Berth No.4 - 200 KVA 1 No	440v, 50 Hz
JSW Jaigarh Port Ltd	Patrol Boat	22 KW	3- Phase -440 V / 50 Hz
	Harbor Tugs	44 KW	
	Mini Bulk Carrier: Will be available from Oct'2023 Onwards	172 KW	
JSW Revdanda Port	MBCs -3000 DWT, Speed Boats, Tug Boats	200KW	3- Phase -415 V / 50 Hz

MARINE ENVIRONMENTAL MANAGEMENT REPORT 2025

Single Use Plastic (SUP) prohibition

DGS Single Use Plastic (SUP) prohibition on board ships- *Analysis and overview*

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Introduction

In recognition of the urgency to address marine plastic litter from ships, IMO adopted the Action Plan to Address Marine Plastic Litter from Ships (resolution MEPC.310(73)) and subsequently adopted the Strategy to Address Marine Plastic Litter from Ships
(Resolution MEPC 341(77).

The 2018 UNEP report titled "Single-Use Plastics – A roadmap for sustainability" report highlighted the ubiquitous nature of plastic for being one of the greatest environmental challenges that chokes marine life, transforming some marine areas into a plastic soup.

Single Use Plastics (SUP) are also known as disposable plastics like plastic bags, straws, coffee stirrers,

water bottles and food packaging which are used only once before they are thrown away or recycled.

The Indian Maritime Administration, as a proactive measure, has introduced from 2 October 2019, a phased reduction on usage and carriage of materials made of single-use plastics on Indian-flagged ships. The directorate issued DGS Order No. 05 of 2019 for Prohibition on Use of Single Use Plastics Onboard Merchant Ships and a ban was imposed on single use plastic on Indian ships and foreign ships while in Indian water, as per terms and conditions of the said order.

As per the said order, Single Use Plastics as listed therein were prohibited to be used on board Indian ships and foreign ships when such ships are at a port or place in India with effect from 1st January 2020 and the list also covers Single Use Plastics which were prohibited with Immediate effect.

The administration issued an Addendum No. I to DGS Order 5 of 2019 on 8th January 2020 which defines single-use plastics as disposable plastics like plastic bags, straws, coffee stirrers, soda and water bottles and food packaging, which are used only once before they are thrown away or recycled. It prohibited all items made of single-use plastics except those related to crew and passenger personnel effects and personal protective equipment, medicines, medicinal equipment, life-saving appliances, fire-fighting appliances, and other statutory items used on such equipment which are made up of SUP or contained in SUP.

Addendum No. I to DGS Order 5 of 2019 also requires all ships to have a plan on board showing how the ship is going to comply with the requirement of gradual phase out of SUP on board. All Indian flag ships have such plans on board, and these are verified by recognized organizations during their annual surveys and by flag State inspections.

The addendum required preparation of inventory of Single Use Plastic on board ship by 3lst January 2020 or 31st March 2020 for cargo ships or passenger ships respectively.

Based on the list of inventories, the Identification, listing and prohibition of Single Use Plastic items are to be as per execution methodology and the execution schedule were detailed in the order for 50%, 75% and 90% of the items detailed in the inventory.

The execution schedule for Identification. listing & prohibition of 90% of items detailed in the inventory was 1st October 2020 for Indian/foreign flag cargo ship at an Indian Port or place and 1st December 2020 for Indian/foreign flag passenger ship at an Indian Port or place.

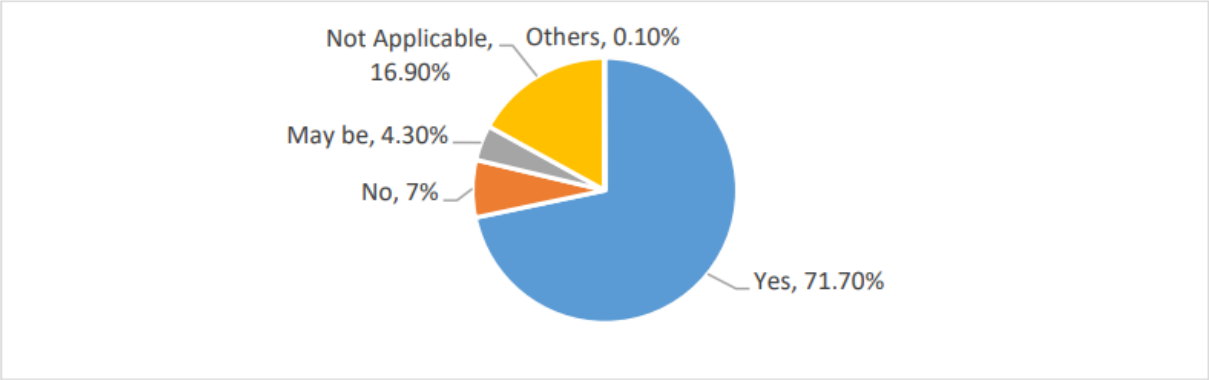
Paper submitted by India at IMO (MEPC 78)

On the impact of the proactive policy on prohibition of SUP:

India had submitted a paper at MEPC (MEPC 78/8) which shares the experience and findings of a survey conducted after two years of introduction of the measure. The survey was carried out to understand whether the measure has served its purpose of educating seafarers on the impact of SUP on the environment and reduced the usage of SUP on board ships.

The participants of the survey included Recognized Organization surveyors, ship staff, master, superintendent; company's purchase division, spare and store suppliers, etc.

The Impact of the proactive policy shows more than 70% of the participants believe that the prohibition is successful and has resulted in reduction of single-use plastics on board ships.



Impact of the prohibition on the reduction of SUP usage on ships

DGS Single Use Plastic portal:

In collaboration with the Indian Registrar of Shipping, the Directorate set up the Swachh Sagar portal of DGS Single Use Plastics Application in September 2021 which required the vessels calling and operating Indian ports to submit details concerning the use of Single Use Plastics.

The DGS Single Use Plastic portal has been used extensively by the ship owners and other users for compliance record on board and verification of Single Use Plastic prohibition by ROs and Administration.

Salient features of the portal:

The ship owners (users) can login to the portal and the login credentials can be obtained at psc-dgs@nic.in.

Once logged in, the user is directed to the homepage where he can add a ship and can enter the ship Single Use Plastic details.

The user to add ship information like Ship Name, Imo Number, Ship type, Distinct number, Flag State

Clicking on Add New SUP will give option to add Single Use Plastic Details. Users can add multiple Single Use Plastic items to ship by clicking on ADD NEW SUP.

The user can add the new Single Use Plastic Category to the existing list.

The report that is generated through the Management Information System- MIS of the portal are as below:

1. Ship details with percentage of Single Use Plastic ban achieved.
2. Ship details where Single Use Plastic ban status ‘Yes’.
3. Ship details where Single Use Plastic ban status ‘No’.
4. Management Information System.
5. Vendor Report.
6. Summarized details of Single Use Plastic Items.

Analysis carried out by the Administration

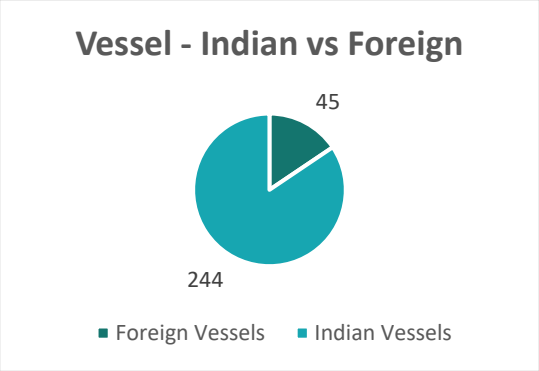
For the data/records submitted on the Swachh Sagar DGS Single Use Plastic portal:

The highlights of analysis of the data gathered for the year 2024 (from January 2024 till December 2024) are as follows:

Total number of records submitted by Ships at Indian ports by Indian flag and foreign flag ships in which a certain SUP item is replaced by an alternative SUP or banned = 289.

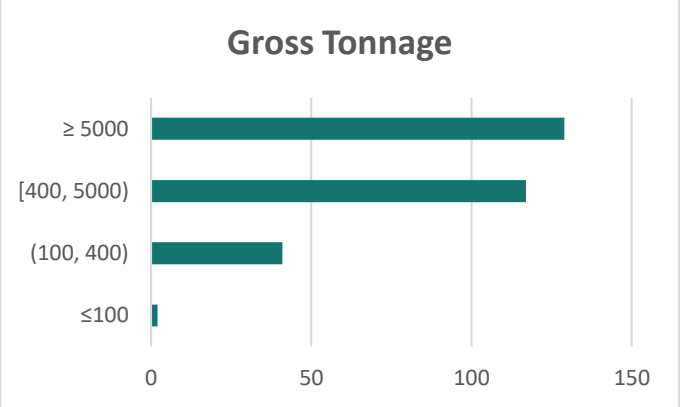
Origin of Ships reported the data

	Count	%
Foreign Vessels	45	16%
Indian Vessels	244	84%
Total	289	100%



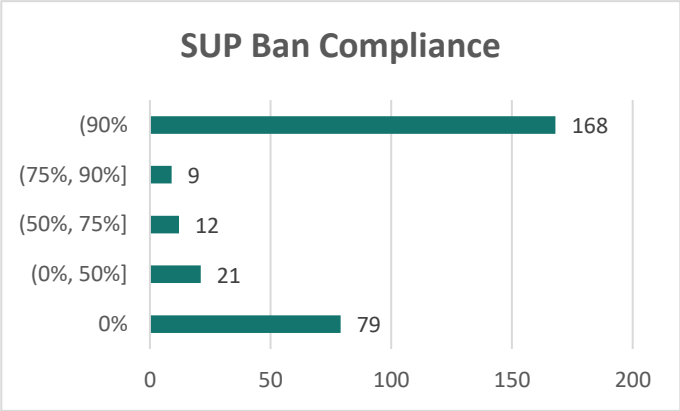
Gross Tonnage wise Records:

Gross Tonnage	%	Count
≤100	0.69%	2
(100, 400)	14.19%	41
[400, 5000)	40.48%	117
≥ 5000	44.64%	129
Total	100.00%	289



SUP ban compliance as per Circular (number of vessels)

SUP Compliance	%	Count
0%	27.34%	79
(0%, 50%]	7.27%	21
(50%, 75%]	4.15%	12
(75%, 90%]	3.11%	9
(90%	58.13%	168
Total	100.00%	289



Distribution of Flag States as per Record Count

Major Flag States	Count	%
Antigua and Barbuda	2	0.69%
Bahamas	5	1.73%
Cook Island	1	0.35%
Hong Kong	2	0.69%
India	244	84.43%
Libya	1	0.35%
Malta	2	0.69%
Ras Al Khaimah (United Arab Emirates)	1	0.35%
Republic of Korea	4	1.38%
Republic of Liberia	7	2.42%
Republic of Marshall Islands	5	1.73%
Republic of Panama	13	4.50%
Singapore	2	0.69%
Total Records	289	100.0%

Inferences from Analysis:

The data fetched from the Swachh Sagar DGS Single Use Plastic portal reflects that the Portal has been highly effective and as can be inferred, there has been a complete awareness and compliance for prohibition of Single Use Plastic either by totally removing the item from the ships or by having alternate compliant replacement as shown in the replacement data mentioned below for reference.

Name of Single Use Plastic Items which got replaced by new items totally by Ships on voluntary basis for compliance with the requirements of SUP prohibition:

Item Name	Replaced Details
Plastic tumbler	Replaced with glass and steel tumbler
Plastic spoon	Replaced with metal spoons
Teacups	Replaced with paper teacups
Plastic container	Refill packs ordered where available. Smaller capacity plastic containers are replaced with larger capacity containers to minimize use of plastic
Plastic waste bag	Plastic waste bags replaced with bio-degradable plastic waste bags
Package material of various provision items	Replaced with paper/jute bags.
Packaged food/spice products	Replaced with paper bags.
Plastic stationery item	Replaced with paper bags.
Carry bags	Replaced with paper bags
Chemical cans	Replaced with large 200 ltr metal drums.
Plastic packing material from store suppliers	Plastic packing material replace with paper bags. Packing material returned to suppliers.
Plastic garbage bins	Replaced with metal garbage bins
Plastic container	Replaced with stainless steel container.
Plastic bowl	Replaced with ss bowl
Waste bag	Replaced with bio-degradable waste bag
Plastic utensils	Replace still utensils
Plastics cups	Replace paper cups
Old lube oil barrels	Replace by steel barrels
Plastic straw & stirrers	Replace by steel straw & stirrers
Plastic plates	Replace by still plates
Plastics drum	Replace by still drum
Plastics drinking bottles (1 litre)	Replace by 20 ltr bottles
Synthetic fevicol bottles	Replaced with steel container
Plastic pouches	Replaced with paper pouches
Old plastic identity cards	Replaced with paper cards
Plastics disposable gloves	Replaced as cotton type
Cutlery plates	Replaced with ceramic plates
Microwave dishes	Replaced with ceramic dishes
Plastic used in various packing of ship spares	Stores shall be checked ashore prior to supply and plastic packing shall be replaced with paper or similar bio degradable material
Sause sachets	Replaced with sauce glass bottles.

Plastic spoons	Disposable plastic spoons replaced with wooden spoons.
Oil storing tanks	Replaced the plastic drums with the metal drums for oil storing
Plastic waste bag	Replaced with paper bags
Pickle	Replaced with glass bottle
Plastic food warping foil	Replaced with aluminum foil
Plastic tumbler	Replaced with glass and steel tumbler
Disposable drums in cabin & common spaces	Replaced with Reusable Metal drums
Food packing films	Replaced with aluminum foil.
Waste bag	Replaced with paper bags
Rice packet	Replaced with steel drum with lid
Plastic polithing for vegetables	Replaced with paper bag
Surf packet	Replaced with glass jar
Surf packet	Replaced with glass jar
Soft drink bottle	Replaced with glass bottle
Candy sticks and icecream sticks	Replaced with wooden sticks
Plastic tea/cofee stirrers	Replaced with wood
Plastic tray	Replaced with steel trays
Plastic disposable oil bottles	Replaced with steel tins
Plastic knife for party	Replaced with steel knife
Plastic refils for hand wash	Replaced with reusable disposers
Thermocol	Replaced with paper stuffed between objects
Plastic straw	Replaced with paper straw
Sweet boxes	Replaced with paper boxes
Plastic garbage cover	Replaced with paper bags
Plastic buckets	Replaced with neoprene rubber buckets
Detergent powder plastic packets	Replaced with jute bags
Plastic folders & files	Replaced with cardboard files
Plastic polythene for vegetable	Replaced with paper bag
Surf packet	Replaced with glass jar
Soft drink bottle	Replaced with glass bottle
Flour bag	Replace with cloth bag
Waste plastic bags in packets	Plastic bags will be replaced by biodegradable paper bags
Cups	Replaced with glass
Plastics cotton buds	Replace by wood buds
Plastic pouches	Replace by paper paunches
Plastic jar	Replaced with ss jar
Plastic Garbage drums	Replaced with metal drums
Plastic packing material	Replaced with cartons
Rice/flour bag	Replaced with steel container
Noodles packaging	Replaced with paper wrapping
Sliced bread packaging	Replaced with paper wrapping
Ice Cream packing	Replaced with paper packaging
Plastic seafood packing	Replaced with cotton bags

Pulses packing	Replaced with cotton bag
Cable ties	Replaced with stainless steel cable ties
Shoe cover	Replaced with biodegradable shoe covers
Water bottle 1 litre.	Replaced with 20 ltrs. Water bottle(reusable)
Shoe cover	Replaced with biodegradable shoe covers
Plastic tumbler	Replaced with glass & stell tumbler
Plastic decorative items	Prohibited onboard. Replaced by paper decorative items
Plastic linings	Replaced with non-plastic
Plastic waste bag	Plastic waste bags replaced with biodegradable waste bags

MARINE ENVIRONMENTAL MANAGEMENT REPORT 2025

Port Reception Facilities Report

International Requirements

Obligations of Coastal State on Port Reception Facilities

The objective of the MARPOL Convention is to reduce the volumes of harmful materials entering the world's ocean and marine environment. To achieve this goal, the Convention and its Annexes contain requirements to control the accidental or deliberate discharge of substances such as oil, chemical, sewage and garbage.

The six technical Annexes of MARPOL contain detailed regulations with respect to the handling on board ships and in respect to any discharge into the sea or release into the atmosphere of six main groups of harmful substances:

i. Petroleum in any form (Annexure I);
ii. Noxious Liquid Substances (NLS) carried in bulk (Annexure II);
iii. Harmful substances carried in packaged form (Annexure III);
iv. Sewage (Annexure IV); Garbage (Annexure V); and
v. Air emissions (Annexure VI)

MARPOL imposes numerous operational and technical requirements on ships. MARPOL also imposes one important obligation to the Government of each Party, which is to ensure the provision for reception of ship-generated residues and garbage that cannot be discharged into the sea. MARPOL requires that residues that cannot be discharged into the sea in accordance with relevant requirements shall be delivered to port reception facilities. It also requires that port States shall ensure the provision of reception facilities, which must be adequate to meet the needs of ships, without causing undue delay to them. The relevant regulations on port reception facilities are:

Oily residues (from ER or from cargo): Annexure I, regulation 38;

NLS residues: Annexure II, regulation 18;

Sewage: Annexure IV, regulation 12;

Garbage: Annexure V, regulation 7; and

Annexure VI wastes & residues: regulation 17.

The word adequate was deliberated at Marine Environmental Protection Committee of IMO and Resolution 83(44) [Guidelines for Ensuring Adequacy of Port Reception Facilities] defines it as those facilities provided by visiting port, which:

i. mariners use;
ii. fully meet the needs of the ships regularly using them;
iii. do not provide mariners with a disincentive to use them; and
iv. contribute to the improvement of the marine environment.

It also states that the facilities provided by the port must:

i. meet the needs of the ships normally using the port; and
ii. allow for the ultimate disposal of ships' wastes to take place in an environmentally appropriate way.

Indian Regulatory Framework

Port Reception Facilities

The Indian Regulatory framework adequately covers the provision of Port Reception facilities in accordance with MARPOL and other IMO Conventions, such as the Anti-Fouling Convention. The law also covers the end-disposal of waste received from ships. The various provisions are detailed in paragraphs below.

Section 356-I [Oil reception facilities at ports in India]: It may be noted that the word Oil reception Facilities has been substituted by word Reception Facilities by 2003 amendments to the Merchant Shipping Act, 1958 provides substantive provisions related to Port Reception Facilities as below:

i. **Sub-section (1) gives duty and Powers to provide Port Reception Facilities**: Notwithstanding anything contained in any other law for the time being in force, in respect of every port in India, the powers of the port authority shall include the power to provide [The word reception facilities].
ii. **Sub-Section 4 defines Port Authorities**: The Central Government may, by notification in the Official Gazette, specify the ports in India having reception facilities in accordance with the requirements of the Convention.
Explanation.—For the purpose of this section, "port authority" means:
(a) in relation to any major port, the Board of Trustees in respect of that port constituted under any law for the time being in force;
(b) in relation to any other port, the Conservator of the Port, within the meaning of section 7 of the Indian Ports Act, 1908 (15 of 1908).

The following Merchant Shipping Rules specify provision related to Port Reception facilities at Indian Ports:

i. Rule 38, Chapter VI of MS (Prevention of Pollution by Oil from Ships) Rules 2010.
ii. Rule 18, Chapter VIII of Merchant Shipping (Control of Pollution by Noxious Liquid Substance in Bulk) Rules, 2010. (MARPOL -Annexure II)
iii. Rule 12 of Merchant Shipping (Prevention of Pollution by Sewage from ships) Rules, 2010. (Annexure-IV)
iv. Rule 7 of Merchant Shipping (Prevention of Pollution by Garbage from Ships) Rules, 2010. (Annexure-V)

The Ministry of Environment and Forest is the nodal agency in the administrative structure of the Central Government of development and implementation of Rules related to end disposal of waste ashore. Some the key rules are:

i. The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 established under the provision of the Environment Protection Act.
ii. The Solid Waste Management Rules 2016.
iii. Plastic Waste Management Rules, 2016
iv. Batteries Waste Management Rules 2001
v. E-Waste Management Rules, 2016

The Efforts of Directorate General of Shipping in ensuring adequate Port Reception Facilities

MEPC had agreed that "to achieve adequacy, the port should have regard to the operational needs of users and provide reception facilities for the types and quantities of wastes from ships normally using the port". Resolution MEPC 83(44) further elaborates the Operational need by stating:

i. **Mutually Agreed Time of Transfer**: The time of transfer of waste should be mutually agreed upon and transfer of waste should take place during the cargo-handling working hours of the port unless the ship's normal call at the port is not at a time within this period.
ii. **Advance Notification:** For logistical reasons, the providers of waste reception facilities may require advance notification of the intention to use facilities, particularly if independent waste contractors provide some or all of the port's waste collection services. Providing advance notification of the type and quantity of wastes on board for delivery to a reception facility should minimise the risk of undue delay to the ship. Once alerted to the volumes and types of wastes expected, the waste facility provider will be better able to meet the needs of the ship at a mutually acceptable time.

Resolution MEPC 83 (44) also stresses the importance on the following aspects to ensure adequate port reception facilities:

i. **Review of Data Collected through Advance Notification**: The universal application of an advance notification or similar procedure should ensure that ports receive a regular supply of documented material. They may use this to monitor the provision and adequacy of their facilities, which will greatly assist the port waste management planning and review process.
ii. **Disposal of Wastes:** The facilities provided by the port must allow for the ultimate disposal of ships' wastes to take place in an environmentally appropriate way.

The Directorate General of Shipping has developed an online module named "Swachh Sagar" to ensure the following:

i. The ships are able to raise Advance Notification for Port Reception Facilities to visiting ports.
ii. The ships can choose vendor, fix the date, and time for collection of waste with the selected vendors.
iii. The vendor is required to upload the receipt of waste received and the proof/ receipt that the waste is disposed in accordance with rules.

The Directorate General of Shipping has also been annually assessing the Port Reception Facilities at various ports across India. This year onwards, an Online digital platform has been developed to ensure that all assessments are carried out using this digital platform so that data can be analysed and improvements suggested.

The DGS Circulars related to Swachh Sagar are:

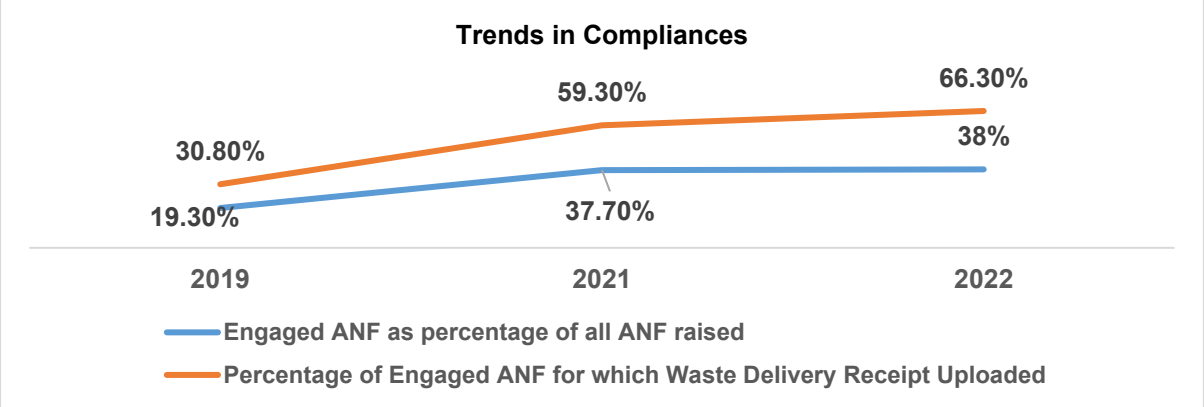
i. DGS Order No. 02 of 2018: Assessment of Port Reception Facilities.
ii. DGS Circular 06 of 2018: Utilization of Centralized Port Reception Facilities: Swachh Sagar.
iii. Addendum to Engineering Circular No. 06 of 2018.
iv. Standard Operating Procedure for Assessment of Adequacy of a Port Reception Facility dated 06.03.2018

Review of Data on Swachh Sagar

Trends in Gross Performance Indicators: The key gross performance indicators:

i. Number of Ports Registered on Swachh Sagar
ii. Vendor count
iii. Number of Advanced Notifications (ANF) which got converted into waste delivery:
iv. Number of Waste Delivery for which waste receipt is uploaded

Attributes	2019	2021	2022	2024
Number of Ports Registered on Swachh Sagar	46	63	66	68
Number of ANFs filled up by Ships	12949	40862	42572	47077
Engaged ANFs	2502	15410	16207	35219
Vendor Count	241	476	402	469
Number of Reception Receipts Uploaded	772	9145	10754	14402



Gross Indicators for the Calendar Year 2024

Number of Ports registered on the Swachh Sagar	68	**Number of Ports on Which ANF raised**	68
Number of Ports which supplied Port Reception Facilities	**52**	**Total Number of Advanced Notifications raised.**	47077
Number of ANF which led to discharge of waste to PRF	35219	**Number of Receipts Uploaded**	14402

Inferences

1. Is Non-Conversion of Advance Notification (ANF) an indication about non-availability or inadequacy of Port Reception Facilities?
   No, because raising of Advance Notification is mandatory irrespective of whether the ship intends to deliver waste or not at visiting port.
2. Is the conversion rate of ANF to delivery of waste is an indication of adequacy of port reception facilities?
   Yes, because a higher conversion rate indirectly indicates that the port facilitate the ships and the facilities are adequate.

There are only 38% of ANF converted into delivery of waste. The ports with less than average that is 38% conversion of ANF to waste delivery may be verified at next assessment for compliance to Swachh Sagar requirements.

% ANF Conversion = (ANF Converted to Waste Delivery/Number of ANF Raised) x 100 %

% Waste Delivery Receipt Uploaded = (Number of Waste Delivery Receipt Uploaded/ ANF Converted to Waste Delivery) x 100 %

The data on ports with respect to conversion of ANF to waste deliver and uploading of waste delivery receipt is as below:

Minor Ports			
Ports	**% ANF Converted to Waste Deliver/% Waste Delivery Receipt Uploaded**	**Port**	**% ANF Converted to Waste Deliver/% Waste Delivery Receipt Uploaded**
Adani Krishnapatnam Port Ltd (AKPL)	0 % / 0 %	Adani Petronet Dahej Port Limited	0 % / 0 %
Adani Ports and SEZ Limited Mundra	0.04 % / 31300 %	AEML Dahanu Port - Adani	0 % /0 %
Ambuja Cement Ltd - Muldwarka	0.39 % / 33.33 %	Ambuja Magdalla Jetty	0 % / 0 %
Ambuja Ulwa Jetty	19.73 % / 505.68 %	AMNS Ports Hazira Ltd.	0 % / 0 %
Angre Port Pvt Ltd	0 % / 0 %	Bedi Group of Ports - owned by GMB	0 % / 0 %
Beypore Port	0 % / 0 %	Bharat Oman Refineries Ltd SPM Sikka	0% /0 %
Bhavnagar Group of Ports -Owned by GMB	0 % / 0 %	Captain of Ports GOA	0 % / 0 %
Dahej RORO Jetty owned by GMB	0 % / 0 %	Dahej Group of Ports - Privately owned terminals	0 % / 0 %
Dhamra Port Company Limited	0.28 % / 50 %	Ennore Minor Port - Coromandel	0 % / 0 %
Essar Bulk Terminal-Salaya	0.57 % / 9600 %	Finolex Terminal Ratnagiri	0 % / 0 %
Gangavaram Port	1.85 % / 1210 %	Gopalpur Ports Ltd	0.72 % / 1100 %
Gujarat Pipavav Port Ltd	0 % / 0 %	Hazira (Surat) Port	0 % / 0 %
JSW Dharamtar Port	1.92 % / 300 %	JSW JAIGARH PORT LIMITED	0.25 % / 10800 %
Kakinada Anchorage Port (Government Of Andhra Pradesh)	0.31 % / 8200 %	Kakinada Deep Water Port (sea port)	0.27 % / 8233.33 %
Karaikal Port Private Limited	0.43 % / 3600 %	Karwar Port	0 % / 0 %
KLL LNG terminal Dabhol	0 % / 0 %	KMB Vizhinjam	0 % / 0 %
Kollam Port	9.09 % / 400 %	Magdalla Group of Ports - owned by GMB	0 % / 0 %
Mandvi Group of Ports -owned by GMB	0 % / 0 %	NAV LAKHI GROUP OF PORTS (owned by GMB)	0 % / 0 %
Nhava Supply Base	3.34 % / 2013.79 %	Okha Group of Ports -Owned by GMB	12.77 % / 550 %
Porbandar Group of Ports -owned by GMB	0 % / 0 %	Port Management Board, Andaman and Nicobar Islands	0.36 % / 50122.22 %
Reliance Hazira Shipping and Offshore Division	1.06 % / 9050 %	Revdanda JSW Steel (Salav) Ltd	0 % / 0 %
Sanghi Port	0 % / 0 %	Sikka Ports and Terminals Ltd	0.18 % / 4800 %
Thirukkadaiyur Port	0 % / 0 %	UltraTech Captive Jetty Sewagram	0% /0 %
UTCL Captive Berth - pipavav	0 % / 0 %		

Taking into account that more than 500 ANF raised in Calendar Year 2022, the best performing ports in terms of ANF conversion to waste delivery and uploading of waste receipt is **Port Management Board, Andaman and Nicobar Islands.**

Major Ports			
Ports	**% ANF Converted to Waste Deliver/% Waste Delivery Receipt Uploaded**	**Port**	**% ANF Converted to Waste Deliver/% Waste Delivery Receipt Uploaded**
Chennai Port Authority	0.78 % / 1133.33 %	Cochin Port Authority	2.1 % / 2484.38 %
Deendayal or Kandla Port Trust	0.26 % / 19000 %	Haldia Dock Complex - KoPT.	0.41 % / 1455.56 %
Jawaharlal Nehru Port trust(JNPT)	0.25 % / 70 %	Kamarajar Port Limited	0.26 % / 6800 %
Mormugao Port Authority	1.06 % / 1100 %	Mumbai Port Authority	0.49 % / 3260 %
New Mangalore Port Authority (NMPT)	0.14% / 16450 %	Paradip Port Authority	0.34 % / 4955.56 %
Syama Prasad Mookerjee Port, Kolkata - Kolkata Dock System	0 % / 0 %	V. O. Chidambaranar Port Trust Tuticorin	0.22 % / 3950 %
Visakhapatnam Port Trust	0.96 % / 7650 %		

Taking into account that more than 500 ANF raised in Calendar Year 2022, the best performing ports in terms of ANF conversion to waste delivery and uploading of waste receipt is **Visakhapatnam Port Authority.**

Port, which have received MARPOL Annex VI Waste in 2024

1. Ozone Depleting Substances

i	Adani Hazira Port Ltd	**xvi**	Kakinada Deep Water Port (Sea Port)
ii	Adani Krishnapatnam Port Ltd (AKPL)	**xvii**	Kamarajar Port Limited
iii	Adani Petronet Dahej Port Pvt Ltd	**xviii**	Karaikal Port Private Limited
iv	Adani Ports And SEZ Limited, Mundra	**xix**	Kattupalli Port - Ennore Chennai
v	Bharat Petroleum Corporation Ltd, Spm – Sikka	**xx**	Magdalla Group Of Ports -Owned By GMB
vi	Chennai Port Trust	**xxi**	Mormugao Port Trust
vii	Dahej Group Of Ports - Privately Owned Terminals	**xxii**	Mumbai Port Trust
viii	Deendayal Or Kandla Port Trust	**xxiii**	New Manglore Port Trust (NMPT)
ix	Gangavaram Port	**xxiv**	Paradip Port Trust
x	Gopalpur Ports Ltd	**xxv**	Port Management Board, Andaman And Nicobar Islands
xi	Haldia Dock Complex - Kopt.	**xxvi**	Sikka Ports And Terminals Ltd.
xii	Hazira (Surat) Port	**xxvii**	Syama Prasad Mookerjee Port, Kolkata - Kolkata Dock System
xiii	Jawaharlal Nehru Port Trust(JNPT)	**xxviii**	V. O. Chidambaranar Port Trust, Tuticorin
xiv	JSW Jaigarh Port Limited	**xxix**	Visakhapatnam Port Trust
xv	Kakinada Anchorage Port (Government Of Andhra Pradesh)		

Ports which Received Exhaust Gas Scrubber Residues

i	Adani Hazira Port Ltd	xv	JSW Jaigarh Port Limited
ii	Adani Krishnapatnam Port Ltd (AKPL)	xvi	Kakinada Deep Water Port (Sea Port)
iii	Adani Petronet Dahej Port Pvt Ltd	xvii	Kamarajar Port Limited
iv	Adani Ports And Sez Limited Mundra	xviii	Kattupalli Port-Ennore Chennai
v	Bharat Petroleum Corporation Ltd, Spm - Sikka	xix	Magdalla Group Of Ports -Owned By GMB
vi	Chennai Port Trust	xx	Mumbai Port Trust
vii	Dahej Group Of Ports - Privately Owned Terminals	xxi	New Manglore Port Trust (NMPT)
viii	Deendayal Or Kandla Port Trust	xxii	Okha Group Of Ports -Owned By GMB
ix	Finolex Terminal Ratnagiri	xxiii	Paradip Port Trust
x	Gangavaram Port	xxiv	Sikka Ports And Terminals Ltd.
xi	Gopalpur Ports Ltd.	Xxv	Syama Prasad Mookerjee Port, Kolkata - Kolkata Dock System
xii	Haldia Dock Complex - Kopt.	Xxvi	V. O. Chidambaranar Port Trust Tuticorin
xiii	Hazira (Surat) Port		
xiv	Jawaharlal Nehru Port Trust (JNPT)		

Port with more than 100 ANF and more than 90% of raised ANF resulting in Delivery of Waste

There are 44 ports with more than 100 ANFs Raised. 14 ports have reported more than 90% raised ANF converted to Waste Delivery (Engagements)

Name
Ambuja Cement Ltd - MULDWARKA
AMBUJA MAGDALLA JETTY
AMBUJA ULWA JETTY
Cochin Port Trust
Deendayal or Kandla Port Trust
Essar Bulk Terminal-Salaya
Gopalpur Ports Ltd
JSW JAIGARH PORT LIMITED
Mormugao Port Trust
Nhava Supply Base
Port Management Board, Andaman and Nicobar Islands
Reliance Hazira Shipping and Offshore Division
The Vizhinjam Port
Visakhapatnam Port Trust

Port with more than 100 ANF and between 50-90% of raised ANF resulting in Delivery of Waste

There are 44 ports with more than 100 ANFs Raised. 13 ports have 50%-90% raised ANF converted to Waste Delivery (Engagements)

Port	% of ANF resulting in waste discharge	% of ANF resulting in waste discharge	Port	% of ANF resulting in waste discharge	% of ANF resulting in waste discharge
Ambuja Cement Ltd - Muldwarka	82.9%	0.5%	Gopalpur Ports Ltd	61.5%	47.5%
AMNS Ports Hazira Ltd.	51.7%	66.3%	Nhava Supply Base	68.4%	42.5%
Cochin Port Trust	64%	66.3%	Sikka Ports and Terminals Ltd.	50.6%	46.5%
Deendayal or Kandla Port Authority	64,2%	36%	Visakhapatnam Port Trust	76.4%	78.2%
Essar Bulk Terminal-Salaya	82.5%	90.7%			

Amount and Type of Waste Discharged at Indian Ports

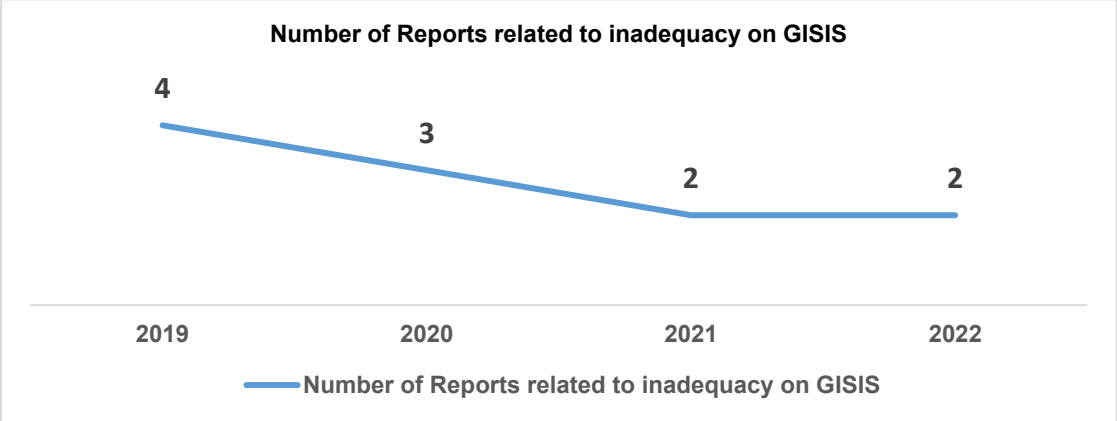
Type of Waste	Quantity Discharged	Type of Waste	Quantity Discharged
Amount of Oily Bilge Water delivered to PRF	201297.77 m^3	**Amount of Oily Residues Sludge delivered to PRF**	415605.65 m^3
Amount of Oily Tank Washings delivered to PRF	540580.92 m^3	**Amount of Dirty Ballast water delivered to PRF**	433949.69 m^3
Scale and Sludge from Tank Cleaning	79554.75 m^3	**Annexure II: Category X**	1747881.9 m^3
Annexure II: Category Y	683544.59 m^3	**Annexure II: Category Z**	562389.85 m^3
Annexure IV: Sewage	0 m^3	**Plastics**	30199.5 m^3
Food Waste	7203.73 m^3	**Domestic Waste**	24763.95 m^3
Cooking Oil	4756.3 m^3	**Incinerator Ashes**	2718.28 m^3
Operational Waste	19617.68 m^3	**Cargo Residues**	62362.21 m^3
Animal Carcasses	180.29 m^3	**Fishing Gear**	428.14 m^3
E-Waste	3622.76 m^3	**Quarantine Waste**	1515.35 m^3
Ozone Depleting Substances	11255.5 m^3	**Exhaust Gas Cleaning Residues**	3542.3 m^3

Ports where less than 10 ANF raised

Port Name	No. of ANFs
Bhogat Port, Vedanta Limited	2
CHHARA Port	4
Dahej RORO Jetty owned by GMB	2
GSFC – Sikka Jetty	8
KMB Vizhinjam	3
Mandvi Group of Ports -owned by GMB	3
MARS- dummy port for trials	4
Redi Port	9
Thirukkadaiyur Port	1

Data Analysis of Reports of Inadequacy Logged-In on IMO GISIS

Trends in Inadequacy Reports Registered on GISIS



Ports against which the Inadequacy Reports Registered

Ports	Jurisdictional MMD	Number of Complaints Registered						Number of pending reports requiring validation
		2019	2020	2021	2022	2023	2024	
Sikka	Kandla	1	1	2	1	0	0	0
Nhava Sheva (JNPA)	Mumbai	**1**	**0**	**0**	**0**	0	**0**	**0**
Mundra	Kandla	0	0	0	1	0	0	0
Vadinar	Kandla	1	0	0	0	0	1	0
Deendyal Port Authority	Kandla	0	1	0	0	0	0	0
Hazira	Mumbai	1	0	0	0	0	0	0
Salaya	Kandla	0	1	0	0	0	0	0
Mumbai	Mumbai	0	0	0	0	0	0	0
Kandla	Kandla	0	0	0	0	0	0	0
Tuticorin	Chennai	0	0	0	0	0	0	0

Nature of Complaints Registered on GISIS

Type of Waste	Nature of Complaint	Port
Plastics, Domestic Waste, Food Waste, E-Waste, Operational Waste, Cooking Oil	Disposal Certificate not issued after discharge	Mundra
Domestic Waste	Metal Onboard	Mundra
Plastics, Domestic Waste, Incinerator Ashes, E-Waste, Operational Waste	Unreasonable Charges	Sikka
Plastics, Domestic wastes, Cooking Oil, Incinerator ashes, Operational wastes, E-waste	Unreasonable charges for use of facilities	Sikka
Plastics, Domestic wastes, Incinerator ashes, Operational wastes, E-waste	Vessel Received This Message From Agent - "Due To The Outbreak Of Covid-19, Garbage Landing Has Been Stopped By The Terminal."	Sikka
Plastics, Food wastes, Domestic wastes, Incinerator ashes, E-waste	GARBAGE DISPOSAL IS NOT ALLOWED DUE TO COVID-19 AS PER SIKKA PORT AUTHORITY REGULATION	Sikka
Category Y substance	On completion of unloading the ship was prohibited from clearing the discharge lines and terminal loading arm necessitating the draining of the loading arm back to the ship. This would appear contrary to MARPOL Annex II regulation 18.6. After stripping the drainage from tanks and transferring to suitable containers, the terminal declined to take the waste, contrary to MARPOL Annex II regulation 18.1	Sikka
Plastics, Food wastes, Domestic wastes, Cooking Oil, Incinerator ashes, Operational wastes, E-waste	No facilities available for expired medicines and pyro-techniques.	Kandla
Plastics, Domestic wastes, Incinerator ashes, Operational wastes, E-waste	No Garbage Discharge Facility Available	Hazira
Plastics, Domestic wastes, Incinerator ashes, Operational wastes, E-waste	The Cost of Garbage Disposal was overrated.	Vadinar
Plastics, Domestic wastes, E-waste	Garbage Disposal Only Through Private Vendor. Garbage Disposal - Very Expensive	Vadinar
Domestic wastes	Metal Onboard	Mumbai
Plastics, Food wastes, Incinerator ashes, Operational wastes	No facility available CAT I - 0.1 M3 - A	Tuticorin
Plastics, Domestic Waste, Food Waste, E-Waste, Operational Waste & Incinerator Ashes.	Undue delay	Salaya
Domestic wastes, Incinerator ashes, Operational wastes, E-waste	No facility available	Nhava Sheva

Review of Inadequacy Reports on GISIS based on Swachh Sagar Data

Inadequacy reports registered on GISIS and sufficiency of vendors for PRF collection and disposal

Ports	Number of Vendors registered on Swachh Sagar
Mundra	6
Sikka	9
Salaya	8
Vadinar	0
Deendayal Port Authority ex Kandla	26
Hazira	23
JNPA	13
Tuticorin	4
Mumbai	12

Port	Number of ANF raised	Number of ANF converted into waste delivery	Percentage of total ANF raised converted into waste delivery	Number of ANF where waste delivery resulted and receipt uploaded (Percentage of total delivery based on ANF Conversion to waste delivery)
Sikka	552	1	0.18%	48 (4800%)
Nhava Sheva	3952	10	0.25%	7 (70%)
Deendayal Port Authority ex Kandla	1921	5	0.26%	950 (19000%)
Salaya	175	1	0.57%	96 (9600)
Hazira	464	0	0.00%	27
Mundra	4673	2	0.04%	626 (31300%)
Vandinar	NA	NA	NA	NA

Data on registered vendors for waste collection, ANFs raised and PRF provided was not available from the ports of Vadinarand.

Assessment of Port Reception Facilities

The DGS Order 02 of 2018 was issued on 21 February 2018 to make mandatory the yearly assessment of port reception facilities. In the years, 2020 & 2021 the ports were not inspected due to the COVID-19 pandemic.

The common deficiencies found were:

i. Vendor demanding higher payment charges than those declared on port website.
ii. End disposal certificates not uploaded on the Swachh Sagar Portal.
iii. No disposal facility for Annexure IV waste.
iv. Limited number of vendors approved by Port.
v. Availability of Waste Management Plan.
vi. Vendor providing reception facilities without being hired through the Swachh Sagar Portal.
vii. Assessment of PRF demand not carried out.
viii. Vendors collecting waste other than what they are approved for by the port.
ix. No end disposal receipts of waste available.
x. Expired port authorization of PRF Vendors.
xi. Non-availability of Port Procedures for the collection and disposal of waste.
xii. No internal audits conducted.
xiii. No specific written Port procedures concerning disposal of waste available and No Waste Management Plan available; procedure for classifying waste into waste and hazardous waste and the method of disposal; The responsibilities of all the agencies/persons involved in providing port reception facilities to be defined.
No specific written Procedures for licensing and monitoring of Private contractor for specific job in the end end waste receiving and management system (The licensing procedures to include authorization as required under Hazardous Rules, 2016).
xiv. No internal Audits/Internal Inspection reports of licensed contractors available for review.
xv. Swachh Sagar Portal is not being fully utilized for waste disposal: Fees charged by the vendor /CBM of waste disposal not updated; Vendor engagement for disposal of waste not done online through the Swachh Sagar Portal.

MARINE ENVIRONMENTAL MANAGEMENT REPORT 2025

Ballast Water Convention

Introduction

The International Convention for the control and management of ships' ballast water and sediment was adopted in the year 2004. The Convention finally achieved the required numbers of ratification and entered into force in 2017. The prolonged delay between the adoption and entering into force of the convention was a marked period of uncertainty for ship owners and the Ballast Water equipment manufacturers. In anticipation of the BWM Convention entering into force, the BWMS manufacturers sought the Type Approval (TA) for their plant as per the G8 Guidelines and by the year 2017, more than 50 Type approved BWMS were available in the market for owners to choose from.

Taking a proactive step towards biodiversity conservation, the Directorate issued circulars 2 of 2016, 32 of 2020 and 16 of 2022, encouraging the Indian ship owners to follow the BW convention requirements. Over the last couple of years, the Indian flagged ships and vessels calling Indian ports have successfully implemented the Ballast Water Convention requirements through the installation of approved Ballast Water Management Systems and carrying our operations to comply with D1 (Ballast Water Exchange) and D2 (Ballast Water Treatment). However, the industry received feedback related to the failures or inoperability of the BWMS in certain conditions. The Indian port state inspection presently does not inspect the vessels for Ballast water compliance. With the MEPC finalizing the Compliance Monitoring Devices' (CMDs) approval process for indicative testing of the ballast water, it is envisaged that in future, the PSC inspection will entail indicative testing of the ships ballast water discharges in ports. Recognizing the importance of the proper operations of the BWMS and higher degree of confidence in the BWMS being able to meet the D2 compliance, the directorate had initiated a study to map the challenges in BWMS operations.

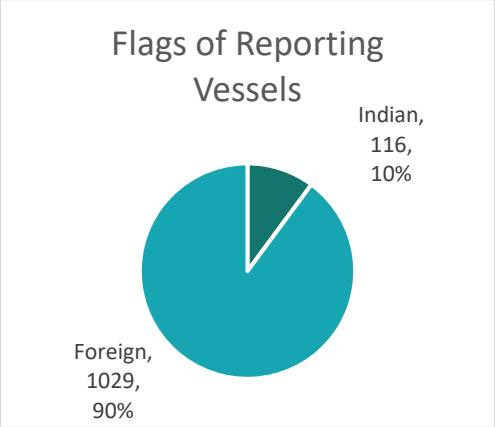
Also, as per the Paris MOU statistics, it was evident that the maximum deficiencies are noted in the Recordkeeping section concerning the Ballast Water Record Book entries.

This paper puts forward the study carried out by the team under the guidance of the directorate in the following paragraphs.

Data on BWMS- Phase 1:

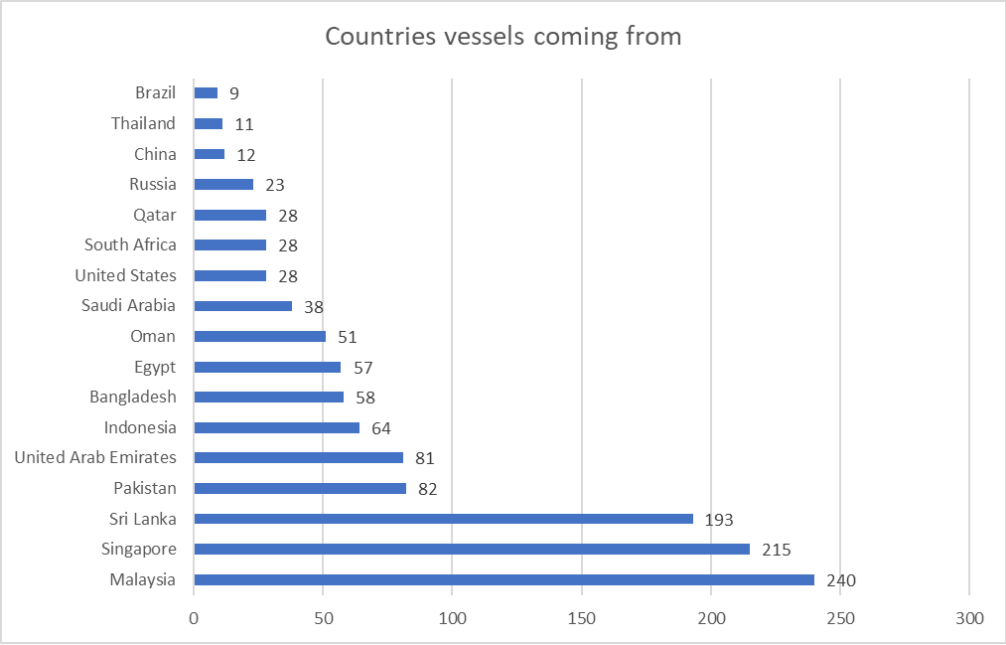
In collaboration with the Indian Registrar of Shipping, the Directorate set up the Swachh Sagar portal on Ballast Water Reporting in September 2022, which required the vessels calling and operating Indian ports to submit details concerning the Ballast Water operations. The highlights of the data gathered and analyzed during October 2022 to January 2023 are:

i. More than 2700 validated entries from vessels.
ii. A Total of 1145 vessels reported, of which 10% were Indian Flagged vessels.
iii. The Chlorination and UV systems adopting BWMS were noted to be the most preferred technology, covering more than 90% of the installations.
iv. Containers were the maximum reported vessels accounting for 35% and are noted not to carry out Ballasting/ deballasting operations.



Ships	Indian	Foreign
Total ships reported	116	1029
Ships with BWTS Installed	69	884
Installed with BWMS %	59.4%	85.9%

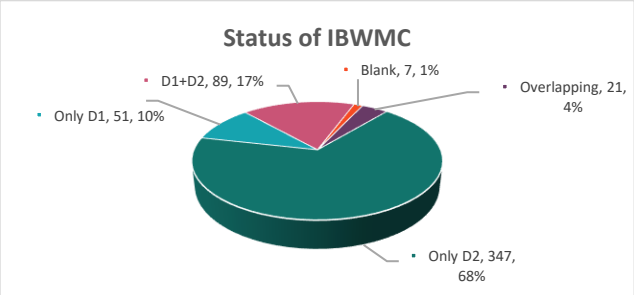
v. The counties where the vessels originate their voyage to arrive at India was analyzed to understand the possible source of Ballast water.

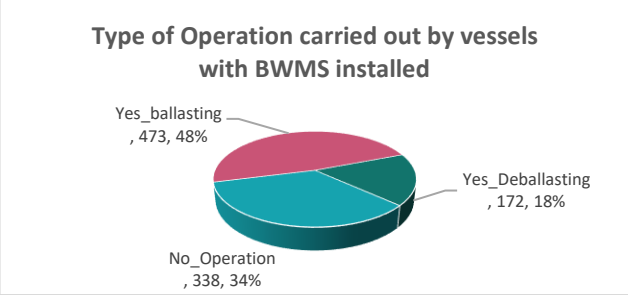


Data on BWMS inoperability – Phase 2

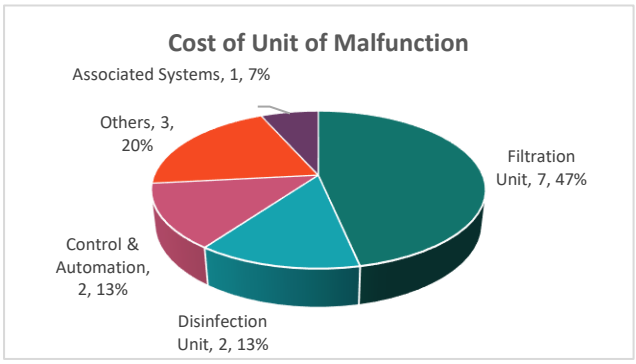
Based on the experience gained through the initial data, the Swachh Sagar portal survey questions were realigned to focus on the BWMS failures, and the new questionnaire was rolled out in July 2023. The data received from the vessels in August and September 2023 was further analyzed to provide greater insights into the Malfunctioning of the BWMS.

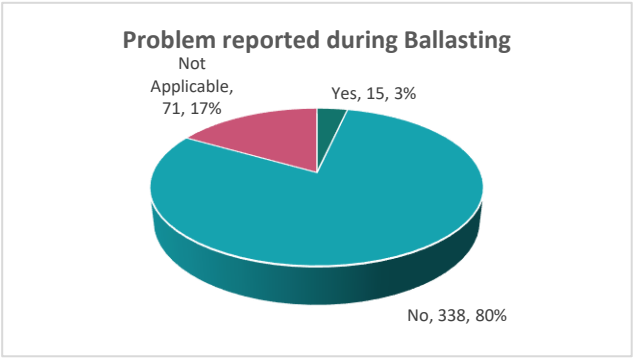
i. A Total of around 1400 entries received in 2 months.
ii. A total of 515 vessels reported.
iii. 455 vessels were installed with BWMS, which accounts for 88% of the vessels.
iv. 17 vessels reported to have faced issues during BWMS operations. 15 vessels faced issues during Ballasting (3.1%) and only 2 faced issues during Deballasting (1%).





v. Majority of the vessels operating in the Indian ports, including those of Dahej, Kandla, Hazira and Haldia, have reported no issues in carrying out Ballasting or Deballasting operations.
vi. 7 out of the 15 units which reported malfunction during the uptake process are attributed to Filters. No particular port is identified as a Port with Challenging Water (PCWQ)
vii. A couple of vessels installed with electro-chlorination plants commented on the issue of achieving TRO due to freshwater in the port.





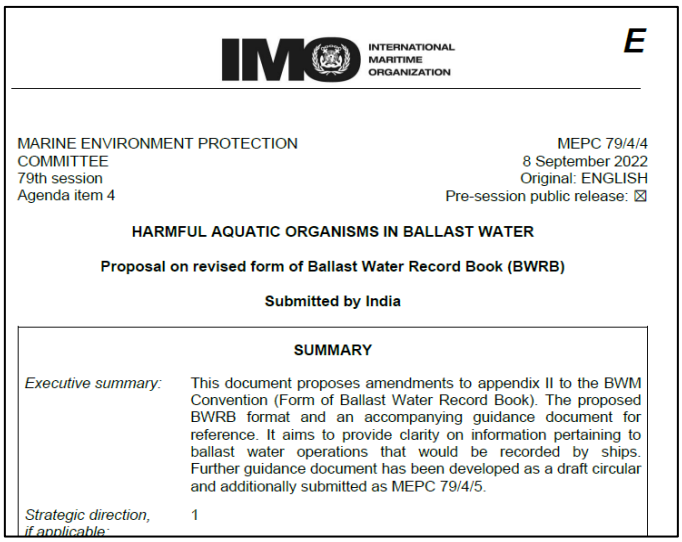
viii. Contrary to the submission made at MEPC, the vessel operating in the Indian ports have reported of lesser challenges in the operation of the BWMS.

Ballast Water Record Book and associated guidelines:

Noting the increased deficiencies in the PSC inspections as per Paris MOU statistics and taking into account the high number of Indian seafarers onboard serving both Indian and foreign-flagged vessels, the directorate submitted papers at the MEPC 78, 79 and 80 to resolve the recordkeeping related issues.

The new Ballast water record book developed by India and submitted to MEPC 79 was unanimously supported by all member states and it was adopted at MEPC 80. The new format of record keeping aligned the record book to the existing Oil record book format which used Item/ Code format.

Further to the amendment of the Ballast Water Record Book, India submitted the guidelines for recording various operations in the BWRB at MEPC 80. This submission was co-sponsored by Canada, Singapore, Netherlands and Intertanko has been accepted at Ballast Water Review Group of MEPC 80 and released as a Circular.



IMO INTERNATIONAL MARITIME ORGANIZATION

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MARINE ENVIRONMENT PROTECTION COMMITTEE
79th session
Agenda item 4

MEPC 79/4/4
8 September 2022
Original: ENGLISH
Pre-session public release: ☒

HARMFUL AQUATIC ORGANISMS IN BALLAST WATER

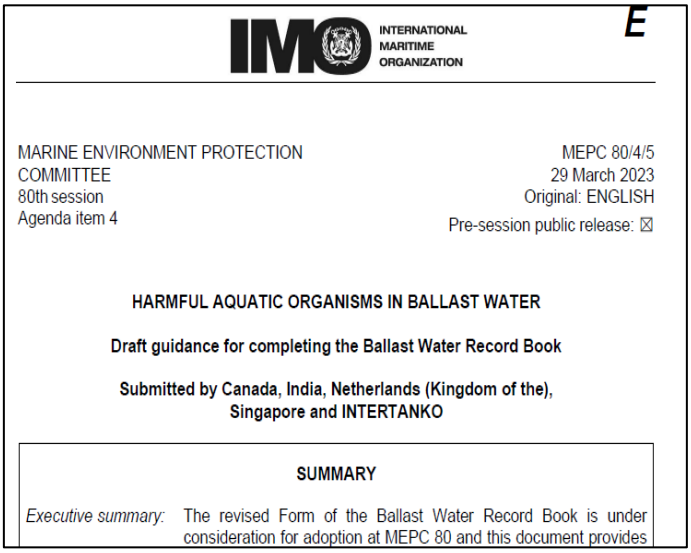
Proposal on revised form of Ballast Water Record Book (BWRB)

Submitted by India

SUMMARY

Executive summary: This document proposes amendments to appendix II to the BWM Convention (Form of Ballast Water Record Book). The proposed BWRB format and an accompanying guidance document for reference. It aims to provide clarity on information pertaining to ballast water operations that would be recorded by ships. Further guidance document has been developed as a draft circular and additionally submitted as MEPC 79/4/5.

Strategic direction, if applicable: 1



IMO INTERNATIONAL MARITIME ORGANIZATION

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MARINE ENVIRONMENT PROTECTION COMMITTEE
80th session
Agenda item 4

MEPC 80/4/5
29 March 2023
Original: ENGLISH
Pre-session public release: ☒

HARMFUL AQUATIC ORGANISMS IN BALLAST WATER

Draft guidance for completing the Ballast Water Record Book

Submitted by Canada, India, Netherlands (Kingdom of the), Singapore and INTERTANKO

SUMMARY

Executive summary: The revised Form of the Ballast Water Record Book is under consideration for adoption at MEPC 80 and this document provides

Main Deficiencies in Paris MOU for 2023 & 2024

TOP 5 MAIN GROUPS

	2023		2024	
Main group of deficiencies	Deficiencies	% Total deficiencies	Deficiencies	% Total deficiencies
SOLAS Chapter II-2	8,227	17.3	8,617	17.2
SOLAS Chapter II-1	5,444	11.5	5,653	11.3
MLC 2006 Title 4	4,750	10.0	5,189	10.4
SOLAS Chapter III	4,391	9.2	4,506	9.0
SOLAS Chapter V	3,843	8.1	3,813	7.6

TOP 5 DEFICIENCIES

	2023		2024	
Deficiencies	Deficiencies	% Total deficiencies	Deficiencies	% Total deficiencies
ISM	2,283	4.8	2,285	4.6
Fire doors/openings in fire-resisting divisions	1,519	3.2	1,612	3.2
Seafarers' employment agreement (SEA)	624	1.3	756	1.5
Voyage or passage plan	648	1.4	661	1.3
Auxiliary engine	626	1.3	654	1.3

Major Categories of Deficiencies in Paris MOU, 2022-24

MAJOR CATEGORIES OF DEFICIENCIES 2022-2024

		2022		2023		2024	
Deficiencies Main Group		**Def**	**Def %**	**Def**	**Def %**	**Def**	**Def %**
Ballast Water Management		898	1.9	907	1.9	964	1.9
COLREG		444	0.9	441	0.9	453	0.9
Load Lines		2,758	5.8	2,644	5.6	2,620	5.2
MARPOL	MARPOL Annex I	1,530	3.2	1,528	3.2	1,635	3.3
	MARPOL Annex IV	418	0.9	515	1.1	486	1.0
	MARPOL Annex V	821	1.7	930	2.0	977	2.0
	MARPOL Annex VI	618	1.3	771	1.6	851	1.7
	MARPOL Other	47	0.1	57	0.1	75	0.2
MLC	MLC 2006 Title 2	1,453	3.1	1,181	2.5	1,442	2.9
	MLC 2006 Title 3	3,201	6.7	3,151	6.6	3,538	7.1
	MLC 2006 Title 4	4,875	10.2	4,750	10.0	5,189	10.4
	MLC 2006 Title 5	319	0.7	289	0.6	370	0.7
	MLC Other	168	0.4	198	0.4	116	0.2
SOLAS	SOLAS Chapter I	506	1.1	501	1.1	530	1.1
	SOLAS Chapter II-1	5,520	11.6	5,444	11.5	5,653	11.3
	SOLAS Chapter II-2	7,360	15.5	8,227	17.3	8,617	17.2
	SOLAS Chapter III	4,541	9.5	4,391	9.2	4,506	9.0
	SOLAS Chapter IV	844	1.8	793	1.7	781	1.6
	SOLAS Chapter V	3,961	8.3	3,843	8.1	3,813	7.6
	SOLAS Chapter VI	285	0.6	224	0.5	255	0.5
	SOLAS Chapter XI-1	492	1.0	404	0.9	442	0.9
	SOLAS Chapter X (ISM)	2,284	4.8	2,308	4.9	2,309	4.6
	SOLAS Chapter XI-2 (ISPS)	432	0.9	420	0.9	353	0.7
	SOLAS Chapter III (LSA)	320	0.7	331	0.7	422	0.8
	SOLAS Other	954	2.0	869	1.8	748	1.5
STCW	STCW Code Part A ch.I	753	1.6	615	1.3	501	1.0
	STCW Code Part A ch.VIII	1,037	2.2	1,112	2.3	841	1.7
	STCW Other	242	0.5	245	0.5	675	1.4
Other		488	1.0	421	0.9	796	1.6

Conclusion

MEPC discussions and the Convention Review Process presently underway is emphasizing on the development of robust BWMS which can be operated in all types of waters. The present study does not indicate presence of challenging water in Indian ports, which would render the BWMS inoperable.

It is proposed that a further scientific study be undertaken to check the effectiveness of the BWMS operations in Indian waters and ensure that the D2 compliance is achieved.

MARPOL AT 50

Our Commitment Goes On

DIRECTORATE GENERAL OF SHIPPING
नौवहन महानिदेशालय
MUMBAI
INDIA
सागराः सुपन्थानः सन्तु