Clean Cargo

Ocean Containership Greenhouse Gas Emission Intensity Calculation Methods

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SUGGESTED CITATION

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ABOUT SMART FREIGHT CENTRE

Smart Freight Centre is an international non-profit organization focused on reducing greenhouse gas emissions from freight transportation. Smart Freight Centre's vision is an efficient and zero emission global logistics sector. Smart Freight Centre's mission is to collaborate with the organization's global partners to quantify impacts, identify solutions, and propagate logistics decarbonization strategies. Smart Freight Centre's goal is to guide the global logistics industry in tracking and reducing the industry's greenhouse gas emissions by one billion tonnes by 2030 and to reach zero emissions by 2050 or earlier, consistent with a 1.5°C future.

ABOUT CLEAN CARGO

Clean Cargo is a collaborative initiative between ocean container carriers, logistics service providers, and cargo owners. Clean Cargo serves as a source of high-quality containership greenhouse gas emission performance information that supports members in their work to decarbonize containerized ocean cargo transportation. Specifically, the Clean Cargo secretariat collects operational and technical data from ocean container carriers to generate containership emission performance information that:

- Facilitates accurate greenhouse gas emissions inventory calculations for Clean Cargo members.
- Guides member companies in making educated ocean freight procurement decisions.

Clean Cargo also serves as a forum for decarbonization best practice sharing amongst members.

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INTRODUCTION

This document outlines the methods applied in calculating Clean Cargo containership greenhouse gas (GHG) emission intensities. The methods described here are based on methods originally developed by the members and secretariat of the Business for Social Responsibility (BSR) Clean Cargo Working Group collaborative initiative.

In 2022, the Clean Cargo secretariat transitioned from BSR to Smart Freight Centre (SFC). SFC established a Clean Cargo Methods Committee tasked with revising and maintaining the Clean Cargo GHG emission calculation methods. Clean Cargo member companies elect eight Clean Cargo Methods Committee members to represent them on the Clean Cargo Methods Committee for two-year terms. SFC representatives serve as the permanent chair and co-chair of the Committee. The methods described here include changes to the previous (2015) version of the Clean Cargo methods. The changes were written based on Methods Committee deliberations in 2022.

These Clean Cargo methods are consistent with the guidelines described in the Global Logistics Emissions Council (GLEC) Framework. For example, the Clean Cargo methods[1]:

- Are based on emissions associated with the entire life cycle of an energy source (i.e., Well-to-Wake emissions).
- Incorporate the warming effect from all GHGs described in the United Nations Framework Convention on Climate Change Kyoto Protocol (currently: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6), and nitrogen trifluoride (NF_3)). That is, Clean Cargo calculations are based on CO_2 equivalent (CO_2e) emissions.

For more on the GLEC Framework, see here.

The methods described in this document:

- Supersede all previous versions of the Clean Cargo methods.
- Will be implemented for calculating Clean Cargo GHG emission performance information beginning in 2024.

For questions about these methods or about Clean Cargo in general, please contact SFC at info@smartfreightcentre.org.

[1] Emission factors applied in Clean Cargo calculations are listed at Annex 1 to this document.

PART 1: CALCULATING CONTAINERSHIP GHG EMISSION PERFORMANCE

Overview

Clean Cargo GHG emission performance information reflects the GHG emissions intensity of Clean Cargo carriers' vessels. Emission intensity is calculated as GHG emissions per transport activity, where transport activity is represented in twenty-foot equivalent unit (TEU) kilometers (km). Units of measure for Clean Cargo emission intensities, then, are gCO_2e per TEU-km. As noted above, the emission intensities are based on well-to-wake energy emission factors.

Dry and Refrigerated Containers

The Clean Cargo calculation methods distinguish between the emission intensity of standard dry container transportation and the emission intensity of refrigerated container transportation. This distinction allows for the increased energy consumption associated with the transportation of temperature-controlled cargo to be reflected in the Clean Cargo GHG emission intensities.

Emission Intensity Formulas

Clean Cargo dry and refrigerated container emission intensities are calculated based on the following formulas.

$$Dry\ Container\ Emission\ Intensity = \frac{Fuel\ Emission\ Factor \times (Total\ Fuel\ Consumption - Refrigerator\ Fuel\ Consumption)}{Distance\ Sailed \times 0.7 \times Vessel\ TEU\ Capacity}$$

$$Refrigerated\ Container\ Emission\ Intensity = Dry\ Container\ Emissions + \frac{Fuel\ Emission\ Factor \times Refrigerator\ Fuel\ Consumption}{Distance\ Sailed \times 0.7 \times Refrigerated\ TEU\ Capacity}$$

Where:

- *Fuel Emission Factor* means the emission factor of the fuel consumed by the vessel. See Annex 1 for fuel emission factors applied in Clean Cargo calculations.
- *Total Fuel Consumption* means the mass of all fuel consumed by the vessel (i.e., fuel consumed in main engines, auxiliary engines, and boilers) during the reporting period. Fuel Consumed includes fuel consumed in sea and at port.
- *Refrigerator Fuel Consumption* is calculated as described below.
- *Distance Sailed* means the total distance sailed by the vessel during the reporting period, in kilometers. Distance Sailed includes distance sailed at sea and in port.
- *Vessel TEU Capacity* means the maximum number of TEU a vessel can carry, as represented in the vessel capacity plan, general arrangement plan, or loading plan.
- *Vessel Refrigerated TEU Capacity* means the number of refrigerated container plugs on the vessel multiplied by 1.9 (in many cases, a refrigerated plug services a container larger than a TEU).
- *0.7* represents an assumption that the vessel operates at 70% capacity utilization (i.e., the vessel carries 70% of its nominal container capacity, on every voyage)[2].

[2] Historical analysis of carrier-reported vessel utilization data reflected an average capacity utilization of 70% across the largest historical Clean Cargo tradelanes.

$$Refrigerator\ Fuel\ Consumption = Vessel\ Refrigerated\ TEU\ Capacity \times Annual\ Refrigerator\ Consumption \times \frac{Days\ Vessel\ Operated}{365}$$

Where:

- *Vessel Refrigerated TEU Capacity* means the number of refrigerated container plugs on the vessel multiplied by 1.9 (in many cases, a refrigerated plug services a container larger than a TEU).
- *Annual Refrigerator Consumption* means 1,914 kg fuel per refrigerated container per year, as calculated below.
- *Days Vessel Operated* means the number of days the vessel is operational during a reporting period.

$$Annual\ Refrigerator\ Consumption = 3.8kW \times 0.23\ {}^{kg\ fuel}/_{kWh} \times 365\ days \times 24\ {}^{hours}/_{day} \times 25\%$$

Where:

- 3.8kW is the average energy consumption per refrigerated container (a historical Clean Cargo carrier average).
- 0.23 kg/kWh is used to convert energy consumption in kW to energy consumption in mass of fuel.
- 365 represents the number of days in a year.
- 24 represents the number of hours in a day.
- 25% represents the average refrigerated plug utilization in a given year (a historical Clean Cargo carrier average).

PART 2: CARRIER DATA COLLECTION

Carrier Data

Clean Cargo carriers report the following data to SFC, by vessel name and IMO number, for each vessel in their operated or chartered fleet:

- Amount of fuel consumed (for each type of fuel consumed)
- Distance sailed
- Number of days of operation
- TEU capacity
- Number of refrigerated container plugs

This data is applied in the formulas outlined in Part 1 to calculate vessel-specific emission intensities for each vessel in each carrier's fleet.

Carriers assign a tradelane (or tradelanes) to each vessel in their fleets. Clean Cargo tradelanes and trade regions are listed in Annex 2. Carriers must assign vessels to tradelanes as follows:

1. Determine the string on which the vessel was operating on the last day of that vessel's operations for the carrier during a reporting period.
2. Determine which Clean Cargo trade regions in which the ports of call on that string are located.
3. If more than 75% of the vessel's port calls on the string are in one region, assign the vessel to an intra-regional tradelane for that region.
   - If the vessel's main service is on a global tradelane, assign the vessel to a global tradelane regardless of the percentage of port calls in a particular region.
4. If fewer than 75% of the vessel's port calls on the string are in one region, assign the vessel to a global tradelane or tradelanes.
   - Include all regions on the string in which 25% or more of the ports on the string are located.
   - Include the regions on the string in which string's start and end points (i.e., the string's "turnaround points") are located.

Tradelane assignments are applied in the formulas outlined in Part 4 to calculate tradelane level emission intensities for each carrier.

Vessels Covered

Carriers are required to report on vessels in their owned or chartered fleet but are not required to report on vessels that may carry cargo for the carrier under a vessel sharing agreement with another carrier. Similarly, carriers are not required to report on vessels that they do not own or operate but that they ship cargo on under a slot charter agreement.

Reporting Period

Carriers report the data described above twice per year:

1. In March, carrier reporting is completed for operations covering the previous calendar year (e.g., a carrier will complete reporting on 2023 calendar year data in March of 2024).
2. In September, carrier reporting is completed for operations covering the period from 1 July of the previous year through 30 June of the current year (e.g., a carrier will complete reporting of July 2022 data through June 2023 data in September of 2023).

Vessels that were operational for 90 or fewer days in a reporting period may be omitted from carrier reports. For example:

- A vessel operational for less than 90 days during the 2022 calendar year may be omitted from the reporting completed in March 2023.
- A vessel that was operational for fewer than 90 days between 1 July 2022 and 30 June 2023 may be omitted from the reporting completed in September 2023.

Data submitted in March serves as the foundation for SFC's annual Global Ocean Container Greenhouse Gas Emission Intensity reports.

PART 3: AGGREGATING DATA INTO PORT PAIR EMISSION INTENSITIES

Port Pair Aggregation: General Calculation Methods

As described in Part 2, Clean Cargo carrier data is collected at a vessel level. SFC partners with its data reporting platform service provider to aggregate this vessel level data to a weighted average carrier-specific port pair emission intensity. Port pair aggregation is conducted following three steps:

1. Calculate the transport activity (in TEU-km) each of the carrier's vessels conducted on the port pair during the reporting period and use that transport activity to calculate the emissions each of the carrier's vessels generated sailing on the port pair during the reporting period.
2. Calculate the total emissions of all the carrier's vessels sailing on the port pair during the reporting period and the total transport activity conducted by the carrier's vessels sailing on the port pair during the reporting period.
3. Divide the carrier's total emissions from all vessels sailing on the port pair during the reporting period by the carrier's total transport activity across all vessels sailing on the port pair during the reporting period.

For example, a carrier has three vessels that sailed between ports A and B during the reporting period, Vessel 1, Vessel 2, and Vessel 3. The weighted average carrier-specific dry container emission intensity[3] for the reporting period is calculated as follows:

STEP 1

Vessel 1

$$Transport\ Activity\ A \leftrightarrow B_{Vessel\ 1} = Distance\ A \leftrightarrow B \times Number\ of\ Trips\ A \leftrightarrow B_{Vessel\ 1} \times 0.7 \times Nominal\ Capacity_{Vessel\ 1}$$

$$A \leftrightarrow B\ Emissions_{Vessel\ 1} = Transport\ Activity\ A \leftrightarrow B_{Vessel\ 1} \times Dry\ Container\ Emission\ Intensity_{Vessel\ 1}$$

Vessel 2

$$Transport\ Activity\ A \leftrightarrow B_{Vessel\ 2} = Distance\ A \leftrightarrow B \times Number\ of\ Trips\ A \leftrightarrow B_{Vessel\ 2} \times 0.7 \times Nominal\ Capacity_{Vessel\ 2}$$

$$A \leftrightarrow B\ Emissions_{Vessel\ 2} = Transport\ Activity\ A \leftrightarrow B_{Vessel\ 2} \times Dry\ Container\ Emission\ Intensity_{Vessel\ 2}$$

Vessel 3

$$Transport\ Activity\ A \leftrightarrow B_{Vessel\ 3} = Distance\ A \leftrightarrow B \times Number\ of\ Trips\ A \leftrightarrow B_{Vessel\ 3} \times 0.7 \times Nominal\ Capacity_{Vessel\ 3}$$

$$A \leftrightarrow B\ Emissions_{Vessel\ 3} = Transport\ Activity\ A \leftrightarrow B_{Vessel\ 3} \times Dry\ Container\ Emission\ Intensity_{Vessel\ 3}$$

STEP 2

$$A \leftrightarrow B\ Emissions_{Carrier} = A \leftrightarrow B\ Emissions_{Vessel\ 1} + A \leftrightarrow B\ Emissions_{Vessel\ 2} + A \leftrightarrow B\ Emissions_{Vessel\ 3}$$

$$A \leftrightarrow B\ Transport\ Activity_{Carrier} = Transport\ Activity\ A \leftrightarrow B_{Vessel\ 1} + Transport\ Activity\ A \leftrightarrow B_{Vessel\ 2} + Transport\ Activity\ A \leftrightarrow B_{Vessel\ 3}$$

[3] The method shown here is also applied to calculate aggregated refrigerated container emissions for A↔B, by applying the vessel specific refrigerated container emission intensity (as described in Part 1) in the place of the vessel specific dry container emission intensity.

STEP 3

$$A \leftrightarrow B\ Emission\ Intensity_{Carrier} = \frac{A \leftrightarrow B\ Emissions_{Carrier}}{A \leftrightarrow B\ Transport\ Activity_{Carrier}}$$

Variables in this example are determined as follows:

- The number of trips A↔B are calculated based on an analysis of Automatic Identification System (AIS) data.
- Distance sailed A↔B is calculated based on AIS data.
- The vessel specific nominal capacity is reported by the carrier.
- The vessel dry container emission intensity is calculated as described in Part 1.

A carrier's vessel is identified as sailing on the A↔B route during a reporting period based on AIS data.

Transshipment: Introduction (not included in 2023 data reporting – to be implemented soon)

When a carrier does not operate vessels that sail directly between a container's port of origin and port of final destination but the carrier still offers a cargo transportation service between those ports, the cargo is assumed to be "transshipped." That is, the cargo is transferred between vessels at intermediate ports on its voyage from the port of origin to the port of final destination.

When a carrier does not operate vessels that sail directly between a container's port of origin and port of final destination, there may be several different routes that cargo could take between those ports. For example, a carrier does not operate any vessels directly between ports A and E, but offers a transport service between ports A and E. The carrier can get cargo from port A to E by routing the cargo A-B-C-D-E, or A-F-E, or A-B-H-E, or A-G-D-E.

In these transshipment situations, the route between the container's port of origin and port of final destination is selected based on the Clean Cargo reporting platform service provider's routing identification system. This routing identification system selects the most likely route between the container's port of origin and port of final destination. For additional details on the approach applied in determining the "most likely" route, see Annex 4.

Transshipment: Calculating Emission Intensities

The emission intensity for container transportation on the route selected by the routing identification system is the weighted average of the emission intensity for a carrier's transport on each leg of the selected route.

For example, a carrier offers a transportation service between ports A and C. This carrier does not operate any vessels that sail directly between ports A and C. A shipper queries the Clean Cargo reporting platform for the carrier's emission intensity for container transportation between A and C and the routing identification system determines that the most likely route between A and C is A-B-C.

The carrier's A↔B and B↔C emission intensities are calculated individually following the three steps described in the section describing general calculation methods for port pair aggregation above.

The carrier's A↔C emission intensity is then calculated as follows:

$$Emission\ Intensity_{A\leftrightarrow C} = \frac{(Emission\ Intensity_{A\leftrightarrow B} \times Distance_{A\leftrightarrow B}) + (Emission\ Intensity_{B\leftrightarrow C} \times Distance_{B\leftrightarrow C})}{Distance_{A\leftrightarrow B} + Distance_{B\leftrightarrow C}}$$

This approach to calculating the emission intensity of transport between the container's port of origin and port of final destination means that the emission intensity of the longer legs between these ports have a greater influence on the route's emission intensity than the shorter legs have on the route's emission intensity.

Transshipment: Carrier Does not Operate Vessels on all Legs of a Route

A carrier may:

- Offer a transportation service between a port of origin and port of final destination; and
- Not operate vessels sailing directly between those ports; and
- Not operate vessels sailing on all legs of the most likely route between those two ports.

For the legs of the route between the port of origin and the port of final destination on which the carrier does operate vessels, each leg's emission intensity is calculated individually following the three steps described in the section describing general calculation methods for port pair aggregation above.

For the legs of the route between the port of origin and the port of final destination on which the carrier does not operate vessels, the leg's emission intensity is calculated based on the emission intensity for a vessel size range.

For example:

- Carrier 1 offers a transportation service between ports A and D.
- Carrier 1 does not operate any vessels that sail directly between ports A and D.
- The Clean Cargo reporting platform routing identification system determines that the most likely route between A and D is A-B-C-D.
- Carrier 1 operates vessels on the legs A↔B and C↔D, but not on the leg B↔C.

Carrier 1's A↔B and C↔D emission intensities are calculated individually following the three steps described in the section describing general calculation methods for port pair aggregation above. The emission intensity for the leg B↔C is calculated as follows:

1. Determine the size range[4] of the most common vessel sailing B↔C, across all Clean Cargo carriers that operate vessels sailing B↔C.
2. Determine the average emission intensity in Carrier 1's fleet for all of Carrier 1's vessels in the size range determined at step one.
3. Assign the emission intensity determined at step two to the leg B↔C.
4. If Carrier 1 does not operate any vessels in the size range determined at step one, determine the average global emission intensity out of all reporting carriers' vessels in that size range.
5. Assign the emission intensity determined at step four to the leg B↔C.

Carrier 1's emission intensity for cargo shipped from A to D is then calculated as follows:

$$Emission\ Intensity_{A\leftrightarrow D} = \frac{(Emission\ Intensity_{A\leftrightarrow B} \times Distance_{A\leftrightarrow B}) + (Emission\ Intensity_{B\leftrightarrow C} \times Distance_{B\leftrightarrow C})(Emission\ Intensity_{C\leftrightarrow D} \times Distance_{C\leftrightarrow D})}{Distance_{A\leftrightarrow B} + Distance_{B\leftrightarrow C} + Distance_{C\leftrightarrow D}}$$

[4] There are ten container vessel size ranges used for this analysis. For more on the size ranges, see Annex 3.

PART 4: AGGREGATING DATA INTO TRADELANE EMISSION INTENSITIES

As described in Part 2, Clean Cargo carrier data is collected at a vessel level. SFC partners with its data reporting platform service provider to aggregate this vessel level data to carrier specific tradelane emission intensities. Carrier-specific tradelane aggregation is conducted following three steps:

1. Calculate the total transport activity for each vessel in a carrier's fleet that has been assigned to a specific tradelane (see Part 2 for a description of the tradelane assignment process).
2. Calculate the total emissions generated by each vessel in a carrier's fleet that has been assigned to that tradelane. These emissions are the product of the transport activity calculated at step one and the vessel's global average emission intensity, calculated as described at Part 1. Calculate the emissions separately for dry and refrigerated containers.
3. Divide the emissions generated by all vessels in the carrier's fleet assigned to the tradelane by the sum of the transport activity of all vessels in the carrier's fleet assigned to the tradelane. Calculate the emissions separately for dry and refrigerated containers.

For example, a carrier has three vessels that are assigned to Tradelane Z for a reporting period (based on the tradelane assignment process described in Part 2), Vessel 1, Vessel 2, and Vessel 3.

STEP 1

Vessel 1

$$Transport\ Activity_{Vessel\ 1} = Total\ Distance\ Sailed_{Vessel\ 1} \times TEU\ Capacity_{Vessel\ 1} \times 0.7$$

Vessel 2

$$Transport\ Activity_{Vessel\ 2} = Total\ Distance\ Sailed_{Vessel\ 2} \times TEU\ Capacity_{Vessel\ 2} \times 0.7$$

Vessel 3

$$Transport\ Activity_{Vessel\ 3} = Total\ Distance\ Sailed_{Vessel\ 3} \times TEU\ Capacity_{Vessel\ 3} \times 0.7$$

STEP 2

Vessel 1

$$Dry\ Container\ Emissions_{Vessel\ 1} = Transport\ Activity_{Vessel\ 1} \times Dry\ Container\ Emission\ Intensity_{Vessel\ 1}$$

$$Refrigerated\ Container\ Emissions_{Vessel\ 1} = Transport\ Activity_{Vessel\ 1} \times Refrigerated\ Container\ Emission\ Intensity_{Vessel\ 1}$$

Vessel 2

$$Dry\ Container\ Emissions_{Vessel\ 2} = Transport\ Activity_{Vessel\ 2} \times Dry\ Container\ Emission\ Intensity_{Vessel\ 2}$$

$$Refrigerated\ Container\ Emissions_{Vessel\ 2} = Transport\ Activity_{Vessel\ 2} \times Refrigerated\ Container\ Emission\ Intensity_{Vessel\ 2}$$

Vessel 3

$$Dry\ Container\ Emissions_{Vessel\ 3} = Transport\ Activity_{Vessel\ 3} \times Dry\ Container\ Emission\ Intensity_{Vessel\ 3}$$

$$Refrigerated\ Container\ Emissions_{Vessel\ 3} = Transport\ Activity_{Vessel\ 3} \times Refrigerated\ Container\ Emission\ Intensity_{Vessel\ 3}$$

STEP 3

$$Emission\ Intensity_{Z\ Dry\ Container} = \frac{Dry\ Container\ Emissions_{Vessel\ 1} + Dry\ Container\ Emissions_{Vessel\ 2} + Dry\ Container\ Emissions_{Vessel\ 3}}{Transport\ Activity_{Vessel\ 1} + Transport\ Activity_{Vessel\ 2} + Transport\ Activity_{Vessel\ 3}}$$

$$Emission\ Intensity_{Z\ Refrigerated\ Container} = \frac{Refrigerated\ Container\ Emissions_{Vessel\ 1} + Refrigerated\ Container\ Emissions_{Vessel\ 2} + Refrigerated\ Container\ Emissions_{Vessel\ 3}}{Transport\ Activity_{Vessel\ 1} + Transport\ Activity_{Vessel\ 2} + Transport\ Activity_{Vessel\ 3}}$$

PART 5: VERIFICATION OF CARRIER DATA

Carriers must have the data they submit to SFC verified by a third party. Details on verification of data are described in the Clean Cargo verification guidelines. Verification is only required for carrier data submitted in March for the previous calendar year (i.e., verification is not required for data submitted in September). Carriers must submit a verification statement along with data reported to SFC for the previous calendar year.

ANNEX 1: FUEL EMISSION FACTORS

All emission factors used for Clean Cargo calculations are based on emission factors in the Global Logistics Emission Council Framework (2023).

ANNEX 2: TRADE REGIONS AND TRADELANES

Coverage	Name
Global	Asia to-from Africa
Global	Asia to-from Mediterranean/Black Sea
Global	Asia to-from Middle East/India
Global	Asia to-from North America EC/Gulf
Global	Asia to-from North America WC
Global	Asia to-from North Europe
Global	Asia to-from Oceania
Global	Asia to-from South America (including Central America)
Global	Europe (North and Med) to-from Africa
Global	Europe (North and Med) to-from Middle East/India
Global	Europe (North and Med) to-from Oceania (via Suez / via Panama)
Global	Europe (North and Med) to-from South America (including Central America)
Global	Mediterranean/Black Sea to-from North America EC/Gulf
Global	Mediterranean/Black Sea to-from North America WC
Global	North America EC/Gulf/WC to-from Africa
Global	North America EC/Gulf/WC to-from Middle East/India
Global	North America EC/Gulf/WC to-from Oceania
Global	North America EC/Gulf/WC to-from South America (including Central America)
Global	North Europe to-from Mediterranean/Black Sea
Global	North Europe to-from North America EC/Gulf
Global	North Europe to-from North America WC
Global	SE Asia to-from NE Asia
Global	South America (including Central America) to-from Africa
Intra	Intra Africa
Intra	Intra Mediterranean/Black Sea
Intra	Intra Middle East/India
Intra	Intra NE Asia
Intra	Intra North America EC/Gulf/WC
Intra	Intra North Europe
Intra	Intra SE Asia
Intra	Intra South America (including Central America)
Other	Other

Trade Region	Countries in Region	Selected Ports in Region
Africa	Angola Benin Cameroon Cape Verde Comoros Congo Cote d'Ivoire Democratic Republic of the Congo Equatorial Guinea Gabon Gambia Ghana Guinea Guinea-Bissau Kenya Liberia Madagascar Mauritania Mauritius Mozambique Namibia Nigeria Sao Tome and Principe Senegal Seychelles Sierra Leone Somalia South Africa Tanzania Togo	Cape Town Dakar Dar Es Salaam Douala Douala Durban Luanda Mogadishu Mombasa Port Elizabeth Tripola Walvis Bay
NE Asia	China Japan Korea Russia (Pacific) Taiwan	Busan Dalian Hong Kong Kaohsiung Kobe Shanghai Shekou Yantian
SE Asia	Brunei Burma Cambodia East Timor Indonesia Malaysia Philippines Singapore Thailand Vietnam	Ho Chi Minh Laem Chabang Manila Port Kelang Singapore Surabaya
Mediterranean/Black Sea	Albania Algeria Bulgaria Croatia Cyprus Egypt (Mediterranean) France (Mediterranean) Georgia Gibraltar	Alexandria Algeciras Barcelona Genoa Gioia Tauro Istanbul Latakia Lisbon Novorossiysk

	Greece Israel Italy Lebanon Libya Malta Montenegro Morocco Portugal Romania Russia (Black Sea) Slovenia Spain Syria Tunisia Turkey Ukraine	Odessa Tangier Tunis
Middle East/India	Bahrain Bangladesh Djibouti Egypt (Red Sea) Eritrea India Iran Iraq Jordon Kuwait Maldives Oman Pakistan Qatar Saudi Arabia Sri Lanka Sudan United Arab Emirates Yemen	Abu Dhabi Aqaba Bandar Abbas Chennai Chittagong Colombo Hodeidah Jebel Ali Dubai Jeddah Mina Sulman Nhava Sheva Port Qasim Port Said Salalah Shuwaikh Swakin
North America EC/Gulf	Bahamas Canada (East Coast) Caribbean Island nations Cuba Dominican Republic Haiti Mexico (East/Gulf Coast) United States (East Coast and Gulf Coast)	Charlestown Houston Miami Montreal Newark Savannah Toronto Veracruz
North America WC	Canada (West Coast) Mexico (West/Pacific Coast) United States (West Coast)	LA / Long Beach Lazaro Cardenas Oakland Tacoma Vancouver
North Europe	Belgium Denmark Estonia Finland France (Atlantic) Germany Ireland Latvia Lithuania Netherlands	Antwerp Bremerhaven Copenhagen Felixstowe Gothenburg Hamburg Le Havre Oslo Rotterdam Southampton

	Norway Poland Russia (North European) Sweden United Kingdom	Vyborg
South America (Including Central America)	Argentina Belize Brazil Chile Columbia Costa Rica Ecuador El Salvador French Guiana Guatemala Guyana Honduras Nicaragua Panama Peru Suriname Uraguay Venezuela	Antofagasta Buenaventura Buenos Aires Callao Guayaquil Iquique Itaguai Itajai Parangua Rio Grande Santos Valparaíso
Oceania	Australia New Zealand Pacific Island nations Papua New Guinea	Adelaide Auckland Brisbane Fremantle Melbourne Sydney

ANNEX 3: VESSEL SIZE RANGES

Vessel size ranges in capacity of TEU:

- 0-999
- 1,000-1,999
- 2,000-2,999
- 3,000-4,999
- 5,000-7,999
- 8,000-11,999
- 12,000-14,499
- 14,500-19,999
- 20,000-30,000