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## ENERGY EFFICIENCY OF SHIPS

### Report of fuel oil consumption data submitted to the IMO Ship Fuel Oil Consumption Database in GISIS (Reporting year: 2020)

#### Note by the Secretariat

#### SUMMARY

*Executive summary:* This document provides a report of the fuel oil consumption data for 2020 submitted to the IMO Ship Fuel Oil Consumption Database in GISIS, in accordance with regulation 22A.10 of MARPOL Annex VI and the *2017 Guidelines for the development and management of the IMO Ship Fuel Oil Consumption Database* (resolution MEPC.293(71))

*Strategic direction, if applicable:* 3

*Output:* 3.7

*Action to be taken:* Paragraph 12

*Related documents:* MEPC 70/18; MEPC 71/17; MEPC 76/6/1; resolutions MEPC.278(70), MEPC.282(70) and MEPC.293(71)

#### Background

1 In accordance with regulation 22A.3 of MARPOL Annex VI (regulation 27.3 of the 2021 revised MARPOL Annex VI, which is to enter into force on 1 November 2022), except as provided for in paragraphs 4, 5 and 6 of the same regulation, within three months after the end of each calendar year, a ship in the scope of regulation 22A shall report to its Administration or any organization duly authorized by it, the aggregated values for the data specified in Appendix IX of MARPOL Annex VI, via electronic communication using the standardized format set out in appendix 3 of resolution MEPC.282(70) on *2016 Guidelines for the development of a Ship Energy Efficiency Management Plan (SEEMP)*.

2 Upon receipt of the reported fuel consumption data, and in accordance with regulation 6.6 of MARPOL Annex VI, the Administration or any organization duly authorized by it shall determine whether the data has been reported in accordance with regulation 22A of MARPOL Annex VI, and, if so, issue a Statement of Compliance not later than five months from the beginning of the calendar year.

3 In accordance with regulation 22A.9 of MARPOL Annex VI, not later than one month after issuing the Statement of Compliance, by 30 June at the latest, the Administration shall ensure that the reported fuel consumption data by its registered ships of 5,000 GT and above and in the scope of regulation 22A of MARPOL Annex VI are transferred to the IMO Ship Fuel Oil Consumption Database in GISIS.

4 Regulation 22A.10 of MARPOL Annex VI requires the Secretariat to produce an annual report to the Committee summarizing the data collected, the status of missing data, and such other relevant information as may be requested by the Committee.

### **Report on the fuel oil consumption data submitted to the IMO Ship Fuel Oil Consumption Database in GISIS**

5 In accordance with regulation 22A.10 of MARPOL Annex VI and section 6 of the *2017 Guidelines for the development and management of the IMO Ship Fuel Oil Consumption Database* (MEPC.293(71)), the Secretariat has prepared a summary report of the fuel oil consumption data for the 2020 reporting period, as set out in the annex to this document.

6 In preparing the summary report, the Secretariat carried out a quality control and verification process of the data submitted to GISIS to identify missing ships and obvious errors in the submitted data.

7 Administrations can download non-anonymized data for the ships flying its flag for which data has been submitted to GISIS by that Administration or on their behalf. In accordance with regulation 22A.11 of MARPOL Annex VI, Parties to MARPOL Annex VI also have access to the data of all ships submitted to GISIS in an anonymized format.

8 The following general findings with regard to the fuel consumption data for the 2020 reporting period can be noted:

- .1 data was reported by 27,723 ships (compared to 27,221 for 2019) out of a potential 32,558 ships (85.1%) that were estimated to fall under the scope of regulation 22A of MARPOL Annex VI with a combined gross tonnage of 1,222 million gross tonnes (1,187 million gross tonnes for 2019);
- .2 on the basis of gross tonnage, the reported data represents 93.8% of the ships that fell under the scope of regulation 22A of MARPOL Annex VI (compared to 93.0% for 2019);
- .3 by 17 August 2021, the number of ships identified with potential errors was reduced to 217 ships; at the time of the report, these potential errors had not been modified by the concerned Administration or recognized organization; these ships with potential errors can have a large impact on the aggregated data and have not been included in the report for the 2020 reporting period;
- .4 203 million tonnes of fuel (compared to 213 million tonnes for 2019), on a quantity basis, was used by the aforementioned 27,723 ships; fuel used was lower in 2020 compared to 2019, but there was a slight increase in the use of Liquefied Natural Gas (LNG), which was 11,974,761 tonnes in 2020 (compared to 10,482,742 tonnes in 2019);
- .5 99.91% of the fuel used was either Heavy Fuel Oil, Light Fuel Oil, Diesel/Gas Oil or Liquefied Natural Gas; and

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- .6 the majority of the reported fuel oil was consumed by the following three EEDI ship types; containerships, bulk carriers and tankers.

### **Recommended improvements to the IMO Ship Fuel Oil Consumption Database module in GISIS**

9 Following the analysis of the 2020 data, the Secretariat proposes the following improvements to the reporting process and the Ship Fuel Oil Consumption module in GISIS:

- .1 a number of Administrations and recognized organizations could not delete unneeded records and had to ask the Secretariat to delete duplicate or not needed records in the GISIS module; it is suggested that the Secretariat look into possible reasons for duplicate records in GISIS and the possibility to add the functionality for Administrations and recognized organizations to delete records they have submitted in the GISIS module; and
- .2 the Secretariat has improved the process of preparing the annual lists of ships falling in the scope of regulation 22A of MARPOL Annex VI that is sent to each Administration for each reporting year, however feedback received from Administrations indicated that some ships on those lists were not relevant, such as due to having no propulsion; it is suggested that the Secretariat look into this issue to further update the process of generating the ships in scope lists, by facilitating the cross-referencing and direct use of data from the Ship and Company Particulars module in GISIS (which is largely populated by data from IHS Markit), as may be necessary.

10 Following the verification of the submitted data by the Secretariat, Administrations and recognized organizations are invited to pay attention to the following:

- .1 it was found that some fuel oil, such as Very Low Sulphur Fuel Oil (VLSFO) and Light Fuel Oil (LFO), was reported incorrectly under the "Other" category; this issue was rectified by moving these ships to be under the Heavy Fuel Oil (HFO) fuel category in-line with the *Fourth IMO GHG Study 2020* in that the Low Sulphur Heavy Fuel Oil has the same emission factors as conventional HFO; and
- .2 a small number of ships were in an incorrect EEDI ship type category, in particular, 94 ships were incorrectly categorized in the "Passenger ship" and in the "Others" category; while the ship categorization has significantly improved compared to the 2019 reporting period, Administrations and recognized organizations should continue to carefully check whether ships should be reported under the "Cruise passenger ship" or "Ro-ro passenger" ship category before reporting under the "Passenger ship" category, and ensure tankers are reported under the "Tankers" category.

11 The Committee may also consider amending the *2018 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships*, as set out in resolution MEPC.308(73), to include ethane and biofuels to facilitate reporting these fuels to the GISIS module with the appropriate  $C_F$  values.

### **Action requested of the Committee**

12 The Committee is invited to consider the summary report of fuel oil consumption data submitted to the IMO Ship Fuel Oil Consumption Database for 2020 and relevant information in this document, and in particular, to:

- .1 approve, in principle, the summary report of fuel oil consumption data submitted to the IMO Ship Fuel Oil Consumption Database for 2020 as set out in the annex;
- .2 agree with the proposed recommendations in paragraph 9 with regard to further improvement to the IMO Ship Fuel Oil Consumption Database module in GISIS;
- .3 request Administrations/recognized organizations to pay attention to the matters described in paragraph 10 when reporting relevant data;
- .4 consider the proposal in paragraph 11 concerning amending the *2018 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships*; and
- .5 take action as appropriate.

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## ANNEX

### SUMMARY REPORT OF FUEL OIL CONSUMPTION DATA SUBMITTED TO THE IMO SHIP FUEL OIL CONSUMPTION DATABASE FOR 2020

#### Total number of ships for which fuel consumption data was reported

1 In accordance with paragraph 5.1 of the *2017 Guidelines for the development and management of the IMO Ship Fuel Oil Consumption Database* (MEPC.293(71)), hereinafter referred to as the "2017 Guidelines", in January 2020 every Administration that had designated a contact person in the Ship Fuel Oil Consumption module in GISIS was sent an indicative list of ships in their Administration falling under the scope of regulation 22A of MARPOL Annex VI, totalling 32,558 ships (compared to 32,511 ships in January 2019) under 135 Administrations. The aforementioned lists of ships were produced by cross-referencing with data from the Ship and Company Particulars module in GISIS.

2 For the period from 1 January 2020 until 31 December 2020 (the 2020 reporting period), by 17 August 2021 fuel consumption data had been reported to the Ship Fuel Oil Consumption module in GISIS from 111 Administrations, consisting of 73 Parties to MARPOL Annex VI and 38 non-Parties, for 27,723 ships (compared to 27,221 ships for 2019) in total out of a potential 32,558 ships (85.1%) that were estimated to fall under the scope of regulation 22A of MARPOL Annex VI. On the basis of gross tonnage, the reported data represents 93.8% of the ships that fell under the scope of regulation 22A of MARPOL Annex VI in January 2020 (compared to 93.0% for 2019).

3 This summary report reflects the fuel consumption data in GISIS up until 17 August 2021, any changes made to the 2020 data in GISIS after this date are not reflected in this report. Additional reported data in GISIS or changes made to the data after 17 August 2021 are not included in the report, but will be available in the data directly downloadable from GISIS.

#### Measures to ensure the completeness of the database

4 In addition to the indicative list of ships falling under the scope of regulation 22A of MARPOL Annex VI, sent to every Administration in January 2020, the Secretariat sent in July 2021 each Administration a list of ships identifying those missing ships for which data had not yet been submitted to the Ship Fuel Oil Consumption Database in GISIS. Where applicable, Administrations were also sent a list of ships for which the analysis of the reported fuel consumption data pointed to potential errors.

5 The Secretariat did not modify any of the reported data in GISIS itself, but in the case of any identified missing ships or potential errors (see section below) contacted the relevant Administrations and recognized organizations so that they could correct and update the data in GISIS and provide further feedback in case of any discrepancies, as may be necessary.

6 This list of missing ships was created for each Administration by comparing the ships that had been reported by July 2021 to the list of ships under the scope of regulation 22A of MARPOL Annex VI that were sent to each Administration in January 2020. In July 2021, Administrations were requested to provide fuel consumption data for 6,935 missing ships.

7 In response to the aforementioned lists of missing ships and ships with potential errors, a number of Administrations and recognized organizations corrected and updated the reported data in GISIS. Some Administrations also informed the Secretariat on the status of missing ships. Approximately half of the aforementioned missing ships were still expected to

report fuel consumption data for 2020; for the other half of the aforementioned missing ships, for which no data had been reported, Administrations stated that these ships were not falling under the scope of regulation 22A of MARPOL Annex VI. The responses included ships being scrapped or laid-up, operating only domestically or the ship being not relevant, such as due to having no propulsion.

8 The Secretariat has included data in GISIS up until 17 August 2021 in the report to allow time for Administrations and recognized organizations to update the data in GISIS.

9 The feedback received from Administrations, indicating the ships not relevant to regulation 22A of MARPOL Annex VI, such as due to having no propulsion, can be used to assist the Secretariat in further updating the process of cross-referencing with the Ship and Company Particulars module in GISIS to produce the indicative lists of ships falling under the scope of regulation 22A of MARPOL Annex VI.

### **Verification of the submitted data in GISIS**

10 In addition to identifying missing ships, and while not specified in the 2017 Guidelines, the Secretariat also carried out a quality control and verification process of the data submitted to GISIS to verify the accuracy of the data and to identify obvious errors in the submitted data. An automated process identified ships with obvious errors in the submitted data, this included identifying ships with unrealistic characteristics, that were not technically possible, checking for duplicate reporting and for ships that may have been categorized under an incorrect ship type, as defined by regulation 2 of MARPOL Annex VI, in the reported data. Ships with errors that were identified using this process were further examined to determine the cause of any errors, this information can then be provided to the concerned Administrations and recognized organizations.

11 During the quality control of the reported data, 2,039 instances of multiple reporting entries for a single ship were found. This does not include errors in reporting, including instances of duplicate reporting, which were removed (see paragraph below). The multiple reporting is mostly due to ships changing between different Administrations and recognized organizations.

12 In July 2021, 327 ships with errors were identified. At this time, 197 ships had instances of duplicate reporting, where the same data was reported more than once. The remaining errors were due to incorrect ship characteristics. This included 69 ships which had reported an "hours underway" which was more than the number of hours in a year. In addition, 94 ships were also identified as being categorized incorrectly in the "Other" and "Passenger ship" ship type categories by comparing the submitted data against data provided by IHS Markit.

13 Following the correction of data in GISIS by Administrations and recognized organizations, the number of errors in the submitted data was reduced. At the time of this report, 17 August 2021, the number of identified errors that could potentially have a large impact on aggregated data was reduced to 217 ships. These ships contain errors that have not been corrected by the responsible Administrations or recognized organizations and have not been included in the data analysis process in this report.

14 Sixty-two ships out of the aforementioned 217 ships were excluded because they had reported "hours underway" which were more than the total number of hours in a year. In addition, 102 ships were removed as they were duplicate reports. The remaining ships were excluded for reporting unrealistic ship parameters which had not been corrected by the submitters, this includes 16 ships that had an unrealistically large deadweight. The aggregated

gross tonnage of those 217 ships represents 0.68% of all ships which reported fuel consumption data, in terms of gross tonnage.

15 In July 2021, less than 100 ships in the "Other" and "Passenger ship" ship type categories were identified as being categorized incorrectly, according to regulation 2 of MARPOL Annex VI. In the 2019 reporting period over 600 ships were identified that needed recategorizing.

16 Overall, the number of errors identified in the submitted data in the 2020 reporting period, including the number of ships categorized incorrectly, was significantly less than the 2019 reporting period, while the way the Secretariat checked for errors in the data was also improved.

### Number of ships for which fuel consumption data has been reported

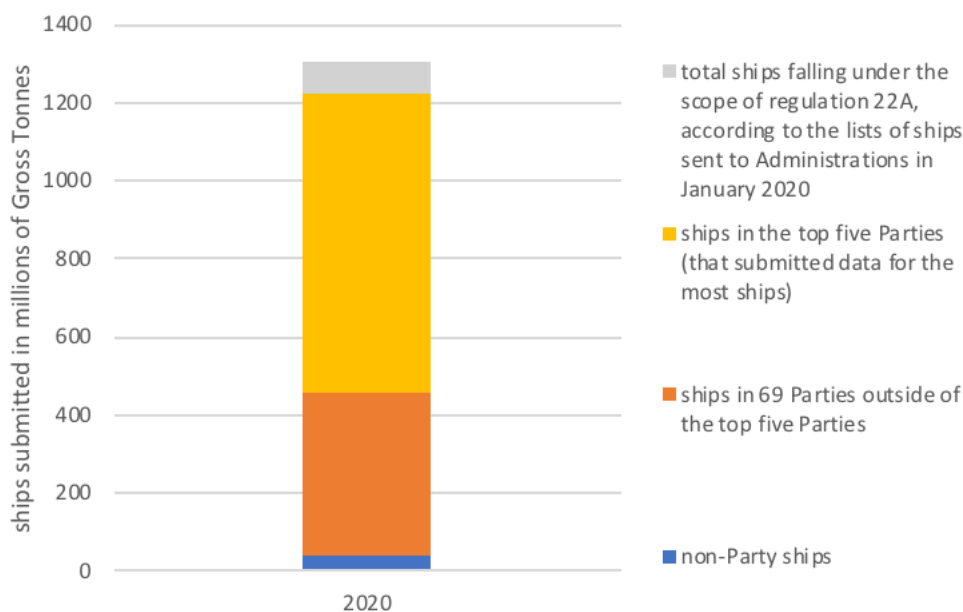
17 Table 1 shows a summary of the ships for which Administrations had reported fuel consumption data for the 2020 reporting period. Table 1 compares the total number of ships for which data had been reported to the indicative lists of ships falling under the scope of regulation 22A of MARPOL Annex VI, as sent to each Administration in January 2020.

**Table 1: Number of ships reported by Administrations in the reporting period**

	<b>Total</b>	<b>Party</b>	<b>non-Party</b>
<b>Ships contained in the lists of ships falling under the scope of regulation 22A as sent to Administrations in January 2020</b>	32,558 ships estimated to fall under the scope of 135 Administrations	30,319 ships under the scope of 87 Administrations	2,239 ships under the scope of 48 Administrations
<b>Total ships for which fuel consumption data was submitted</b>	27,723 ships reported by 111 Administrations	26,716 ships reported by 73 Administrations	1,007 ships reported by 38 Administrations

18 Table 1 shows a high reporting rate. Data was reported for 85.1% of the total number of ships that were estimated to fall under the scope of regulation 22A of MARPOL Annex VI. The reporting rate is also high in terms of the number of Administrations, both Parties and non-Parties to MARPOL Annex VI, that reported data for their ships; in total, 111 Administrations out of a potential 135 Administrations submitted data. The number of Administrations in table 1 also includes national registries or sub-registries through which data was submitted.

19 Figure 1 compares the total number of ships for which data had been reported to the lists of ships falling under the scope of regulation 22A of MARPOL Annex VI, in terms of gross tonnage.



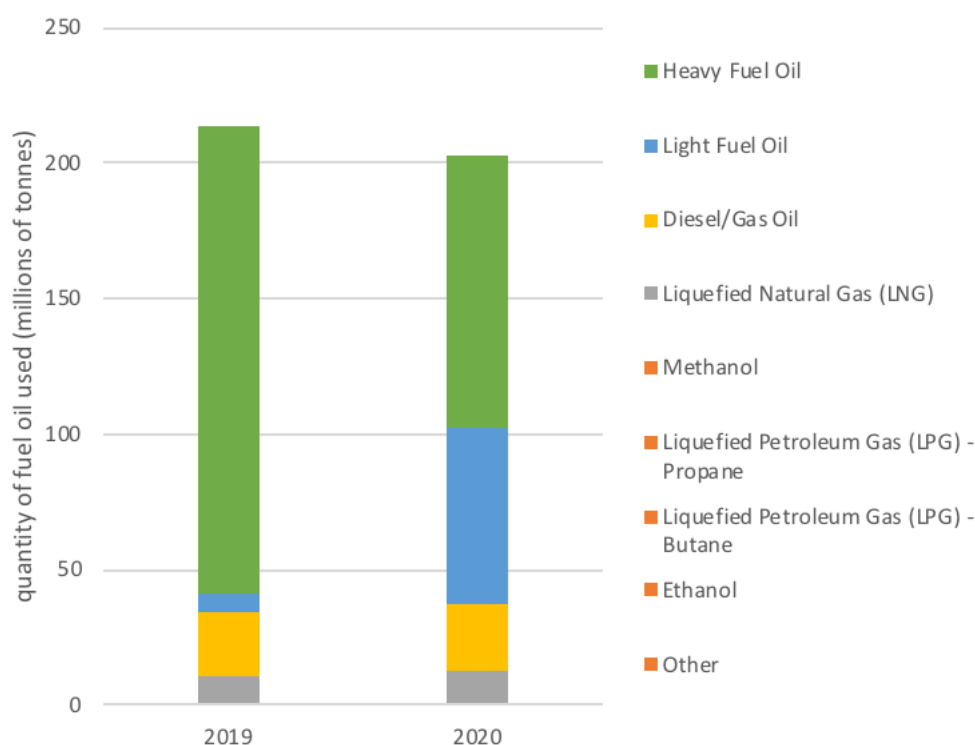
**Figure 1: Gross tonnage of ships reported by Administrations**

20 As shown in figure 1, the 32,558 ships that were estimated to fall under the scope of regulation 22A of MARPOL Annex VI in January 2020 represent a total of 1,303 million gross tonnes. The 27,723 ships for which fuel consumption data was reported for the 2020 reporting period represent a combined gross tonnage of 1,222 million gross tonnes (this is 93.8% of 1,303 million gross tonnes).

**The aggregated annual amount of each type of fuel oil consumed, distance travelled and hours underway for ships of 5,000 GT and above, by EEDI ship type and EEDI size category, "Others" and "Passenger ship" categories for ships not subject to EEDI**

21 In total, on a quantity basis, 203 million tonnes of fuel were used in the 2020 reporting period (compared to 213 million tonnes for 2019). Figure 2 shows that 94.01% of the fuel oil used during 2020 was either Heavy Fuel Oil, Light Fuel Oil or Diesel/Gas Oil. 99.91% of the fuel oil that was reported was either Heavy Fuel Oil, Light Fuel Oil, Diesel/Gas Oil or Liquefied Natural Gas. The remaining fuels outside of these four fuel types amounted to 0.09% of the fuel used during the 2020 reporting period.



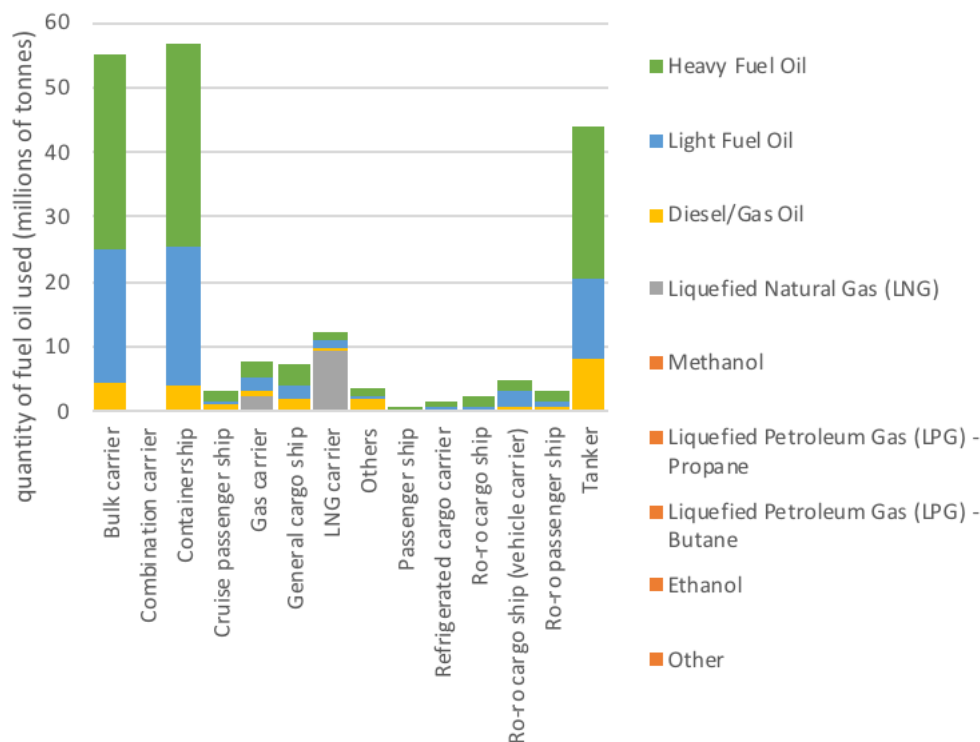


**Figure 2: The aggregated annual amount of each type of fuel oil consumed by all ships of 5,000 GT and above**

22 Less fuel was used by the reported ships during the 2020 reporting period when compared to the 2019 reporting period. A higher proportion of Light Fuel Oil was also used in 2020 compared to 2019. There was also a slight increase in Liquefied Natural Gas use during 2020 when compared to 2019. There were 11,974,761 tonnes of Liquefied Natural Gas in 2020 (5.90% of the reported fuel) compared to 10,482,742 tonnes of Liquefied Natural Gas in 2019 (4.92% of the reported fuel). In addition, no Ethanol was reported in 2020 compared to 2019. In 2020, in the "Other" fuel type category in GISIS, 62,345 tonnes of Ethane, 27,792 tonnes of Used Cooking Oil, 2,651 tonnes of Biofuel and 19 tonnes of Biogas Refrigerated Liquid (LBG) were reported. These fuels were reported in the "Other" category and jointly represent 0.05% of global fuel usage, on a quantity basis.

23 When analysing the data, it was also found some fuel oil was reported incorrectly, such as VLSFO and LFO, under the "Other" fuel category. This issue was rectified by moving these ships to be under the Heavy Fuel Oil (HFO) fuel category in-line with the *Fourth IMO GHG Study 2020* in that the Low Sulphur Heavy Fuel Oil has the same emission factors as conventional HFO.

24 As explained further in document MEPC 76/6/1 (Secretariat), given that the use of ethane and biofuel is very low, it is recommended that ships using ethane or biofuel as a fuel continue to report under the "Other" category, specifying a user defined description and  $C_F$  value, in GISIS for the time being. However, in the future, the Committee may wish to consider amending the *2018 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships*, as set out in resolution MEPC.308(73), to include ethane and biofuel.



**Figure 3: The aggregated annual amount of each type of fuel oil consumed for ships of 5,000 GT and above by EEDI ship type, including the "Others" and "Passenger ship" categories for ships not subject to EEDI for the 2020 reporting period**

25 Figure 3 shows how different fuels were used by different ship types during the 2020 reporting period. During the reporting period the majority of fuel oil was consumed by three ship types; containerships, bulk carriers and tankers. The aggregated data used to create figure 3 is also in table 2.

26 In accordance with paragraph 6.2 of the 2017 Guidelines, table 2 contains the aggregated annual amount of each type of fuel oil consumed for ships of 5,000 GT and above by EEDI ship type and EEDI size category, including the "Others" and "Passenger ship" categories for ships not subject to EEDI.

27 In accordance with paragraphs 6.2 and 6.3 of the 2017 Guidelines, table 3 contains the number of ships that reported, including the aggregated gross tonnage, aggregated deadweight, and the aggregated annual amount of distance travelled and hours underway for ships of 5,000 GT and above by EEDI ship type and EEDI size category, including the "Others" and "Passenger ship" categories for ships not subject to EEDI.

**Table 2: The aggregated annual amount of each type of fuel oil consumed for ships of 5,000 GT and above by EEDI ship type and EEDI size category, including the "Others" and "Passenger ship" categories for ships not subject to EEDI**

	Diesel / Gas Oil (MDO / MGO)	Ethanol	Heavy Fuel Oil (HFO)	Light Fuel Oil (LFO)	Liquefied Natural Gas (LNG)	Liquefied Petroleum Gas (LPG) – Butane	Liquefied Petroleum Gas (LPG) – Propane	Methanol	Other
<b>Bulk carrier</b>	<b>4,387,887</b>	<b>0</b>	<b>30,361,496</b>	<b>20,490,441</b>	<b>10,929</b>	<b>0</b>	<b>5,105</b>	<b>0</b>	<b>0</b>
10,000 ≤ DWT < 20,000	158,178	0	316,181	303,570	795	0	0	0	0
20,000 DWT and above	4,183,640	0	30,006,510	20,147,186	10,134	0	5,105	0	0
Less than 10,000 DWT	46,069	0	38,805	39,685	0	0	0	0	0
<b>Combination carrier</b>	<b>12,388</b>	<b>0</b>	<b>89,226</b>	<b>17,491</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
20,000 DWT and above	12,388	0	89,226	17,491	0	0	0	0	0
<b>Containership</b>	<b>3,919,662</b>	<b>0</b>	<b>31,537,988</b>	<b>21,347,262</b>	<b>49,887</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>27,792</b>
10,000 ≤ DWT < 15,000	364,277	0	1,168,107	884,434	3,364	0	0	0	0
15,000 DWT and above	3,340,556	0	30,041,604	20,232,180	46,523	0	0	0	27,792
Less than 10,000 DWT	214,829	0	328,277	230,648	0	0	0	0	0
<b>Cruise passenger ship</b>	<b>1,361,318</b>	<b>0</b>	<b>1,603,873</b>	<b>114,872</b>	<b>20,109</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
25,000 ≤ GT < 85,000	522,334	0	313,267	75,225	0	0	0	0	0
5,000 ≤ GT < 25,000	75,076	0	2,124	4,106	0	0	0	0	0
85,000 GT and above	763,908	0	1,288,482	35,541	20,109	0	0	0	0
<b>Gas carrier</b>	<b>856,632</b>	<b>0</b>	<b>2,472,973</b>	<b>2,183,016</b>	<b>2,298,402</b>	<b>0</b>	<b>479</b>	<b>0</b>	<b>59,353</b>
10,000 DWT and above	657,094	0	2,282,447	2,111,855	2,296,443	0	479	0	59,353
2,000 ≤ DWT < 10,000	199,538	0	190,526	71,161	1,959	0	0	0	0
<b>General cargo ship</b>	<b>2,090,802</b>	<b>0</b>	<b>3,112,264</b>	<b>1,935,498</b>	<b>7,498</b>	<b>0</b>	<b>11,038</b>	<b>0</b>	<b>3,011</b>
15,000 DWT and above	829,636	0	2,015,359	1,087,523	3,661	0	2,865	0	481
3,000 ≤ DWT < 15,000	1,219,576	0	1,082,946	847,526	3,837	0	8,173	0	2,530
Less than 3,000 DWT	41,590	0	13,959	449	0	0	0	0	0
<b>LNG carrier</b>	<b>658,897</b>	<b>0</b>	<b>1,170,283</b>	<b>1,147,384</b>	<b>9,282,739</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
10,000 DWT and above	649,543	0	1,165,755	1,147,166	9,262,278	0	0	0	0
Less than 10000 DWT	9,354	0	4,528	218	20,461	0	0	0	0
<b>Others</b>	<b>1,924,251</b>	<b>0</b>	<b>1,287,416</b>	<b>554,214</b>	<b>37,162</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,651</b>
5,000 GT and above	1,924,251	0	1,287,416	554,214	37,162	0	0	0	2,651
<b>Passenger ship</b>	<b>152,731</b>	<b>0</b>	<b>160,267</b>	<b>16,268</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

	Diesel / Gas Oil (MDO / MGO)	Ethanol	Heavy Fuel Oil (HFO)	Light Fuel Oil (LFO)	Liquefied Natural Gas (LNG)	Liquefied Petroleum Gas (LPG) – Butane	Liquefied Petroleum Gas (LPG) – Propane	Methanol	Other
5,000 GT and above	152,731	0	160,267	16,268	0	0	0	0	0
<b>Refrigerated cargo carrier</b>	<b>199,952</b>	<b>0</b>	<b>897,626</b>	<b>372,552</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
5,000 DWT and above	199,952	0	897,626	372,552	0	0	0	0	0
<b>Ro-ro cargo ship</b>	<b>496,349</b>	<b>0</b>	<b>1,639,211</b>	<b>385,186</b>	<b>5,153</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
2,000 DWT and above	496,313	0	1,639,211	385,186	5,153	0	0	0	0
Less than 1,000 DWT	36	0	0	0	0	0	0	0	0
<b>Ro-ro cargo ship (vehicle carrier)</b>	<b>726,142</b>	<b>0</b>	<b>1,707,772</b>	<b>2,570,812</b>	<b>10,540</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
10,000 DWT and above	633,299	0	1,601,052	2,528,347	10,540	0	0	0	0
Less than 10,000 DWT	92,843	0	106,720	42,465	0	0	0	0	0
<b>Ro-ro passenger ship</b>	<b>708,843</b>	<b>0</b>	<b>1,717,619</b>	<b>656,474</b>	<b>129,613</b>	<b>0</b>	<b>0</b>	<b>1,904</b>	<b>0</b>
1,000 DWT and above	576,385	0	1,712,695	656,474	129,613	0	0	1,904	0
250 ≤ DWT < 1,000	132,458	0	4,924	0	0	0	0	0	0
<b>Tanker</b>	<b>8,004,146</b>	<b>0</b>	<b>23,510,528</b>	<b>12,380,238</b>	<b>122,729</b>	<b>1,562</b>	<b>0</b>	<b>75,727</b>	<b>0</b>
20,000 DWT and above	6,486,604	0	21,658,247	11,157,943	92,754	1,562	0	75,727	0
4,000 ≤ DWT < 20,000	1,512,981	0	1,817,208	1,208,874	29,975	0	0	0	0
Less than 4,000 DWT	4,561	0	35,073	13,421	0	0	0	0	0
<b>Total (203,103,633)</b>	<b>25,500,000</b>	<b>0</b>	<b>101,268,542</b>	<b>64,171,708</b>	<b>11,974,761</b>	<b>1,562</b>	<b>16,622</b>	<b>77,631</b>	<b>92,807</b>

**Table 3: The number of ships that reported, including the aggregated gross tonnage and aggregated deadweight, and the aggregated annual amount of distance travelled and hours underway for ships of 5,000 GT and above by EEDI ship type and EEDI size category, including the "Others" and "Passenger ship" categories for ships not subject to EEDI**

	<b>Number of ships</b>	<b>Aggregated gross tonnage</b>	<b>Aggregated deadweight</b>	<b>Distance travelled</b>	<b>Hours underway</b>
<b>Bulk carrier</b>	<b>10,123</b>	<b>452,141,647</b>	<b>827,709,832</b>	<b>514,767,823</b>	<b>47,018,025</b>
10,000 ≤ DWT < 20,000	343	3,705,447	5,122,663	13,999,862	1,368,997
20,000 DWT and above	9,702	447,866,622	821,951,269	498,021,458	45,356,619
Less than 10,000 DWT	78	569,578	635,900	2,746,503	292,409
<b>Combination carrier</b>	<b>21</b>	<b>891,028</b>	<b>1,516,483</b>	<b>1,149,108</b>	<b>100,134</b>
20,000 DWT and above	21	891,028	1,516,483	1,149,108	100,134
<b>Containership</b>	<b>4,480</b>	<b>240,330,640</b>	<b>270,179,229</b>	<b>317,093,667</b>	<b>23,261,474</b>
10,000 ≤ DWT < 15,000	537	5,383,490	6,720,780	29,203,693	2,363,655
15,000 DWT and above	3,728	233,419,479	261,673,262	277,091,673	19,989,052
Less than 10,000 DWT	215	1,527,671	1,785,187	10,798,301	908,767
<b>Cruise passenger ship</b>	<b>237</b>	<b>19,325,064</b>	<b>1,817,606</b>	<b>6,763,403</b>	<b>602,595</b>
25,000 ≤ GT < 85,000	91	5,117,366	546,462	2,530,875	221,011
5,000 ≤ GT < 25,000	37	422,851	59,304	583,795	63,795
85,000 GT and above	109	13,784,847	1,211,840	3,648,733	317,789
<b>Gas carrier</b>	<b>855</b>	<b>32,611,232</b>	<b>32,432,198</b>	<b>56,763,092</b>	<b>4,241,852</b>
10,000 DWT and above	683	31,451,104	31,144,419	49,314,757	3,585,517
2,000 ≤ DWT < 10,000	172	1,160,128	1,287,779	7,448,335	656,335
<b>General cargo ship</b>	<b>2,181</b>	<b>29,109,510</b>	<b>40,237,642</b>	<b>95,005,166</b>	<b>8,972,137</b>
15,000 DWT and above	799	18,676,173	26,882,990	39,844,255	3,490,224
3,000 ≤ DWT < 15,000	1,366	10,314,950	13,316,920	54,884,532	5,429,707
Less than 3,000 DWT	16	118,387	37,732	276,379	52,206
<b>LNG carrier</b>	<b>457</b>	<b>48,138,108</b>	<b>38,932,001</b>	<b>39,494,650</b>	<b>2,778,241</b>
10,000 DWT and above	442	47,941,446	38,839,836	39,001,082	2,726,375
Less than 10000 DWT	15	196,662	92,165	493,568	51,866
<b>Others</b>	<b>869</b>	<b>15,575,480</b>	<b>15,263,915</b>	<b>24,054,127</b>	<b>3,598,541</b>
5,000 GT and above	869	15,575,480	15,263,915	24,054,127	3,598,541
<b>Passenger ship</b>	<b>61</b>	<b>2,028,290</b>	<b>271,632</b>	<b>1,405,112</b>	<b>136,998</b>
5,000 GT and above	61	2,028,290	271,632	1,405,112	136,998

	<b>Number of ships</b>	<b>Aggregated gross tonnage</b>	<b>Aggregated deadweight</b>	<b>Distance travelled</b>	<b>Hours underway</b>
Refrigerated cargo carrier	268	2,708,280	2,951,433	15,797,373	1,103,099
5,000 DWT and above	268	2,708,280	2,951,433	15,797,373	1,103,099
<b>Ro-ro cargo ship</b>	<b>334</b>	<b>8,882,187</b>	<b>4,484,818</b>	<b>21,606,462</b>	<b>1,523,327</b>
2,000 DWT and above	333	8,875,631	4,484,097	21,606,202	1,523,298
Less than 1,000 DWT	1	6,556	721	260	29
<b>Ro-ro cargo ship (vehicle carrier)</b>	<b>673</b>	<b>35,930,487</b>	<b>12,144,707</b>	<b>49,317,061</b>	<b>3,663,488</b>
10,000 DWT and above	610	34,857,137	11,790,660	46,138,641	3,397,412
Less than 10,000 DWT	63	1,073,350	354,047	3,178,420	266,076
<b>Ro-ro passenger ship</b>	<b>348</b>	<b>8,422,930</b>	<b>1,779,394</b>	<b>18,898,249</b>	<b>1,187,152</b>
1,000 DWT and above	313	8,196,901	1,756,386	17,906,857	1,138,309
250 ≤ DWT < 1,000	35	226,029	23,008	991,392	48,843
<b>Tanker</b>	<b>6,816</b>	<b>325,603,229</b>	<b>589,296,190</b>	<b>321,414,740</b>	<b>28,829,696</b>
20,000 DWT and above	5,172	310,631,033	567,926,307	255,283,659	22,556,052
4,000 ≤ DWT < 20,000	1,640	14,418,134	21,368,806	65,921,931	6,255,285
Less than 4,000 DWT	4	554,062	1,077	209,150	18,359
<b>Total</b>	<b>27,723</b>	<b>1,221,698,112</b>	<b>1,839,017,080</b>	<b>1,483,530,033</b>	<b>127,016,759</b>

28 With regard to the ships that had been identified on the lists of ships to potentially fall under the scope of regulation 22A of MARPOL Annex VI, as submitted in January 2020, and for which no data had been reported, it was not possible to group those missing ships by EEDI ship type and EEDI size category, as requested in paragraphs 5.5 and 6.4 of the 2017 Guidelines. This is because it is not possible to determine whether those missing ships would indeed fall under the scope of regulation 22A and how these ships should be categorized. The EEDI ship type and EEDI size categories are only defined by Administrations or recognized organizations acting on behalf of Administrations when submitting fuel consumption data to the Fuel Oil Consumption Database module in GISIS. The Secretariat does not add or alter information by Member States, but can only suggest Administrations to review the data and amend, where appropriate.

### **C<sub>F</sub>, conversion factor between fuel consumption and CO<sub>2</sub> emissions**

29 The IMO Fuel Oil Consumption Database in GISIS automatically assigns a value for the carbon conversion factor (C<sub>F</sub>) for each fuel that is submitted for each ship according to the type of fuel that has been entered by the user. The C<sub>F</sub> values are consistent with the *2018 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships*, as set out in resolution MEPC.308(73). A user can also select "Other" for fuel types that are not on the list, this allows a user to enter a user defined fuel name and C<sub>F</sub> value.

Type of fuel	Carbon conversion factor (C <sub>F</sub> )
Diesel/Gas Oil	3.206
Light Fuel Oil (LFO)	3.151
Heavy Fuel Oil (HFO)	3.114
Liquefied Petroleum Gas (LPG) – Propane	3.000
Liquefied Petroleum Gas (LPG) – Butane	3.030
Liquefied Natural Gas (LNG)	2.750
Methanol	1.375
Ethanol	1.913

**Table 4: Types of fuels and C<sub>F</sub> factors selectable in the IMO Ship Fuel Oil Consumption Database**

30 The C<sub>F</sub> value of each fuel that is used for each ship is available in both the anonymized and non-anonymized data that can be downloaded from the IMO Fuel Oil Consumption Database in GISIS. Ships reporting the use of Low Sulphur Heavy Fuel Oil may also report under the Heavy Fuel Oil fuel category in-line with the *Fourth IMO GHG Study 2020* in that the emission factors for Low Sulphur Heavy Fuel Oil are the same as conventional HFO.

### **Downloading the data from the Ship Fuel Oil Consumption module in GISIS**

31 Administrations can download non-anonymized data for ships flying their flag, this is data that has been submitted to GISIS by the Administration or on their behalf. In accordance with regulation 22A.11 of MARPOL Annex VI, Parties to MARPOL Annex VI also have access to the data of all ships submitted to GISIS in an anonymized format, ship related data is rounded to 2 significant figures.