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REPORT FROM THE COMMISSION

**Fourth Annual Report from the European Commission on CO₂ Emissions from
Maritime Transport (period 2018-2021)**

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1. Introduction

This is the fourth annual report on CO₂ emissions data from ships entering and leaving ports in the European Economic Area (EEA), collected under the EU Regulation on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport adopted in 2015¹ (EU Maritime MRV Regulation). The present report covers the first four compliance cycles, i.e. data collected for the period 2018-2021. It builds on the previous reports² and allows for a comparison of data, and examining trends in emissions, and energy efficiency, over the four available reporting years. This information is an essential part of EU's action on addressing climate change from the maritime sector.

Transparency brings accountability and incentives for emission reductions. Through the EU Maritime MRV Regulation, a large amount of verified CO₂ emission data and other relevant information is reported every year, making possible the publication of an annual report that provides a comprehensive and granular understanding of CO₂ emissions from ships travelling to, from and between ports located in the EEA. It also provides valuable analysis on the characteristics and energy efficiency of ships, helping to better understand maritime transport CO₂ emissions.

2. Policy development

Maritime transport is an important industry, and in addition plays an essential role for the EU economy, and it will keep doing so in a climate-neutral Europe.

As part of the package to deliver the European Green Deal, the Commission proposed in July 2021 a series of regulatory measures to ensure that the maritime transport sector contributes to the EU's climate ambitions. These measures are presently under inter-institutional negotiations. They include a proposal extending the European emissions trading system to maritime transport, a dedicated initiative to boost demand for sustainable alternative fuels (the FuelEU Maritime initiative), and the revision of existing directives on energy taxation³, alternative fuel infrastructures⁴ and renewable energy⁵. In addition, the Commission has launched some non-regulatory measures, which include amongst other a stronger, more targeted support to development, demonstration and deployment of clean innovative technologies, enabling use of sustainable alternative fuels and other emission reducing solutions by ships. One of the initiatives

¹ Regulation (EU) 2015/757 of the European Parliament and of the Council of 29 April 2015 on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport, and amending Directive 2009/16/EC, OJ L 123, 19.5.2015, p. 55–76.

² Communication C(2020) 3184 final, Communication C(2021) 6022 final, and Communication C(2022) 5759 final.

³ Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity, OJ L 283, 31.10.2003, p. 51–70.

⁴ Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure, OJ L 307, 28.10.2014, p. 1–20.

⁵ Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast), OJ L 328 21.12.2018, p. 82.

supporting research and innovation in this area is the Horizon Europe Zero-Emission Waterborne Transport partnership, which underpins the objectives of the upcoming regulations.

All these measures aim to reduce greenhouse gas emissions by addressing the various barriers to the decarbonisation of the sector (technological barriers, economic barriers, etc.) through two complementary angles: first, the improvement of energy efficiency (i.e. using less fuel) and, second, increased use of renewable and low-carbon fuels (i.e. using cleaner fuels). The measures will allow the creation of a virtuous ecosystem for cleaner fuels, boosting demand, distribution, and supply thereof.

In the same year, the Commission also adopted the Communication on a new approach for a sustainable blue economy in the EU,⁶ setting a detailed agenda for the sector to transition from “Blue Growth” to a “Sustainable Blue Economy”, thus contributing to climate change mitigation, including by supporting the decarbonisation of maritime transport.

Furthermore, the Commission is committed to support actions at global level to encourage the decarbonisation of the sector, notably at the International Maritime Organization (IMO) through the swift implementation and revision of the initial IMO Strategy for greenhouse gas emission reductions. The European Union advocates for a revised Strategy that would phase out GHG emissions from international shipping by 2050 at the latest, with a pathway consistent with the goals of the Paris Agreement.

3. The fourth reporting year: a new geographical scope following the withdrawal of the United Kingdom from the EU combined with a partial post-COVID economic recovery

The year 2021 was marked by two structural differences, which make direct comparison with the three previous reporting years a challenging exercise. First, the withdrawal of the United Kingdom (UK) from the EU brought a significant change in the geographical scope of the EU Maritime MRV Regulation, as voyages within the UK and between the UK and non-EEA countries are no longer reported under the system.⁷ Secondly, the long-lasting effects of the COVID-19 crisis kept affecting seaborne trade and maritime passenger transports, which only recorded a partial recovery from 2020, still below 2019 levels.

The monitored voyages (all trips to/from EEA ports) for the reporting year 2021 emitted 124.3 million tonnes of CO₂ into the atmosphere. Those emissions originated from a fleet of almost 11 800 ships. For comparison, 128.7 million tonnes of the CO₂ emissions were reported for the year 2020, and 147 million tonnes for the year 2019, which both included UK related emissions.

⁶ Communication on a new approach for a sustainable blue economy in the EU Transforming the EU's Blue Economy for a Sustainable Future, Communication C(2021) 240 final.

⁷ For this Report it was not possible to recalculate historical data before 2021 so to exclude the emissions resulting from the full application of the EU Maritime MRV Regulation to the United Kingdom. This is because the legislation does not require shipping companies to report emissions at voyage level. Therefore, throughout the Report, the figures presented for the year 2021 are based on the data as reported excluding the Regulation full application to the United Kingdom (but only to EEA countries, including EU27), while for the three previous MRV reporting years the United Kingdom is accounted for as part of the EEA (EU28).

Expressed in terms of fuel consumption, the monitored ships consumed 40 million tonnes of fuel in 2021.

The withdrawal of the United Kingdom from the EU caused a significant change in the distribution of the fleet's total CO₂ emissions over the different types of voyages. The share of emissions from intra-EEA voyages decreased from 33% in 2019 to 26% in 2021, and the contribution of extra-EEA voyages increased from 33% to 35% in the same years. For some ship types (ro-ro and ro-pax ships) there was also a clear shift of reported emissions between voyage types compared to 2020.

However, the share of the different ship types in the overall CO₂ emissions remained stable across the four reporting periods. Container ships emitted the highest proportion in the fleet CO₂ emissions (2021: 33%) and together with the emissions of oil tankers and bulk carriers, emitted almost 60% of the 2021 total fleet CO₂ emissions.

The share of fuel consumed at berth (6.4%) remained stable.

No major changes were recorded in the relative shares of the main fuel types consumed in 2021 compared to 2020. Among the main used fuels, LNG is the only fuel type for which consumption levels close to pre-COVID 2019 (-2%) were reported in 2021, with clear signs of an uptake in LNG consumption in some ship types (container ships, oil tankers, and passenger ships), beyond LNG carriers. The share of LNG carriers in total LNG consumption decreased from 88% in 2018 to 80% in 2021.

4. The monitored fleet: shipping routes, speed and time spent at sea

According to Eurostat data, following the 2020 decrease in extra-EU-27 trade flows handled in main ports, the volume of traded goods for seven out of the fifteen main partners increased in 2021, yet in general below 2019 pre-COVID levels. The volume of waterborne transport services in 2021 was particularly high on shipping routes between the EU and countries like Russia, the USA, the United Kingdom, Norway and Turkey.

The data collected during the fourth reporting year showed that speed variation in the period 2018-2021 is negligible for most ship types. There are no signs of any ship type structurally slowing down over the period, with the notable exception of those still suffering from the economic effects of COVID-19 (e.g. passenger ships), which showed a decrease in speed in 2020 and only a partial recovery in 2021.

Both the average time at sea and the total time at sea increased in 2021 compared to 2020 for passenger ships and ro-pax ships, an indication that for such ship types the recovery from the COVID-19 crisis more than balanced the negative effects of the United Kingdom's withdrawal from the EU.

5. Technical and operational efficiency of the monitored fleet

The graphical analysis of key technical and operational efficiency indicators⁸ shows that no significant changes took place over the period 2018-2021. Furthermore, the gradual increase of data correlation values indicates that the reported data is complete and correct, and that it has improved over the last four years.

In 2021, in total, 3 545 ships have reported their Energy Efficiency Design Index (EEDI) and 7 775 ships their Estimated Index Value (EIV). The number of ships reporting their EEDI value is increasing over the years due to the continuous fleet renewal. The year 2021 registered a slight improvement in the average technical efficiency of the reported fleet (1% average improvement in the EEDI value at fleet level).

In summary, the lower level of CO₂ emissions observed for 2021 compared to both 2020 and pre-COVID years should not be linked to a supposed overall improvement of the operational efficiency of the fleet but could instead be associated to the combined effect of the withdrawal of the UK from the EU and the long-lasting effects of the COVID economic crisis.

6. The implementation of the EU Maritime MRV Regulation in 2021

The main outcome of the EU Maritime MRV Regulation is the insight gained into the CO₂ performance of the largest vessels (above 5 000 gross tonnage) entering or leaving EEA ports. This enables shipping companies, and other stakeholders, like Member State authorities, to identify trends in the overall performance of individual vessels and/or the entire fleet that is subject to the EU Maritime MRV Regulation. It therefore represents a key tool for the development and implementation of EU policies to decarbonise maritime transport.

The analysis of 2021 data showed that implementation actors (shipping companies and verifiers) are now more familiar with the system, resulting in smoother internal procedures and better quality of the submitted data. There is a positive trend in punctuality in data submission for the period 2018-2021: in 2021, 65% of all emissions reports were submitted to the European Commission by the deadline at the end of April, up from 55% in the first reporting year (2018). The same positive trend is clear in the share of emissions report verified as satisfactory without the need of any additional revision, which increased from 35% in 2018 to 71% in 2021. Still, compliance needs to be further improved.

Few verified emissions reports still include outlying data (outliers), which could imply e.g. typing mistakes or other reporting inconsistencies. The number of reports with outliers has decreased over the last four years, from 365 in 2018 to only 83 cases in 2021 (0.7% of all emissions reports).

7. Maritime transport sector's overall impact on the global climate and the environment

Article 21.5 of the EU Maritime MRV Regulation provides for an obligation for the Commission to report on the maritime transport sector's overall impact on the global climate and the

⁸ The Energy Efficiency Design Index (EEDI) and the Estimated Index Value (EIV) are assessed for the technical efficiency of ships, while the Energy Efficiency Operational Indicator (EEOI) and the Annual Efficiency Ratio (AER) for their operational efficiency.

environment. The Fourth Greenhouse Gas (GHG) Study from the International Maritime Organization (IMO) shows that GHG emissions (including carbon dioxide, methane and nitrous oxide) from shipping increased by 9.6% in the period 2012-2018 (from 977 million tonnes to 1 076 million tonnes). The share of shipping emissions in global anthropogenic GHG emissions increased from 2.8% in 2012 to 2.9% in 2018. Over the same period, the study also highlighted the importance of black carbon emissions, which represents around 7% of international shipping GHG emissions and it showed a high increase in methane emissions from ships.

The data reported under the IMO Data Collection System (DCS) gives an indication of the development of the CO₂ emissions after 2018, at least for the ships of 5 000 GT and above. According to the reported data, the CO₂ emissions of these ships amounted to 662 Mt in 2019. In 2020, these emissions decreased by 4.4%.

According to the Fourth IMO GHG Study, CO₂ emissions are projected to increase from about 90% of 2008 emissions in 2018 to 90-130% of 2008 emissions by 2050 for a range of plausible long-term economic and energy scenarios.