

GHG EMISSIONS FROM INTERNATIONAL SHIPPING

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International shipping is exempted from the general obligations of the Paris Agreement of states to report on the reduction of emissions of greenhouse gases (GHG). The matter was left to the IMO, but not excluded from the jurisdiction of the EU and individual states. The paper compares the measures of the IMO and the EU.

Keywords: *GHG emissions; international shipping; EU; IMO; Carbon Intensity Indicator (CII).*

1. TARGETS

The European Union (EU) has ambitious plans for reducing greenhouse gas (GHG) emissions caused by human activity. The European Climate Law¹ sets the target at 100% reduction (net zero GHG emissions) by 2050 (Article 3) and 55% by 2030 (Article 4) as compared to levels in 1990. The member states are supposed to implement these goals pursuant to the Effort Sharing Regulation (ESR).²

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¹ Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 (“European Climate Law”). EU legal documents can be retrieved from <https://eur-lex.europa.eu>.

² COM/2021/555 final Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by member states from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement.

The targets and obligations of the member states also apply to emissions from international shipping.³

The Paris Agreement⁴ leaves GHG emissions from international shipping mainly to the International Maritime Organization (IMO).⁵ This was not changed by the Glasgow Climate Pact.⁶ The targets of the IMO are much less ambitious than those of the EU. Currently, the goals are:⁷

“2. carbon intensity of international shipping to decline to reduce CO₂ emissions per transport work, as an average across international shipping, by at least 40% by 2030, pursuing efforts towards 70% by 2050, compared to 2008; and

3. GHG emissions from international shipping to peak and decline to peak GHG emissions from international shipping as soon as possible and to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008 whilst pursuing efforts towards phasing them out as called for in the Vision as a point on a pathway of CO₂ emissions reduction consistent with the Paris Agreement temperature goals.”

The purpose of this paper is to compare the efforts of the EU and the IMO with respect to reducing GHG emissions from international shipping.⁸ It is difficult to follow these ongoing processes, so the intention is to provide an overview. Because the documents are replete with acronyms, a selected list is included.

³ European Environment Agency and European Maritime Safety Agency, *European Maritime Transport Environmental Report 2021*, available at <https://tinyurl.com/erikro117>, p. 24.

⁴ The Paris Agreement, United Nations 2015, available at <https://tinyurl.com/erikro118>.

⁵ Røsæg, E., *The Aviation and Shipping Exemptions in the Paris Agreement on Climate Change*, *Journal of International Maritime Law*, vol. 27 (2021), no. 1, pp. 55-64. For more nuances, see Ringbom, H., *Regulating Greenhouse Gases from Ships: Some Light at the End of the Funnel?*, in Veierud Busch, S.; Karlsen, E.; Johansen, I. (eds.), *The Law of the Sea and Climate Change: Solutions and Constraints*, Cambridge University Press, Cambridge, 2020, pp. 135 *et seq.*

⁶ The Glasgow Climate Pact, United Nations 2021, available at <https://tinyurl.com/erikro119>.

⁷ MEPC 72/17/Add.1 Annex 11 Resolution MEPC.304(72) Initial IMO Strategy on Reduction of GHG Emissions from Ships, item 3.1. IMO documents can be retrieved from <https://docs.imo.org> or, in the case of resolutions, via any search engine. IMO Conventions can be retrieved from <https://vp.imo.org>.

⁸ See also Ringbom, H., *Regulating Greenhouse Gases...*, *op. cit.*; Finska, L.; Ringbom, H., *Regulating Greenhouse Gases from Ships. On the Available Discretion for Regulatory Solutions in a European and Finnish Perspective*, 2022, available at <http://tinyurl.com/erikro101>; Eftestøl, E. J., “Fit for 55” and the Polluter Pays Principle. Who Pays under the Proposed EU ETS for Shipping? *European Transport Law*, 2022, pp. 111-125.

2. STRATEGY

The current primary strategy documents of the EU are the communications European Green Deal⁹ and Fit for 55.¹⁰ These outline a number of measures. At the time this paper was being written, the IMO had an initial strategy.¹¹ The intention is to develop a revised strategy in 2023.¹² The elements of the new strategy are under discussion.¹³

The IMO has already implemented quite a few measures through an amendment to MARPOL.¹⁴ These rules have now been revised and will be implemented after a tacit amendment procedure.¹⁵ The substantive rules are discussed below in conjunction with secondary legislation.¹⁶

There are some concerns about the impacts of various measures on the industry – perhaps greater concerns than those concerning the effects of not

⁹ COM/2019/640 final Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee, and the Committee of the Regions.

¹⁰ COM/2021/550 final Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions, “Fit for 5”: Delivering the EU’s 2030 Climate Target on the Way to Climate Neutrality.

¹¹ Resolution MEPC.304(72); see footnote 7.

¹² MEPC 77/16 Report of the Marine Environment Protection Committee on its Seventy-seventh Session, para. 7.22.

¹³ MEPC 76/15/Add.2 Annex 14 Work Plan for the Development of Mid- and Long-term Measures as a Follow-up of the Initial IMO Strategy on Reduction of GHG Emissions from Ships; ISWG-GHG 12/INF.3 Consideration of Concrete Proposals for Mid- and Long-term Measures and Associated Impact Assessments in the Context of Phase I of the Work Plan as well as the Proposal to Establish an International Maritime Research Board. Collation of views expressed during ISWG-GHG 10 and MEPC 77 on the proposals for mid- and long-term measures in the context of phase 1 of the work plan. Note by the Secretariat.

¹⁴ MARPOL, Annex VI, Chapter 4. Annex VI was added to MARPOL 1973/78 by Protocol of 1998. Chapter 4 entered into force on 1 January 2013. The rules are not supposed to apply to non-international shipping; see MEPC.1/Circ.863 Recommendation on Exemption of Ships Not Normally Engaged on International Voyages from the Requirements in Chapter 4 of MARPOL Annex VI.

¹⁵ MEPC 76/15/Add.1 Resolution MEPC.328(76) – Amendments to MARPOL Annex VI (2021 Revised MARPOL Annex VI). The amendments are expected to enter into force on 1 November 2022.

¹⁶ For an overview of some secondary legislation, see <http://tinyurl.com/erikro94>.

implementing the measures. The IMO is still organising its impact analysis,¹⁷ while the EU has published some reports.¹⁸

3. ENERGY EFFICIENCY

Energy efficiency means that a ship can produce more transport services per consumed unit of fuel and therefore reduce GHG emissions. Energy efficiency indices that measure energy efficiency are therefore good indications of whether a ship is good or bad from a GHG perspective. One can also demand a certain level of energy efficiency in various contexts.

The EU does not have rules for the energy efficiency of vessels. The IMO, on the other hand, has such rules.

There are IMO rules for determining the **energy efficiency design indices of new ships (EEDI)**. In MARPOL Annex VI, the EEDI is addressed in Regulations 20 and 21 (which will be Regulations 22 and 24 after the revision). In addition, there is secondary legislation for calculating the EEDI.¹⁹

These rules apply to new ships. It is therefore of paramount importance to clarify when a ship is to be considered a new ship – for example, whether a ship is “new” after a major modification. Such clarification has been provided in the format of a uniform interpretation.²⁰

For safety reasons, ships must not save energy to the extent that emergency manoeuvrability is impaired. The national administrations lend some guidance in this respect.²¹

¹⁷ ISWG-GHG 11/WP.1/Rev.1 Annex 2 Draft Process and Methodological Elements to Complement the Procedure for Assessing Impacts on States of Candidate Measures (to be included in a future MEPC.1/Circ.885/Rev.1).

¹⁸ See, in particular, the Commission Staff Working Documents SWD/2021/623 final Impact Assessment Report Accompanying the Proposal for a Directive of the European Parliament and of the Council on Energy Efficiency (recast) and SWD/2020/176 final Impact Assessment Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Stepping up Europe’s 2030 climate ambition investing in a climate-neutral future for the benefit of our people.

¹⁹ Resolution MEPC.332(76) Amendments to the 2018 Guidelines on the Method of Calculation of the Attained Energy Efficiency Design Index (EEDI) for New Ships.

²⁰ MEPC.1/Circ.795/Rev.5 Unified Interpretations to Marpol Annex VI.

²¹ MEPC.1/Circ.850/Rev.3 Guidelines for Determining Minimum Propulsion Power to Maintain the Manoeuvrability of Ships in Adverse Conditions.

The use of new technology creates special challenges for rule makers, and the purpose of the technology may be to reduce EEDI. These issues have been addressed in special guidelines.²²

The EEDIs are recorded. The cumulative records provide information on technological development.²³

These rules for new ships were developed without establishing corresponding rules for existing ships. Later, **energy efficiency indices for existing ships (EEXI)** were also developed.²⁴ There are no rules for EEXI in the MARPOL Annex VI currently in force, but new Regulations 23 and 25 deal with this issue.

Even for existing ships, there is a trade-off between safety and energy savings. One possibility is to limit the use of the engine's capabilities unless there is an emergency. This is addressed in the guidelines.²⁵

The EEDI and EEXI provide a good basis for setting minimum requirements for the energy efficiency of ships. Such minimum requirements are set in Regulations 24 and 25 of the 2021 Revised MARPOL Annex VI for new and existing ships, respectively. The requirements are gradually tightened at a different pace for different categories of ships.

4. SHIP OPERATION

However technically fit a vessel is, its operation greatly influences its emissions. A prerequisite for energy-efficient operation is knowledge. The IMO has therefore developed guidelines for an operational handbook for each ship in this respect, called the **Ship Energy Efficiency Management Plan (SEEMP)**.²⁶ The handbook is required on board, but following its advice is not required.²⁷ There are even guidelines for an operational index that is called the **Efficiency Operational Indicator (EEOI)**.²⁸

²² MEPC.1/Circ.896 2021 Guidance on Treatment of Innovative Energy Efficiency Technologies for Calculation and Verification of the Attained EEDI and EEXI. (On EEXI, see below).

²³ MEPC 78/INF.3 Energy Efficiency of Ships. EEDI database – Review of Status of Technological Development (Regulation 21.6 of MARPOL Annex VI). Note by the Secretariat.

²⁴ Resolution MEPC.333(76) 2021 Guidelines on the Method of Calculation of the Attained Energy Efficiency Existing Ship Index (EEXI).

²⁵ MEPC.335(76) 2021 Guidelines on the Shaft/Engine Power Limitation System to Comply with the EEXI Requirements and Use of a Power Reserve.

²⁶ MEPC.282(70) 2016 Guidelines for the Development of a Ship Energy Efficiency Management Plan (SEEMP).

²⁷ MARPOL Annex VI regulation 21; 2021 Revised MARPOL Annex VI regulation 26.

²⁸ MEPC.1/Circ.684 Guidelines for Voluntary Use of the Ship Energy Efficiency Operational Indicator (EEOI).

The goal is for the ship, in practice, to limit its emissions. The measurement of performance is called a **Carbon Intensity Indicator (CII)**.²⁹ The intention is to extend this indicator to GHG other than carbon (dioxide) at a later stage.³⁰ The rules are mandatory in the sense that ships that do not perform well must submit a plan for corrective action.³¹ Their performances are graded on a scale from A to F.³²

MARPOL Annex VI Regulation 28.4 requires a reference value – different for various categories of ships – to calculate the CII. These reference values or reference lines are set out in secondary legislation.³³ Similarly, secondary legislation determines reduction factors so that requirements will be introduced gradually.³⁴

One of the factors that influences CII is fuel. The IMO initiative on fuel standards, which will be discussed below, is therefore likely to influence the attained CIIs. There is a need to clarify the relationship between these measures.³⁵

5. DATA COLLECTION

The total GHG emissions from international shipping are the sum of the emissions from individual ships. It is therefore of interest to monitor these emissions. Monitoring can be used to obtain a better overview of the problem, and it is possible to link levies, etc., to the performance of an individual ship. In addition, experience shows that reporting on, for example, emissions brings the problem to the attention of decision makers in the industry.

²⁹ Resolution MEPC.336(76) 2021 Guidelines on Operational Carbon Intensity Indicators and the Calculation Methods (CII Guidelines, G1).

³⁰ Reduction of methane slip and emissions of volatile organic compounds (VOCs). See MEPC 77/16 (footnote 12) para. 7.31 *et seq.*

³¹ 2021 Revised MARPOL Annex VI regulation 28.

³² MEPC.339(76) 2021 Guidelines on the Operational Carbon Intensity Rating of Ships (CII Rating Guidelines, G4).

³³ MEPC.337(76) 2021 Guidelines on the Reference Lines for Use with Operational Carbon Intensity Indicators (CII Reference Lines Guidelines, G2).

³⁴ MEPC.338(76) 2021 Guidelines on the Operational Carbon Intensity Reduction Factors Relative to Reference Lines (CII Reduction Factors Guidelines, G3).

³⁵ ISWG-GHG 12/3/12 Consideration of Concrete Proposals for Mid- and Long-term Measures and Associated Impact Assessments in the Context of Phase I of the Work Plan as well as the Proposal to Establish an International Maritime Research Board. Consideration of the CII in relation to a new GHG fuel standard. Submitted by Norway.

The EU has established an elaborate monitoring and reporting scheme under the **MRV Regulation**.³⁶ However, the IMO scheme is also very elaborate. The IMO database forms part of the **IMO Global Integrated Shipping Information System (GISIS)**.³⁷ The duty to report is set out in MARPOL Annex VI.³⁸ Data are submitted and verified via flag states, and there are special rules for the submission of data with respect to ships flagged in a state that is not party to MARPOL Annex VI.³⁹ The organisation of data submissions is set out in guidelines.⁴⁰ The data are reported regularly.⁴¹

The IMO rules on data collection are under development.⁴²

The two data collection systems are not well coordinated.⁴³ For example, the IMO system is global and compiles data anonymously, while the EU system is regional and non-anonymous. A coordination effort is desirable.

6. RENEWABLE FUELS

Changing to fuels that leave fewer or no greenhouse gases after combustion or yield more energy without increasing GHG emissions seems a good strategy.

³⁶ 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. (Text with EEA relevance). Consolidated text: data.europa.eu/eli/reg/2015/757/2016-12-16.

³⁷ IMO Circular Letter No. 3827 Global Integrated Shipping Information System (GISIS) – IMO Ship Fuel Oil Consumption Database Module.

³⁸ MARPOL Annex VI regulation 22A; 2021 Revised MARPOL Annex VI regulation 27.

³⁹ MEPC.1/Circ.871 Submission of Data to the IMO Data Collection System of Fuel Oil Consumption of Ships from a State Not Party to MARPOL Annex VI.

⁴⁰ Resolution MEPC.292(71) 2017 Guidelines for Administration Verification of Ship Fuel Oil Consumption Data; Resolution MEPC.293(71) 2017 Guidelines for the Development and Management of the IMO Ship Fuel Oil Consumption Database.

⁴¹ See, for example, MEPC 77/6/1 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.

⁴² ISWG-GHG 11/WP.1/Rev.1 Annex 3 Draft Amendments to MARPOL Annex VI (Appendix IX on Information to be submitted to the IMO Ship Fuel Oil Consumption Database); ISWG-GHG 11/WP.1/Rev.1 Annex 4 Draft Modifications to the 2017 Guidelines for the Development and Management of the IMO Ship Fuel Oil Consumption Database (Resolution MEPC.293(71)).

⁴³ See further, International Chamber of Shipping, European Union MRV Regulation. Guidance for Ships over 5000 GT which Carry Passengers or Cargo to, from or between EU/EEA Ports, available at <http://tinyurl.com/erikro93>.

One example is installing engines on board that run on ammonia (NH₃), which would mainly emit water vapor. However, such changes presuppose the commercial availability of the fuels, and commercial availability presupposes demand. Incentives associated with GHG emissions are unlikely to suffice.

The **FuelEU Maritime** proposal addresses this issue. Ships calling in EU ports must declare the greenhouse gas intensity of the energy used on board, and the greenhouse gas intensity must be reduced over the years to come.⁴⁴ The effect of this is both to facilitate the transition to renewable fuels and, of course, to reduce GHG emissions.

There is already a renewable energy directive in place⁴⁵ and further development of the rules have been proposed (**Renewal Energy Directive [RED II]**).⁴⁶ RED II requires suppliers of fuel to supply 14% of it from certain renewable sources, which may increase the supply of renewable fuels, even in the maritime market.⁴⁷ Even the proposed **Energy Tax Directive** may increase the demand for and the supply of renewable fuels.⁴⁸ There is a specialised impact assessment for this branch of EU maritime policy.⁴⁹

The IMO has also focused on fuels, initially particularly on the **lifetime assessment of various fuels**, “well to wake”. It does not make sense to run ships on hydrogen if its production causes large GHG emissions. Work on this issue is at the initial phase,⁵⁰ based, *inter alia*, on a Secretariat study.⁵¹

⁴⁴ COM/2021/562 final, Proposal for a Regulation of the European Parliament and of the Council on the Use of Renewable and Low-carbon Fuels in Maritime Transport and Amending Directive 2009/16/EC.

⁴⁵ 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; Text with EEA relevance).

⁴⁶ COM/2021/557 final, Proposal for a Directive of the European Parliament and of the Council amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the Promotion of Energy from Renewable Sources, and Repealing Council Directive (EU) 2015/652.

⁴⁷ European Maritime Transport Environmental Report 2021; see footnote 3, p. 24.

⁴⁸ COM/2021/563 final, Proposal for a Council Directive Restructuring the Union Framework for the Taxation of Energy Products and Electricity (recast).

⁴⁹ European Parliament, “Fit for 55” package: Fuel EU Maritime, February 2022, available at <http://tinyurl.com/erikro95> with further references.

⁵⁰ ISWG-GHG 11/WP.1/Rev.1 Annex 1 Draft Terms of Reference for the Establishment of a Correspondence Group on Marine Fuel Lifecycle GHG Assessment.

⁵¹ ISWG-GHG 11/2/5 Development of Draft Lifecycle GHG and Carbon Intensity Guidelines for Maritime Fuels (Draft LCA Guidelines). Study on Sustainability Criteria and Lifecycle

7. MARKET-BASED MEASURES

All the measures discussed above interfere with the market for shipping services. However, some measures interfere more directly with the price mechanism without regulating exactly how commercial parties adapt to the new market situation. One example is a levy on bunker fuel oil, which is thought to be an incentive to burn less oil and thereby reduce GHG emissions. Variants of this regulatory technique are called market-based measures (MBM).

The beauty of MBM is that commercial parties can be expected to find solutions to reduce their costs and thereby their GHG emissions. They “internalise” the societal cost of, for example, GHG emissions. The solutions they find and prefer are likely to be cost effective for them, for the benefit of themselves and society. The problem is that repercussions of the market mechanism may not be known or may be undesirable, for example if the effect of MBM is that some market actors dominate even more. In some cases, for instance with respect to the availability of alternative fuels, the market may respond too slowly, and the MBM may create a crisis.

The measures are market based in the sense that as much flexibility as possible is left to the market in how to respond to the measures. The pressure on the markets by the measures is a political decision, for example by raising levies or limiting such emission-trading quotas as described below.

The foundation of the EU GHG policy is market based. An **emission trading scheme (ETS)**⁵² requires the industry to purchase quotas in order to emit GHG legally. In this respect, the system functions as a levy on GHG emissions. However, quotas can be traded. If a factory does not need its quotas because the cost makes production too expensive for their product’s market, they can cease production and the quotas can be sold to another factory that produces items that are in such demand that the process can pay for the quotas. The idea is that emissions can be limited and allocated to the production of goods and services that are most in demand.

Some will also find it attractive that the payments for the quotas do not go to the government (but to the sellers of the quotas), so there can be no fiscal motive for the payments.

GHG Emission Assessment Methods and Standards for Alternative Marine Fuels. Note by the Secretariat.

⁵² Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for GHG emission allowance trading within the community and amending Council Directive 96/61/EC (text with EEA relevance).

Currently, this scheme does not apply to shipping. However, there is a proposal for an extension and strengthening of the scheme⁵³ that will most likely include shipping as well.⁵⁴

Even the Energy Tax Directive⁵⁵ can be regarded as an MBM. Differentiating taxes so that low-carbon fuels are taxed less than high-carbon fuels has the same effect as a levy on the use of high-carbon fuels.

In the IMO, discussions on MBM were deliberately postponed after some initial rounds but are now on the table.⁵⁶ Depending on the outcome of such discussions, some of the measures already agreed upon may prove unnecessary and may even prevent commercial parties from choosing the most cost-effective solutions.

8. FINANCING

Another cornerstone of the GHG policy of the EU is financial incentives. Credit from financial institutions is channelled to activities with a low carbon footprint. Even shipping activities are affected by these rules. The IMO has not considered rules of this kind, perhaps because regulating the finance industry falls outside the IMO's remit.

To channel finances to activities with low carbon footprints, different activities must be classified. This is ongoing work, but a great deal of classification is being done by the **Taxonomy Regulation**.⁵⁷ Pursuant to the **Sustainable Finance**

⁵³ COM/2021/551 final, Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC Establishing a System for Greenhouse Gas Emission Allowance Trading within the Union, Decision (EU) 2015/1814 Concerning the Establishment and Operation of a Market Stability Reserve for the Union Greenhouse Gas Emission Trading Scheme, and Regulation (EU) 2015/757.

⁵⁴ See the background paper by Graichen, J.; Graichen, V.; Jakob, M.; Wissner, N., *Including Transport Sectors in the EU ETS*, Background paper for the ENVI Committee, Öko-Institut e.V., 2021, available at <http://tinyurl.com/erikro99>.

⁵⁵ Above in Section 6.

⁵⁶ ISWG-GHG 12/INF.2 Consideration of Concrete Proposals for Mid- and Long-term Measures and Associated Impact Assessments in the Context of Phase I of the Work Plan as well as the Proposal to Establish an International Maritime Research Board. Summary of the Organisation's previous discussions on market-based measures. Note by the Secretariat.

⁵⁷ Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the Establishment of a Framework to Facilitate Sustainable Investment, and Amending Regulation (EU) 2019/2088 (Text with EEA relevance).

Disclosure Regulation (SFDR), financial institutions must disclose the environmental profile of their engagements with reference to this taxonomy.⁵⁸ The result is pressure in the direction of financing environmentally sustainable projects. It is likely that this policy will be extended.⁵⁹ However, even crude oil tankers, which are not classified in the taxonomy and would not be recognised as carrying out a sustainable activity if they were, can be financed, as there is still some leeway for financial institutions.

9. CORPORATE GOVERNANCE

A recent EU proposal requires the directors of certain corporations to “adopt a plan to ensure that the business model and strategy of the company are compatible with the transition to a sustainable economy and with the limiting of global warming to 1.5 °C in line with the Paris Agreement”.⁶⁰ Shipping companies are not exempted. The criteria for when a company strategy complies with the global target are not clarified. Failure to comply with this requirement may be serious, including civil liability.

10. CONCLUSION

The efforts of the IMO and the EU to reduce GHG emissions from shipping are still under development. In the IMO, even the strategy has yet to be determined.

The measures discussed and implemented are likely to promote a green shift. It is, however, not unlikely that some changes as a result of these measures would have been made anyway because of changed business attitudes. There are many business initiatives dealing with the problem of GHG emissions.⁶¹ Government

⁵⁸ Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector (Text with EEA relevance).

⁵⁹ See, for example, the consultation paper *Sustainable Finance – Environmental, Social and Governance Ratings and Sustainability Risks in Credit Ratings*, available at <http://tinyurl.com/erikro96>.

⁶⁰ COM/2022/71 final, Proposal for a Directive of the European Parliament and of the Council on Corporate Sustainability Due Diligence and Amending Directive (EU) 2019/1937 (Text with EEA relevance), Article 15.

⁶¹ Some bank initiatives are, for example, the United Nations Environment Programme Finance Initiative (UNEP FI), Principles for Responsible Banking (PRB); the Equator Principles, Partnership for Carbon Accounting Financials (PCAF), Strategic Framework for Paris Alignment (2021), and the Poseidon Principles.

measures may have triggered a change in business attitudes, or a change in business attitudes may have made implementing government measures possible.

It is remarkable that neither the EU nor the IMO has taken initiatives to regulate commercial relationships in shipping. It would be beneficial to address contract practices that are unsuitable from an environmental sustainability point of view.⁶² However, this approach would perhaps fall outside the current remit and competencies of the two organisations.

The EU's initiatives are generally broad, policy oriented, and driven by economic incentives rather than command and control rules. The initiatives of the IMO are based on careful consideration of the practical consequences and a desire not to bring the market or equilibrium among states out of balance. The measures have a remarkable technical profile, as with most IMO instruments. Perhaps it is fair to say that the IMO has an engineering approach, while the approach of the EU is more political and economic.

The work in the IMO takes time, and it may not have been a good move to exclude international shipping from the direct responsibility of states in the Paris Agreement. Given this arrangement, one could still expect the efforts of the IMO, the EU, and other regional organisations and individual governments to be better coordinated. There is only one atmosphere, and time is of the essence.

SOME ACRONYMS

AER – Average Efficiency Ratio

BDN – Bunker Delivery Note

CBDR+RC – Common But Differentiated Responsibilities and Respective Capabilities

CIC – Carbon Intensity Code

CII – Carbon Intensity Indicator

CO_{2eq} – Carbon Dioxide Equivalents

CGE – Computable General Equilibrium

DCS – Data Collection System (for fuel consumption; MARPOL Annex VI)

EEDI – Energy Efficiency Design Index

EEMs – Energy Efficiency Measures

⁶² See, for example, Røsæg, E., *A System for Queuing in Ports*, 2010, available at <http://tinyurl.com/erikro98>.

EEOI – Efficiency Operational Indicator
EEXI – Energy Efficiency Existing Ship Index
EGD – European Green Deal
ESR – Effort Sharing Regulation
FLL – Fuel Lifecycle Label
GCF – Green Climate Fund
GHG – Greenhouse Gases
GISIS – Global Integrated Shipping Information System
GWP100 – 100-year Global Warming Potential
IAPPC – International Air Pollution Prevention Certificate
IEEC – International Energy Efficiency Certificate
ILUC – Induced Land Use Change
IMRB – International Maritime Research and Development Board
IMRF – IMO Maritime Research Fund
IPCC – The Intergovernmental Panel on Climate Change
ISWG – Inter-Sessional Working Group
LCA – Life Cycle Assessment
LCF – Low-Carbon Fuels
LDCs – Least Developed Countries
LSFO – Low Sulfur Fuel Oil
LGFS – Low GHG Fuel Standard
MACC – Marginal Abatement Cost Curve
MARPOL – The International Convention for the Prevention of
Pollution from Ships
MBM – Market Based Measures
MCR – Maximum Continuous Rating (of engines)
MDO – Marine Diesel Oil
MEPC – Marine Environment Protection Committee (of the IMO)
MGO – Marine Gas Oil
MRV – Monitoring, Reporting, and Verification (of GHG emissions)
MTM – Mid-Term Measures
NAP – National Action Plan

NMFT – No More Favourable Treatment

OPS – On-shore Power Supply

RLF – Renewable Low-Carbon Fuel

RFNBO – Renewable Fuel of Non-Biological Origin

SAF – Sustainable Alternative Fuels

SEEMP – Ship Energy Efficiency Management Plan

SFC – Specific Fuel Consumption

SMART – Specific, Measurable, Achievable, Realistic, Time-Bound

SIDS – Small Island Developing States

SoC – Statement of Compliance

ST-GHG – Standing Technical Group on Reduction of GHG
Emissions from Ships

ISWG-GHG – Intersessional Working Group on Reduction of GHG
Emissions from Ships

TNM – Tonne-Nautical Mile

UI – Unified Interpretation

VOCs – Volatile Organic Compounds

V_{ref} – Reference Speed

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Sažetak:

EMISIJE STAKLENIČKIH PLINOVA U MEĐUNARODNOM BRODARSTVU

Međunarodno je brodarstvo izuzeto od općih obveza država iz Pariškog sporazuma da izvještavaju o smanjenju emisija stakleničkih plinova. Stvar je prepuštena IMO-u, ali nije isključena iz nadležnosti EU-a i pojedinih država. U radu se uspoređuju mjere IMO-a i EU-a u vezi sa smanjenjem emisija stakleničkih plinova u međunarodnom brodarstvu.

Ključne riječi: *emisije stakleničkih plinova; međunarodno brodarstvo; EU; IMO; Indikator intenziteta ugljika (CII).*