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REPORT

From: General Secretariat of the Council
To: Permanent Representatives Committee/Council

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Subject: 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
– General approach

I. INTRODUCTION

1. On 14 July 2021, the Commission submitted to the European Parliament and to the Council a proposal for a Regulation on the use of renewable and low-carbon fuels in maritime transport ('FuelEU Maritime')¹, as part of the 'fit for 55' package (the 'package').
2. The main aim of the proposal is to increase the demand for and consistent use of renewable and low-carbon fuels in the maritime sector, while ensuring the smooth operation of maritime traffic and avoiding distortions in the internal market. Notably, its main provisions focus on the following aspects:

¹ ST 10327/21, ADD 1, ADD 2 and ADD 3.

- i) the scope, in terms of the size of the ships concerned and the geographical scope;
 - ii) reduction targets for the greenhouse gas intensity of energy used on board by ships;
 - iii) the scope of the on-shore power supply (OPS) requirements; or alternative zero emission technologies for ships in ports;
 - iv) the certification of renewable and low-carbon fuels; and
 - v) the governance relating to these new obligations (including the penalties to be applied to companies in cases of non-compliance of their ships and the assignment of the revenue generated by these penalties to the Innovation Fund).
3. FuelEU Maritime also has links to Regulation (EU) 2015/757 on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport² and other proposals in the package, in particular those on renewable energy (RED), on the deployment of alternative fuels infrastructure (AFIR), and on the emissions trading scheme (EU ETS).

II. SCRUTINY BY THE OTHER INSTITUTIONS

4. The European Parliament has designated the Committee on Transport and Tourism (TRAN) as the committee responsible for the FuelEU Maritime proposal and Mr Jörgen Warborn (SE, EPP) has been appointed as its rapporteur. The European Parliament is expected to adopt its position in plenary in September 2022.
5. The European Economic and Social Committee adopted its opinion on the abovementioned proposal on 8 December 2021, while the European Committee of the Regions has declined to deliver an opinion.

² OJ L 123, 19.5.2015.

III. STATE OF PLAY IN THE COUNCIL

6. The Working Party on Shipping started its work on the proposal in September 2021. The impact assessment carried out by the Commission was discussed in the Working Party on 1 and 13 September 2021.
7. The TTE Council of ministers for transport held a policy debate for further work on the file at its meeting on 9 December 2021.
8. Under the French Presidency, regular and intensive discussions have continued to take place within the Working Party, first in thematic blocks and then on the basis of global proposals.
9. The Permanent Representatives Committee held a debate on 13 April 2022 with the aim of deepening the discussion and receiving guidance from delegations on the following three aspects: (i) the scope, in terms of the size of the ships covered and the geographical scope of the obligations; (ii) the level of the carbon intensity targets; and (iii) the taking into account of fuels. The positions set out at this meeting of the Permanent Representatives Committee showed that the parameters established by the Presidency on these three aspects struck a certain balance.
10. In preparation for the meeting of the TTE (Transport) Council on 2 June 2022, on 20 May 2022 the Permanent Representatives Committee examined the Presidency compromise annexed to the report set out in ST 8882/22, which mainly addressed the following aspects:
 - (a) Some definitions had been added or amended to ensure a better understanding of the text and for consistency.
 - (b) The scope of the requirements in terms of on-shore power supply had been revised in order to focus the obligations imposed on ships moored at the quayside, to provide a better framework for the exemptions, to ensure consistency with the AFIR proposal, and to offer Member States the possibility of extending the obligations already imposed on ships moored at the quayside to those at anchorage in ports.
 - (c) The provisions on the role of companies, verifiers and the public authorities, and on the monitoring, reporting and verification procedures, had been clarified and strengthened with the aim of ensuring a more robust governance system. The work of verifiers is thus more clearly defined and the public authorities can carry out additional checks.

- (d) The provisions on flexibility mechanisms had been revised in order to clarify their scope and prevent circumvention of the Regulation.
- (e) The main provisions on sanctions and penalties had been carefully amended in order to ensure the consistency and robustness of the enforcement system provided for in the Regulation and respect for Member States' legal systems. In this regard, the provision in the Commission proposal on earmarking revenues generated from penalties for the Innovation Fund had been replaced by a system for allocating these revenues to Member States, while continuing to prioritise their use to support the energy transition of the maritime transport sector.
- (f) The annexes on the methodology for calculating the greenhouse gas intensity of the energy used on board by a ship, on the default emission factors and on the calculation of penalties had been simplified and partially restructured in order to make their highly technical aspects more easily understandable and to improve their consistency with the RED.
11. This compromise amended most aspects of the Commission proposal, thus responding to the queries and requests received from several delegations, while maintaining its general approach and level of contribution to the objective of the package.
12. However, at the meeting of the Permanent Representatives Committee on 20 May 2022, some delegations expressed concerns about whether their local characteristics had been sufficiently taken into account through exemptions or the handling of specific cases, while others wanted to stimulate demand for sustainable fuels, and particularly the cleanest fuels, even further.
13. In view of the importance of these issues, the Presidency submitted to delegations its meeting amendments in order to stabilise the compromise. These amendments were welcomed by most delegations, while others expressed concerns about the effectiveness of the proposed measures to stimulate demand for the cleanest sustainable fuels. Some delegations also requested more time to analyse the meeting amendments, and especially those relating to the possible negative effect of the measure to encourage the use of RFNBOs.

14. Following an in-depth discussion of the information provided by delegations at the meeting of the Permanent Representatives Committee on 20 May 2022, and with a view to reaching a general approach, the Presidency has drafted the compromise annexed to this report. This compromise corresponds to the one annexed to the report set out in ST 8882/22, updated to include the amendments distributed at the meeting of the Permanent Representatives Committee on 20 May 2022, and one additional amendment³ on correcting the possible negative effect of the measure to encourage the use of RFNBOs⁴.

IV. CONCLUSION

12. In the light of the above, the Permanent Representatives Committee is invited to:
- examine and approve the text set out in the annex to this note, with a view to a general approach;
 - recommend that the Council, at the meeting of the TTE (Transport) Council on 2 June 2022, reach a general approach on the 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.

³ In particular, it is proposed to reduce the values of the multiplier in Annex I.

⁴ The compromise may also include corrections of a technical nature or relating to the layout.

2021/0210 (COD)

Proposal for a

REGULATION (EU)/... OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of...

on the use of renewable and low-carbon fuels in maritime transport and amending Directive 2009/16/EC

(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 100(2) thereof,

Having regard to the proposal from the European Commission,

After transmission of the draft legislative act to the national parliaments,

Having regard to the opinion of the European Economic and Social Committee⁵,

Having regard to the opinion of the Committee of the Regions⁶,

Acting in accordance with the ordinary legislative procedure,

Whereas:

⁵ OJ C , , p. .

⁶ OJ C , , p. .

- (1) Maritime transport accounts for around 75% of EU external trade and 31% of EU internal trade in terms of volume. At the same time, ship traffic to or from ports in the European Economic Area accounts for some 11% of all EU CO₂ emissions from transport and 3-4% of total EU CO₂ emissions. 400 million passengers embark or disembark annually in ports of Member States, including around 14 million on cruise ships. Maritime transport is therefore an essential component of Europe's transport system and plays a critical role for the European economy. The maritime transport market is subject to strong competition between economic actors in the Union and beyond for which a level playing field is indispensable. The stability and prosperity of the maritime transport market and its economic actors rely on a clear and harmonised policy framework where maritime transport operators, ports and other actors in the sector can operate on the basis of equal opportunities. Where market distortions occur, they risk putting ship operators or ports at a disadvantage compared to competitors within the maritime transport sector or in other transport sectors. In turn, that can result in a loss of competitiveness of the maritime transport industry, and a loss of connectivity for citizens and businesses.
- (2) To enhance the Union's climate commitment under the Paris Agreement adopted under the United Nations Framework Convention on Climate Change⁷ (the 'Paris Agreement'), Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality ('European Climate Law')⁸ aims at cutting greenhouse gas emissions by at least 55% compared to 1990 levels by 2030 and puts the Union on a path to becoming climate neutral by 2050. Additionally, various complementary policy instruments are needed to motivate the use of sustainably produced renewable and low-carbon fuels, including in the maritime transport sector. The necessary technology development and its deployment have to take place by 2030 to prepare for much more rapid change thereafter.

⁷ OJ L 282, 19.10. 2016, p. 4.

⁸ OJ L 243, 9.7.2021.

- (3) In the context of fuel transition to renewable and low carbon-fuels and substitute sources of energy, it is essential to ensure the proper functioning of and fair competition in the EU maritime transport market regarding maritime fuels, which account for a substantial share of ship operators' costs. Differences in fuel requirements across Member States can significantly affect ship operators' economic performance and negatively impact competition in the market. Due to the international nature of shipping, ship operators may easily bunker in third countries and carry large amounts of fuel. This may lead to carbon leakage and detrimental effects on the competitiveness of the sector if the availability of renewable and low-carbon fuels in maritime ports under the jurisdiction of a Member State is not accompanied by requirements for their use that apply to all ship operators arriving at and departing from ports under the jurisdiction of Member States. Therefore, this Regulation should lay down measures to ensure that the penetration of renewable and low-carbon fuels in the maritime fuels market takes place under the conditions of fair competition on the EU maritime transport market.
- (4) In order to produce an effect on all the activities in the maritime transport sector, this Regulation should thus apply to half of the energy used by a ship performing voyages arriving at a port under the jurisdiction of a Member State from a port outside the jurisdiction of a Member State, half of the of the energy used by a ship performing voyages departing from a port under the jurisdiction of a Member State and arriving at a port outside the jurisdiction of a Member State, the entirety of the energy used by a ship performing voyages arriving at a port under the jurisdiction of a Member State from a port under the jurisdiction of a Member State, and the energy used at berth in a port under the jurisdiction of a Member State. Such application ensures the effectiveness of this Regulation, including by increasing the positive impact on the environment of such framework. Simultaneously, such framework limits the risk of evasive port calls and the risk of delocalisation of rerouting activities outside the Union. In order to ensure smooth operation of maritime traffic and to avoid distortions in the internal market, a level playing field among maritime transport operators and among ports with regard to all journeys arriving or departing from ports under jurisdiction of Member States, as well as the stay of ships in those ports should be covered by consistent rules contained in this Regulation.

- (5) The rules laid down in this Regulation should apply in a non-discriminatory manner to all ships regardless of their flag. For reasons of coherence with Union and international rules in the area of maritime transport, this Regulation should focus on ships with a gross tonnage above 5 000 gross tonnage (GT) and should not apply to warships, naval auxiliaries, fish-catching or fish-processing ships, wooden ships of a primitive build, ships not propelled by mechanical means, or government ships used for non-commercial purposes. Even though these latter ships above 5 000 GT represent only approximately 55% of all ships calling at ports under the Regulation (EU) 2015/757 of the European Parliament and of the Council, they are responsible for a large majority of carbon dioxide (CO₂) emissions from the maritime sector. The Commission should regularly reassess the situation, with a view to eventually extending the scope to ships with a gross tonnage below 5000.
- (5a) Member States which have no maritime ports in their territory, no accredited verifier, no ships flying their flag that fall within the scope of this Regulation, and which are not an administering State within the meaning of this Regulation would not need to take any action concerning the requirements relating thereto in this Regulation as long as those conditions are fulfilled.
- (5b) Taking into account the special characteristics and constraints of the outermost regions of the Union, notably their remoteness and insularity, special consideration should be given to preserving their accessibility and efficient connectivity by maritime transport. Therefore, only half of the energy used on voyages departing from or arriving to a port of call located in an outermost region should be included in the scope of this Regulation. For the same reasons, temporary exemptions should be allowed for voyages between a port of call located in an outermost region and another port of call located in an outermost region, and to the energy used during their stay within the port of calls of the corresponding outermost regions.
- (5c) In order to take into account the specific situation of island regions, as underlined in Article 174 of the Treaty, and the need to preserve connectivity between islands and peripheral regions with central regions of the Union, temporary exemptions should be allowed for voyages performed by passenger ships other than cruise passenger ships between a port of call under the jurisdiction of a Member State and a port of call under the jurisdiction of the same Member State located in an island with less than 200.000 permanent residents.

- (5d) Public service obligations between Cyprus and other Member States should be temporarily exempted. Indeed the maritime connection between Cyprus and continental Europe has been absent for over two decades. Ongoing efforts to set up such a connection under public service obligations aim at effectively respond to the compelling need to provide a service of general interest and ensure connectivity as well as economic, social and territorial cohesion.
- (5e) With the increased costs of shipping for the vessels non compliant with the requirement of this Regulation, the risk of evasive behaviour and circumvention of the provisions of this Regulation, in particular on the segment of liner container trade, should be addressed. Port calls to ports in the Union's vicinity in order to limit costs of compliance with this Regulation would not only diminish the environmental benefits expected and significantly undermine the objectives pursued by this Regulation, but may lead to additional emissions due to the extra distance travelled to evade application of this Regulation. It is therefore appropriate to exclude from the concept of port of call certain stops at non-Union ports. That exclusion should be targeted to ports in the Union's vicinity where the risk of evasion is the greatest. A limit of 300 nautical miles constitutes a proportionate response to that risk, balancing the additional burden and the risk of evasion. Moreover, the exclusion from the concept of port of call should only target containerships and ports whose main activity is the transshipment of containers. For such shipments the risk of evasion also consist in a shift of port hub to ports outside the Union aggravating the effects of the evasion. For this reason, and in the absence of an IMO mandatory scheme on the use of renewable and low carbon fuels for international voyages at the global level with a similar level of ambition in comparison with the requirements set out in this Regulation, stops of containerships in a neighbouring container transshipment port should not be considered as stops in ports of calls in the sense of this Regulation. To ensure the proportionality and equal treatment of the measure, account should be taken to measures in third countries that have an effect equivalent to this Regulation.

- (5f) Sailing in ice conditions and the technical properties of ice-classed ships cause additional costs to the maritime transport, especially in the northern parts of the Baltic Sea, which could be further increased by this Regulation. These additional costs of ice-classed ships due to sailing in ice conditions and due to their technical properties should thus be mitigated in order to establish a level playing field with other ships. To that purpose, companies should be temporarily allowed to apply an adjusted amount of energy used on-board for those ice-classed ships. The Commission should reassess the need and the methodology of such mechanism, notably in light of the robustness of the monitoring of the data necessary to report the distance and the additional energy of navigation in ice conditions, in the view of a possible prolongation of this measure.
- (5g) In order to create a clear and predictable legal framework and in doing so encourage the market development and deployment of the most sustainable and innovative fuel technologies with growth potential to meet future needs, a dedicated incentive for renewable fuels of non-biological origins is necessary in view of the significant decarbonisation potential of such fuels, and in view of their estimated production costs in the short and mid terms. When produced from renewable electricity and carbon captured directly from the air, synthetic fuels can achieve as high as 100% emissions savings compared to fossil fuels. They also have considerable advantages compared to other types of sustainable fuels with regards to resource efficiency (in particular for water needs) of the production process. However, their production costs are currently much higher than the market price of conventional fuel and are projected to continue to be so in the mid term. Therefore, this Regulation should introduce a dedicated and temporary multiplier supporting the uptake of this technology.
- (6) The entity responsible for ensuring the compliance with this Regulation should be the shipping company, defined as the shipowner or any other organisation or person, such as the manager or the bareboat charterer, that has assumed the responsibility for the operation of the ship from the shipowner and that, on assuming such responsibility, has agreed to take over all the duties and responsibilities imposed by the International Management Code for the Safe Operation of Ships and for Pollution Prevention as implemented within the Union by Regulation (EC) No 336/2006 of the European Parliament and of the Council⁹. That

⁹ OJ L 64, 4.3.2006, p. 1.

definition is based on the definition of ‘company’ in Article 3, point (d), of Regulation (EU) 2015/757 of the European Parliament and of the Council¹⁰, and is in line with the global data collection system established in 2016 by the International Maritime Organization (IMO).

- (6a) Whilst the company should remain responsible for fulfilling monitoring and reporting obligations under this Regulation, as well as for paying the remedial penalties, in accordance with the ‘polluter pays’ principle and to promote the uptake of cleaner fuels, the entity responsible for purchasing the fuel and/or taking operational decisions that affect the greenhouse gas intensity of the energy used by the ship could, through contractual agreements with the latter, in case of compliance deficit, reimburse or otherwise compensate the company with respect to the cost of the remedial penalties resulting from the operation of the ship. The company may, on contractual basis, request the verifier to calculate the amounts of the penalties corresponding to the operation of the ship by the other entity during the reporting period. For the purpose of this Regulation, operation of the ship means determining the cargo carried, the route and the speed of the ship.
- (7) The development and deployment of new fuels and energy solutions requires a coordinated approach to match supply, demand and the provision of appropriate distribution infrastructure. While the current European regulatory framework already partly addresses fuel production with Directive (EU) 2018/2001 of the European Parliament and of the Council¹¹ and fuel distribution with Directive 2014/94/EU of the European Parliament and of the Council¹², there is also a need for a tool that establishes increasing levels of demand for renewable and low-carbon maritime fuels.
- (8) While instruments such as carbon pricing or targets on the carbon intensity of activity promote improvements in energy efficiency, they are not suited to bring about a significant shift towards renewable and low-carbon fuels in the short and medium term. A specific regulatory approach dedicated to the deployment of renewable and low-carbon maritime fuels and substitute sources of energy, such as wind or electricity, is therefore necessary.

¹⁰ 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).

¹¹ 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 (OJ L 328, 21.12.2018, p. 82).

¹² 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).

- (9) Policy intervention to stimulate demand for renewable and low-carbon maritime fuels should be goal-based and respect the principle of technological neutrality. Accordingly, limits should be set on the GHG intensity of the energy used on-board by ships without prescribing the use of any particular fuel or technology.
- (10) Development and deployment of renewable and low-carbon fuels with a high potential for sustainability, commercial maturity and a high potential for innovation and growth to meet future needs should be promoted. This will support creating innovative and competitive fuels markets and ensure sufficient supply of sustainable maritime fuels in the short and long term to contribute to Union transport decarbonisation ambitions, while strengthening Union's efforts towards a high level of environmental protection. For this purpose, sustainable maritime fuels produced from feedstocks listed in Parts A and B of Annex IX to Directive (EU) 2018/2001, as well as synthetic maritime fuels should be eligible. In particular, sustainable maritime fuels produced from feedstocks listed in Part B of Annex IX to Directive (EU) 2018/2001 are essential, as the most commercially mature technology for the production of such maritime fuels with a view to decarbonising maritime transport will already be available in the short term.
- (11) Indirect land-use change occurs when the cultivation of crops for biofuels, bioliquids and biomass fuels displaces traditional production of crops for food and feed purposes. Such additional demand increases the pressure on land and can lead to the extension of agricultural land into areas with high-carbon stock, such as forests, wetlands and peatland, causing additional GHG emissions and loss of biodiversity. Research has shown that the scale of the effect depends on a variety of factors, including the type of feedstock used for fuel production, the level of additional demand for feedstock triggered by the use of biofuels, bioliquids and biomass fuels, and the extent to which land with high-carbon stock is protected worldwide. The level of GHG emissions caused by indirect land-use change cannot be unequivocally determined with the level of precision required for the establishment of emission factors required by the application of this Regulation. However, there is evidence that all fuels produced from feedstock cause indirect land-use change to various degrees. In addition to the GHG emissions linked to indirect land-use change – which is capable of negating some or all GHG emissions savings of individual biofuels, bioliquids or biomass fuels – indirect land-use change poses risks to biodiversity. That risk is particularly serious in connection with a potentially large expansion of production

determined by a significant increase in demand. Accordingly, the use of food and feed crop-based fuels should not be promoted under this Regulation. Directive (EU) 2018/2001 already limits and sets a cap on the contribution of such biofuels, bioliquids and biomass fuels to the GHG emissions savings targets in the road and rail transport sector considering their lower environmental benefits, lower performance in terms of greenhouse gas reduction potential and broader sustainability concerns.

- (12) The maritime sector has currently insignificant levels of demand for food and feed crop-based biofuels, bioliquids and biomass fuels, since over 99% of currently used maritime fuels are of fossil origin. Therefore, the non-eligibility of food and feed crop-based fuels under this Regulation also minimises any risk to slow down the decarbonisation of the transport sector, which could otherwise result from a shift of crop-based biofuels from the road to the maritime sector. It is essential to minimise such a shift, as road transport currently remains by far the most polluting transport sector and the maritime transport currently uses predominantly fuels of fossil origin. It is therefore appropriate to avoid the creation of a potentially large demand for food and feed crop-based biofuels, bioliquids and biomass fuels by promoting their use under this Regulation. Accordingly, the additional GHG emissions and loss of biodiversity caused by all types of food and feed crop-based fuels require that those fuels be considered to have the same emission factors as the least favourable pathway.
- (13) The long lead times associated to the development and deployment of new fuels and energy solutions for maritime transport require rapid action and the establishment of a clear and predictable long-term regulatory framework facilitating planning and investment from all the stakeholders concerned. Such regulatory framework will facilitate the development and deployment of new fuels and energy solutions for maritime transport, and encourage investment from stakeholders. Such regulatory framework should also define limits for the GHG intensity of the energy used on-board by ships until 2050. Those limits should become more ambitious over time to reflect the expected technology development and increased production of renewable and low-carbon maritime fuels.

- (14) This Regulation should establish the methodology and the formula that should apply to the calculation of the yearly average GHG intensity of the energy used on-board by a ship. That formula should be based on the fuel consumption reported by ships and consider the relevant emission factors of the consumed fuels. The use of substitute sources of energy, such as wind or electricity, should also be reflected in the methodology.
- (15) In order to provide a more complete picture of the environmental performance of the various energy sources, the GHG performance of fuels should be assessed on a well-to-wake basis, taking into account the impacts of energy production, transport, distribution and use on-board. This is to incentivise technologies and production pathways that provide a lower GHG footprint and real benefits compared to the existing conventional fuels.
- (16) The well-to-wake performance of renewable and low-carbon maritime fuels should be established using default or actual and certified emission factors covering the well-to-tank and tank-to-wake emissions. The well-to-tank emission factors and the tank-to-wake CO₂ emission factors of fossil fuels should however only be determined through the use of default emission factors as provided for by this Regulation.
- (17) A comprehensive approach on all the most relevant GHG emissions (CO₂, CH₄ and N₂O) is necessary to promote the use of energy sources providing a lower GHG footprint overall. In order to reflect the global warming potential of methane and nitrous oxides, the limit set by this Regulation should therefore be expressed in terms of ‘CO₂ equivalent’.

- (18) The use of renewable energy sources and alternative propulsion, such as wind and solar energy, greatly reduces the GHG intensity of the overall ship energy use. The difficulty to accurately measure and quantify those energy sources (intermittence of the energy use, direct transfer as propulsion, etc.) should not impede their recognition in the overall ship energy use through means of approximations of their contribution to the ship's energy balance.
- (19) Air pollution produced by ships (sulphur oxides, nitrogen oxides and particulate matter) in ports is a significant concern for coastal areas and port cities. Therefore, specific and stringent obligations should be imposed to reduce emissions from ships moored at the quayside which draw power from their engines.
- (20) The use of on-shore power supply (OPS) abates air pollution produced by ships as well as reduces the amount of GHG emissions generated by maritime transport. OPS represents an increasingly clean power supply available to ships, in view of the growing renewables share in the EU electricity mix. While only the provision on OPS connection points is covered by Directive 2014/94/EU, the demand for and, as a result, the deployment of this technology have remained limited. Therefore, specific rules should be established to mandate the use of OPS by container ships and passenger ships, being the ship categories which are producing the highest amount of emissions per ship while moored at the quayside, according to the data collected within the framework of Regulation (EU) 2015/757 in 2018.
- (21) In addition to OPS, other technologies might be capable of offering equivalent environmental benefits in ports. When the use of an alternative technology is demonstrated to be equivalent to the use of OPS, a ship should be exempted from the obligation to use OPS.

- (22) Different OPS projects and solutions have been tested for ships at anchorage, but there is currently no mature and scalable technical solution available. For this reason, the obligation to use OPS should be limited to ships moored at the quayside in the first place. Nevertheless, the Commission should regularly reassess the situation, with a view to extending this obligation to ships at anchorage, when the due technologies are mature enough. In the meantime, Member States should be allowed to impose such obligation to ships at anchorage, for example in ports that are already equipped with such technology or are located in areas where any pollution should be avoided.
- (23) Exceptions from the obligation to use OPS should also be provided for a number of objective reasons, subject to verification by the competent authority of the Member State of the port of call or any entity duly authorised, after consultation of the managing body of the port where appropriate, and limited to unscheduled and not systematic port calls for reasons of safety or saving life at sea, to short stays of ships moored at the quayside of less than two hours as this is the minimum time required for connection, to unavailability or incompatibility of OPS, to the use of on-board energy generation under emergency situations and to maintenance and functional tests.
- (24) Exceptions in case of unavailability or incompatibility of OPS should be limited, in order to provide the necessary incentives for those investments and avoid unfair competition. Therefore, while some exceptions should be possible for example for occasional last-minute changes in port call schedules and calls in ports with incompatible equipment, those exceptions should be limited in ports which are covered by the obligation to offer OPS connections in application of AFIR¹³. Ship operators should thus plan carefully their port calls to make sure that they can carry out their activities without emitting air pollutants and GHG while ships are moored at the quayside and compromising the environment in coastal areas and port cities.

¹³ Exact title to be added later.

- (24b) Considering the positive effects of the use of OPS on local air pollution and the need to incentivise the ramp up of this technology in the short term, the carbon intensity of the production of the electricity supplied at berth should be counted at zero. The Commission should envisage the possibility to take into account the GHG emissions associated to the electricity delivered via OPS at a later stage.
- (25) A robust monitoring, reporting and verification system should be put in place by this Regulation in order to trace compliance with its provisions. Such system should apply in a non-discriminatory way to all ships and require third party verification in order to ensure the accuracy of the data submitted within that system. In order to facilitate achieving the objective of this Regulation, any data already reported for the purposes of Regulation (EU) 2015/757 should be used, when necessary, for verifying compliance with this Regulation in order to limit administrative burden imposed on companies, verifiers and competent authorities.
- (26) Companies should be responsible for monitoring and reporting the amount and type of energy used on-board by ships in navigation and at berth, as well as other relevant information, such as information on the type of engine on board or presence of wind assisting technologies, with a view to showing compliance with the limit on the GHG intensity of the energy used on-board by a ship set out by this Regulation. To facilitate the fulfilment of those monitoring and reporting obligations and the verification process by the verifiers, similarly to Regulation (EU) 2015/757, companies should document the envisaged monitoring method and provide further details on the application of the rules of this Regulation in a monitoring plan. The monitoring plan, as well as its subsequent modifications, if applicable, should be submitted to and assessed by the verifier.

- (26b) In order to limit the administrative burden, a unique monitoring, reporting and verification system for shipping companies should, to the extent possible, be achieved for the implementation of European regulations on reduction of GHG emissions from shipping. To that purpose, shortly after the publication of this Regulation, the Commission shall examine the consistency and possible duplication between this Regulation and Regulation (EU) 2015/757 and, where appropriate, prepare a legislative proposal to amend this Regulation or Regulation (EU) 2015/757.
- (27) Certification of fuels is essential to achieve the objectives of this Regulation and guarantee the environmental integrity of the renewable and low-carbon fuels that are expected to be deployed in the maritime sector. Such certification should be undertaken by means of a transparent and non-discriminatory procedure. With a view to facilitating certification and limiting the administrative burden, biofuels, biogas, renewable fuels of non-biological origin and recycled carbon fuels defined in accordance with Directive (EU) 2018/2001 should rely on the rules established by said directive for certification. That approach to certification should also apply to fuels bunkered outside the Union, which should be considered as imported fuels, in a similar way as in Directive (EU) 2018/2001. Where companies intend to depart from the default values provided for by that Directive or by this new framework, that should only be done when values can be certified by one of the voluntary schemes recognised under Directive (EU) 2018/2001 (for well-to-tank values) or by means of laboratory testing or direct emissions measurements (tank-to-wake).
- (28) Verification activities are carried out by verifiers. In order to ensure impartiality, verifiers should be independent and competent legal entities and should be accredited by national accreditation bodies established pursuant to Regulation (EC) No 765/2008 of the European Parliament and of the Council¹⁴. Verifiers should be equipped with means and staff commensurate with the size of the fleet for which they perform verification activities under this Regulation. Verification should ensure the accuracy and completeness of the monitoring and reporting by companies and the compliance with this Regulation.

¹⁴ Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products and repealing Regulation (EEC) No 339/93 (OJ L 218, 13.8.2008, p. 30).

- (29) Based on the data and information monitored and reported by companies, the verifiers should calculate and establish the yearly average GHG intensity of energy used on-board by a ship and the ship's balance with respect to the limit, including any compliance surplus or deficit, as well as the respect of the obligation to use OPS. The verifier should notify that information to the company concerned. Where the verifier is the same entity as the verifier for the purposes of Regulation (EU) 2015/757, such notification could be done together with the verification report under that Regulation.
- (30) The Commission should establish and ensure the functioning of an electronic FuelEU database that registers the performance of each ship and ensures its compliance with this Regulation. This database should be used for all most important actions necessary to fulfill the obligations set out in this Regulation. In order to facilitate reporting and limit administrative burden to companies, verifiers and other users, that electronic database should build upon the existing THETIS-MRV module or, to the extent possible, should be developed as an upgraded version of it. That electronic database should also enable the possibility to reuse information and data collected for the purposes of Regulation (EU) 2015/757.
- (31) Compliance with this Regulation would depend on elements that could be beyond control of the company, such as issues related to fuel availability or fuel quality. Therefore, companies should be allowed the flexibility of rolling-over a compliance surplus from one year to another or borrowing an advance compliance surplus, within certain limits, from the following year. The use of OPS at berth, being of high importance for local air quality in port cities and coastal areas should not be eligible for similar flexibility provisions.
- (32) In order to avoid technology lock-in and continue supporting the deployment of most performant solutions, companies should be allowed to pool the performances of different ships. To this purpose, the possible over-performance of one ship could be used to compensate the under-performance of other ships, provided that the total pooled compliance is positive. This creates a possibility to reward overcompliance and incentivates investment in more advanced technologies. The possibility to opt for pooled compliance should remain voluntary and should be subject to agreement of the companies concerned.

- (33) A document of compliance ('FuelEU document of compliance') issued by a verifier or, where applicable, the competent authority of the administering State, following the procedures established by this Regulation, should be held by ships as evidence of compliance with the limits on the GHG intensity of the energy used on-board by a ship and with the obligations on the use of OPS. Verifiers or, where applicable, the competent authority of the administering State should record in the FuelEU database the issuance of the FuelEU document of compliance.
- (34) The number of non-compliant port calls should be determined by verifiers in accordance with a set of clear and objective criteria taking into account all relevant information, including time of stay, the amount of each type and energy consumed, and the application of any excluding conditions, for each port call in the Union. That information should be made available by the companies to the verifiers for the purpose of determining compliance.
- (35) Without prejudice to the possibility of complying through the flexibility and pooling provisions, the ships that do not meet the limits on the yearly average GHG intensity of the energy used on-board should be subject to a remedial penalty that has dissuasive effect, is proportionate to the extent of the non-compliance and removes any economic advantage of non-compliance, thus preserving a level playing field in the sector. The remedial penalty should be based on the amount and cost of renewable and low-carbon fuels that the ships should have used to meet the requirements of this Regulation.
- (36) A remedial penalty should be imposed also for each non-compliant port call. That remedial penalty should be proportionate to the cost of using the electricity at sufficient level, should have a dissuasive effect from the use of more polluting energy sources and should be equal to a fixed amount in EUR multiplied by the established total electrical power demand of the ship at berth and by the total number of rounded-up hours spent at berth in non-compliance with OPS requirements. Due to lack of accurate figures on the cost of providing OPS in the Union, this rate should be based on the EU average electricity price for non-household consumers multiplied by a factor of two to account for other charges related to the provision of the service, including among others connection costs and investment recovery elements.

- (37) The revenues generated and collected by the administering States from the payment of remedial penalties should be used to promote the distribution and use of renewable and low-carbon fuels in the maritime sector and help maritime operators to meet their climate and environmental goals.
- (38) Enforcement of the obligations relating to this Regulation should be based on existing instruments, including those established under Directives 2009/16/EC¹⁵ and 2009/21/EC of the European Parliament and of the Council¹⁶. Additionally, Member States should lay down the rules on effective, proportionate and dissuasive sanctions applicable to infringements of this Regulation. To avoid undue or double punishment for the same infringements, such sanctions should not duplicate the remedial penalties applied in case a ship has a compliance deficit or made non-compliant port calls. The document confirming compliance of the ship with the requirements of this Regulation should be added to the list of certificates and documents referred to in Annex IV to Directive 2009/16/EC.^(38b) In order to reduce the administrative burden on shipping companies, one Member State for each shipping company should be responsible for supervising the enforcement of this Regulation. The provisions laid down in the ETS Directive¹⁷ should be used to determine the administering State in respect of each shipping company. The administering State should be allowed to conduct additional checks on the compliance of a specific ship with this Regulation, for the two previous reporting periods and should also ensure that the remedial penalties are paid in due time.

¹⁵ Directive 2009/16/EC of the European Parliament and of the Council of 23 April 2009 on port State control (OJ L 131, 28.5.2009, p. 57).

¹⁶ Directive 2009/21/EC of the European Parliament and of the Council of 23 April 2009 on compliance with flag State requirements (OJ L 131, 28.5.2009, p. 132).

¹⁷ Exact title to be added later.

- (39) Given the importance of consequences that the measures taken by the verifiers under this Regulation may have for the companies concerned, in particular regarding the determination of non-compliant port calls, calculation of the amounts of remedial penalties and refusal to issue a FuelEU document of compliance, those companies should be entitled to apply for a review of such measures to the competent authority of the Member State where the verifier was accredited. In the light of the right to an effective remedy, enshrined in Article 47 of the Charter of Fundamental Rights of the European Union, decisions taken by the competent authorities under this Regulation should be subject to review by a court of the Member State of that competent authority, carried out in accordance with its national law.
- (40) In order to maintain a level playing field through the efficient functioning of this Regulation, the power to adopt acts in accordance with Article 290 of the Treaty on the Functioning of the European Union should be delegated to the Commission in respect of amendment of the list of well-to-wake emission factors, establishment of the rules on conducting the laboratory testing and direct emissions measurements or by referring to ISO appropriate test standards in case such standards have been developed, adaptation of a remedial penalty factor based on the developments in the cost of energy and amendment of the numerical factor amount of the remedial penalty, based on the indexation of the average cost of electricity in the Union, . It is of particular importance that the Commission carry out appropriate consultations during its preparatory work, including at expert level, and that those consultations be conducted in accordance with the principles laid down in the Interinstitutional Agreement of 13 April 2016 on Better Law-Making¹⁸. In particular, to ensure equal participation in the preparation of delegated acts, the European Parliament and the Council receive all documents at the same time as Member States' experts, and their experts systematically have access to meetings of Commission expert groups dealing with the preparation of delegated acts.

¹⁸ OJ L 123, 12.5.2016, p. 1.

- (41) In order to ensure uniform conditions for the implementation of this Regulation, implementing powers should be conferred on the Commission. Those powers should be exercised in accordance with Regulation (EU) No 182/2011 of the European Parliament and of the Council¹⁹. When establishing, by means of implementing acts, the list and acceptance criteria of the technologies and the way they are operated to be considered as zero-emission technologies, the templates for standardised monitoring plans, including the technical rules for their uniform application, further specifications of the rules for verification activities, further methods and criteria for the accreditation of verifiers, rules for access rights to and the functional and technical specifications of the FuelEU database and the modalities for the payment of the remedial penalties, the Commission should take into account the possibility of reusing information and data collected for the purposes of Regulation (EU) 2015/757.
- (42) Given the international dimension of the maritime sector, a global approach to limiting the GHG intensity of the energy used by ships is preferable as it could be regarded as more effective due to its broader scope. In this context, and with a view to facilitating the development of international rules within the IMO, the Commission should share relevant information on the implementation of this Regulation with the IMO and other relevant international bodies, and relevant submissions should be made to the IMO. Where an agreement on a global approach is reached on matters of relevance to this Regulation, the Commission should review this Regulation with a view to aligning it, where appropriate, with the international rules.

¹⁹ Regulation (EU) No 182/2011 of the European Parliament and of the Council of 16 February 2011 laying down the rules and general principles concerning mechanisms for control by Member States of the Commission's exercise of implementing powers (OJ L 55, 28.2.2011, p. 13).

(43) Since the objective of this Regulation, namely the uptake of renewable and low-carbon fuels and substitute sources of energy by ships arriving at, within or departing from ports under the jurisdiction of a Member State across the Union, cannot be sufficiently achieved by the Member States without risking to introduce barriers to the internal market and distortions of competition between ports and between maritime operators, but can rather be better achieved by introducing uniform rules at Union level that create economic incentives for maritime operators to continue operating unimpededly while meeting obligations on the use of renewable and low-carbon fuels, the Union may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty on European Union. In accordance with the principle of proportionality as set out in that Article, this Regulation does not go beyond what is necessary in order to achieve that objective.

CHAPTER I

GENERAL PROVISIONS

Article 1

Objective and purpose

This Regulation lays down uniform rules imposing:

- (a) the limit on the greenhouse gas ('GHG') intensity of energy used on-board by a ship arriving at, staying within or departing from ports under the jurisdiction of a Member State and
- (b) the obligation to use on-shore power supply or zero-emission technology in ports under the jurisdiction of a Member State,

in order to increase consistent use of renewable and low-carbon fuels and substitute sources of energy in maritime transport across the Union, while ensuring its smooth operation and avoiding distortions in the internal market.

Article 2

Scope

1. This Regulation applies to all ships above a gross tonnage of 5000 that serve the purpose of transporting passengers or cargo for commercial purposes, regardless of their flag, in respect to:
 - (a) the energy used during their stay within a port of call under the jurisdiction of a Member State,
 - (b) the entirety of the energy used on voyages from a port of call under the jurisdiction of a Member State to a port of call under the jurisdiction of a Member State, without prejudice to paragraph 1(bbis),
 - (bbis) a half of the energy used on voyages departing from or arriving to a port of call located in an outermost region under the jurisdiction of a Member State,

- (c) a half of the energy used on voyages departing from or arriving to a port of call under the jurisdiction of a Member State, where the last or the next port of call is under the jurisdiction of a third country.

The neighbouring container transshipment ports excluded from the definition of ports of call for containerships, as specified in Article 3(i), are defined in accordance with this paragraph. The Commission is empowered to adopt implementing acts in accordance with Article 27(3) in order to establish the list of the neighbouring container transshipment ports. The first list shall be established before 31 December 2025 and it shall be updated before 31 December every [two] year[s] thereafter. Those implementing acts shall list neighbouring container transshipment ports located outside the Union but less than 300 nautical miles of the Union territory, where the share of transshipment of containers, measured in twenty-foot equivalent unit, exceeds 65% of the total container traffic of that port during the most recent twelve-month period for which relevant data are available. For the purpose of this paragraph containers shall be considered as transhipped when they are unloaded from a ship to the port for the sole purpose of loading them on another ship. The list shall not include ports located in a third country that effectively applies measures with an equivalent level of ambition in comparison with the requirements set out in this Regulation.

1bis. Member States may exempt, at the latest until 31 December 2029, specific routes and ports from the application of paragraphs 1(a) and 1(b) concerning the energy used on voyages performed by passenger ships other than cruise passenger ships between a port of call under the jurisdiction of a Member State and a port of call under the jurisdiction of the same Member State located in an island with less than 200.000 permanent residents, and concerning the energy used during their stay within a port call of the corresponding island. Member States shall notify those exemptions prior to their entry into force to the Commission, which shall publish them in the Official Journal of the European Union.

1ter. Member States may exempt, at the latest until 31 December 2029, specific routes and ports from the application of paragraphs 1(a) and 1(bbis) concerning the energy used on voyages between a port of call located in an outermost region and another port of call located in an outermost region, and concerning the energy used during their stay within the ports of call of the corresponding outermost regions. Member States shall notify those exemptions prior to their entry into force to the Commission, which shall publish them in the Official Journal of the European Union.

1 quarter. By way of derogation, this Regulation shall not apply to passenger ships performing voyages under the scope of a public service obligation between Cyprus and other Member States until 31 December 2029.

2. This Regulation does not apply to warships, naval auxiliaries, fish-catching or fish-processing ships, wooden ships of a primitive build, ships not propelled by mechanical means, or government ships used for non-commercial purposes.

Article 3

Definitions

For the purposes of this Regulation, the following definitions apply:

- (a) ‘greenhouse gas emissions’ means the release of carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) into the atmosphere;
- (b) ‘biofuels’ means biofuels as defined in Article 2, point (33), of Directive (EU) 2018/2001;
- (c) ‘biogas’ means biogas as defined in Article 2, point (28), of Directive (EU) 2018/2001;
- (d) ‘recycled carbon fuels’ means recycled carbon fuels as defined in Article 2, point (35), of Directive (EU) 2018/2001;
- (dd) ‘sailing in ice conditions’ means sailing of an ice-classed ship in a sea area within the ice edge;
- (e) ‘renewable fuels of non-biological origin’ means renewable fuels of non-biological origin as defined in Article 2, point (36), of Directive (EU) 2018/2001;
- (ee) ‘ice edge’ is defined by paragraph 4.4. of the WMO Sea-Ice Nomenclature, March 2014 as the demarcation at any given time between the open sea and sea ice of any kind, whether fast or drifting;
- (f) ‘food and feed crops’ means food and feed crops as defined in Article 2, point (40), of Directive (EU) 2018/2001;
- (g) ‘zero-emission technology’ means a technology that does not imply, when used to provide energy, the release of the following greenhouse gases and air pollutants into the

atmosphere by ships: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulphur oxide (SO_x), nitrogen oxide (NO_x) and particulate matter (PM);

- (h) ‘substitute sources of energy’ means renewable wind or solar energy generated on-board or electricity supplied from on-shore power supply;
- (i) ‘port of call’ means a port where ships stop to load or unload cargo or to embark or disembark passengers, considering that stops for the sole purposes of refueling, obtaining supplies, relieving the crew, going into dry-dock or making repairs to the ship and/or its equipment, stops in port because the ship is in need of assistance or in distress, ship-to-ship transfers carried out outside ports, stops for the sole purpose of taking shelter from adverse weather or rendered necessary by search and rescue activities, and stops of containerships in a neighbouring container transshipment port are excluded;
- (j) ‘voyage’ means voyage as defined in Article 3, point (c) of Regulation (EU) 2015/757;
- (j2) ‘outermost region’ means an overseas territory listed in Article 349 TFEU;
- (k) ‘company’ means company as defined in Article 3, point (d) of Regulation (EU) 2015/757;
- (l) ‘gross tonnage’ (GT) means GT as defined in Article 3, point (e) of Regulation (EU) 2015/757;
- (m) ‘ship at berth’ means ship at berth as defined in Article 3, point (n) of Regulation (EU) 2015/757;
- (m2) ‘ship at anchorage’ means a ship at berth which is not moored at the quayside;
- (n) ‘energy use on-board’ means the amount of energy, expressed in mega joules (MJ), used by a ship for propulsion and for the operation of any on-board equipment, at sea or at berth;
- (o) ‘greenhouse gas intensity of the energy used on-board’ means the amount of greenhouse gas emissions, expressed in grams of CO₂ equivalent established on a well-to-wake basis, per MJ of energy used on-board;

- (p) ‘well-to-wake’ means a method for calculating emissions that takes into account the greenhouse gas impact of energy production, transport, distribution and use on-board, including during combustion;
- (q) ‘emission factor’ means the average emission rate of a greenhouse gas relative to the activity data of a source stream, assuming complete oxidation for combustion and complete conversion for all other chemical reactions;
- (r) ‘on-shore power supply’ means the system to supply electricity to ships at berth, at low or high voltage, alternate or direct current, including ship side and shore side installations, when feeding directly the ship main distribution switchboard for powering hotel, service workloads or charging secondary batteries;
- (r2) ‘electrical power demand at berth’ means the demand in electricity from a ship at berth for powering all energy needs based on electricity on board;
- (r3) ‘established total electrical power demand of the ship at berth’ means the highest value, expressed in kilowatts, of the total demand in electricity of the ship at berth, including hotel and cargo handling workloads;
- (s) ‘verifier’ means a legal entity carrying out verification activities, which is accredited by a national accreditation body pursuant to Regulation (EC) No 765/2008 and this Regulation;
- (u) ‘FuelEU document of compliance’ means a document specific to a ship, issued to a company by a verifier, which confirms that that ship has complied with this Regulation for a specific reporting period;

- (v) ‘passenger ship’ means a ship as defined in Article 2, point (i) of Directive (EU) 2016/802;
- (v2) ‘cruise passenger ship’ means a passenger ship not having a cargo deck, designed exclusively for commercial transportation of passengers in overnight accommodation on a sea voyage;
- (w) ‘containership’ means a ship designed exclusively for the carriage of containers in holds and on deck;
- (x) ‘non-compliant port call’ means a port call during which the ship does not comply with the requirement of Article 5(1), and none of the exceptions provided for in Article 5(3) apply;
- (y) ‘least favourable pathway’ means the most carbon-intensive production pathway used for any given fuel;
- (z) ‘CO₂ equivalent’ means the metric measure used to compute the emissions from CO₂, CH₄ and N₂O on the basis of their global-warming potential, by converting amounts of CH₄ and N₂O to the equivalent amount of carbon dioxide with the same global warming potential;
- (aa) ‘compliance balance’ means the measure of a ship’s over- or under-compliance with regards to the limits to the yearly average greenhouse gas intensity of the energy used on-board by a ship, which is calculated in accordance with Annex V Part A;
- (bb) ‘compliance surplus’ means a compliance balance with a positive value;
- (cc) ‘compliance deficit’ means a compliance balance with a negative value;
- (dd) ‘total pool compliance balance’ means the sum of the compliance balances of all ships included in the pool;
- (ee) ‘managing body of the port’ means any public or private body as defined in Article 2(5) of Regulation (EU) 2017/352 of the European Parliament and of the Council²⁰;

²⁰ Regulation (EU) 2017/352 of the European Parliament and of the Council of 15 February 2017 establishing a framework for the provision of port services and common rules on the financial transparency of ports (OJ L 57, 3.3.2017, p. 1).

(ff) ‘administering State’ means the administering Member State in respect of a shipping company as defined and determined respectively in Articles 3(w) and 3gd of Directive 2003/87/EC of the European Parliament and of the Council, without prejudice to the choice of the competent authorities in charge within the relevant Member State²¹;

(gg) ‘reporting year’ means a period of one year, starting 1 January and ending 31 December, in which the report referred to in Article 14 is to be submitted;

(hh) ‘reporting period’ means a period from 1 January until 31 December of the year preceding the reporting year.

²¹ This provision might be further aligned, pending the outcome of the negotiations on the revision of Directive 2003/87/EC.

CHAPTER II

REQUIREMENTS ON ENERGY USED ON-BOARD BY SHIPS

Article 4

Greenhouse gas intensity limit of energy used on-board by a ship

1. The yearly average greenhouse gas intensity of the energy used on-board by a ship during a reporting period shall not exceed the limit set out in paragraph 2.
2. The limit referred to in paragraph 1 shall be calculated by reducing the reference value of [X grams of CO₂ equivalent per MJ]* by the following percentage:

²²2% from 1 January 2025;

6% from 1 January 2030;

13% from 1 January 2035;

26% from 1 January 2040;

59% from 1 January 2045;

75% from 1 January 2050.

[Asterix: The reference value, which calculation will be carried out at a later stage of the legislative procedure, corresponds to the fleet average greenhouse gas intensity of the energy used on-board by ships in 2020 determined on the basis data monitored and reported in the framework of Regulation (EU) 2015/757 and using the methodology and default values laid down in Annexes I and II to this Regulation.]

²² Please note that all symbols "minus" have been deleted.

3. The greenhouse gas intensity of the energy used on-board by a ship shall be calculated as the amount of greenhouse gas emissions per unit of energy according to the methodology specified in Annex I.
4. The Commission is empowered to adopt delegated acts in accordance with Article 26 to amend Annex II in order to include the well-to-wake emission factors related to any new sources of energy or to adapt the existing emission factors to ensure consistency with future international standards or the legislation of the Union in the field of energy.

Article 5

Additional zero-emission requirements of energy used at berth

1. From 1 January 2030, a ship moored at the quayside in a port of call under the jurisdiction of a Member State shall connect to on-shore power supply and use it for its electrical power demand at berth.
2. Paragraph 1 shall apply to:
 - (a) containerships;
 - (b) passenger ships.

3. Paragraph 1 shall not apply to ships:

- (a) that are moored at the quayside for less than two hours, calculated on the basis of hour of departure and arrival monitored and recorded in accordance with Article 14;
- (b) that use zero-emission technologies for their electrical power demand at berth, while moored at the quayside;
- (c) that have to make an unscheduled and not systematic port call for reasons of safety or saving life at sea, due to unforeseen circumstances beyond the control of the ship;
- (d) that are unable to connect to on-shore power supply due to unavailable connection points in a port;
- (da) that are unable to connect to on-shore power supply because exceptionally the electrical grid stability is at risk, due to insufficient available shore-power to satisfy the ship's required electrical power demand at berth;
- (e) that are unable to connect to on-shore power supply because the shore installation at the port is not compatible with the on-board on-shore power equipment, provided that the installation for shore-connection on-board the ship is certified in accordance with the standards specified in Annex II of AFIR²³ for seagoing ships shore connection systems;
- (f) which, for a limited period of time, require the use of on-board energy generation, under emergency situations representing immediate risk to life, the ship, the environment or for other reasons of force majeure;
- (g) which, while remaining connected, for a period of time limited to the strict necessary, require the use of on-board energy generation for maintenance tests, or for functional tests carried out upon request of an officer from a competent authority or the representative of a recognised organization undertaking a survey or inspection.

²³ Correct title to be added later.

4. The Commission is empowered to adopt implementing acts in accordance with Article 27(3) in order to establish the list and acceptance criteria of the technologies and the way they are operated to be considered as zero-emission technologies within the meaning of Article 3(g), for the uniform implementation of this Regulation. The Commission shall regularly update the list and acceptance criteria in the light of the scientific and technical progress to assess if new technologies can be considered as zero-emission technologies within the meaning of this Regulation.

5. A ship that intends to use zero-emission technologies as a substitute to on-shore power supply, in application of paragraph 3(b), shall inform the competent authority of the Member State of the port of call or any entity duly authorized prior to entry into ports.

The Commission shall, by means of implementing acts, lay down the details and timing of the information to be provided. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 27(3).

5bis The competent authority of the Member State of the port of call or any entity duly authorized, after consultation of the managing body of the port where appropriate, shall record in the FuelEU database, without delay, the following information:

- (a) the application of any exception set in paragraph 3 points (a), (b), (c), (d), or (e);
- (b) the non application by a ship of the requirement of paragraph 1 without being eligible to any exception set in paragraph 3.

6. From 1 January 2030, in ports mentioned in Article 9 of AFIR²⁴ equipped to provide the required shore-side electricity to supply a given ship type, the exceptions provided for in paragraph 3, points (d) and (e), shall not be applied to a ship of that given type, in total, more than five times, during one reporting period. A port call shall not be counted for the purpose of compliance with this provision where the company demonstrates that it could not have reasonably known that the ship will be unable to connect for the reason referred to in paragraph 3, points (d) and (e).

²⁴ Correct title to be added later.

7. A Member State may decide that, in a port or some parts of a port located in its jurisdiction, containerships or passenger ships at anchorage are covered by the same obligations made to ships moored at the quayside in this Regulation. The Member State shall notify its decision to the Commission a year prior to its application, which must start at the beginning of a reporting period. The Commission shall publish the information in the *Official Journal of the European Union* and provide an updated list of the concerned ports which shall be easily accessible.

CHAPTER III

COMMON PRINCIPLES AND CERTIFICATION

Article 6

Common principles for monitoring and reporting

1. In accordance with Articles 7 to 9, companies shall, for each of their ships, monitor and report on the relevant data during a reporting period. They shall carry out that monitoring and reporting within all ports under the jurisdiction of a Member State and for any voyages mentioned in Article 2(1).
2. Monitoring and reporting shall be complete and cover the energy used on-board by ships at any time, while the ships are at sea as well as at berth. Companies shall apply appropriate measures to prevent any data gaps within the reporting period.
3. Monitoring and reporting shall be consistent and comparable over time. To that end, companies shall use the same monitoring methodologies and data sets subject to modifications assessed by the verifier. Companies shall enable reasonable assurance of the integrity of the data to be monitored and reported.
4. Companies shall obtain, analyse and store for at least five years all monitoring data and documentation, including assumptions, references, emission factors, Bunker Delivery Notes as complemented pursuant to Annex I and activity data, in a transparent and accurate manner, in paper or electronic form, so that the verifier can determine the greenhouse gas intensity of the energy used on-board by ships.
5. In undertaking the monitoring and reporting activities set out in Articles 7 to 9 and 14 of this Regulation, information and data collected for the purpose of Regulation (EU) 2015/757 shall be used where appropriate.

Article 7

Monitoring plan

1. By 31 August 2024, companies shall submit to the verifiers a monitoring plan for each of their ships indicating the method chosen from among those set out in Annex I to monitor and report the amount, type and emission factor of energy used on-board by ships and other relevant information.
2. For ships falling under the scope of this Regulation for the first time after 31 August 2024, companies shall submit a monitoring plan to the verifier without undue delay and no later than two months after each ship's first call in a port under the jurisdiction of a Member State.
3. The monitoring plan shall consist of a complete and transparent documentation and shall contain at least the following elements:
 - (a) the identification and type of the ship, including its name, its IMO identification number, its port of registry or home port, and the name of the ship-owner;
 - (b) the name of the company and the address, telephone and e-mail details of a contact person;
 - (c) a description of the energy conversion systems installed on-board, and the related power capacity expressed in megawatt (MW);

- (d) a description, for ships within the scope of Article 5, of the standards and characteristics of the equipment to allow connection to on-shore power supply, or a zero-emission technology ;
- (d2) the value of the established total electrical power demand of the ship at berth, as provided in its Electrical load balance or Electrical load study used to demonstrate compliance with Regulations 40 and 41 of Chapter II-1 of the SOLAS Convention, as approved by its flag Administration or a recognised organisation as defined in the IMO Code for Recognized Organizations adopted by Resolution MEPC237(65). In case the ship is not able to provide this reference, the value considered is 25% of the total of the maximum continuous ratings of the main engines of the ship as specified in their EIAPP certificate delivered in application of the MARPOL Convention or, if the engines are not required to have an EIAPP certificate, on the nameplate of the engines;
- (e) a description of the intended source(s) of energy to be used on-board while in navigation and at berth to comply with the requirements set out in Articles 4 and 5;
- (f) a description of the procedures for monitoring the fuel consumption of the ship as well as the energy provided by substitute sources of energy or a zero-emission technology ;
- (g) a description of the procedures for monitoring and reporting the well-to-tank and tank-to-wake emission factors of energy to be used on-board, in accordance with the methods specified in Article 9 and Annexes I and II;
- (h) a description of the procedures used to monitor the completeness of the list of voyages;
- (i) a description of the procedures used for determining activity data per voyage, including the procedures, responsibilities, formulae and data sources for determining and recording the time spent at sea between the port of departure and the port of arrival and the time spent at berth;

- (j) a description of the procedures, systems and responsibilities used to update any of the data contained in the monitoring plan over the reporting period;
 - (k) a description of the method to be used to determine surrogate data for closing data gaps;
 - (l) a revision record sheet to record all the details of the revision history;
 - (m) information on the ice class of the ship, if the company requests to exclude the additional energy due to the ship's ice class from the scope of the energy used on-board;
 - (n) a description of a verifiable procedure for monitoring the distance travelled for the whole voyage and when sailing in ice conditions, the date and time when sailing in ice conditions, the fuel consumption, if the company requests to exclude the additional energy due to sailing in ice conditions from the scope of the energy used on-board.
4. Companies shall use standardised monitoring plans based on templates. The Commission shall, by means of implementing acts, determine those templates, including the technical rules for their uniform application. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 27(3).

Article 8

Modifications to the monitoring plan

1. Companies shall check regularly, and at least annually, whether a ship's monitoring plan reflects the nature and functioning of the ship and whether any of the data it contains can be improved.
2. Companies shall modify the monitoring plan in any of the following situations:
 - (a) where a change of company occurs;

- (b) where new energy conversion systems, new types of energy, new systems for connection to on-shore power supply, or new substitute sources of energy or a zero-emission technology are in use;
 - (c) where a change in availability of data, due to the use of new types of measuring equipment, new sampling methods or analysis methods, or for other reasons, may affect the accuracy of the data collected;
 - (d) where data resulting from the monitoring method applied has been found to be incorrect;
 - (e) where any part of the monitoring plan is identified as not being in conformity with the requirements of this Regulation and the company is required by the verifier to revise it.
3. Companies shall notify to the verifiers without undue delay any proposals for modification of the monitoring plan.

Article 9

Certification of fuels and emission factors

1. Where biofuels, biogas, renewable fuels of non-biological origin and recycled carbon fuels, as defined in Directive (EU) 2018/2001, are to be taken into account for the purposes referred to in Articles 4(1) of this Regulation, the following rules apply:
- (a) biofuels and biogas that do not comply with the sustainability and greenhouse gas saving criteria set out in Article 29 of Directive (EU) 2018/2001 or that are produced from food and feed crops shall be considered to have the same emission factors as the least favourable fossil fuel pathway for this type of fuel;
 - (b) renewable fuels of non-biological origin and recycled carbon fuels that do not comply with the greenhouse gas emission savings thresholds set out in Article 25(2) of Directive (EU) 2018/2001 shall be considered to have the same emission factors as the least favourable fossil fuel pathway for this type of fuels.

2. On the basis of the Bunker Delivery Notes as complemented pursuant to Annex I, companies shall provide accurate and reliable data on the GHG emission intensity and the sustainability characteristics of biofuels, biogas, renewable fuels of non-biological origin and recycled carbon fuel, as certified under a scheme that is recognised by the Commission in accordance with Article 30(5) and (6) of the Directive (EU) 2018/2001.
3. Companies shall not divert from the default values for the well-to-tank emission factors reported in Annex II for fossil fuels. Companies shall be entitled to divert from the default values for the well-to-tank emission factors reported in Annex II provided that actual values are certified, under a scheme that is recognised by the Commission in accordance with Article 30(5) and (6) of the Directive (EU) 2018/2001 for biofuels, biogas, renewable fuels of non-biological origin and recycled carbon fuels.
4. Companies shall be entitled to divert from the default values for the tank-to-wake emission factors defined in Annex II, with the exception of tank-to-wake CO₂ emission factors for fossil fuels, provided that actual values are certified by means of laboratory testing or direct emissions measurements.

CHAPTER IV

VERIFICATION AND ACCREDITATION

Article 10

Assessment of the monitoring plan

1. For each ship and in the case of change of verifier, the verifier shall assess the conformity of the monitoring plan with the requirements laid down in Articles 6 to 8. Where the verifier's assessment identifies non-conformities with those requirements, the company concerned shall revise its monitoring plan accordingly and submit the revised plan for a final assessment by the verifier before the reporting period starts. The company concerned shall agree with the verifier on the timeframe necessary to introduce those revisions. That timeframe shall in any event not extend beyond the beginning of the reporting period.
- 1bis. Modifications of the monitoring plan under points (b), (c) and (d) of Article 8(2) shall be subject to an assessment by the verifier. Following the assessment, the verifier shall notify the company concerned whether those modifications are in conformity with the requirements laid down in Articles 6 to 8.
- 1ter. The verifier shall record the monitoring plan and the modified monitoring plan, once satisfactorily assessed, in the FuelEU database. The monitoring plan and the modified monitoring plan shall be accessible to the administering State.

Article 11

General obligations and principles for the verifiers

1. The verifier shall be independent from the company or from the operator of a ship and shall carry out the activities required under this Regulation in the public interest. For that purpose, neither the verifier nor any part of the same legal entity shall be a company or ship operator, the owner of a company, or be owned by them, nor shall the verifier have relations with the company that could affect its independence and impartiality.

2. The verifier shall assess the reliability, credibility, accuracy and completeness of the data and information relating to the amount, type and emission factor of the energy used on-board by ships, in particular:
- (a) the attribution of fuel consumption and the use of substitute sources of energy to voyages and at berth;
 - (b) the reported fuel consumption data and related measurements and calculations;
 - (c) the choice and the employment of emission factors;
 - (d) the use of on-shore power supply or the presence of exceptions certified in accordance with Article 5(5);
 - (e) the information required under Article 9(2).
3. The assessment referred to in paragraph 2 shall be based on the following considerations:
- (a) the reported data are coherent in relation to estimated data that are based on ship tracking data and characteristics such as the installed engine power;
 - (b) the reported data are free of inconsistencies, in particular when comparing the total volume of fuel purchased annually by each ship and the aggregate fuel consumption during voyages;
 - (c) the collection of the data has been carried out in accordance with the applicable rules; and
 - (d) the relevant records of the ship are complete and consistent.

Article 12

Verification procedures

1. The verifier shall identify potential risks related to the monitoring and reporting process by comparing reported amount, type and emission factor of the energy used on-board by ships with estimated data based on ship tracking data and characteristics such as the installed engine power. Where significant deviations are found, the verifier shall carry out further analyses.
2. The verifier shall identify potential risks related to the different calculation steps by reviewing all data sources and methodologies used by the company.
3. The verifier shall take into consideration any effective risk control methods applied by the company concerned to reduce levels of uncertainty associated with the accuracy specific to the monitoring methods used.
4. On the request of the verifier, the company concerned shall provide any additional information that enables the verifier to carry out its verification activities. Where necessary to determine the reliability, credibility, accuracy and completeness of reported data and information, the verifier shall conduct checks during the verification process. In case of doubts, the verifier may conduct site visits at the premises of the company or on-board the ship. The company shall allow the verifier to access the premises of the company or the ship, in order to facilitate its verification activities.
5. The Commission shall adopt implementing acts in order to further specify the rules for the verification activities referred to in this Regulation, at least on the following elements²⁵: competencies of verifiers, documents to be provided by companies to verifiers, risk assessment – including checks – to be carried out by verifiers, assessment of the conformity of the monitoring plan, verification of the FuelEU report, materiality level, reasonable assurance of verifiers, misstatements and non-conformities, content of the verification report, recommendations for improvements, site visits and communication between companies, verifiers, competent authorities and the Commission. The rules

²⁵ These elements are similar to those set out in Part A of Annex III of MRV Regulation, this paragraph being the equivalent of Article 15(5) of MRV Regulation.

specified in those implementing acts shall be based on the principles for verification provided for in Articles 10 to 12 and on relevant internationally accepted standards. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 27(3).

Article 13

Accreditation of verifiers

1. Verifiers shall be accredited for activities under the scope of this Regulation by a national accreditation body pursuant to Regulation (EC) No 765/2008.
2. Where no specific provisions concerning the accreditation of verifiers are laid down in this Regulation, the relevant provisions of Regulation (EC) No 765/2008 shall apply.
- 2bis. Verifiers shall be equipped at all times with means and staff commensurate with the size of the fleet for which they perform verification activities under this Regulation and with sufficient expertise to carry out the tasks required by this Regulation. They shall be capable of assigning their means and staff to every place of work, when and as needed for the tasks to be carried out in application of this Regulation.
- 2ter. Any competent authority identifying non-conformities of a verifier's activities within the scope of this Regulation shall inform the competent authority of the Member State of the national accreditation body having accredited the verifier. The competent authority of the Member State of the national accreditation body shall request its national accreditation body to take into account this information as part of its surveillance activities.

3. The Commission is empowered to adopt implementing acts, in order to establish further methods and criteria of accreditation of verifiers, at least on the following elements²⁶: request for accreditation for activities under the scope of this Regulation, assessment of verifiers by the national accreditation bodies, surveillance activities performed by the national accreditation bodies to confirm the continuation of the accreditation, administrative measures to be adopted in case the verifier does not satisfy the requirements of this Regulation, and requirements for national accreditation bodies in order to be competent to provide accreditation to verifiers for activities under the scope of this Regulation, including reference to harmonised standards. The methods and criteria specified in those implementing acts shall be based on the principles for verification provided for in Articles 10 to 12 and on relevant internationally accepted standards. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 27(3).

²⁶ These elements are similar to those set out in Part B of Annex III of MRV Regulation, this paragraph being the equivalent of Article 16(3) of MRV Regulation.

CHAPTER V

RECORDING, VERIFICATION, REPORTING AND ASSESSMENT OF COMPLIANCE

Article 14

Monitoring and recording

1. As of 1 January 2025, based on the monitoring plan referred to in Article 7, and following the assessment of that plan by the verifier, companies shall monitor and record, for each ship arriving in or departing from, and for each voyage to or from a port of call under the jurisdiction of a Member State, the following information:
 - (a) port of departure and port of arrival including the date and hour of departure and arrival and time spent at berth;
 - (b) for each ship to which Article 5(1) applies, the connection to and use of on-shore power or the application of any of the exceptions listed in Article 5(3) as confirmed pursuant to Article 5(5ter, point a), where applicable;
 - (c) the amount of each type of fuel consumed at berth and at sea;
 - (cbis) the amount of electricity delivered to the ship via on-shore power supply;
 - (d) for each type of fuel consumed at berth and at sea, the well-to-tank emission factor, the tank-to-wake emission factors of combusted fuel and the tank-to-wake emission factors of slipped fuel associated to the different fuel consumers onboard, covering all relevant greenhouse gases;
 - (e) the amount of each type of substitute source of energy consumed at berth and at sea;
 - (f) the ship's ice class, if the company requests to exclude the additional energy due to ship's ice class from the scope of the energy used on-board. To establish the correspondence between ice classes, HELCOM Recommendation 25/7 shall be used;

- (g) the date, time and position when entering and leaving the ice conditions, the amount of each type of fuel consumed when sailing in ice conditions, the distance travelled when sailing in ice conditions and the distance travelled during the voyage, if the company requests to exclude the additional energy due to sailing in ice conditions is to be left out from the scope of the energy used on-board.
2. Companies shall record the information listed in paragraph 1 on annual basis in a transparent manner, that enables the verification of compliance with this Regulation by the verifier.
3. By 31 January of the reporting year, companies shall provide to the verifier a ship-specific FuelEU report containing all the information referred to in paragraph 1 and the monitoring data and documentation referred to in Article 6(4) for the reporting period.
4. In the event of the transfer of a ship from one company to another:
- (a) the previous company shall notify to the verifier the information referred to in paragraph 1 for the time during which it has assumed the responsibility for the operation of the ship. As close as practical to the day of the completion of the transfer and no later than one month thereafter this information shall be verified and recorded in the FuelEU database in accordance with Article 15 by the verifier that performed verification activities for the ship under the previous company; and
- (b) without prejudice to sub-paragraph (a), the new company assuming the responsibility for the operation of the ship on 31 December of the reporting period shall be responsible for the compliance of the ship with the requirements of Articles 4 and 5 for the entire reporting period during which the transfer or multiple transfers took place.

Article 15

Verification and calculation

1. Following the verification as set out in Articles 10 to 12, the verifier shall assess the quality, completeness and accuracy of the FuelEU report. To this purpose, the verifier shall use any information contained in the FuelEU database, including information provided on port calls in accordance with Article 5.
- 1bis²⁷. Where the verification assessment concludes, with reasonable assurance from the verifier, that the FuelEU report is free from material misstatements, the verifier shall notify to the company a verification report stating that the FuelEU report complies with this Regulation. The verification report shall specify all issues relevant to the work carried out by the verifier.
- 1ter²⁸. Where the verification assessment identifies misstatements or non-conformities with this Regulation, the verifier shall inform the company thereof in a timely manner. The company shall then correct the misstatements or non-conformities so as to enable the verification process to be completed in time and shall submit to the verifier an amended FuelEU report and any other information that was necessary to correct the non-conformities identified. In its verification report, the verifier shall state whether the amended FuelEU report complies with this Regulation. Where the communicated misstatements or non-conformities have not been corrected and lead to material misstatements, the verifier shall notify to the company a verification report stating that the FuelEU report does not comply with this Regulation.
2. On the basis of the compliant FuelEU report, the verifier shall:
 - (a) calculate, using the method specified in Annex I, the yearly average greenhouse gas intensity of the energy used on-board by the ship concerned;

²⁷ This paragraph is inspired from Article 13(3) of MRV Regulation, for better consistency and robustness of the verification process.

²⁸ This paragraph corresponds to the initial Article 10(3), with additional elements from Article 13(4) of MRV Regulation, for better consistency and robustness of the verification process.

- (b) calculate, using the formula specified in Annex V Part A, the ship's compliance balance;
 - (c) calculate the number of non-compliant port calls in the previous reporting period including the time spent moored at the quayside and, where applicable in accordance with Article 5(7), at anchorage, for each port call non compliant with the requirements set in Article 5.
3. By 31 March of the reporting year, the verifier shall notify to the company the information referred to in paragraph 2 and record in the FuelEU database the compliant FuelEU report, the verification report and the information referred to in paragraph 2.

Article 15bis

Additional checks by a competent authority

1. At any time and for the two previous reporting periods, the competent authority of the administering State in respect of a shipping company may, for any of its ships, conduct additional checks of any of the following:
 - (a) the compliant FuelEU report established in application of Articles 14 and 15;
 - (b) the verification report established in application of Article 15;
 - (c) the calculations made by the verifier in application of Article 15(2).
2. On the request of the competent authority, the company shall provide any necessary information or document and shall allow the access to the premises of the company or the ship to facilitate the checks.
3. The competent authority shall issue an additional checks report including, where applicable, the updated calculations made in application of Article 15bis(1)(c), the updated amount of the compliance surplus or of the advance compliance surplus and the updated amount of the remedial penalty.

4. Where the report referred to in paragraph 3 finds misstatements, non-conformities or miscalculations resulting in a non-conformity to the requirements set out in Articles 4 or 5 of this Regulation and, consequently, in a remedial penalty or a modification of the amount of a remedial penalty already paid, the competent authority shall notify to the company the corresponding amount of the remedial penalty or of the modified remedial penalty. Member States shall ensure that the company responsible for the ship during the period subject to the additional checks shall pay an amount equal to the remedial penalty or that modified remedial penalty within one month after its notification, in accordance with the modalities referred to in Article 21.
5. The competent authority shall withdraw without delay in the FuelEU database the FuelEU document of compliance of the ship whose company has not paid in due time the penalties referred to in paragraph 4 and shall notify this withdrawal to the company in a timely manner. It shall issue the document of compliance again when an amount equal to the remedial penalty has been paid, provided that the other conditions set out in this Regulation for holding this document are fulfilled by the company.
6. Paragraph 5 shall not apply to a ship which has been transferred to a company other than the one that assumed the responsibility for its operation during the period subject to the additional checks.
7. The actions referred to in this Article as well as the proof of the financial payments in accordance with Article 21 shall be recorded without delay in the FuelEU database by the entities performing these actions.

Article 15ter

Supporting tools and guidance

The Commission shall develop appropriate monitoring tools, as well as guidance and risk-based targeting tools, to facilitate and coordinate verification and enforcement activities related to this Regulation. As far as practicable, such guidance and tools shall be made available to the Member States, the verifiers and the national accreditation bodies for information sharing purpose and in order to better ensure robust enforcement of this Regulation.

Article 16

FueIEU database and reporting

1. The Commission shall develop, ensure functioning and update an electronic FueIEU database for the monitoring of compliance with this Regulation. The FueIEU database shall be used to keep a record of the actions related to verification activities, of the compliance balance of the ships, including the use of the flexibility mechanisms set out in Articles 17 and 18, and of the actions related to the payment of the penalties referred to in Article 20 and the issuance of the FueIEU document of compliance. It shall be accessible to the companies, the verifiers, the competent authorities and any duly authorized entity, the national accreditation bodies, the European Maritime Safety Agency and the Commission, with appropriate access rights and functionalities corresponding to their respective responsibilities in the implementation of this Regulation.
- 1bis. Any elements recorded or modified in the FueIEU database shall be notified to the entities to which they are accessible.
2. The Commission shall, by means of implementing acts, lay down the rules for access rights and the functional and technical specifications, including notification rules and filtering, of the FueIEU database. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 27(3).

Article 17

Banking and borrowing of compliance surplus between reporting periods

1. On the basis of the information referred to in Article 15(2), where the ship has a compliance surplus for the reporting period, the company may bank it to the same ship's compliance balance for the following reporting period. The company shall record the banking of the compliance surplus to the following reporting period in the FuelEU database subject to approval by its verifier. The company may no longer bank the compliance surplus once the FuelEU document of compliance has been issued.
2. On the basis of the information referred to in Article 15(2), where the ship has a compliance deficit for the reporting period, the company may borrow an advance compliance surplus of the corresponding amount from the following reporting period. The advance compliance surplus shall be added to the ship's balance in the reporting period and the advance compliance surplus multiplied by 1.1 shall be subtracted from the same ship's balance in the following reporting period. The advance compliance surplus may not be borrowed:
 - (a) for the amount exceeding by more than 2% the limit set out in Article 4(2), multiplied by the energy consumption of the ship calculated in accordance with Annex I;
 - (b) for two consecutive reporting periods.
3. By 30 April of the reporting year, the company shall record the advance compliance surplus, following approval by its verifier, in the FuelEU database.
4. When a ship does not have any port call in the Union during the reporting period and has borrowed an advance compliance surplus in the previous reporting period, the competent authority of the administering State shall notify by 1 June of the reporting year to the company the amount of the remedial penalty mentioned in Article 20(1bis) initially avoided by means of borrowing this advance compliance surplus, multiplied by 1.1.

Article 18

Pooling of compliance

1. The compliance balances of two or more ships, as calculated in application of Article 15(2), may be pooled for the purposes of fulfilling the requirements of Article 4. A ship's compliance balance may not be included in more than one pool in the same reporting period.
2. To that end, the company shall notify in the FuelEU database the intention of including the ship's compliance balance in a pool, the allocation of the total compliance balance of the pool to each individual ship, and the choice of the verifier selected for verifying this allocation.
- 2bis. In the case where the ships participating in the pool are controlled by two or more companies, the notification, including the allocation of the total compliance balance of the pool to its ships and the choice of the verifier selected for verifying the allocation of the total compliance balance of the pool to each individual ship, shall be accepted by all the companies concerned.
3. A pool is valid only if the total pooled compliance is positive, if ships which had a compliance deficit as calculated in application of Article 15(2) do not have a higher compliance deficit after the allocation of the pooled compliance and if ships which had a compliance surplus as calculated in application of Article 15(2) do not have a compliance deficit after the allocation of the pooled compliance.
4. A ship shall not be included in a pool if it does not comply with the obligation set out in Article 22.
5. If the total pooled compliance balance results in a compliance surplus for an individual ship, Article 17(1) applies.
6. Article 17(2) does not apply to a ship participating in the pool.

8. By 30 April of the reporting year, the selected verifier shall record in the FuelEU database the definitive composition of the pool and allocation of the total pooled compliance balance to each individual ship.

Article 19

FuelEU document of compliance

1. By 30 June of the reporting year, the verifier shall issue a FuelEU document of compliance for the ship concerned, provided that the ship does not have a compliance deficit, after possible application of Articles 17 and 18, does not have non-compliant port calls and complies with the obligation set out in Article 22.
- 1bis. Where remedial penalties pursuant to Article 20(1bis) or Article 20(2bis) are due, the competent authority of the administering State shall, by 30 June of the reporting year, issue a FuelEU document of compliance for the ship concerned, provided that an amount equal to the remedial penalties has been paid.
2. The FuelEU document of compliance shall include the following information:
- (a) identity of the ship (name, IMO identification number and port of registry or home port);
 - (b) name, address and principal place of business of the ship-owner;
 - (c) identity of the verifier;
 - (d) date of issue of this document, its period of validity and the reporting period it refers to.
3. The FuelEU document of compliance shall be valid for a period of 18 months after the end of the reporting period, or expire if a new document is issued in the meantime.

4. The verifier or where applicable the competent authority of the administering State shall record in the FuelEU database without delay, the issuance of any FuelEU document of compliance.
5. The Commission shall adopt implementing acts establishing models for the FuelEU document of compliance, including electronic templates . Those implementing acts shall be adopted in accordance with the advisory procedure referred to in Article 27(2).

Article 20

Remedial penalties

1. Before 1 May of the reporting year on the basis of the calculation undertaken pursuant to Article 15(2) and after application of Articles 17 and 18, where applicable, the verifier shall record in the FuelEU database the verified compliance balance of the ship.
- 1bis. The administering State in respect of a company shall ensure that, for any of its ships having a compliance deficit on 1 June of the reporting year, after a possible validation by their competent authority, the company shall pay by 30 June of the reporting year an amount equal to the remedial penalty resulting from the application of the formula specified in Annex V Part B. When a ship has a compliance deficit for two consecutive reporting periods or more, that amount shall be multiplied by $1 + (n - 1)/10$, where n is the number of consecutive reporting periods for which the company is subject to a remedial penalty for this ship.
- 1ter. The administering State in respect of a company shall ensure that, for any of its ships which is in the situation referred to in Article 17(4), the company shall pay by 30 June of the reporting year an amount equal to the remedial penalty notified pursuant to that Article.
2. Before 1 May of the reporting year, where applicable on the basis of the calculation undertaken pursuant to Article 15(2), the verifier shall record in the FuelEU database the total number of hours spent moored at the quayside by the ship in non-compliance with the requirements set in Article 5.

- 2bis. The administering State in respect of a company shall ensure that for any of its ships which made at least one non-compliant port call, after a possible validation by their competent authority, the company shall pay by 30 June of the reporting year an amount equal to the remedial penalty resulting from the multiplication of EUR 1.5 by the established total electrical power demand of the ship at berth and by the total number of rounded-up hours spent at berth in non-compliance with the requirements set in Article 5.
- 2ter. Member States shall have the necessary legal and administrative framework in place at national level to ensure the fulfilment of the obligations concerning the imposition, payment and collection of the remedial penalties provided for in this Regulation.
3. The actions referred to in this Article as well as the proof of the financial payments in accordance with Article 21 shall be recorded without delay in the FuelEU database by the entities who had performed those actions.
- 3bis. The company shall remain responsible for the payment of the remedial penalties, without prejudice to the possibility to conclude contractual agreements with the commercial operators of the ship that foresee the liability of the latter to reimburse the company for the payment of the remedial penalties referred to in this Article, when the responsibility for the purchase of the fuel or the operation of the ship is assumed by the commercial operator. For the purposes of this paragraph, operation of the ship shall mean determining the cargo carried, the route and the speed of the ship.
4. The Commission is empowered to adopt delegated acts in accordance with Article 26 to amend Annex V in order to adapt the factor defined in cells 7 of the table in Part B of that Annex and used in the formula referred to in paragraph 1 of this Article, based on the developments in the cost of energy, and to amend the numerical factor laid down in paragraph 2bis of this Article, based on the indexation of the average cost of electricity in the Union.

5. Member States should ensure that the revenues generated from remedial penalties, or the equivalent in financial value of those revenues, are used to support the rapid deployment and use of renewable and low carbon fuels in the maritime sector, by stimulating the production of greater quantities of renewable and low carbon fuels for the maritime sector, facilitating the construction of appropriate bunkering facilities or electric connection ports in ports, and supporting the development, testing and deployment of the most innovative technologies in the fleet to achieve significant emission reductions.

Article 22

Obligation to hold a valid FuelEU document of compliance

1. By 30 June of the reporting year, the ships calling at a port under the jurisdiction of a Member State, arriving at, within or departing from a port under the jurisdiction of a Member State, and which have carried out voyages during that reporting period, shall hold a valid FuelEU document of compliance.
2. The Fuel EU document of compliance issued for the ship concerned in accordance with Article 19 shall constitute evidence of compliance with this Regulation.

Article 23

Enforcement

1. Member States shall lay down the rules on sanctions applicable to infringements of this Regulation and shall take all measures necessary to ensure that they are implemented. The sanctions provided for must be effective, proportionate and dissuasive. Member States shall notify those provisions to the Commission by [dd/mm/20xx], and shall notify to the Commission without delay any subsequent amendments.
2. Each Member State shall ensure that any inspection of a ship in a port under its jurisdiction carried out in accordance with Directive 2009/16/EC includes checking that a valid FuelEU document of compliance is carried on board.

3. Where a ship has failed to present a valid FuelEU document of compliance for two or more consecutive reporting periods and where other enforcement measures have failed to ensure compliance, the competent authority of the Member State of the port of call may, in respect of a ship not flying the flag of that Member State and after giving the opportunity to the company concerned to submit its observations, issue an expulsion order. In case the competent authority of the Member State of the port of call decides to issue an expulsion order, it shall notify it to the Commission, the other Member States and the flag State concerned through the FuelEU database. Every Member State, with the exception of any Member State whose flag the ship is flying, shall refuse entry of the ship which is subject to the expulsion order into any of its ports until the company fulfils its obligations. Where the ship flies the flag of a Member State and enters one of its ports or is found with such failure while in one of its ports, the Member State concerned shall, after giving the opportunity to the company concerned to submit its observations, order a flag detention until the company fulfils its obligations.
4. The fulfilment of those obligations shall be confirmed by the notification of a valid FuelEU document of compliance to the competent national authority which issued the expulsion order. This paragraph shall be without prejudice to the provisions of international law applicable in the case of ships in distress.
5. Sanctions against a specified ship by any Member State shall be notified to the Commission, to the other Member States and to the flag State concerned through the FuelEU database.

Article 24
Right to review

1. The companies shall be entitled to apply for a review of the calculations and measures addressed to them by the verifier under this Regulation, including the refusal to issue a FuelEU document of compliance pursuant to Article 19(1). The application for review shall be lodged, within one month of the notification of the result of calculation or of the measure by the verifier, with the competent authority of the Member State in which the verifier has been accredited.

3. The decisions taken under this Regulation by the competent authority of a Member State shall be subject to review by a court of the Member State of that competent authority.

Article 25

Competent authorities

Member States shall designate one or more competent authorities as responsible for the application and enforcement of this Regulation ('competent authorities'). They shall communicate their names and contact information to the Commission. The Commission shall publish on its website the list of competent authorities.

CHAPTER VI

DELEGATED AND IMPLEMENTING POWERS AND FINAL PROVISIONS

Article 26

Exercise of delegation

1. The power to adopt delegated acts is conferred on the Commission subject to the conditions laid down in this Article.
2. The power to adopt delegated acts referred to in Articles 4(4), 9(4), and 20(4) shall be conferred on the Commission for an indeterminate period of time from [date of entry into force of this Regulation].
3. The delegation of power referred to in Articles 4(4), 9(4), and 20(4) may be revoked at any time by the European Parliament or by the Council. A decision to revoke shall put an end to the delegation of the power specified in that decision. It shall take effect the day following the publication of the decision in the *Official Journal of the European Union* or at a later date specified therein. It shall not affect the validity of any delegated acts already in force.
4. Before adopting a delegated act, the Commission shall consult experts designated by each Member State in accordance with the principles laid down in the Interinstitutional Agreement on Better Law-Making of 13 April 2016.
5. As soon as it adopts a delegated act, the Commission shall notify it simultaneously to the European Parliament and to the Council.

6. A delegated act adopted pursuant to Articles 4(4), 9(4), and 20(4) shall enter into force only if no objection has been expressed either by the European Parliament or by the Council within a period of two months of notification of that act to the European Parliament and the Council or if, before the expiry of that period, the European Parliament and the Council have both informed the Commission that they will not object. That period shall be extended by two months at the initiative of the European Parliament or of the Council.

Article 27

Committee procedure

1. The Commission shall be assisted by the Committee on Safe Seas and the Prevention of Pollution from ships (COSS) established by Regulation (EC) 2099/2002 of the European Parliament and of the Council²⁹. That committee shall be a committee within the meaning of Regulation (EU) No 182/2011.
2. Where reference is made to this paragraph, Article 4 of Regulation (EU) No 182/2011 shall apply.
3. Where reference is made to this paragraph, Article 5 of Regulation (EU) No 182/2011 shall apply. Where the committee delivers no opinion, the Commission shall not adopt the draft implementing act and the third subparagraph of Article 5(4) of Regulation (EU) No 182/2011 shall apply.

²⁹ Regulation (EC) No 2099/2002 of the European Parliament and of the Council of 5 November 2002 establishing a Committee on Safe Seas and the Prevention of Pollution from Ships (COSS) and amending the Regulations on maritime safety and the prevention of pollution from ships (OJ L 324, 29.11.2002, p. 1).

Article 28

Report and review

0. Within one year after the publication of this Regulation, the Commission shall present a report to the European Parliament and to the Council examining the consistency and possible duplication between this Regulation and Regulation (EU) 2015/757. Where appropriate, the report shall be accompanied by a legislative proposal to amend this Regulation or Regulation (EU) 2015/757, with the view to ensure a unique monitoring, reporting and verification system for companies.
1. The Commission shall report to the European Parliament and the Council, by 31 December 2027, and every five years thereafter, the results of an evaluation on the functioning of this Regulation, on the evolution of the technologies and market for renewable and low-carbon fuels, zero-emission technologies in maritime transport and on-shore power supply including at anchorage, and of its impact on the maritime sector in the Union. The Commission shall consider possible amendments including but not limited to:
- (0) the geographical and material scope of this Regulation referred to in Article 2;
 - (a) the limit referred to in Article 4(2), with the view to fulfilling the objectives set out in Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality;
 - (b) the ship types and size to which Article 5(1) applies and the extension of the obligations referred to in Article 5(1) to ships at anchorage;
 - (c) the exceptions listed in Article 5(3);
 - (d) the accountability of the electricity delivered via on-shore power supply and the well-to-tank emission factor associated to this electricity defined in Annex I;
 - (e) the possibility to include dedicated mechanisms for the most sustainable and innovative fuel technologies with a significant decarbonisation potential, in order to create a clear and predictable legal framework and encourage the market

development and deployment of such fuels, such as renewable fuels of non-biological origins;

- (f) the calculation of the compliance balance for ships requesting to exclude the additional energy due to sailing in ice conditions and/or due to their ice-class set out in Annex V and Annex VI, and the possible prolongation of these provisions after 31 December 2029.

2. In the event of the adoption by the International Maritime Organization of a global low-GHG fuel standard for maritime transport, the Commission shall, without delay and in any event no later than 30 September 2028, present a report to the European Parliament and to the Council. The Commission shall in that report examine that global measure as regards its ambition in light of the objectives of the Paris Agreement and its overall environmental integrity. It shall also examine any issue related to the possible articulation or alignment of this Regulation with that measure, including the need to avoid double coverage of greenhouse gas emissions from maritime transport. Where appropriate, the report shall be accompanied by a legislative proposal to amend this Regulation, consistent with the Union economy-wide greenhouse gas emission commitments, and with the aim of preserving the environmental integrity and effectiveness of the Union climate action.

Article 29

Amendments to Directive 2009/16/EC

The following point shall be added to the list set out in Annex IV to Directive 2009/16/EC: ‘51. The FuelEU document of compliance issued under Regulation (EU) xxxx on the use of renewable and low-carbon fuels in maritime transport’.

Article 30

Entry into force

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*. It shall apply from 1 January 2025, with the exception of Articles 7 and 8 that shall apply from 31 August 2024.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels,

For the European Parliament

The President

For the Council

The President

METHODOLOGY FOR ESTABLISHING THE GREENHOUSE GAS INTENSITY OF THE ENERGY USED ON-BOARD BY A SHIP

For the purpose of calculating the greenhouse gas intensity of the energy used on-board by a ship, the following formula, referred to as Equation (1) shall apply:

GHG intensity index	WtT	TtW
$GHG\ intensity\ index\ \left[\frac{gCO_{2eq}}{MJ}\right] =$	$\frac{\sum_i^n fuel\ M_i \times CO_{2eq\ WtT,i} \times LCV_i + \sum_k^c E_k \times CO_{2eq\ electricity,k}}{\sum_i^n fuel\ M_i \times LCV_i \times RWD_i + \sum_k^c E_k}$	$\frac{\sum_i^n fuel\ \sum_j^m engine\ M_{i,j} \times \left[\left(1 - \frac{1}{100} C_{slip,j}\right) \times (CO_{2eq,TtW,j}) + \left(\frac{1}{100} C_{slip,j} \times CO_{2eq,TtW,slip,j}\right) \right]}{\sum_i^n fuel\ M_i \times LCV_i \times RWD_i + \sum_k^c E_k}$

Equation (1)

where the following formula is referred to as Equation (2):

$$CO_{2eq,TtW,j} = \left(C_{fCO_2,j} \times GWP_{CO_2} + C_{fCH_4,j} \times GWP_{CH_4} + C_{fN_2O,j} \times GWP_{N_2O} \right)_i \text{ Equation (2)}$$

Term	Explanation
<i>i</i>	Index corresponding to the fuels delivered to the ship in the reporting period
<i>j</i>	Index corresponding to the fuel consumer units on board the ship. For the purpose of this Regulation the fuel consumer units considered are the main engine(s), auxiliary engine(s), boilers, fuel cells and waste incinerators
<i>k</i>	Index corresponding to the on-shore power supply connection points.
<i>n</i>	Total number of fuels delivered to the ship in the reporting period
<i>c</i>	Total number of on-shore power supply connection points
<i>m</i>	Total number of fuel consumer units
$M_{i,j}$	Mass of fuel <i>i</i> consumed by fuel consumer unit <i>j</i> [gFuel]
E_k	Electricity delivered to the ship <i>per</i> on-shore power supply connection point <i>k</i> [MJ]
$CO_{2eqWtT,i}$	WtT GHG emission factor of fuel <i>i</i> [gCO _{2eq} /MJ]
$CO_{2eq\ electricity,k}$	WtT GHG emission factor associated to the electricity delivered to the ship at berth <i>per</i> on-shore power supply connection point <i>k</i> [gCO _{2eq} /MJ]
LCV_i	Lower Calorific Value of fuel <i>i</i> [MJ/gFuel]
RWD_i	In case the fuel <i>i</i> is a renewable fuel of non-biological origin, a reward factor of 2 for the period until 1 January 2030, and 1.5 for the period from 1 January 2030 until 1 January 2035 can be applied. Otherwise, $RWD_i = 1$.

$C_{engineslipj}$	Non-combusted fuel[...] coefficient as a percentage of the mass of the fuel i consumed by fuel consumer unit j [%]. C_{slip} includes fugitive and slipped emissions[...]
$C_{fCO_2,j}, C_{fCH_4,j}, C_{fN_2}$	TtW GHG emission factors by combusted fuel in fuel consumer unit j [gGHG/gFuel]
$CO_{2eq,TtW,j}$	TtW CO ₂ equivalent emissions of combusted fuel i in fuel consumer unit j [gCO ₂ eq/gFuel] $CO_{2eq,TtW,j} = \left(C_{cfCO_2j} \times GWP_{CO_2} + C_{cfCH_4j} \times GWP_{CH_4} + C_{cfN_2O_j} \times GWP_{N_2O} \right)_i$
$C_{sfCO_2,j}, C_{sfCH_4,j}, C_s$	TtW GHG emission factors by slipped fuel towards [...] fuel consumer unit j [gGHG/gFuel]
$CO_{2eq,TtWslippage,j}$	TtW CO ₂ equivalent emissions of slipped fuel i towards fuel consumer unit j [gCO ₂ eq/gFuel] $CO_{2eq,TtWslippage,j} = \left(C_{sfCO_2j} \times GWP_{CO_2} + C_{sfCH_4j} \times GWP_{CH_4} + C_{sfN_2O_j} \times GWP_{N_2O} \right)_i$ where: C_{sfCO_2} and C_{sfN_2O} are set to zero.
$GWP_{CO_2}, GWP_{CH_4},$	CO ₂ , CH ₄ , N ₂ O Global Warming Potential over 100 years, which are defined in Directive (EU) 2018/2001, Paragraph 4 of Part C of Annex V

For the purpose of this regulation the term $\sum_k^c E_k \times CO_{2eq\,electricity,k}$ in the numerator of Equation (1) shall be set to zero.

Method for determining [M_i]

The [M_i] mass of fuel shall be determined using the amount reported in accordance with the framework of the reporting under Regulation (EU) 2015/757 for voyages falling within the scope of this Regulation based on the chosen monitoring methodology by the company.

Method for determining WtT GHG emission factors

The WtT emissions are determined on the basis of the methodology contained in this Annex as provided in Equation (1).

The WtT GHG emission factors ($CO_{2eqWtT,i}$) default values are contained in Annex II.

In the case of fossil fuels, only the default values in Annex II shall be used.

Actual values may be used provided that they are certified, under a scheme that is recognised by the Commission in accordance with Article 30(5) and (6) of the Directive (EU) 2018/2001 for biofuels, biogas, renewable fuels of non-biological origin and recycled carbon fuels, in application of Article 9(3).

Fuel Bunker Delivery Note (BDN)

Under existing MARPOL Annex VI regulations, the BDN is mandatory and information to be included in the bunker delivery note is specified.

For the purposes of this regulation:

0) BDNs including fuels other than fossil fuels used on board shall be complemented with the following information regarding those fuels:

- Lower Calorific Value [MJ/g].
- For biofuels, *E* values as established in accordance with the methodologies laid down in Directive (EU) 2018/2001, Part C of Annex V and Part B of Annex VI [gCO₂eq/MJ] and related evidence of compliance with the rules set out in that Directive for those fuels, identifying the fuel production pathway,
- For fuels other than fossil fuels and biofuels, WtT GHG emission factor CO₂eq [gCO₂eq/gFuelMJ] and related certificate identifying the fuel production pathway,

[In case of product blending, information required by this regulation shall be given for each product].

Electricity Delivery Note (EDN)

For the purposes of this regulation, relevant EDNs for electricity delivered to the ship shall contain at least the following information:

supplier: name, address, telephone, email, representative

receiving ship: IMO number (MMSI), ship name, ship type, flag, ship representative

port: name, location (LOCODE), terminal/ berth

on-shore power supply connection point: connection point details

on-shore power supply time: date/time of commencement/finalisation

energy supplied: power fraction allocated to supply point (if applicable) [kW], electricity consumption (kWh) for the billing period, peak power information (if available)

metering

Method for determining TtW GHG emission factors

The TtW emissions are determined on the basis of the methodology contained in this Annex as provided in Equation (1) and Equation (2)

The TtW GHG emission factors ($CO_{2eq,TtW,j}$) default values are contained in Annex II.

In accordance with its monitoring plan referred to in Article 7 and upon assessment by the verifier, other methods, such as direct CO_{2eq} measurement, laboratory testing, may be used if it enhances the overall accuracy of the calculation, in application of Article 9(4).

Method for determining TtW fugitive and slipped emissions

Fugitive and slipped emissions are emissions caused by the amount of fuel that does not reach the combustion chamber of the combustion unit or that is not consumed by the fuel consumer unit because they are uncombusted, vented, or leaked from the system. For the purpose of this Regulation, fugitive and slipped emissions are taken into account as a percentage of the mass of the fuel used by the fuel consumer unit. The default values are contained in Annex II.

Methods for determining the reward factors linked to substitute sources of energy

In case substitute sources of energy are installed on board, a reward factor for substitute sources of energy can be applied. In case of wind power such reward factor is determined as follow:

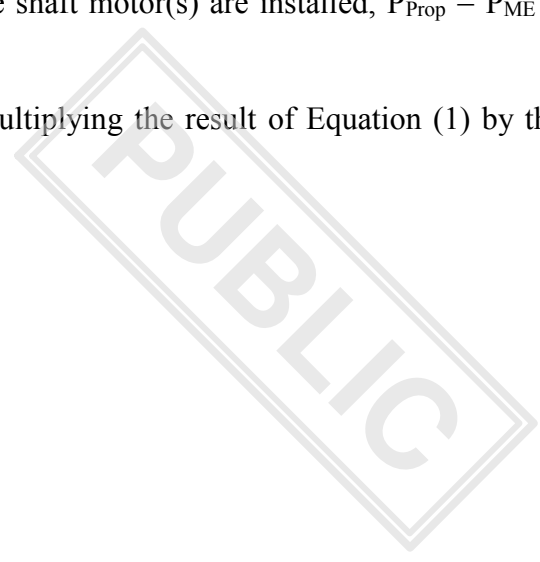
Reward factor for substitute sources of energy- WIND (f_{wind})	$\frac{P_{Wind}}{P_{Prop}}$
0.99	0.05
0.97	0.1
0.95	$\geq 0,15$

Where:

- P_{Wind} is the available effective power of the wind assisted propulsion systems and corresponds to $f_{eff} * P_{eff}$ as calculated in accordance with the *2021 guidelines on treatment of innovative energy efficiency technologies for calculation and verification of the attained EEDI and EEXI* (MEPC.1/Circ.896);
- P_{Prop} is the propulsion power of the ship and corresponds to P_{ME} as defined in the *2018 guidelines on the method of calculation of the attained energy efficiency design index (EEDI) for new ships* (IMO resolution MEPC.308(73), as amended) and the *2021 guidelines on the method of calculation of the attained energy efficiency existing ships index (EEXI)*

(IMO resolution MEPC.333(76)). In case where shaft motor(s) are installed, $P_{Prop} = P_{ME} + P_{PTI(i),shaft}$.

The ship GHG intensity index is then calculated by multiplying the result of Equation (1) by the reward factor.



DEFAULT EMISSION FACTORS

The default emissions factors contained in the table below shall be used for the determination of the greenhouse gas intensity index referred to in Annex I of this Regulation, except when companies divert from these default emissions factors in application of Article 9(3) and (4).

In the table:

TBM stands for To Be Measured

N/A stands for Not Available

The dash means not applicable

E is established in accordance with the methodologies laid down in Directive (EU) 2018/2001, Part C of Annex V and Part B of Annex VI

Where a cell indicates either TBM or N/A, the highest default value of the fuel class in the same column shall be used. Where, for a particular fuel class, all cells in the same column indicate either TBM or N/A, default value of the least favourable fossil fuel pathway shall be used.

1	2	3	4	5	6	7	8	9
			WtT	TtW				
Fuel Class	Pathway name	LCV [$\frac{MJ}{g}$]	CO _{2eq} WtT [$\frac{gCO_2eq}{MJ}$]	Fuel Consumer Unit Class	C _{fCO₂} [$\frac{gCO_2}{gFuel}$]	C _{fCH₄} [$\frac{gCH_4}{gFuel}$]	C _{fN₂O} [$\frac{gN_2O}{gFuel}$]	C _{stip} As % of the mass of the fuel used by the engine
Fossil	HFO ISO 8217 Grades RME to RMK	0.0405	13.5	ALL ICES	3.114	0.00005	0.00018	-
	LSFO	0.0405	13,2 crude	ALL ICES	3.151	0.00005	0.00018	-

1	2	3	4	5	6	7	8	9
			WtT	TtW				
			13,7 blend					
	ULSFO	0.0405	13.2	ALL ICES	3.114	0.00005	0.00018	-
	VLSFO	0.041	13.2	ALL ICES	3.206	0.00005	0.00018	-
	LFO ISO 8217 Grades RMA to RMD	0.041	13.2	ALL ICES	3.151	0.00005	0.00018	-
	MDO MGO ISO 8217 Grades DMX to DMB	0.0427	14.4	ALL ICES	3.206	0.00005	0.00018	-
	LNG	0.0491	18.5	LNG Otto (dual fuel medium speed)	2.750	0	0.00011	3.1
LNG Otto (dual fuel slow speed)				1.7				
LNG Diesel (dual fuel slow speed)				0.2				
LBSI				N/A				
	LPG	0.046	7.8	ALL ICES	3,030 Butane 3,000 Propane	TBM	TBM	N/A
	H2 (natural gas)	0.12	132	Fuel Cells	0	0	-	=
				ICE	0	0	TBM	

1	2	3	4	5	6	7	8	9
			WtT	TtW				
	NH3 (natural gas)	0.0186	121	No engine	0	0	TBM	-
	Methanol (natural gas)	0.0199	31.3	ALL ICES	1.375	TBM	TBM	-
Liquid biofuels	Ethanol Production Pathways of Directive (EU) 2018/2001	Value as set out in Annex III of Directive (EU) 2018/2001	$E - \frac{C_{fCO_2}}{LCV}$	ALL ICES	1.913	TBM	TBM	-
	Bio-diesel Production Pathways of Directive (EU) 2018/2001			ALL ICES	2.834	TBM	TBM	-
	Hydrotreated Vegetable Oil (HVO) Production Pathways of Directive (EU) 2018/2001			ALL ICES	3.115	0.00005	0.00018	-
	Liquefied Bio- methane as transport fuel (Bio-LNG) Production Pathways of Directive (EU) 2018/2001			LNG Otto (dual fuel medium speed)	2.750	0	0.00011	3.1
	LNG Otto (dual fuel slow speed)			1.7				
	LNG Diesel (dual fuels)			0.2				
	LBSI			N/A				

1	2	3	4	5	6	7	8	9	
			WtT	TtW					
	Bio-methanol Production Pathways of Directive (EU) 2018/2001			ALL ICEs	1.375	TBM	TBM	-	
	Other Production Pathways of Directive (EU) 2018/2001			ALL ICEs	3.115	0.00005	0.00018	-	
Gaseous biofuels	Bio-H2 Production Pathways of Directive (EU) 2018/2001	Value as set out in Annex III of Directive (EU) 2018/2001	N/A	Fuel Cells	0	0	0	-	
				ICE	0	0	TBM		
Renewable Fuels of non-Biological Origin (RFNBO) - e- fuels	e-diesel	0.0427	N/A	ALL ICEs	3.206	0.00005	0.00018	-	
	e-methanol	0.0199	N/A	All ICEs	1.375	0.00005	0.00018	-	
	e-LNG	0.0491	N/A	LNG Otto (dual fuel medium speed)	2.750	0	0.00011	3.1	
				LNG Otto (dual fuel slow speed)				1.7	
				LNG Diesel (dual fuels)				0.2	
				LBSI				N/A	
	e-H2	0.12	N/A	Fuel Cells	0	0	0	-	
ICE				0	0	TBM			

1	2	3	4	5	6	7	8	9	
			WtT	TtW					
	e-NH3	0.0186	N/A	Fuel Cells	0	N/A	TBM	N/A	
				ICE	0	N/A	TBM	N/A	
	e-LPG	N/A	N/A		N/A	N/A	N/A	N/A	
	E-DME	N/A	N/A		N/A	N/A	N/A	-	
Others	Electricity	-	EU ENERGY MIX	On-shore power supply (OPS)	-	-	-	-	

Column 1 identifies the class of the fuels namely Fossils, Liquid Biofuels, Gaseous Biofuels, e-Fuels.

Column 2 identifies the name or the pathways of the relevant fuels within the class.

Column 3 contains the Lower Calorific Value of the fuels expressed in [MJ/g]. For liquid biofuels, values of Energy content by weight (lower calorific value, MJ/kg) as set out in Annex III of Directive (EU) 2018/2001 shall be converted in MJ/g and used.

Column 4 contains the WtT GHG emission factors in [gCO_{2eq}/MJ]. For liquid biofuels, the default values shall be calculated by using the values of *E* established in accordance with the methodologies laid down in Directive (EU) 2018/2001, Part C of Annex V for all liquid biofuels except bio-LNG and Part B of Annex VI for bio-LNG, and on the basis of default values associated to the particular biofuel used as a transport fuel and its production pathway, laid down in that Directive, Part D and E of Annex V for all liquid biofuels except bio-LNG and in Part D of Annex VI for bio-LNG. However, the values of *E* need to be adjusted by subtracting the ratio of the values contained in column 6 (C_{F_CO2}) and column 3 (LCV). This is required in this regulation, which separates the WtT and the TtW calculations, to avoid double counting of emissions.

For RFNBO, default values are to be calculated by using the methodology of the delegated act taken on basis of Article 28(5) of Directive (EU) 2018/2001³⁰.

³⁰ Or on basis of the corresponding provisions in the amended Directive, according to the progress of the co-legislators.

Column 5 identifies the main types/classes of fuel consumer units such as 2 and 4 strokes Internal Combustion Engines (ICE) Diesel or Otto cycle, Lean-Burn Spark-Ignited (LBSI) engines, gas turbines, fuel cells, etc.

Column 6 contains the emission factor C_f for CO_2 in $[\text{gCO}_2/\text{gfuel}]$. Emission factors values as specified in the Regulation (EU) 2015/757 shall be used. For all those fuels not contained in Regulation (EU) 2015/757, the default values are specified in the Table.

Column 7 contains the emission factor C_f for methane in $[\text{gCH}_4/\text{gfuel}]$. For LNG fuels, C_f for methane are set to zero.

Column 8 contains the emission factor C_f for nitrous oxide in $[\text{gN}_2\text{O}/\text{gfuel}]$.

Column 9 identifies the part of fuel lost as fugitive and slipped emissions (C_{slip}) measured as % of mass of fuel used by the specific fuel consumer unit. For fuels such as LNG for which the fugitive and slipped emissions exist, the amount of fugitive and slipped emissions as presented in the Table is expressed in % of the mass of fuel used (Column 9 The values of C_{slip} in the Table are calculated at 50% of the full engine load.

FORMULAS FOR CALCULATING THE COMPLIANCE BALANCE AND REMEDIAL PENALTY laid down in Article 20(1bis)

A. FORMULA FOR CALCULATING THE SHIP’S COMPLIANCE BALANCE

For the purpose of calculating the compliance balance of a ship the following formula shall apply:

Compliance balance [gCO _{2eq}] =	$(GHGIE_{target} - GHGIE_{actual}) \times [\sum_i^{n_{fuel}} M_i \times LCV_i + \sum_i^l E_i]$
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Where:

gCO_{2eq}	
GHGIE _{target}	Greenhouse gas intensity limit of the energy used on-board a ship according to Article 4(2) of this Regulation
GHGIE _{actual}	Yearly average of the greenhouse gas intensity of the energy used on-board a ship calculated for the relevant reporting period

Until 31 December 2029, for any ship having the ice-class IC, IB, IA or IA Super or an equivalent ice class, the company may requests to exclude the additional energy due to sailing in ice conditions and/or due to ice class IA or IA Super. In this case, for the calculation of the compliance balance above, the values of Mi shall be replaced by the adjusted mass of fuel MiA defined in Annex VI and the value of GHGIE_{actual} to be used for calculating the compliance balance shall be recalculated with the corresponding values of MiA.

B. FORMULA FOR CALCULATING THE REMEDIAL PENALTY LAID DOWN IN ARTICLE 20(1BIS)

The amount of the remedial penalty laid down in Article 20(1bis) shall be calculated as follows:

Remedial Penalty =	$\frac{ (\text{Compliance balance}) }{GHGIE_{actual} \times 41000} \times 2400$
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1. Remedial Penalty	2. Is in EUR
3. abs(Compliance balance)	4. Is the absolute value of the compliance balance
5. 41000	6. Is 1 metric ton of VLSFO that is equivalent to 41000 MJ
7. 2400	8. Is the amount to be paid in EUR per equivalent metric ton of VLSFO

CALCULATION OF ADJUSTED MASS OF FUEL FOR ICE NAVIGATION

This Annex describes how to calculate:

- the additional energy due to technical characteristics of a ship having the ice class IA or IA Super or an equivalent ice class
- the additional energy used by a ship having the ice class IC, IB, IA or IA Super or an equivalent ice class due to sailing in ice conditions
- the adjusted mass [$M_i A$] after the deduction of the additional energy, allocated to each fuel i

Additional energy due to ice class

The additional energy consumption due to the technical characteristics of a ship having the ice class IA or IA Super or an equivalent ice class is calculated as follows :

$$E_{\text{additional due to ice class}} = 0.05 \times (E_{\text{voyages, total}} - E_{\text{additional due to ice conditions}})$$

where $E_{\text{voyages, total}}$ denotes the total energy consumed for all voyages and $E_{\text{additional due to ice conditions}}$ additional energy consumption due to sailing in ice conditions.

The total energy consumed for all voyages is calculated using :

$$E_{\text{voyages, total}} = \sum M_{i, \text{voyages, total}} \times LCV_i$$

where $M_{i, \text{voyages, total}}$ denotes the mass of fuel i consumed for all voyages within the scope of the regulation, LCV_i the lower calorific value of fuel i .

Additional energy due to sailing in ice conditions

The additional energy consumption due to sailing in ice conditions is calculated as follows :

$$E_{\text{additional due to ice conditions}} = E_{\text{voyages, total}} - E_{\text{voyages, open water}} - E_{\text{voyages, ice conditions, adjusted}}$$

where $E_{\text{voyages, open water}}$ denotes the energy consumed on voyages in open water and $E_{\text{voyages, ice conditions, adjusted}}$ the adjusted energy consumed in ice conditions.

$E_{\text{additional due to ice conditions}}$ cannot be higher than $1,3 * E_{\text{voyages, open water}}$

The energy consumed for voyages that include sailing in open water only is calculated as follows:

$$E_{\text{voyages, open water}} = E_{\text{voyages, total}} - E_{\text{voyages, ice conditions}}$$

where *E_{voyages, ice conditions}* denotes energy consumed for sailing in ice conditions, which is calculated as follows :

$$E_{\text{voyages, ice conditions}} = \sum M_i \text{voyages, ice conditions} \times LCV_i$$

where *M_{i, voyages, ice conditions}* denotes the mass of fuel *i* consumed for sailing in ice conditions.

The adjusted energy consumed in ice conditions is calculated as follows:

$$E_{\text{voyages, ice conditions, adjusted}} = D_{\text{ice conditions}} \times (E/D)_{\text{open water}}$$

Where:

D_{ice conditions} denotes the aggregated distance travelled when sailing in ice conditions within the scope of the regulation.

(E/D)_{open water} is the energy consumption per distance travelled in open water calculated as follows:

$$(E/D)_{\text{open water}} = (E_{\text{voyages, total}} - E_{\text{voyages, ice conditions}}) / (D_{\text{total}} - D_{\text{ice conditions}})$$

Where:

E_{voyages, ice conditions} denotes the energy consumption when sailing in ice conditions and *D_{total}* the total annual distance travelled.

D_{total} is the aggregated distance travelled within the scope of the regulation.

Total additional ice energy due to ice class and sailing in ice conditions

$$E_{\text{additional ice}} = E_{\text{additional due to ice class}} + E_{\text{additional due to ice conditions}}$$

Adjusted mass [*M_{i A}*]

The company shall allocate the total additional ice energy *E_{i additional ice}* to the different fuels *i* used during the year, with the following conditions:

$$\sum E_{\text{i additional ice}} = E_{\text{additional ice}}$$

$$\text{For each fuel } i, E_{\text{i additional ice}} \leq M_i * LCV_i$$

The [*M_{i A}*] adjusted mass of fuel is calculated as follows :

$$M_{i A} = M_i - E_{\text{i additional ice}} / LCV_i$$