

REGULATION (EU) 2023/1805 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL**of 13 September 2023****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 Committee ⁽¹⁾,

After consulting the Committee of the Regions,

Acting in accordance with the ordinary legislative procedure ⁽²⁾,

Whereas:

- (1) Maritime transport accounts for around 75 % of the Union's external trade and 31 % of its internal trade in terms of volume. 400 million passengers embark or disembark annually in ports of Member States, including around 14 million on cruise passenger ships. Maritime transport is therefore an essential component of the Union's transport system and plays a critical role for the Union's economy. The maritime transport market is subject to strong competition between economic actors within and outside the Union 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 within which 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 maritime transport operators or ports at a disadvantage compared to their competitors within the maritime transport sector or in other transport sectors. In turn, it is possible for that disadvantage to result in a loss of competitiveness of the maritime transport industry, fewer jobs and a loss of connectivity for citizens and businesses.
- (2) According to the EU Blue Economy Report, 2022, the EU Blue Economy created a total of approximately 5,7 million jobs in 2014, of which 3,2 million were created through direct employment in the established sectors and an additional 2,5 million were generated via the respective supply chains. That report also states that Union maritime ports alone create approximately 2,5 million jobs (direct and indirect) in 2014. Of that amount of jobs, only approximately 0,5 million are captured by sectoral statistics, because maritime ports generate employment and economic benefits in other sectors such as logistics and maritime shipping services. The seven established sectors of the EU Blue Economy generated a gross value added of EUR 183,9 billion in 2019 ⁽³⁾.

⁽¹⁾ OJ C 152, 6.4.2022, p. 145.

⁽²⁾ Position of the European Parliament of 11 July 2023 (not yet published in the Official Journal) and decision of the Council of 25 July 2023.

⁽³⁾ European Commission, Directorate-General for Maritime Affairs and Fisheries, Joint Research Centre, Addamo, A., Calvo Santos, A., Guillén, J., et al., The EU blue economy report 2022, Publications Office of the European Union, 2022, <https://data.europa.eu/doi/10.2771/793264>.

- (3) According to the Commission Staff Working Document accompanying the Commission Communication of 9 December 2020 entitled ‘Sustainable and Smart Mobility Strategy – putting European transport on track for the future’, compared to other modes of transport, maritime transport remains the most carbon-efficient mode of transport per ton km. At the same time, ship traffic to or from ports in the European Economic Area accounts for some 11 % of all Union carbon dioxide (CO₂) emissions from transport and 3 to 4 % of total Union CO₂ emissions. CO₂ emissions from maritime transport are expected to increase, unless further action is taken. All sectors of the Union economy are to contribute to the swift reduction of greenhouse gas (GHG) emissions to net zero at the latest by 2050, as enshrined in Regulation (EU) 2021/1119 of the European Parliament and of the Council ⁽⁴⁾. It is therefore essential for the Union to set out an appropriate pathway for the swift ecological transition of the maritime transport sector, which would also contribute to maintaining and further promoting the Union’s global leadership in relation to green technologies, services and solutions, and to further stimulating job creation in the related value chains while maintaining competitiveness.
- (4) To enhance the Union’s climate commitment under the Paris Agreement ⁽⁵⁾, adopted under the United Nations Framework Convention on Climate Change (the ‘Paris Agreement’), Regulation (EU) 2021/1119 aims to reduce GHG emissions (emissions after deduction of removals) by at least 55 % compared to 1990 levels by 2030 and puts the Union on a path to becoming climate neutral by 2050 at the latest. Additionally, various complementary policy instruments are needed to promote and speed up the use of sustainably produced renewable and low-carbon fuels, including in the maritime transport sector, while respecting the principle of technological neutrality. The necessary technology development and its deployment have to be under way by 2030 to prepare for much more rapid change thereafter. It is also essential to foster innovation and to support research for emerging and future innovation such as emerging alternative fuels, eco-design, bio-based materials, wind propulsion and wind-assisted propulsion.
- (5) 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 Union maritime transport market regarding maritime fuels, which account for a substantial share of companies’ and operators’ costs. Policy measures should therefore be cost-effective. 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, which could also contribute to a risk of loss of competitiveness of Union ports in comparison to non-Union ports. That situation could 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 ships arriving at and departing from maritime 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 Union maritime transport market.
- (6) The maritime transport sector is subject to strong international competition. Major differences in regulatory burdens across flag states have often led to unwanted practices such as the reflagging of ships. The sector’s intrinsic global character underlines the importance of a flag-neutral approach and of a favourable regulatory environment, which would help to attract new investment and safeguard the competitiveness of Union ports, shipowners and ship operators.

⁽⁴⁾ Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 (‘European Climate Law’) (OJ L 243, 9.7.2021, p. 1).

⁽⁵⁾ OJ L 282, 19.10.2016, p. 4.

- (7) In order to produce an effect on all activities in the maritime transport sector, this Regulation should 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 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 within a port under the jurisdiction of a Member State. Such a framework of application would ensure the effectiveness of this Regulation, including by increasing the positive impact on the environment of such framework. That framework should limit the risk of evasive port calls and the risk of delocalisation or rerouting of 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 at or departing from ports under jurisdiction of Member States, as well as the stay of ships in those ports, should be ensured by consistent rules set out in this Regulation.
- (8) It is essential for the Commission and the competent authorities of Member States to continuously ensure that their administrative procedures reflect best practices and to take measures in order to ensure consistency, avoid duplication in sectoral legislation and simplify the enforcement of this Regulation, thereby keeping the administrative burden on shipowners, ship operators, ports and verifiers to a minimum.
- (9) This Regulation should be consistent with Regulation (EU) 2023/1804 of the European Parliament and of the Council ⁽⁶⁾, Directive (EU) 2023/959 of the European Parliament and of the Council ⁽⁷⁾, a Directive of the European Parliament and of the Council amending Directive (EU) 2018/2001 of the European Parliament and of the Council ⁽⁸⁾, Regulation (EU) 2018/1999 of the European Parliament and of the Council ⁽⁹⁾ and Directive 98/70/EC of the European Parliament and of the Council ⁽¹⁰⁾ as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652 ⁽¹¹⁾, and a Council Directive restructuring the Union framework for the taxation of energy products and electricity (recast) in order to ensure the necessary degree of legal and investment certainty. Such consistency would ensure a coherent legislative framework for the maritime transport sector, that contributes to significantly increasing the production of sustainable alternative fuels, ensures the deployment of the necessary infrastructure and incentivises the use of those fuels in a steadily growing proportion of ships.
- (10) Consultations between the managing body of the port and port users and other relevant stakeholders, as provided for in Article 15(2) of Regulation (EU) 2017/352 of the European Parliament and of the Council ⁽¹²⁾, should take place in order to coordinate the availability of port services with regard to the alternative fuel supply that is planned and deployed in ports, as well as with regard to the demand expected from ships calling at those ports.

⁽⁶⁾ Regulation (EU) 2023/1804 of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU (See page 1 of this Official Journal.)

⁽⁷⁾ Directive (EU) 2023/959 of the European Parliament and of the Council of 10 May 2023 amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union and Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading system (OJ L 130, 16.5.2023, p. 134).

⁽⁸⁾ 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).

⁽⁹⁾ Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council (OJ L 328, 21.12.2018, p. 1).

⁽¹⁰⁾ Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC (OJ L 350, 28.12.1998, p. 58).

⁽¹¹⁾ Council Directive (EU) 2015/652 of 20 April 2015 laying down calculation methods and reporting requirements pursuant to Directive 98/70/EC of the European Parliament and of the Council relating to the quality of petrol and diesel fuels (OJ L 107, 25.4.2015, p. 26).

⁽¹²⁾ 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).

- (11) The rules laid down in this Regulation should apply in a non-discriminatory manner to ships regardless of their flag. For reasons of coherence with Union and international rules in the area of maritime transport, and in order to limit the administrative burden, this Regulation should apply to ships with a gross tonnage (GT) above 5 000, but 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. Although ships above 5 000 GT represent only approximately 55 % of all ships calling at ports under Regulation (EU) 2015/757 of the European Parliament and of the Council ⁽¹³⁾, they are responsible for approximately 90 % of CO₂ emissions from the maritime transport sector. The Commission should regularly reassess the situation, with a view to eventually extending the scope of this Regulation to ships below 5 000 GT.
- (12) Member States which have no maritime ports on their territory, no accredited verifier, no ships flying their flag that fall under the scope of this Regulation, and which are not an administering state within the meaning of this Regulation do not need to take any action concerning the respective requirements under this Regulation for as long as those circumstances are present.
- (13) Given the increased costs for ships which comply with the requirements of this Regulation, the absence of a global measure exacerbates the risk of circumvention. Evasive port calls to ports outside of the Union and relocation of transshipment activities to ports outside of the Union will not only diminish the environmental benefits of internalising the cost of emissions from maritime transport activities but may lead to additional emissions due to the additional distance travelled by ships in order to evade the 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 target ports in the Union's vicinity where the risk of evasion is most significant. A limit of 300 nautical miles from a port under the jurisdiction of a Member State constitutes a proportionate response to evasive behaviour, balancing the additional burden and the risk of evasion. Moreover, the exclusion from the concept of port of call should only target stops by containerships at certain non-Union ports, where the transshipment of containers accounts for most container traffic. For such shipments, the risk of evasion, in the absence of mitigating measures, also consists in a shift of port hub to ports outside the Union, aggravating the effects of the evasion. To ensure the proportionality and equal treatment of the global measure, account should be taken of measures in third countries that are equivalent to this Regulation.
- (14) In order to take into account the specific situation of island regions, as underlined by Article 174 of the Treaty on the Functioning of the European Union (TFEU), and the need to preserve connectivity between islands and peripheral regions of the Union 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 on an island with fewer than 200 000 permanent residents.
- (15) Taking into account the special characteristics and constraints of the outermost regions of the Union, in particular their remoteness and insularity, special consideration should be given to preserving their accessibility and efficient connectivity by maritime transport. Therefore, for ships falling under the scope of this Regulation only half of the energy used on voyages departing from or arriving at 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 in respect of the energy used by ships during their stay within the ports of call of the corresponding outermost regions.

⁽¹³⁾ Regulation (EU) 2015/757 of the European Parliament and of the Council of 29 April 2015 on the monitoring, reporting and verification of greenhouse gas emissions from maritime transport, and amending Directive 2009/16/EC (OJ L 123, 19.5.2015, p. 55).

- (16) Member States that do not share a land border with any other Member State are particularly dependent on their maritime connection to the rest of the Union, in particular to maintain necessary connectivity for their citizens. Such Member States have to rely on public service contracts or public service obligations in order to achieve the goal of maintaining connectivity through passenger ships. A temporary exemption should be allowed in order to enable Member States to address the compelling need of providing a service of general economic interest and ensure connectivity as well as economic, social and territorial cohesion.
- (17) In addition to a general possibility for Member States to exempt voyages performed by passenger ships, other than cruise passenger ships, to islands with fewer than 200 000 permanent residents, a similar exemption should be allowed with regard to domestic voyages to islands which are performed within the framework of a public service contract or subject to a public service obligation. Such contracts and obligations have been established by Member States in order to ensure an appropriate level of connectivity to island regions at affordable prices, which would otherwise not have been achieved by market forces. Member States should be entitled to temporarily exempt such voyages performed by passenger ships between its mainland and an island of the same Member State, in order to maintain the conditions under which the public service contracts or public service obligations were established and ensure the sustained connectivity, as well as the economic, social and territorial cohesion, of the island concerned.
- (18) Article 2, point 1, of Council Regulation (EEC) No 3577/92⁽¹⁴⁾ establishes that the ports situated in Ceuta and Melilla are to be treated in the same way as island ports. Although they are not island ports by nature, their geographical position in mainland Africa and absence of land links with Spain means that, in relation to mainland Europe and in particular to Spain, those ports are comparable to island ports. Therefore, Ceuta and Melilla should be considered to be island ports in relation to the temporary exemption for the maritime cabotage between the mainland of a Member State and the islands under its jurisdiction.
- (19) Sailing in ice conditions, especially in the northern parts of the Baltic Sea, and the technical properties of ice-class ships cause additional costs for maritime transport and such costs could be further increased by this Regulation. Such additional costs for ice-class ships due to sailing in ice conditions and due to their technical properties should be mitigated in order to maintain a level playing field. Companies should therefore be allowed to apply a limited adjusted amount of energy used on board for ice-class ships. In addition, for a limited period of time, this Regulation should enable a share of the additional energy used during sailing in ice conditions to be exempted for the specific periods during which ice-class ships face conditions of navigation in ice. To that end, a verifiable methodology should be established to enable correlation between exempted share of energy and actual ice navigation conditions. The Commission should reassess such methodology, in particular 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, with a view to possibly extending that measure.
- (20) The entity responsible for ensuring compliance with this Regulation should be the company, defined as the shipowner or any other organisation or person, such as the manager or the bareboat charterer, that has assumed 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 Council⁽¹⁵⁾. The definition of company under this Regulation is in line with the global data collection system established in 2016 by the International Maritime Organization (IMO).

⁽¹⁴⁾ Council Regulation (EEC) No 3577/92 of 7 December 1992 applying the principle of freedom to provide services to maritime transport within Member States (maritime cabotage) (OJ L 364, 12.12.1992, p. 7).

⁽¹⁵⁾ Regulation (EC) No 336/2006 of the European Parliament and of the Council of 15 February 2006 on the implementation of the International Safety Management Code within the Community and repealing Council Regulation (EC) No 3051/95 (OJ L 64, 4.3.2006, p. 1).

- (21) 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 Union regulatory framework already partly addresses fuel production by means of Directive (EU) 2018/2001 and fuel distribution by means of Directive 2014/94/EU of the European Parliament and of the Council ⁽¹⁶⁾, there is also a need for a tool that establishes increasing levels of demand for renewable and low-carbon maritime fuels.
- (22) While instruments such as carbon pricing or targets for 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.
- (23) 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. Such limits should be set in relation to a reference value, corresponding to the fleet average GHG intensity of the energy used on board by ships in 2020 determined on the basis of the data monitored and reported in the framework of Regulation (EU) 2015/757, of the methodology and of the default values laid down in Annexes I and II to this Regulation.
- (24) 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 the Union's efforts towards a high level of environmental protection. For this purpose, sustainable maritime fuels produced from feedstock 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 feedstock 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.
- (25) 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. Those risks are 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 GHG reduction potential and broader sustainability concerns.

⁽¹⁶⁾ 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).

- (26) In order to create a clear and predictable legal framework and thereby encourage the early 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 origin (RFNBO) is necessary. This incentive is justified by the fact that those types of fuels have high potential to introduce renewable energy into the marine bunker fuel mix, by their significant decarbonisation potential, as well as by their estimated production costs in the short- and mid-term. When produced from renewable electricity and carbon captured directly from the air, synthetic fuels can achieve up to 100 % emissions savings compared to fossil fuels. They also have considerable advantages compared to other types of sustainable fuels with regard to resource efficiency of the production process, in particular as regards water consumption. However, the production costs of RFNBO are currently much higher than the market price of conventional fuel and are expected to retain such higher costs in the mid-term. Therefore, this Regulation should provide for a combination of measures to ensure the support for the uptake of sustainable RFNBO, including the possibility to use a 'multiplier' until the end of 2033, allowing the energy from RFNBO to count twice. In addition, a 2 % RFNBO subtarget should apply as of 2034 if, further to monitoring of the market, the Commission reports that the share of RFNBO in the maritime bunker fuels used by ships falling under the scope of this Regulation is less than 1 % by 2031. That combination of measures to support RFNBO is intended to give ship operators and fuel suppliers a signal of opportunity for investment for the uptake of that type of renewable, scalable and sustainable fuel, as it provides both an end target giving the fuel suppliers certainty regarding future minimum demand as well as the opportunity for the market to find the most efficient way to adjust accordingly. Given that a market for maritime RFNBO is yet to develop, this Regulation includes safeguards and flexibility towards different possible market uptake scenarios.
- (27) Although RFNBO present a high potential to meet decarbonisation needs in the maritime sector, it is possible that other fuels will also present comparable decarbonisation potential. Factors such as technology maturity or availability to the maritime sector may affect the uptake of renewable and low-carbon fuels in different ports. Therefore, it is essential to ensure technological neutrality and avoid unduly discriminating against other fuels that achieve similar GHG intensity reductions as RFNBO, as well as to avoid penalising ships that use such fuels. To this end, it is important to note the GHG saving threshold of 70 % required for RFNBO, as set out by a Directive of the European Parliament and of the Council amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652. Such threshold can also be met by fuels other than RFNBO, of biologic or synthetic origin.
- (28) The maritime transport sector currently has 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. The non-eligibility of food- and feed crop-based fuels for contributing to the objectives of this Regulation also minimises any risk to the slowing down of decarbonisation of the transport sector, which could otherwise result from a shift of crop-based biofuels from road transport to maritime transport. It is essential to minimise such a shift, as road transport currently remains by far the most polluting transport sector and 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.
- (29) The long lead times associated with the development and deployment of new fuels and energy solutions for maritime transport, as well as the long average lifespan of ships, which typically ranges between 25 and 30 years, require rapid action and the establishment of a clear and predictable long-term regulatory framework that facilitates 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.

- (30) This Regulation should establish the methodology and the formula for 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.
- (31) 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 provide incentives regarding technologies and production pathways that provide a lower GHG footprint and real benefits compared to the existing conventional fuels.
- (32) 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. For the purpose of this Regulation, only default well-to-tank emission factors and default tank-to-wake CO₂ emission factors for fossil fuels should be used.
- (33) In the event of technological progress concerning new GHG abatement technologies, such as onboard carbon capture, the Commission should assess the possibility to reflect, in the GHG intensity and compliance balance formulas set out in Annexes I and IV respectively, the contribution of such technologies to lowering the GHG direct emissions on board ships.
- (34) A comprehensive approach to 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'.
- (35) 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 compliance balance.
- (36) 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.
- (37) The obligation for ports to provide on-shore power supply (OPS), laid down in Regulation (EU) 2023/1804, should be matched by a corresponding obligation set out in this Regulation for ships to connect to OPS infrastructure while moored at the quayside, in order to ensure the effectiveness of that infrastructure and avoid the risk of stranded assets.
- (38) The use of OPS abates air pollution produced by ships and 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 shares of renewables and fossil-free energy sources in the Union 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, that technology have remained limited. Therefore, specific rules should be established to mandate the use of OPS by containerships and passenger ships, since those are the ship categories that produce 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.

- (39) 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.
- (40) Different OPS projects and solutions have been tested for ships at anchorage, but there is currently no mature and scalable technical solution available. For that reason, the obligation to use OPS should be, in principle, limited to ships moored at the quayside. Nevertheless, the Commission should regularly reassess the situation, with a view to extending that obligation to ships at anchorage, when the necessary technologies are sufficiently mature. In the meantime, Member States should be allowed to impose, in certain cases, the obligation to use OPS on 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.
- (41) 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 duly authorised entity, after consulting relevant entities where appropriate. Such exceptions should be limited to unscheduled port calls, which are not made on a systematic basis, 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 cases of unavailability or incompatibility of OPS, to the use of onboard energy generation under emergency situations and to maintenance and functional tests.
- (42) In ports falling under the requirements of Article 9 of Regulation (EU) 2023/1804, exceptions applicable in the event of unavailability or incompatibility of OPS should be limited after shipowners and port operators have had sufficient time to make the necessary investments, in order to provide the necessary incentives for those investments and avoid unfair competition. Ship operators should plan carefully their port calls to make sure that they can carry out their activities when moored at the quayside without emitting air pollutants and GHG, in order to protect the environment in coastal areas and port cities. A limited number of exceptions applicable in the event of unavailability or incompatibility of OPS should be provided for to cater for situations where OPS was not provided, for reasons beyond the control of the ship operator. In order to mitigate the risk of stranded assets, incompatibility of OPS infrastructure on board and at berth as well as alternative fuel demand and supply imbalances, frequent consultation meetings between relevant stakeholders should be organised to discuss and take decisions on requirements and future plans.
- (43) The requirement for ports to provide OPS, laid down in Regulation (EU) 2023/1804, takes into account the types of ships served and the respective traffic volumes of maritime ports. The requirement for ships to connect to OPS should not apply to ships when calling at ports that are not covered by the OPS requirement set out in that Regulation, unless the port has OPS installed and available at the visited quayside, in which case the ship should be required to connect to OPS from 1 January 2035.
- (44) Considering the positive effects of the use of OPS on local air pollution and the need to incentivise the uptake of that technology in the short term, the carbon intensity of the production of the electricity supplied at berth should be counted as zero. The Commission should envisage the possibility to take into account the actual GHG emissions related to the electricity delivered through OPS at a later stage.
- (45) The implementation of this Regulation should take due account of the diverse governance models for ports across the Union, in particular as regards the responsibility for issuing a certificate exempting a ship from the obligation to connect to OPS.
- (46) Coordination between ports and ship operators is crucial to ensure smooth connection procedures to OPS in ports. Ship operators should inform the ports they call at about their intention to connect to OPS and about the amount of power needed during the given call, in particular when it exceeds the estimated needs for that ship category.

- (47) From 2035, the number of exceptions granted under this Regulation from the obligation to connect to OPS, which apply to certain cases where the ship is unable to connect to OPS, should be limited per ship during a reporting period. To ensure fair treatment of ships and to reflect the differences in their operating profiles, the number of exceptions should reflect the frequency of their port calls but should never amount to more than ten port calls per reporting period. However, a ship should not be penalised and port calls should not be counted against the maximum number of exceptions where, prior to arrival to a port, the ship has requested to connect to OPS and that request has been accepted by the port or the duly authorised entity, but the ship is unable to connect to OPS, and it is able to demonstrate that it could not have reasonably known it would be unable to connect to OPS.
- (48) A robust and transparent 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.
- (49) 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-assisted propulsion 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 carrying-out of verification activities by the verifiers, similarly to Regulation (EU) 2015/757, companies should document the envisaged monitoring method and provide further details on the application 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.
- (50) In order to limit the administrative burden, a unique monitoring, reporting and verification system for companies should be established for the purpose of implementing Union legal acts on reduction of GHG emissions from maritime transport. To that purpose, shortly after the publication of this Regulation, the Commission should examine the consistency of this Regulation with Regulation (EU) 2015/757 and possible duplication between those two regulations and, where appropriate, prepare a legislative proposal to amend this Regulation or Regulation (EU) 2015/757.
- (51) A robust certification and monitoring 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, the certification of fuels defined in accordance with Directive (EU) 2018/2001 or, where applicable, with the relevant provisions of a Union legal act concerning the internal markets in renewable and natural gases and in hydrogen, should rely on the rules established by those Union legal acts for certification. That approach to certification should also apply to fuels bunkered outside the Union, which should be considered to be imported fuels, in a similar way as in Directive (EU) 2018/2001. Where companies intend to depart from the default values provided for by those Union legal acts 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 or, where applicable, under a Union legal act which concerns the internal markets in renewable and natural gases and in hydrogen, and which establishes certain GHG emissions savings thresholds as well as the methodologies for their calculation (for well-to-tank values).
- (52) The possibility to calculate actual tank-to-wake emission factors, deviating from those defined in Annex II, should be made available to companies, provided that such calculation is determined in accordance with and supported by recognised international standards relevant for the subject matter. Such calculation of tank-to-wake emission factors should be primarily scoped to laboratory testing or direct emissions measurement of slipped emissions from energy converters, including internal combustion engines, fuel cells and associated reforming units, gas turbines or boilers.

Since actual tank-to-wake CO₂ emission factors are related to the fuel composition rather than the energy converter, they should not be different from the default values contained in Annex II. Those tank-to-wake emission factors should only be recalculated, in particular for synthetic fuels or biofuels, in the event that any relevant international standard is developed to that effect. It should not be possible to deviate from the default values presented for the CO₂ combustion emission factors for fossil fuels.

- (53) Verification activities are carried out by verifiers. In order to ensure impartiality and effectiveness, 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 Council ⁽¹⁷⁾. 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.
- (54) 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 compliance balance with respect to the limit, including any compliance surplus or deficit, as well as determine whether the ship has complied with 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.
- (55) The Commission should establish and ensure the functioning of an electronic database that registers the performance of each ship and ensures its compliance with this Regulation (the 'FuelEU database'). The FuelEU database should be used for all most important actions necessary to fulfil the obligations set out in this Regulation. In order to facilitate reporting and limit administrative burden to companies, verifiers and other users, the FuelEU database should build upon the existing THETIS-MRV module or, to the extent possible, should be developed as an upgraded version of it. The FuelEU database should also enable information and data collected for the purposes of Regulation (EU) 2015/757 to be used.
- (56) Compliance with this Regulation will depend on elements that might be beyond the 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.
- (57) In order to avoid technology lock-in and continue supporting the deployment of the most performant solutions, companies should be allowed to pool the performances of different ships. To that effect, it should be possible to use the over-performance of one ship to compensate the under-performance of other ships, provided that the total pooled compliance is positive. This creates a possibility to reward over-compliance and provides incentives for 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.
- (58) A document of compliance (the '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 obligation to use 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.

⁽¹⁷⁾ 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).

- (59) 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 and type of energy consumed, and the application of any exceptions, for each port call falling under the scope of this Regulation. That information should be made available by the companies to the verifiers for the purpose of determining compliance.
- (60) Without prejudice to the possibility of complying through the flexibility and pooling provisions, ships that do not meet the limits on the yearly average GHG intensity of the energy used on board should be subject to a 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 'FuelEU penalty'). The FuelEU 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.
- (61) A FuelEU penalty should be imposed also for each non-compliant port call. That FuelEU penalty should be proportionate to the cost of using the electricity at sufficient level, should have a dissuasive effect as regards the use of more polluting energy sources and should be expressed in a fixed amount in EUR, multiplied by the established total electrical power demand of the ship at berth and by the total number of hours, rounded up to the nearest whole hour, 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 average electricity price in the Union for non-household consumers multiplied by a factor of two to account for other charges related to the provision of the service, including, inter alia, connection costs and investment recovery elements.
- (62) The revenue generated by the payment of FuelEU penalties and collected by the administering States should be used to promote the distribution and use of renewable and low-carbon fuels in the maritime transport sector and help maritime transport operators to meet their climate and environmental goals.
- (63) While the company should remain responsible for fulfilling monitoring and reporting obligations under this Regulation, as well as for paying the FuelEU penalties, in line with the 'polluter pays' principle and in order to promote the uptake of cleaner fuels, the entity responsible for purchasing the fuel or for taking operational decisions that affect the GHG intensity of the energy used by the ship could, through contractual agreements with the company, in the event of compliance deficit, be put under the obligation to reimburse or otherwise compensate the company with respect to the cost of the FuelEU penalties resulting from the operation of the ship. That company should be able to, on a contractual basis, request the verifier to calculate the amount of the FuelEU penalties corresponding to the operation of the ship by the other entity during the reporting period. Within this context, operation of the ship should be understood to mean determining the cargo carried, the route and the speed of the ship. Similarly, while the company should remain responsible for fulfilling monitoring and reporting obligations under this Regulation, as well as for paying the FuelEU penalties, companies and fuel suppliers should be able to, by means of contractual agreements, agree on mutual commitments to produce, supply and purchase predetermined quantities of certain fuels. Such contractual agreements could provide for the liability of fuel suppliers to compensate the company for the payment of penalties in cases where fuels were not made available to the company as agreed.
- (64) Enforcement of the obligations relating to this Regulation should be based on existing instruments, including those established under Directives 2009/16/EC ⁽¹⁸⁾ and 2009/21/EC ⁽¹⁹⁾ of the European Parliament and of the Council. Additionally, Member States should lay down the rules on sanctions applicable to infringements of this Regulation. The sanctions provided for should be effective, proportionate and dissuasive. To avoid undue or double punishment for the same infringements, such sanctions should not duplicate the FuelEU penalties applied in a case where 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.

⁽¹⁸⁾ 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).

⁽¹⁹⁾ 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).

- (65) In order to reduce the administrative burden on companies, for each company only one Member State should be responsible for supervising the enforcement of this Regulation. The relevant provisions of Directive 2003/87/EC of the European Parliament and of the Council ⁽²⁰⁾ should be applied to determine the administering State in respect of each 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 FuelEU penalties are paid in due time.
- (66) 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 FuelEU 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 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.
- (67) 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 TFEU should be delegated to the Commission in respect of: amendment of the list of well-to-wake emission factors; information about the RFNBO subtarget; amending the existing table set out in Annex III by adding other zero-emission technologies; establishment of further methods and criteria of accreditation of verifiers; adaptation of a FuelEU penalty factor based on the developments in the cost of energy; and amendment of the numerical factor amount of the FuelEU 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-Making ⁽²¹⁾. 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.
- (68) 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 Council ⁽²²⁾. The Commission should take into account the possibility of reusing information and data collected for the purposes of Regulation (EU) 2015/757 when it establishes, by means of implementing acts, the list of neighbouring container transshipment ports excluded from the definition of ports of call; the criteria for assessment of the production capacity and availability of RFNBO in the maritime transport sector and the method to calculate the factor of price difference between RFNBO and fossil fuels; the specification of rules for the application of the RFNBO subtarget, if applicable; the detailed criteria for acceptance of the technologies and the way they are operated to be considered as zero-emission technologies; the information from ships intending to connect to OPS or use a zero-emission technology in ports and the procedure for providing such information; the templates for standardised monitoring plans, including the technical rules for their uniform application; the list of international standards and certification references to demonstrate actual tank-to-wake emission factors; further specifications of the rules for verification activities referred to in this Regulation; rules for access rights to and the functional and technical specifications of the FuelEU database; and models for the FuelEU document of compliance.

⁽²⁰⁾ Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC (OJ L 275, 25.10.2003, p. 32).

⁽²¹⁾ OJ L 123, 12.5.2016, p. 1.

⁽²²⁾ 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).

- (69) Given the international dimension of the maritime transport sector, a global approach to limiting the GHG intensity of the energy used by ships is preferable as such an approach would be significantly more effective due to its broader scope. In that 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, continuing the Union's efforts to promote ambitious maritime decarbonisation targets at an international level. 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.
- (70) The Commission should ensure implementation and availability of tools for collaboration and exchange of best practices for the maritime transport sector, as defined in the Commission Staff Working Document entitled 'Better Regulation Guidelines'.
- (71) Given that this Regulation will result in additional adjustment costs and administrative costs, the overall regulatory burden for the maritime transport sector should be kept under close review. To that end, the Commission should present a report to the European Parliament and to the Council evaluating the functioning of this Regulation. The Commission should assess in that report the extent to which the objectives of this Regulation have been met and to which extent it has impacted the competitiveness of the sector. That report should also cover the interaction of this Regulation with other relevant Union legal acts, including possible actions and measures that have been or could be taken to reduce the total cost pressure on the maritime transport sector.
- (72) Since the objective of this Regulation, namely the uptake of renewable and low-carbon fuels and substitute sources of energy by ships arriving at, staying 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 transport operators, but can rather, by reason of its scale and effects, 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,

HAVE ADOPTED THIS REGULATION:

Chapter I

General provisions

Article 1

Subject matter and objective

This Regulation lays down uniform rules imposing:

- (a) a 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) an obligation to use on-shore power supply (OPS) or zero-emission technology in ports under the jurisdiction of a Member State.

Its objective in doing so is to increase consistent use of renewable and low-carbon fuels and substitute sources of energy in maritime transport across the Union, in line with the objective of reaching Union-wide climate neutrality at the latest by 2050, while ensuring the smooth operation of maritime transport, creating regulatory certainty for the uptake of renewable and low-carbon fuels and sustainable technologies and avoiding distortions in the internal market.

Article 2

Scope

1. This Regulation applies to all ships of above 5 000 gross tonnage that serve the purpose of transporting passengers or cargo for commercial purposes, regardless of their flag, in respect of:

- (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;
- (c) notwithstanding point (b), one half of the energy used on voyages arriving at or departing from a port of call located in an outermost region under the jurisdiction of a Member State; and
- (d) one half of the energy used on voyages arriving at or departing from a port of call under the jurisdiction of a Member State, where the previous or the next port of call is under the jurisdiction of a third country.

2. By 31 December 2025, the Commission shall adopt implementing acts establishing a list of neighbouring container transshipment ports. The Commission shall update that list by 31 December every two years thereafter.

The implementing acts referred to in the first subparagraph shall list a port as a neighbouring container transshipment port where the share of transshipment of containers, measured in 20 foot equivalent units, exceeds 65 % of the total container traffic of that port during the most recent 12-month period for which relevant data are available and where that port is located outside the Union but less than 300 nautical miles from a port under the jurisdiction of a Member State.

For the purpose of those implementing acts, containers shall be considered to be transhipped when they are unloaded from a ship to a port for the sole purpose of being loaded onto another ship.

The list of neighbouring container transshipment ports established by the Commission shall not include ports located in a third country for which that third country effectively applies measures equivalent to this Regulation.

The implementing acts referred to in the first subparagraph shall be adopted in accordance with the examination procedure referred to in Article 29(3).

3. Member States may exempt from the application of paragraph 1, points (a) and (b) specific routes and ports in respect of 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 on an island with fewer than 200 000 permanent residents, and in respect of the energy used during their stay within a port of call of that island. No such exemptions shall apply beyond 31 December 2029. Prior to the entry into force of those exemptions, Member States shall notify them to the Commission. The Commission shall publish those exemptions in the *Official Journal of the European Union*.

4. Member States may exempt from the application of paragraph 1, points (a) and (c) specific routes and ports in respect of the energy used by ships on voyages between a port of call located in an outermost region and another port of call located in an outermost region, and in respect of the energy used during their stay within the ports of call of those outermost regions. No such exemptions shall apply beyond 31 December 2029. Prior to the entry into force of those exemptions, Member States shall notify them to the Commission. The Commission shall publish those exemptions in the *Official Journal of the European Union*.

5. Member States that do not share a land border with any other Member State may exempt from the application of paragraph 1 passenger ships performing transnational voyages under public service obligations or public service contracts to the ports of call of other Member States. No such exemptions shall apply beyond 31 December 2029. Prior to the entry into force of those exemptions, Member States shall notify them to the Commission. The Commission shall publish those exemptions in the *Official Journal of the European Union*.

6. Member States may exempt from the application of paragraph 1 passenger ships providing maritime transport services within the meaning of Regulation (EEC) No 3577/92 under public service obligations or public service contracts, operating before 12 October 2023, for the specific routes between their mainland ports of call and ports of call under their jurisdiction located on an island or the cities of Ceuta and Melilla. No such exemptions shall apply beyond 31 December 2029. Prior to the entry into force of those exemptions, Member States shall notify them to the Commission. The Commission shall publish those exemptions in the *Official Journal of the European Union*.

For the purposes of the application of this paragraph, the cities of Ceuta and Melilla shall be considered as ports of call located on an island.

7. 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 ships owned or operated by a government and used only for non-commercial purposes.

Article 3

Definitions

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

- (1) 'greenhouse gas emissions' or 'GHG emissions' means the release of carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) into the atmosphere;
- (2) 'biofuels' means biofuels as defined in Article 2, second paragraph, point (33), of Directive (EU) 2018/2001;
- (3) 'biogas' means biogas as defined in Article 2, second paragraph, point (28), of Directive (EU) 2018/2001;
- (4) 'recycled carbon fuels' means recycled carbon fuels as defined in Article 2, second paragraph, point (35), of Directive (EU) 2018/2001;
- (5) 'renewable fuels of non-biological origin' (RFNBO) means renewable fuels of non-biological origin as defined in Article 2, second paragraph, point (36), of Directive (EU) 2018/2001;
- (6) 'food and feed crops' means food and feed crops as defined in Article 2, second paragraph, point (40), of Directive (EU) 2018/2001;
- (7) 'zero-emission technology' means a technology that, when used to provide energy, does not result in the release of the following greenhouse gases and air pollutants into the atmosphere by ships: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulphur oxides (SO_x), nitrogen oxides (NO_x) and particulate matter (PM);
- (8) 'substitute sources of energy' means renewable energy generated on board or electricity supplied from OPS;
- (9) 'wind-assisted propulsion' means propulsion, whether partial or full, of a ship by wind energy harnessed by means of wind-assistance propulsion systems such as, inter alia, rotor sails, kites, hard or rigid sails, soft sails, suction wings or turbines;

- (10) 'port of call' means a port where ships stop to load or unload cargo or to embark or disembark passengers with the exclusion of stops for the sole purposes of refuelling, obtaining supplies, relieving the crew, going into dry-dock or making repairs to the ship, its equipment or both; 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 listed in the implementing act adopted pursuant to Article 2(2);
- (11) 'voyage' means voyage as defined in Article 3, point (c), of Regulation (EU) 2015/757;
- (12) 'outermost region' means a territory referred to in Article 349 TFEU;
- (13) 'company' means the shipowner or any other organisation or person such as the manager or the bareboat charterer, which has assumed the responsibility for the operation of the ship from the shipowner and 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;
- (14) 'gross tonnage' (GT) means gross tonnage as defined in Article 3, point (e), of Regulation (EU) 2015/757;
- (15) 'ship at berth' means ship at berth as defined in Article 3, point (n), of Regulation (EU) 2015/757;
- (16) 'ship at anchorage' means a ship at berth which is not moored at the quayside;
- (17) 'energy used on board' means the amount of energy, expressed in mega joules (MJ), used by a ship for propulsion and for the operation of any onboard equipment, at sea or at berth;
- (18) 'well-to-wake' means a method for calculating emissions that takes into account the GHG impact of energy production, transport, distribution and use on board, including during combustion;
- (19) 'GHG intensity of the energy used on board' means the amount of GHG emissions, expressed in grams of CO₂ equivalent established on a well-to-wake basis, per MJ of energy used on board;
- (20) 'emission factor' means the average emission rate of a GHG relative to the activity data of a source stream, assuming complete oxidation for combustion and complete conversion for all other chemical reactions;
- (21) 'ice class' means the notation assigned to the ship by the competent national authorities of the flag state or an organisation recognised by that state, showing that the ship has been designed for navigation in sea-ice conditions;
- (22) 'ice edge' means the demarcation at any given time between the open sea and sea ice of any kind, whether fast or drifting, as set out in paragraph 4.4.8 of the World Meteorological Organisation Sea-Ice Nomenclature, March 2014;
- (23) 'sailing in ice conditions' means the sailing by an ice-class ship in a sea area within the ice edge;
- (24) 'on-shore power supply' (OPS) means the system to supply electricity to ships at berth, at low or high voltage, alternate or direct current, including ship-side and port-side installations, when feeding directly the ship main distribution switchboard for powering hotel and service workloads or charging secondary batteries;
- (25) 'electrical power demand at berth' means the demand for electricity of a ship at berth for meeting all energy needs based on electricity on board;

- (26) 'established total electrical power demand of the ship at berth' means the highest value, expressed in kilowatts, of the total demand for electricity of a ship at berth, including hotel and cargo handling workloads;
- (27) '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;
- (28) '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;
- (29) 'passenger ship' means a passenger ship as defined in Article 2, point (i), of Directive (EU) 2016/802 of the European Parliament and of the Council ⁽²³⁾;
- (30) 'cruise passenger ship' means a passenger ship that has no cargo deck and is designed exclusively for commercial transportation of passengers in overnight accommodation on a sea voyage;
- (31) 'containership' means a ship designed exclusively for the carriage of containers in holds and on deck;
- (32) 'non-compliant port call' means a port call during which the ship does not comply with the requirement set out in Article 6(1), and to which none of the exceptions provided for in Article 6(5) apply;
- (33) 'least favourable pathway' means the most carbon-intensive production pathway used for any given fuel;
- (34) '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 CO₂ with the same global warming potential;
- (35) 'compliance balance' means the measure of a ship's over- or under-compliance with regard to the limits for the yearly average GHG intensity of the energy used on board by a ship or the RFNBO subtarget, which is calculated in accordance with Part A of Annex IV;
- (36) 'compliance surplus' means a compliance balance with a positive value;
- (37) 'compliance deficit' means a compliance balance with a negative value;
- (38) 'total pool compliance balance' means the sum of the compliance balances of all ships included in the pool;
- (39) 'managing body of the port' means managing body of the port as defined in Article 2, point (5), of Regulation (EU) 2017/352;
- (40) 'administering State' means a Member State determined by applying Article 3gf(1) of Directive 2003/87/EC in relation to a company within the meaning of this Regulation, without prejudice to the choice of the competent authorities in charge within the relevant Member State;
- (41) 'reporting period' means a period from 1 January to 31 December of the year during which information referred to in this Regulation is monitored and recorded, where data for voyages starting and ending in two different calendar years is accounted under the calendar year concerned;
- (42) 'verification period' means the calendar year directly following the reporting period.

⁽²³⁾ Directive (EU) 2016/802 of the European Parliament and of the Council of 11 May 2016 relating to a reduction in the sulphur content of certain liquid fuels (OJ L 132, 21.5.2016, p. 58).

Chapter II

Requirements for energy used on board by ships

Article 4

GHG intensity limit on energy used on board by a ship

1. The yearly average GHG 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 91,16 grams of CO₂ equivalent per MJ by the following percentage:
 - 2 % from 1 January 2025;
 - 6 % from 1 January 2030;
 - 14,5 % from 1 January 2035;
 - 31 % from 1 January 2040;
 - 62 % from 1 January 2045;
 - 80 % from 1 January 2050.
3. The GHG intensity of the energy used on board by a ship shall be calculated as the amount of GHG emissions per unit of energy in accordance with the methodology set out in Annex I.
4. The Commission is empowered to adopt delegated acts in accordance with Article 28 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 Union legal acts in the field of energy, in accordance with the best available scientific and technical knowledge.

Article 5

Use of Renewable Fuels of Non-Biological Origin

1. For the calculation of the GHG intensity of the energy used on board by a ship, from 1 January 2025 to 31 December 2033 a multiplier of '2' can be used to reward the ship for the use of RFNBO. The methodology for this calculation is set out in Annex I.
2. The Commission shall monitor, calculate and annually publish, on the basis of the data recorded in the FuelEU database referred to in Article 19 and at the latest 18 months after the end of each reporting period, the share of RFNBO in the yearly energy used on board by ships falling under the scope of this Regulation.
3. If the share of RFNBO referred to in paragraph 2 is less than 1 % for the reporting period 2031, a subtarget of 2 % shall apply for such fuels in the yearly energy used on board by a ship from 1 January 2034, subject to paragraph 5.
4. Paragraph 3 shall not apply where the monitoring results provided for in paragraph 2 that are available before 1 January 2033 demonstrate that the share referred to in paragraph 2 is more than 2 %.
5. If, based on the monitoring activities referred to in paragraph 2 and following the Commission's assessment, there is evidence of insufficient production capacity and availability of RFNBO to the maritime sector, uneven geographical distribution or a too high price of those fuels, the subtarget provided for in paragraph 3 shall not apply.

6. The Commission shall adopt implementing acts specifying the criteria for the assessment provided for in paragraph 5 and the method for calculating the factor of price difference between RFNBO and fossil fuels used in cell 14 of the table in Part B of Annex IV. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 29(3).

7. The Commission is empowered to adopt delegated acts in accordance with Article 28 to:

- (a) supplement paragraph 5 of this Article with additional elements;
- (b) inform about the non-applicability of the subtarget referred to in paragraph 3 of this Article, resulting from the monitoring referred to in paragraph 2 of this Article or the assessment referred to in paragraph 5 of this Article.

8. Where the subtarget referred to in paragraph 3 of this Article applies, the Commission shall adopt, by 31 December 2033, implementing acts to further specify the rules for the application of paragraph 3 of this Article as regards:

- (a) verification and calculation as referred to in Article 16;
- (b) applicable flexibility mechanisms set out in Articles 20 and 21;
- (c) applicable FuelEU penalties as referred to in Article 23 and Annex IV.

Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 29(3).

9. The subtarget referred to in paragraph 3 of this Article, if applicable, shall not apply to a ship which demonstrates that the same share of the yearly energy used on board is met by other fuels that provide equivalent GHG emissions savings and are certified pursuant to Article 10 of this Regulation, excluding biofuels referred to in Part B of Annex IX to Directive (EU) 2018/2001.

10. This Article shall not apply to the share of yearly energy used on board by ships from OPS.

Article 6

Additional zero-emission requirements for energy used at berth

1. From 1 January 2030, a ship moored at the quayside in a port of call which is covered by Article 9 of Regulation (EU) 2023/1804 and which is under the jurisdiction of a Member State shall connect to OPS and use it for all its electrical power demand at berth.

2. From 1 January 2035, a ship moored at the quayside in a port of call which is not covered by Article 9 of Regulation (EU) 2023/1804, which is under the jurisdiction of a Member State and where the quay is equipped with available OPS shall connect to that OPS and use it for all its electrical power demand at berth.

3. From 1 January 2030 and until 31 December 2034, and after consulting relevant stakeholders, including, where appropriate, the managing body of the port, a Member State may decide that a ship moored at the quayside in a port of call under its jurisdiction which is not covered by Article 9 of Regulation (EU) 2023/1804, or in certain parts of such port, shall connect to OPS and use it for all its electrical power demand at berth. The Member State shall notify its decision imposing such requirement to the Commission a year prior to the application thereof. Such decision must apply from the beginning of a reporting period. The Commission shall publish the information in the *Official Journal of the European Union* and make publicly available an updated list of the ports concerned. Such list shall be easily accessible.

4. Paragraphs 1, 2 and 3 shall apply to:

- (a) containerships;
- (b) passenger ships.

5. Paragraphs 1, 2 and 3 shall not apply to ships that:
- (a) are moored at the quayside for less than two hours, calculated on the basis of time of arrival and time of departure monitored and recorded in accordance with Article 15;
 - (b) use zero-emission technologies which comply with the general requirements for such technologies provided for in Annex III and are listed and specified in the delegated and implementing acts adopted in accordance with paragraphs 6 and 7 of this Article, for all their electrical power demand at berth, while moored at the quayside;
 - (c) due to unforeseen circumstances beyond the control of the ship, have to make an unscheduled port call, which is not made on a systematic basis, for reasons of safety or saving life at sea, other than those already excluded under Article 3, point (10);
 - (d) are unable to connect to OPS due to the unavailability of OPS connection points in a port;
 - (e) are unable to connect to OPS 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;
 - (f) are unable to connect to OPS because the shore installation at the port is not compatible with the onboard on-shore power equipment, provided that the installation for shore-connection on board the ship is certified in accordance with the technical specifications set out in Annex II to Regulation (EU) 2023/1804 for the shore-connection systems of seagoing ships;
 - (g) for a limited period of time, require the use of onboard energy generation, under emergency situations representing immediate risk to life, the ship or the environment or for other reasons of *force majeure*;
 - (h) while remaining connected to OPS, for a period of time limited to what is strictly necessary, require the use of onboard energy generation for maintenance tests or for functional tests carried out at the request of an officer of a competent authority or the representative of a recognised organisation undertaking a survey or inspection.
6. The Commission is empowered to adopt and regularly update delegated acts in accordance with Article 28 in order to amend the non-exhaustive table set out in Annex III by adding other zero-emission technologies, within the meaning of Article 3, point (7).
7. The Commission may adopt implementing acts to establish the detailed criteria for acceptance, including the definition of system boundaries and certification requirements, to be considered as fulfilling the general requirements for zero-emission technologies provided for in Annex III, including its future updates.

For the list of existing technologies provided for in Annex III, those implementing acts shall be adopted by 30 June 2024, where applicable. For any new technologies, those implementing acts shall be adopted, where other technologies as referred to in Annex III become available, without undue delay.

Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 29(3).

8. Ships shall inform in advance the competent authority of the Member State of the port of call or any duly authorised entity prior to entry into ports about their intention to connect to OPS or their intention to use a zero-emission technology in application of paragraph 5, point (b). Ships that intend to connect to OPS shall also indicate the amount of power they expect to require during that port call.

Upon receipt of the information from a ship regarding the connection to OPS referred to in the first subparagraph, the competent authority of the Member State of the port of call or any duly authorised entity shall confirm to the ship whether connection to OPS is available.

The Commission shall adopt implementing acts specifying the information to be provided in accordance with the first and second subparagraphs, as well as the procedure for providing that information. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 29(3).

9. The competent authority of the Member State of the port of call or any duly authorised entity, after consulting the managing body of the port where appropriate, shall determine and record in the FuelEU database, without delay, the following information:

- (a) the application of an exception set out in paragraph 5;
- (b) the non-compliance of a ship with the requirements set out in paragraphs 1, 2 and 3 where none of the exceptions set out in paragraph 5 apply.

10. From 1 January 2035, in ports falling under the requirements of Article 9 of Regulation (EU) 2023/1804, it shall only be possible to apply the exceptions provided for in paragraph 5, points (d), (e) and (f) to a maximum number of port calls corresponding to 10 % of a ship's total number of port calls that took place during a reporting period, rounded up to the nearest whole number, where relevant, or to a maximum of 10 port calls during the relevant reporting period, whichever is lower.

A port call shall not be counted for the purposes of compliance with this provision where the company demonstrates, on the basis of the exchange of information provided for in paragraph 8, that it could not have reasonably known that the ship would be unable to connect to OPS for any of the reasons referred to in paragraph 5, points (d), (e) or (f).

11. A Member State may decide that, in a port or in certain parts of a port under its jurisdiction, containerships or passenger ships at anchorage are covered by the same obligations set out in this Regulation applicable to ships moored at the quayside. The Member State shall notify its decision imposing such requirement to the Commission a year prior to the application thereof. Such decision must apply from the beginning of a reporting period. The Commission shall publish the information in the *Official Journal of the European Union* and make publicly available an updated list of the ports concerned. Such list shall be easily accessible.

Chapter III

Common principles and certification

Article 7

Common principles for monitoring and reporting

1. In accordance with Articles 8, 9 and 10, 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 referred to in Article 2(1).
2. Monitoring and reporting shall be complete and cover the energy used on board by ships at any time, whether at sea or 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, fuel bunker delivery notes as complemented in accordance with Annex I and activity data, and any other information needed to verify compliance with this Regulation, in a transparent and accurate manner, in paper or electronic form, so that the verifier is able to determine the GHG intensity of the energy used on board by ships.

5. In undertaking the monitoring and reporting activities set out in Articles 8, 9, 10 and 15 of this Regulation, information and data collected for the purposes of Regulation (EU) 2015/757 shall be used where appropriate.

Article 8

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 methods set out in Annex I for monitoring and reporting 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 at 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 International Maritime Organization (IMO) identification number, its port of registry or home port, and the name of the shipowner;
- (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) for ships referred to in Article 6(4), point (b), a description of the standards and characteristics of the equipment to allow connection to OPS, or a zero-emission technology;
- (e) 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 International Convention for the Safety of Life at Sea (SOLAS), as approved by its flag administration or a recognised organisation as defined in the IMO Code for Recognized Organizations adopted by resolutions MEPC.237(65) and MSC.349(92). If a ship is not able to provide that 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 International Convention for the Prevention of Pollution from Ships (MARPOL) or, if the engines are not required to have an EIAPP certificate, on the nameplate of the engines;
- (f) a description of the intended sources of energy to be used on board while in navigation and at berth to comply with the requirements set out in Articles 4 and 6;
- (g) 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;
- (h) 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 10 and Annexes I and II;

- (i) a description of the procedures used to monitor the completeness of the list of voyages;
- (j) a description of the procedures used for determining activity data per voyage, including the procedures, responsibilities, formulas 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;
- (k) a description of the procedures, systems and responsibilities used to update any of the data contained in the monitoring plan over the reporting period;
- (l) a description of the method to be used to determine surrogate data that can be used for closing data gaps or for identifying and correcting data errors;
- (m) a revision record sheet to record all details of the revision history;
- (n) where the company requests to exclude the additional energy used due to the ship's ice class from the calculation of the compliance balance set out in Annex IV, information on the ice class of the ship;
- (o) where the company requests to exclude the additional energy used due to sailing in ice conditions from the calculation of the compliance balance set out in Annex IV, information on the ice class of the ship and a description of a verifiable procedure for monitoring the distance travelled for the whole voyage as well as the distance travelled when sailing in ice conditions, the date, time and position when entering and leaving the ice conditions and the fuel consumption when sailing in ice conditions;
- (p) for a ship equipped with wind-assisted propulsion, a description of the installed wind propulsion equipment on board and the values of P_{Wind} and P_{Prop} as defined in Annex I.

4. Companies shall use standardised monitoring plans based on templates. The Commission shall adopt implementing acts determining 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 29(3).

Article 9

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, corrected or updated.
2. Companies shall modify the monitoring plan without undue delay where any of the following situations occurs:
 - (a) a change of company;
 - (b) new energy conversion systems, new types of energy, new systems for connection to OPS, or new substitute sources of energy or new zero-emission technologies enter into use;
 - (c) 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) companies, verifiers or competent authorities have found that data resulting from the monitoring method applied are incorrect;
 - (e) verifiers have identified any part of the monitoring plan as not being in conformity with the requirements of this Regulation and the company is required by the verifier to revise it in accordance with Article 11(1);

- (f) companies, verifiers or competent authorities have found that the methods to prevent data gaps and identify data errors are inadequate to ensure data accuracy, completeness and transparency.
3. Companies shall notify to the verifiers without undue delay any proposals for modification of the monitoring plan.

Article 10

Certification of fuels and emission factors

1. Where biofuels, biogas, RFNBO and recycled carbon fuels, as defined in Directive (EU) 2018/2001, are to be taken into account for the purposes referred to in Article 4(1) of this Regulation, the following rules apply:
- (a) biofuels and biogas that do not comply with the sustainability and GHG emissions 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 that type of fuel;
- (b) RFNBO and recycled carbon fuels that do not comply with the GHG emissions savings threshold 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 that type of fuel.
2. Fuels not covered in paragraph 1 shall be considered to have the same emission factors as the least favourable fossil fuel pathway for the type of fuel in question, unless they have been certified in accordance with Union legal acts concerning the internal markets in renewable and natural gases and in hydrogen, establishing a GHG emissions savings threshold and an associated methodology to calculate GHG emissions from production of such fuels.
3. On the basis of the fuel bunker delivery notes complemented in accordance with Annex I to this Regulation, companies shall provide accurate, complete and reliable data on the GHG emission intensity and the sustainability characteristics of fuels to be taken into account for the purposes referred to in Article 4(1) of this Regulation that have been certified under a scheme that is recognised by the Commission in accordance with Article 30(5) and (6) of Directive (EU) 2018/2001 or, where applicable, the relevant provisions of Union legal acts concerning the internal markets in renewable and natural gases and in hydrogen.
4. Companies shall not diverge from the default values for the well-to-tank emission factors set out in Annex II to this Regulation for fossil fuels. Without prejudice to paragraph 1, companies shall be entitled to diverge from the default values for the well-to-tank emission factors set out in Annex II to this Regulation provided that actual values are certified under a scheme that is recognised by the Commission. That certification shall be done, for biofuels, biogas, RFNBO and recycled carbon fuels, in accordance with Article 30(5) and (6) of Directive (EU) 2018/2001 or, where applicable, in accordance with the relevant provisions of Union legal acts concerning the internal markets in renewable and natural gases and in hydrogen.
5. Companies shall be entitled to diverge from the default values for the tank-to-wake emission factors set out 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.
6. The Commission shall adopt implementing acts in order to specify which international standards and certification references are accepted for demonstration of actual tank-to-wake emission factors. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 29(3).

Chapter IV

Verification and accreditation

Article 11

Assessment of the monitoring plan and of the modified monitoring plan

1. For each ship and in the event of a change of verifier, the verifier shall assess the conformity of the monitoring plan with the requirements set out in Articles 7, 8 and 9. Where the verifier's assessment identifies non-conformities with those requirements, the company concerned shall without undue delay 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 time-frame necessary to introduce those revisions. That timeframe shall in any event not extend beyond the beginning of the reporting period.
2. Modifications to the monitoring plan under Article 9(2), points (b), (c) and (d), shall be subject to an assessment by the verifier. Following that assessment, the verifier shall notify the company concerned whether those modifications are in conformity with the requirements set out in Articles 7, 8 and 9.
3. Once the monitoring plan and the modified monitoring plan have been satisfactorily assessed, the verifier shall record them in the FuelEU database. The monitoring plan and the modified monitoring plan shall be accessible to the administering State.

Article 12

General obligations and principles for the verifiers

1. The verifier shall be independent from the company or from the ship operator and shall carry out the activities required under this Regulation in the public interest. For that purpose and in order to avoid potential conflicts of interest, neither the verifier nor any part of a legal entity of which it is part shall be a company, ship operator or the owner of a company. In addition, the verifier shall not be owned by a company, ship operator or the owner of a company nor shall it have relations with a 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 OPS or the application of any of the exceptions recorded in the FuelEU database in accordance with Article 6(9), point (a);
 - (e) the data required under Article 10(3).
3. The assessment referred to in paragraph 2 shall be based on the following considerations:
 - (a) whether 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) whether 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) whether the collection of the data has been carried out in accordance with the applicable rules; and
- (d) whether the relevant records of the ship are complete and consistent.

Article 13

Verification procedures

1. The verifier shall identify potential risks related to the monitoring and reporting process by comparing the reported amount, type and emission factor of the energy used on board by ships with estimated data based on the ship's tracking data and characteristics, such as the installed engine power. Where significant divergences 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 concerned.
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. At 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 doubt, 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 the 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, as regards at least the following elements: competencies of verifiers; documents to be provided by companies to verifiers; assessment of the conformity of the monitoring plan and of the modified monitoring plan; risk assessment, including checks, to be carried out by verifiers; verification of the FuelEU report referred to in Article 15(3); materiality level; reasonable assurance from 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 specified in those implementing acts shall be based on the principles for verification provided for in Articles 11 and 12 and in this Article and on relevant internationally accepted standards. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 29(3).

Article 14

Accreditation of verifiers

1. Verifiers shall be accredited for verification activities falling under the scope of this Regulation by a national accreditation body pursuant to Regulation (EC) No 765/2008. By the end of each year, the national accreditation body shall notify the list of accredited verifiers to the Commission, together with all relevant contact information.
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.
3. Verifiers shall always have sufficient means and staff to enable them to deal with the size of the fleet for which they perform verification activities under this Regulation. In particular, verifiers shall always have sufficient expertise, particularly in maritime transport, to enable them to carry out the tasks required under this Regulation. They shall be capable of assigning means and staff to every place of work, when and as needed to carry out the tasks required under this Regulation.

4. A competent authority that identifies the non-conformity 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 that information as part of its surveillance activities.

5. The Commission is empowered to adopt delegated acts in accordance with Article 28 in order to supplement this Regulation by establishing further methods and criteria of accreditation of verifiers, on at least the following elements: request for accreditation for verification activities within 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 if the verifier does not fulfil the requirements of this Regulation; and requirements for national accreditation bodies in order to be competent to provide accreditation to verifiers for verification activities within the scope of this Regulation, including a reference to harmonised standards. The methods and criteria specified in such delegated acts shall be based on the principles for verification provided for in Articles 11, 12 and 13 and on relevant internationally accepted standards.

Chapter V

Recording, verification, reporting and assessment of compliance

Article 15

Monitoring and recording

1. As of 1 January 2025, based on the monitoring plan referred to in Article 8 and following the assessment of that plan by the verifier, companies shall monitor and record, for each ship arriving at or departing from a port of call, and for each voyage referred to in Article 2(1), the following information:

- (a) port of departure and port of arrival including the date and time of departure and arrival and time spent at berth;
- (b) for each ship to which Article 6(1) applies, the connection to and use of OPS or the application of any of the exceptions provided for in Article 6(5) as confirmed pursuant to Article 6(9), point (a), where applicable;
- (c) the amount of each type of fuel consumed at berth and at sea;
- (d) the amount of electricity delivered to the ship through OPS;
- (e) 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 with the different fuel consumers on board, covering all relevant greenhouse gases;
- (f) the amount of each type of substitute source of energy consumed at berth and at sea;
- (g) the ship's ice class, if the company requests to exclude the additional energy used due to ship's ice class from the calculation of the compliance balance set out in Annex IV, using the Baltic Marine Environment Protection Commission (HELCOM) Recommendation 25/7 on safety of winter navigation in the Baltic Sea to establish the correspondence between ice classes;
- (h) the ship's ice class, the date, time and position when entering and leaving the ice conditions, the amount of each type of fuel consumed and the distance travelled when sailing in ice conditions as well as the total distance travelled for all voyages during the reporting period, if the company requests to exclude the additional energy used due to sailing in ice conditions from the calculation of the compliance balance set out in Annex IV.

2. Companies shall record the information and data listed in paragraph 1 in a timely and transparent manner and compile them on an annual basis to enable the verifier to verify compliance with this Regulation.
3. By 31 January of the verification period, companies shall provide to the verifier a ship-specific report (the 'FuelEU report') containing all the information referred to in paragraph 1 of this Article and the monitoring data and documentation referred to in Article 7(4) for the reporting period.
4. In the event of the transfer of a ship from one company to another:
 - (a) the transferring company shall notify to the verifier the information referred to in paragraph 1 of this Article for the time during which it had responsibility for the operation of the ship;
 - (b) as close as practical to the day of completion of the transfer and no later than one month thereafter, the information referred to in point (a) shall be verified and recorded in the FuelEU database in accordance with Article 16 by the verifier that performed verification activities for the ship under the transferring company; and
 - (c) without prejudice to points (a) and (b), the company that has 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 set out in Articles 4 and 6 for the entire reporting period during which the transfer or multiple transfers took place.

Article 16

Verification and calculation

1. Following the verification as set out in Articles 11, 12 and 13, the verifier shall assess the quality, completeness and accuracy of the FuelEU report. To that end, the verifier shall use any information contained in the FuelEU database, including information provided on port calls in accordance with Article 6.
2. Where the verification assessment referred to paragraph 1 concludes, with reasonable assurance from the verifier, that the FuelEU report is free from material misstatements or non-conformities, the verifier shall notify to the company concerned 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.
3. Where the verification assessment identifies misstatements or non-conformities with this Regulation, the verifier shall inform the company concerned thereof in a timely manner. The company shall without undue delay 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 necessary to correct the misstatements or 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.
4. On the basis of the FuelEU report that complies with this Regulation, the verifier shall calculate:
 - (a) using the method specified in Annex I, the yearly average GHG intensity of the energy used on board by the ship concerned;
 - (b) using the formula specified in Part A of Annex IV, the ship's compliance balance;

- (c) 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 6(9), at anchorage, for each port call by the ship in non-compliance with the requirements set in out Article 6;
- (d) the amount of the yearly energy used on board by a ship, excluding energy from OPS;
- (e) the amount of the yearly energy used on board by a ship from the RFNBO.

5. By 31 March of the verification period, the verifier shall notify to the company the information referred to in paragraph 4 and record in the FuelEU database the FuelEU report that complies with this Regulation, the verification report and the information referred to in paragraph 4.

All information recorded in the FuelEU database shall be accessible to the administering State.

Article 17

Additional checks by a competent authority

1. At any time, the competent authority of the administering State in respect of a company may, for any of its ships, conduct, in relation to the two previous reporting periods, additional checks of any of the following:

- (a) the FuelEU report that complies with this Regulation established in accordance with Articles 15 and 16;
- (b) the verification report established in accordance with Article 16;
- (c) the calculations made by the verifier in accordance with Article 16(4).

2. At the request of the competent authority referred to in paragraph 1, the company shall provide any necessary information or documents enabling the competent authority to conduct additional checks and shall allow access to the premises of the company or the ship to facilitate such additional checks.

3. The competent authority referred to in paragraph 1 of this Article shall issue an additional checks report including, where applicable, the updated calculations made in application of Article 17(1), point (c), the updated amount of the compliance surplus or of the advance compliance surplus and the updated amount of the FuelEU penalty.

4. Where the additional checks report referred to in paragraph 3 of this Article identifies misstatements, non-conformities or miscalculations resulting in a non-conformity with the requirements set out in Article 4 or 6 and, consequently, in a FuelEU penalty or a modification of the amount of a FuelEU penalty already paid, the competent authority referred to in paragraph 1 of this Article shall notify to the company concerned the corresponding amount of the FuelEU penalty or of the modified FuelEU 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 FuelEU penalty or the modified FuelEU penalty within one month after its notification, in accordance with the arrangements provided for in Article 23.

5. The competent authority referred to in paragraph 1 shall remove without delay from the FuelEU database the FuelEU document of compliance of a ship in respect of which its company has not paid in due time the FuelEU penalties referred to in paragraph 4 and shall notify that removal to the company concerned in a timely manner. It shall re-issue the relevant FuelEU document of compliance only when an amount equal to the FuelEU penalty has been paid, provided that the other conditions set out in this Regulation for holding the FuelEU document of compliance are fulfilled by the company.

6. Paragraph 5 shall not apply to a ship which has been transferred to a company other than the company that assumed responsibility for its operation during the period subject to the additional checks.
7. The actions referred to in this Article, the additional checks report referred to in paragraph 3 and proof of the payments of the FuelEU penalties shall be recorded without delay in the FuelEU database by the entities that performed those actions or made that report or payment.

Article 18

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 purposes and in order to better ensure robust enforcement of this Regulation.

Article 19

FuelEU database and reporting

1. The Commission shall develop, ensure the functioning of and update an electronic database for the monitoring of compliance with this Regulation (the 'FuelEU database'). The FuelEU database shall be used to keep a record of actions related to verification activities, of the compliance balance of ships, including use of the flexibility mechanisms set out in Articles 20 and 21, of the application of the exceptions set out in Article 6(5), of actions related to payment of the FuelEU penalties imposed under Article 23 and of the issuance of the FuelEU document of compliance. It shall be accessible to the companies, the verifiers, the competent authorities and any duly authorised entity, the national accreditation bodies, the European Maritime Safety Agency established by Regulation (EC) No 1406/2002 of the European Parliament and of the Council ⁽²⁴⁾ and the Commission, with appropriate access rights and functionalities corresponding to their respective responsibilities for the implementation of this Regulation.
2. Any elements recorded or modified in the FuelEU database shall be notified to the entities to which they are accessible.
3. The Commission shall adopt implementing acts laying down the rules for access rights and the functional and technical specifications, including notification rules and filtering, of the FuelEU database. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 29(3).

Article 20

Banking and borrowing of compliance surplus between reporting periods

1. On the basis of the calculations undertaken in accordance with Article 16(4), where the ship has, for the reporting period, a compliance surplus on its GHG intensity as referred to in Article 4(2) or, if applicable, on the RFNBO subtarget as referred to in Article 5(3), 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.

⁽²⁴⁾ Regulation (EC) No 1406/2002 of the European Parliament and of the Council of 27 June 2002 establishing a European Maritime Safety Agency (OJ L 208, 5.8.2002, p. 1).

2. On the basis of the calculations undertaken in accordance with Article 16(4), where the ship has, for the reporting period, a compliance deficit, 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 compliance balance in the reporting period and the advance compliance surplus multiplied by 1,1 shall be subtracted from the same ship's compliance balance in the following reporting period. The advance compliance surplus may not be borrowed:

- (a) for an 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 verification period, the company shall record the advance compliance surplus, following approval by its verifier, in the FuelEU database.

4. Where a ship does not have any port call in the Union during the reporting period and borrowed an advance compliance surplus in the previous reporting period, the competent authority of the administering State shall notify by 1 June of the verification period to the company concerned the amount of the FuelEU penalty as referred to in Article 23(2) that it initially avoided by means of borrowing that advance compliance surplus, multiplied by 1,1.

Article 21

Pooling of compliance

1. The compliance balances for GHG intensity referred to in Article 4(2) and, if applicable, the RFNBO subtarget as referred to in Article 5(3) of two or more ships, as calculated in accordance with Article 16(4), may be pooled for the purposes of complying with the requirements set out in Article 4 and, if applicable, Article 5(3). A ship's compliance balance may not be included in more than one pool in the same reporting period.

Two separate pools may be used for GHG intensity target and for the subtarget for RFNBO.

2. The company shall register in the FuelEU database its intention to include the ship's compliance balance in a pool, the allocation of the total pool compliance balance to each individual ship, and the choice of the verifier selected for verifying that allocation.

3. Where the ships participating in the pool are controlled by two or more companies, the pool details registered in the FuelEU database, including the allocation of the total pool compliance balance to the pool's 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 validated in the FuelEU database by all the companies concerned in the pool.

4. A pool is valid only if the total pooled compliance is positive, if ships which had a compliance deficit as calculated in accordance with Article 16(4) 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 accordance with Article 16(4) do not have a compliance deficit after the allocation of the pooled compliance.

5. A ship shall not be included in a pool if it does not comply with the obligation set out in Article 24.

6. If the total pool compliance balance results in a compliance surplus for an individual ship, Article 20(1) shall apply.

7. Article 20(2) shall not apply to a ship participating in the pool.
8. By 30 April of the verification period, the selected verifier shall record in the FuelEU database the definitive composition of the pool and allocation of the total pool compliance balance to each individual ship.

Article 22

FuelEU document of compliance

1. By 30 June of the verification period, the verifier shall issue a FuelEU document of compliance for the ship concerned, provided that the ship does not have a compliance deficit further to application of Articles 20 and 21, does not have non-compliant port calls and complies with the obligation set out in Article 24.
2. Where FuelEU penalties referred to in Article 23(2) or 23(5) are due, the competent authority of the administering State shall, by 30 June of the verification period, issue a FuelEU document of compliance for the ship concerned, provided that an amount equal to the FuelEU penalties has been paid.
3. 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 shipowner;
 - (c) identity of the verifier;
 - (d) date of issue of that document, its period of validity and the reporting period it refers to.
4. The FuelEU document of compliance shall be valid for a period of 18 months after the end of the reporting period or until a new FuelEU document of compliance is issued, whichever occurs earlier.
5. The verifier or, where applicable, the competent authority of the administering State shall record the issued FuelEU document of compliance in the FuelEU database without delay.
6. 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 29(2).

Article 23

FuelEU penalties

1. Before 1 May of the verification period, on the basis of the calculations undertaken pursuant to Article 16(4) and after possible application of Articles 20 and 21, the verifier shall record in the FuelEU database the verified compliance balances of the ship for GHG intensity as referred to in Article 4(2) and, if applicable, for the subtarget for RFNBO as referred to in Article 5(3).

If a ship has a compliance deficit for the subtarget for RFNBO as referred to in Article 5(3), the FuelEU penalty shall be calculated in accordance with the formula specified in Part B of Annex IV.

2. The administering State in respect of a company shall ensure that, for any of its ships having a compliance deficit for GHG intensity as referred to in Article 4(2) or, if applicable, for the subtarget for RFNBO as referred to in Article 5(3) on 1 June of the verification period, after a possible validation by its competent authority, the company shall pay by 30 June of the verification period an amount equal to the FuelEU penalty resulting from the application of the formulas specified in Part B of Annex IV. If 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 FuelEU penalty for that ship.

3. 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 20(4), the company pays by 30 June of the verification period an amount equal to the FuelEU penalty notified pursuant to that paragraph.
4. Before 1 May of the verification period, where applicable on the basis of the calculations undertaken in accordance with Article 16(4), 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 out in Article 6.
5. 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 its competent authority, the company shall pay by 30 June of the verification period an amount equal to the FuelEU 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 hours rounded up to the nearest whole hour, spent at berth by the ship in non-compliance with the requirements set out in Article 6.
6. 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 FuelEU penalties.
7. The actions referred to in this Article as well as the proof of the payments of FuelEU penalties shall be recorded without delay in the FuelEU database by the entities that performed those actions or made that payment.
8. The company shall remain responsible for the payment of the FuelEU penalties, without prejudice to the possibility for the company to conclude contractual agreements with the commercial operators of the ship that provide for the liability of the commercial operators to reimburse the company for the payment of the FuelEU penalties, 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.
9. The company shall remain responsible for the payment of the FuelEU penalties, without prejudice to the possibility for the company to conclude contractual agreements with fuel suppliers that provide for the liability of the fuel suppliers to reimburse the company for the payment of the FuelEU penalties.
10. The Commission is empowered to adopt delegated acts in accordance with Article 28 to amend Annex IV in order to adapt the factor indicated in cell 7 and, where applicable, cell 14 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 multiplication factor laid down in paragraph 5 of this Article, based on the indexation of the average cost of electricity in the Union.
11. Member States shall endeavour to ensure that the revenue generated from the FuelEU penalties, or its equivalent financial value, is used to support the rapid deployment and the 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 OPS infrastructure in ports, and supporting the development, testing and deployment of the most innovative technologies in the fleet to achieve significant emission reductions.

By 30 June 2030, and every five years thereafter, Member States shall make public a report on the use of revenue generated from the Fuel EU penalties over the five-year period preceding the year of every such report, including information on the beneficiaries and the level of expenditure concerning the objectives listed in the first subparagraph.

Article 24

Obligation to hold a valid FuelEU document of compliance

1. By 30 June of the verification period, ships calling at a port under the jurisdiction of a Member State, arriving at, staying within or departing from a port under the jurisdiction of a Member State, or which have carried out voyages during the corresponding reporting period, shall hold a valid FuelEU document of compliance.

2. The FuelEU document of compliance issued for the ship concerned in accordance with Article 22 shall constitute evidence of compliance with this Regulation.

Article 25

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 shall be effective, proportionate and dissuasive. Member States shall notify the Commission of those rules and of those measures and shall notify it, without delay, of any subsequent amendment affecting them.

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 the ship holds a valid FuelEU document of compliance.

3. Where a ship fails to comply with the obligation set out in Article 24 for two or more consecutive reporting periods, and where other enforcement measures have failed to ensure compliance with this Regulation, 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. Where the competent authority of the Member State of the port of call decides to issue an expulsion order, it shall notify that order to the Commission, the other Member States and the flag State concerned through the FuelEU database. Every Member State, with the exception of the 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 a ship fails to comply with the obligation set out in Article 24 for two or more consecutive reporting periods and enters into a port of the Member State whose flag it flies, the Member State concerned shall, while that ship is in one of its ports, after giving the opportunity to the company concerned to submit its observations, order a flag detention until the company fulfils its obligations.

4. The company concerned shall confirm compliance with the obligation to hold a valid FuelEU document of compliance by notifying 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 specific 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 26

Right to review

1. 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 in accordance with Article 22(1).

The application for a review shall be lodged with the competent authority of the Member State in which the verifier is accredited within one month of the notification of the result of the calculation or of the measure by the verifier.

2. 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 27

Competent authorities

Member States shall designate one or more competent authorities to be responsible for the application and enforcement of this Regulation ('competent authorities') and 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 28

Exercise of the 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), 5(7), 6(6), 14(5) and 23(10) shall be conferred on the Commission for an indeterminate period of time from 12 October 2023.
3. The delegation of power referred to in Articles 4(4), 5(7), 6(6), 14(5) and 23(10) 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 of 13 April 2016 on Better Law-Making.
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), 5(7), 6(6), 14(5) and 23(10) 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 29

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) No 2099/2002 of the European Parliament and of the Council ⁽²⁵⁾. 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 Article 5(4), third subparagraph, of Regulation (EU) No 182/2011 shall apply.

Article 30

Reports and review

1. By 23 September 2024, the Commission shall present a report to the European Parliament and to the Council examining the interaction and convergence between this Regulation and Regulation (EU) 2015/757 or any other sectoral legal acts. Where appropriate, that report may be accompanied by a legislative proposal.

⁽²⁵⁾ 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).

2. By 31 December 2027, and every five years thereafter at the latest, the Commission shall report to the European Parliament and the Council the results of an evaluation as regards the functioning of this Regulation, including possible impacts of market distortions or port evasion; as regards the evolution of the zero-emission technologies in maritime transport and their market, as well as the evolution of the technologies and market for renewable and low-carbon fuels and for OPS, including at anchorage; as regards the use of revenue generated by the FuelEU penalties; and as regards the impact of this Regulation on the competitiveness of the maritime sector in the Union.

In that report, the Commission shall consider, inter alia:

- (a) the material and geographical scope of this Regulation, as regards decreasing the gross tonnage threshold referred to in Article 2(1) or expanding the share of energy used by ships in voyages to and from third countries referred to in Article 2(1), point (d);
- (b) the limit referred to in Article 4(2), with a view to achieving the objectives set out in Regulation (EU) 2021/1119;
- (c) the ship types and size to which Article 6(1) applies and an extension of the obligations referred to in Article 6(1) to ships at anchorage;
- (d) the exceptions provided for in Article 6(5);
- (e) the counting of the electricity delivered through OPS in Annex I and the well-to-tank emission factor associated with that electricity defined in Annex II;
- (f) the possibility to include in the scope of this Regulation 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 fuel technologies;
- (g) the calculation of the compliance balance for ships requesting to exclude the additional energy used due to sailing in ice conditions set out in Annexes IV and V, and the possible extension of the validity of those provisions after 31 December 2034;
- (h) the possibility to include energy provided by wind in the calculation of the GHG intensity of the energy used on board set out in Annex I, subject to the availability of a verifiable method for monitoring and accounting of wind propulsion energy;
- (i) the possibility to include new GHG abatement technologies, such as onboard carbon capture, in the calculation of the GHG intensity of the energy used on board and of the compliance balance as set out in Annexes I and IV respectively, subject to the availability of a verifiable method for monitoring and accounting of the captured carbon;
- (j) the possibility to include additional elements in this Regulation, in particular black carbon emissions;
- (k) the need for measures to address attempts by companies to evade the requirements set out in this Regulation.

The Commission shall consider, if appropriate, whether to accompany that report by a proposal to amend this Regulation.

3. The Commission shall include in the report provided for in paragraph 2 an evaluation of the social impacts of this Regulation in the maritime sector, including on its workforce.

4. In preparing its report referred to in paragraph 2 the Commission shall consider the extent to which the implementation of this Regulation has met its objectives and the extent to which it has impacted the competitiveness of the maritime sector. In that report, the Commission shall also consider the interaction of this Regulation with other relevant Union legal acts and identify any provisions that could be updated and simplified, as well as actions and measures that have been or could be taken to reduce the total cost pressure on the maritime sector. As part of the Commission's analysis of the efficiency of this Regulation, the report shall also include an assessment of the burden this Regulation imposes on businesses.

The Commission shall consider, if appropriate, whether to accompany that report by a proposal to amend this Regulation, in view of the conclusions of the report referred to in the first subparagraph.

5. In the event of the adoption by the IMO of a global GHG fuel standard or global GHG intensity limits for the energy used on board by ships, the Commission shall, without delay, present a report to the European Parliament and to the Council. In that report, the Commission shall 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 global measure, including the need to avoid duplicating regulation of GHG emissions from maritime transport at Union as well as international level.

Where appropriate, that report may be accompanied by a legislative proposal to amend this Regulation, consistent with the Union economy-wide GHG emission commitments, and with the aim of preserving the environmental integrity and effectiveness of the Union climate action.

6. The Commission shall monitor the implementation of this Regulation in relation to maritime transport, in particular to detect evasive behaviour in order to prevent such behaviour at an early stage, and including with regard to outermost regions.

The monitoring results shall be reflected in the report to be made every two years referred to in Article 3gg(3) of Directive 2003/87/EC.

Article 31

Amendment 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) 2023/1805 of the European Parliament and of the Council (*).

(*). Regulation (EU) 2023/1805 of the European Parliament and of the Council of 13 September 2023 on the use of renewable and low-carbon fuels in maritime transport, and amending Directive 2009/16/EC (OJ L 234, 22.9.2023, p. 48).

Article 32

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 8 and 9 which shall apply from 31 August 2024.

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

Done at Strasbourg, 13 September 2023.

For the European Parliament
The President
R. METSOLA

For the Council
The President
J. M. ALBARES BUENO

ANNEX I

Methodology for establishing the greenhouse gas intensity of the energy used on board by a ship

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

$$\text{GHG intensity } \left[\frac{\text{gCO}_2\text{eq}}{\text{MJ}} \right] = f_{\text{wind}} \times (\text{WtT} + \text{TtW}) \text{ Equation (1)}$$

WtT	$\frac{\sum_i^n \text{fuel } M_i \times \text{CO}_{2\text{eq WtT}, i} \times \text{LCV}_i + \sum_k^c E_k \times \text{CO}_{2\text{eq electricity}, k}}{\sum_i^n \text{fuel } M_i \times \text{LCV}_i \times \text{RWD}_i + \sum_k^c E_k}$
TtW	$\frac{\sum_i^n \text{fuel } \sum_j^m \text{engine } M_{i,j} \times \left[\left(1 - \frac{1}{100} C_{\text{slip } j} \right) \times (\text{CO}_{2\text{eq, TtW}, i, j}) + \left(\frac{1}{100} C_{\text{slip } j} \times \text{CO}_{2\text{eq TtW, slip, i, j}} \right) \right]}{\sum_i^n \text{fuel } M_i \times \text{LCV}_i \times \text{RWD}_i + \sum_k^c E_k}$
f_{wind}	Reward factor for wind-assisted propulsion

For the purposes of Equation (1), the different terms and notations used are presented in the following table:

Term	Explanation
i	Index corresponding to the fuel types delivered to the ship in the reporting period
j	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
k	Index corresponding to the OPS connection points
n	Total number of fuel types delivered to the ship in the reporting period
c	Total number of OPS connection points
m	Total number of fuel consumer units
$M_{i,j}$	Mass of fuel i consumed by fuel consumer unit j [gFuel]
E_k	Electricity delivered to the ship per OPS connection point k [MJ]
$\text{CO}_{2\text{eq WtT}, i}$	WtT GHG emission factor of fuel i [$\text{gCO}_{2\text{eq}}/\text{MJ}$]
$\text{CO}_{2\text{eq electricity}, k}$	WtT GHG emission factor associated with the electricity delivered to the ship at berth per OPS connection point k [$\text{gCO}_{2\text{eq}}/\text{MJ}$]
LCV_i	Lower calorific value of fuel i [MJ/gFuel]
RWD _i	Where the fuel is of non-biological origin, a reward factor of 2 from 1 January 2025 to 31 December 2033 can be applied. Otherwise RWD _i = 1.

C_{slipj}	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.
$C_{fCO_{2i,j}}, C_{fCH_{4i,j}},$ $C_{fN_2O_{i,j}}$	TtW GHG emission factors by combusted fuel i in fuel consumer unit j [gGHG/gFuel]
$CO_{2eq,TtWi,j}$	TtW CO ₂ equivalent emissions of combusted fuel i in fuel consumer unit j [gCO ₂ eq/gFuel] $CO_{2eq,TtWi,j} = (C_{fCO_{2j}} \times GWP_{CO_2} + C_{fCH_{4j}} \times GWP_{CH_4} + C_{fN_2O_{j}} \times GWP_{N_2O})_i$ Equation (2)
$C_{sfCO_{2i,j}}, C_{sfCH_{4i,j}},$ $C_{sfN_2O_{i,j}}$	TtW GHG emission factors by slipped fuel i towards fuel consumer unit j [gGHG/gFuel]
$CO_{2eq,TtWslipi,j}$	TtW CO ₂ equivalent emissions of slipped fuel i towards fuel consumer unit j [gCO ₂ eq/gFuel] $CO_{2eq,TtWslipi,j} = (C_{sfCO_{2j}} \times GWP_{CO_2} + C_{sfCH_{4j}} \times GWP_{CH_4} + C_{sfN_2O_{j}} \times GWP_{N_2O})_i$ Where: C_{sfCO_2} , and C_{sfN_2O} , = 0. $C_{sfCH_{4j}} = 1$.
$GWP_{CO_2}, GWP_{CH_4},$ GWP_{N_2O}	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 purposes of this Regulation, the term $\sum_k E_k \times CO_{2eq,electricity,k}$ 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 within the scope of this Regulation based on the monitoring methodology chosen 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 ($CO_{2eq,WtT,i}$) default values are contained in Annex II.

In the case of fossil fuels, only the default values contained 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 Directive (EU) 2018/2001 for biofuels, biogas, RFNBO and recycled carbon fuels, or, where applicable, in accordance with the relevant provisions of Union legal acts for the internal markets in renewable and natural gases and in hydrogen, in application of Article 10(4) of this Regulation.

Fuel Bunker Delivery Note (BDN)

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

For the purposes of this Regulation:

1. 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 [gCO₂eq/MJ] and related certificate identifying the fuel production pathway.
2. Where there is 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:

1. supplier: name, address, telephone number, email address, representative;
2. receiving ship: IMO number (MMSI), ship name, ship type, flag, ship representative;
3. port: name, location (LOCODE), terminal/berth;
4. OPS connection point: connection point details;
5. OPS time: date/time of commencement/finalisation;
6. energy supplied: power fraction allocated to supply point (if applicable) [kW], electricity consumption (kWh) for the billing period, peak power information (if available);
7. 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,TtWj}) default values are contained in Annex II.

In accordance with its monitoring plan referred to in Article 8 and upon assessment by the verifier, a company may use other methods, such as direct CO_{2eq} measurement or laboratory testing, if they enhance the overall accuracy of the calculation, in application of Article 10(5).

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 purposes 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 wind-assisted propulsion

Where wind-assisted propulsion is installed on board, a reward factor can be applied, determined as follows:

Reward factor for wind-assisted propulsion – 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 guidance on treatment of innovative energy efficiency technologies for calculation and verification of the attained energy efficiency design index (EEDI) and energy efficiency existing ships index (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 EEDI for new ships (IMO resolution MEPC.364(79)) and the 2021 guidelines on the method of calculation of the attained EEXI (IMO resolution MEPC.333(76)). Where shaft motor(s) are installed, $P_{Prop} = P_{ME} + P_{PTI(i),shaft}$.

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

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ANNEX II

Default emission factors

The default emission factors contained in the table below shall be used for the determination of the GHG intensity index referred to in Annex I of this Regulation, except where companies diverge from those default emission factors in application of Article 10(4) and (5) of this Regulation.

In the table below:

- 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, unless a value is demonstrated in accordance with Article 10, 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, unless a value is demonstrated in accordance with Article 10, the default value of the least favourable fossil fuel pathway shall be used. This rule does not apply to column 9, where TBM or N/A refers to non-available values for the fuel consumer. In case of no default value, a certified value in accordance with Article 10(5) should be used.

1	2	3	4	5	6	7	8	9	
			WtT	TtW					
Fuel Class	Pathway name	LCV [$\frac{\text{MJ}}{\text{g}}$]	CO _{2eq} WtT [$\frac{\text{gCO}_2\text{eq}}{\text{MJ}}$]	Fuel Consumer Unit Class	C _f CO ₂ [$\frac{\text{gCO}_2}{\text{gFuel}}$]	C _f CH ₄ [$\frac{\text{gCH}_4}{\text{gFuel}}$]	C _f N ₂ O [$\frac{\text{gN}_2\text{O}}{\text{gFuel}}$]	C _{slip} 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	-	
	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	-	

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 _f CO ₂ [$\frac{gCO_2}{gFuel}$]	C _f CH ₄ [$\frac{gCH_4}{gFuel}$]	C _f N ₂ O [$\frac{gN_2O}{gFuel}$]	C _{slip} As % of the mass of the fuel used by the engine
Fossil	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				2,6
	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	
	NH3 (natural gas)	0,0186	121	Fuel Cells	0	N/A	TBM	N/A
				ICE	0	N/A	TBM	N/A
	Methanol (natural gas)	0,0199	31,3	ALL ICES	1,375	TBM	TBM	-

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 _f CO ₂ [$\frac{gCO_2}{gFuel}$]	C _f CH ₄ [$\frac{gCH_4}{gFuel}$]	C _f N ₂ O [$\frac{gN_2O}{gFuel}$]	C _{slip} As % of the mass of the fuel used by the engine	
Biofuels	Ethanol Production Pathways of Directive (EU) 2018/2001	Value as set out in Annex III of Directive (EU) 2018/2001	$E - \frac{C_f CO_2}{LCV}$	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)					3,1
				LNG Otto (dual fuel slow speed)	2,750	0	0,00011	1,7	
				LNG Diesel (dual fuels)				0,2	
				LBSI				2,6	

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 _f CO ₂ [$\frac{gCO_2}{gFuel}$]	C _f CH ₄ [$\frac{gCH_4}{gFuel}$]	C _f N ₂ O [$\frac{gN_2O}{gFuel}$]	C _{slip} As % of the mass of the fuel used by the engine
	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	-
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	Ref. to Directive (EU) 2018/2001)	ALL ICES	3,206	0,00005	0,00018	-
	e-methanol	0,0199	Ref. to Directive (EU) 2018/2001)	All ICES	1,375	TBM	TBM	-
	e-LNG	0,0491	Ref. To 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				2,6				

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 _f CO ₂ [$\frac{gCO_2}{gFuel}$]	C _f CH ₄ [$\frac{gCH_4}{gFuel}$]	C _f N ₂ O [$\frac{gN_2O}{gFuel}$]	C _{slip} As % of the mass of the fuel used by the engine	
	e-H2	0,12	Ref. to Directive (EU) 2018/2001)	Fuel Cells	0	0	0	-	
				ICE	0	0	TBM		
	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 fuels, liquid biofuels, gaseous biofuels and 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 in [MJ/g]. For liquid biofuels, values of energy content by weight (lower calorific value, MJ/kg) as set out in Annex III to Directive (EU) 2018/2001 shall be converted in [MJ/g] and used.

Column 4 contains the WtT GHG emission factors in [gCO_{2eq}/MJ]:

- (a) 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 to that Directive for all liquid biofuels except bio-LNG and Part B of Annex VI to that Directive for bio-LNG, and on the basis of default values related to the particular biofuel used as a transport fuel and its production pathway, laid down in that Directive, Parts D and E of Annex V to that Directive for all liquid biofuels except bio-LNG and in Part D of Annex VI to that Directive 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 under this Regulation, which separates the WtT and the TtW calculations, to avoid double counting of emissions;
- (b) For RFNBO and other fuels not referred to in point (a) to be taken into account for the purpose referred to in Article 4(1) of this Regulation, default values are to be either calculated by using the methodology of the delegated act referred to in Article 28(5) of Directive (EU) 2018/2001, or, if applicable, a similar methodology if defined under a Union legal act concerning the internal markets in renewable and natural gases and in hydrogen, pursuant to Article 10(1) and (2) of this Regulation.

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, 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 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 the 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.

ANNEX III

General requirements for zero-emission technologies

The following non-exhaustive table identifies types of technologies as well as general requirements for their operation to be considered as zero-emission technologies within the meaning of Article 3, point (7).

Types of technology	General requirements for operation
Fuel cells	Power supplied by onboard fuel cells with a fuel or a system ensuring that, when used to provide energy, it does not release any emissions referred to in Article 3, point (7), into the atmosphere
On-board electrical energy storage	Power supplied by on-board electrical energy storage systems previously charged via: <ul style="list-style-type: none">— onboard power generation at sea— shore side battery charging— battery swapping
On-board power generation from wind and solar energy	Power supplied by on-board renewable energy sources, either directly supplying to the ship grid or via charging of on-board intermediate electrical energy storage

Power supplied by on-board technologies not identified in this table that achieve zero emissions, within the meaning of Article 3, point (7), can be added to this table by means of delegated acts in accordance with Article 6(6).

The fulfilling of the general requirements indicated above and in Article 6(6) for other technologies as well as of the detailed criteria for acceptance specified in the implementing acts referred to in Article 6(7), is to be proved by relevant documentation.

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ANNEX IV

Formulas for calculating the compliance balance and FuelEU penalties laid down in Article 23(2)

A. Formulas for calculating the ship's compliance balance

- (a) For the purpose of calculating the compliance balance of a ship for GHG intensity as referred to in Article 4(2), the following formula shall apply:

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

gCO _{2eq}	Grams of CO ₂ equivalent
GHGIE _{target}	GHG intensity limit of the energy used on-board a ship according to Article 4(2)
GHGIE _{actual}	Yearly average of the GHG intensity of the energy used on-board a ship calculated for the relevant reporting period

For any ship having the ice class IC, IB, IA or IA Super or an equivalent ice class, the company may request, until 31 December 2034, to exclude the additional energy consumption, due to sailing in ice conditions.

For any ship having the ice class IA or IA Super or an equivalent ice class, the company may request to exclude the additional energy consumption, due to the technical characteristics of the ship.

For both cases in which additional energy consumption is excluded, the calculation of the compliance balance above, the values of M_i shall be replaced by the adjusted mass of fuel M_{iA} defined in Annex V and the value of GHGIE_{actual} to be used for calculating the compliance balance shall be recalculated with the corresponding values of M_{iA}.

- (b) For the purpose of calculating the compliance balance of a ship with respect to the subtarget for RFNBO according to Article 5(3), the following formula shall apply:

CB _{RFNBO} [MJ] =	$(0,02 \times (\sum_i^{n_{fuel}} M_i \times LCV_i)) - (\sum_i^{n_{RFNBO}} M_i \times LCV_i)$
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Where:

CB _{RFNBO}	Compliance balance in MJ of RFNBO subtarget referred to in Article 5(3)
$\sum_i^{n_{RFNBO}} M_i \times LCV_i$	Annual sum of energy used from RFNBO and/or from fuels providing equivalent GHG emissions savings referred to in Article 5

B. Formula for calculating the FuelEU Penalties laid down in Article 23(2)

The amount of the FuelEU penalties laid down in Article 23(2) shall be calculated as follows:

(a) FuelEU penalty with respect to compliance balance for GHG intensity of the ship according to Article 4(2)

FuelEU Penalty =		$\frac{ \text{Compliance Balance} }{\text{GHGIE}_{\text{actual}} \times 41\,000} \times 2\,400$	
1.	FuelEU Penalty	2.	Is in EUR
3.	Compliance Balance	4.	Is the absolute value of the compliance balance
5.	41 000	6.	Is 1 metric ton of VLSFO that is equivalent to 41 000 MJ
7.	2 400	8.	Is the amount to be paid in EUR per equivalent metric ton of VLSFO

(b) FuelEU penalty with respect to the subtarget for RFNBO according to Article 5(3)

If $\text{CB}_{\text{RFNBO}} \geq 0$, the amount of the FuelEU penalty as referred to in Article 23(2) shall be calculated as follows:

FuelEU Penalty (RFNBO) =		$\frac{\text{CB}_{\text{RFNBO}}}{41\,000} \times P_d$	
9.	FuelEU Penalty	10.	Is in EUR
11.	CB_{RFNBO}	12.	Is the value of the compliance balance for RFNBO
13.	P_d	14.	Price difference between RFNBO and fossil fuel compatible with ship installation
15.	41 000	16.	Is 1 metric ton of VLSFO that is equivalent to 41 000 MJ

ANNEX V

Calculation of adjusted mass of fuel for ice navigation

This Annex describes how to calculate:

- the additional energy consumption due to technical characteristics of a ship having the ice class IA or IA Super or an equivalent ice class
- the additional energy consumption of 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 [Mi 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;

$E_{\text{additional due to ice conditions}}$ denotes the additional energy consumption due to sailing in ice conditions.

The total energy consumed for all voyages is calculated as follows:

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

Where:

$M_{i, \text{voyages, total}}$ denotes the mass of fuel i consumed for all voyages within the scope of this Regulation and;

LCV_i the lower calorific value of fuel i.

Additional energy due to sailing in ice conditions

The additional energy consumption of a ship having the ice class IC, IB, IA or IA Super or an equivalent ice class 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;

$E_{\text{voyages, ice conditions, adjusted}}$ denotes the adjusted energy consumed in ice conditions.

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

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:

$E_{\text{voyages, ice conditions}}$ 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:

$M_{i,\text{voyages,ice conditions}}$ denotes the mass of fuel i consumed for sailing in ice conditions, within the scope of this Regulation.

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

$$E_{\text{voyages,ice conditions,adjusted}} = D_{\text{ice conditions}} \times \frac{E}{D_{\text{open water}}}$$

Where:

$D_{\text{ice conditions}}$ denotes the aggregated distance travelled when sailing in ice conditions within the scope of this Regulation.

$\frac{E}{D_{\text{open water}}}$ is the energy consumption per distance travelled in open water calculated as follows:

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

Where:

$E_{\text{voyages,ice conditions}}$ denotes the energy consumption when sailing in ice conditions and;

D_{total} is the aggregated annual distance travelled within the scope of this 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 $E_{i,\text{additional ice}}$ to the different fuels i used during the year, with the following conditions:

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

For each fuel i ,

$$E_{i,\text{additional ice}} \leq M_i \times \text{LCV}_i$$

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

$$M_{i,A} = M_i - \frac{E_{i,\text{additional ice}}}{\text{LCV}_i}$$
