European Commission

Mobility and Transport

Questions and Answers on Regulation (EU) 2023/1805 on the use of renewable and low-carbon fuels in maritime transport, and amending Directive 2009/16/EC

General

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, is a fundamental cornerstone to support the transition towards more sustainable modes of transport, and to put the Union on track for the full decarbonisation of the transport sector by 2050.

The uniform application of FuelEU Maritime to all commercial ships above 5,000GT calling at EU Ports is of critical relevance for the promotion of a level playing field amongst stakeholders in the maritime value chain, including shipping companies, competent authorities, verifiers, accreditation companies, port authorities, equipment manufacturers, fuel suppliers, and bunkering operators, amongst others.

Even if the present Q&A was drafted by the services of the Directorate-General for Mobility and Transport of the European Commission it reflects questions and feedback received from the members of the European Sustainable Shipping Forum (ESSF) – the European Commission's main expert group

within the field of alternative fuels infrastructure – and other key maritime stakeholders.

However, the Q&A does not commit the European Commission. Moreover, it can in no way alter the legal effects of FuelEU Maritime and is without prejudice to the prerogatives of the European Court of Justice, which alone is empowered by the Treaties to interpret Union legislation with binding effect.

Article 1 - Subject matter and objective

Article 1

Question 1.1: What are the primary obligations and timelines introduced by the FuelEU Maritime Regulation for involved parties?

Regulation EU 2023/1805 (FuelEU Maritime Regulation) establishes two core obligations for vessels calling at EU ports:

1. Greenhouse Gas (GHG) Intensity reduction: There are specific targets for reduction of the yearly average GHG intensity of the energy used on board by ships, set in 5-year steps, ranging from 2% in 2025 to 80% in 2050. (Article 4)
2. Mandatory Use of Alternative Power Sources in Ports: Ships must use either on-shore power supply (OPS) or zero-emission technologies while at berth. (Article 6)

Compliance steps for shipping companies include:

- Monitoring Plan Submission: By 31 August 2024, companies are required to submit a monitoring plan for each ship in their fleet. (Article 8)
- Monitoring Requirements: From 1 January 2025, companies are required to record data for each of their ships' arrivals and departures at EU ports, in particular (Article 15):
    - Ports of departure and arrival, with dates and times, including duration of stay at berth;
    - Connection to on-shore power supply (OPS) or the application of relevant exceptions, detailing fuel consumption at berth and at sea;
    - The amount of electricity received through OPS;
    - For each fuel type used, report well-to-tank and tank-to-wake emission factors for combusted and slipped fuels, encompassing all relevant greenhouse gases;
    - The amount of each type of substitute source of energy consumed both at berth and at sea;
    - If applicable, the ship's ice class and information about voyages undertaken in ice conditions.
- Annual Reporting: By 31 January of each verification period, a ship-specific 'FuelEU report' must be provided to the verifier. (Article 15(3))
- Additional Requirements for Zero emissions at Berth for Containerships and Passenger Ships above 5,000GT (Article 6):
    1. From 1 January 2030 for EU ports covered by the Alternative Fuels Infrastructure Regulation (AFIR).
    2. From 1 January 2035 for all EU ports equipped with OPS facilities.

Question 1.2: Who is the entity responsible for ensuring compliance with FuelEU Maritime Regulation, defined as “the company” in Article 3(13) of the Regulation?

The entity responsible for ensuring compliance with FuelEU Maritime Regulation should be the entity that is responsible for compliance of the ship with the International Safety Management Code (ISM Company). This is the company assuming responsibility for the operation of the ship and taking on all the duties and responsibilities imposed by the International Management Code for the Safe Operation of Ships and for Pollution Prevention, transposed in Union by virtue of Regulation (EC) No 336/2006 on the implementation of the International Safety Management Code within the Community and repealing Council Regulation (EC) No 3051/95.

In practice, this entity can be either the shipowner, or any other entity organisation and person, distinct from the shipowner.

Where a shipowner is responsible for the compliance of its ship with the ISM Code, there is no “ISM company” distinct from the shipowner. In this case the shipowner is also the “ISM company” and it is also the entity responsible for compliance with the FuelEU.

In cases when the shipowner has delegated the responsibilities to comply with the ISM Code to any other organisation or person, then that organisation or person will become the “ISM company” and it is also the entity responsible for compliance with the FuelEU.

Question 1.3: How are FuelEU Maritime Regulation and the extension of the EU Emissions Trading System (ETS) to maritime transport linked?

FuelEU Maritime Regulation and the EU ETS extension to maritime are complementary regulatory frameworks in the sense that they address, respectively, the two main approaches to reduce greenhouse gas emissions from shipping: 1) low-GHG fuel standard promoting use of decarbonized energy/low-to-zero carbon fuels and 2) improvement of energy efficiency through a cap-and-trade CO_2 pricing system.

While both regulations aim to reduce emissions from the shipping sector, they work in different ways: The EU ETS extension to maritime transport requires shipping companies to buy emission allowances for each tonne of reported CO_2 emitted (or CO_2 equivalent, from 1 January 2026). The system sets a cap on the total emissions from industry, aviation, and shipping combined, thereby encouraging, and incentivising the reduction of CO_2 emissions in these sectors.

FuelEU Maritime Regulation, on the other hand, sets a limit on the GHG intensity of energy used on board ships, establishing a technology-neutral, goal/performance-based regulation. On a life-cycle “Well-to Wake” basis, the use of different fuels/energy sources is possible, as a function of different compliance strategies, for different ship energy systems and operating profiles. In addition, FuelEU Maritime Regulation also sets an obligation for containerships and passenger ships to use on-shore power supply (OPS) or zero-emission technology in EU ports.

Article 2 - Scope

Article 2

Question 2.1: Which ships fall under the scope of the FuelEU Maritime Regulation?

The rules apply to all commercial ships exceeding 5,000 gross tonnes, that serve the purpose of transporting passengers or cargo, irrespective of their flag.

The Regulation identifies different ships falling outside of the scope of application:

- warships, meaning all ships operated by armed forces and used exclusively by governments for military purposes or engaged in crisis response or humanitarian relief operations.
- naval auxiliaries, meaning all vessels engaged in supply operations to military ships, including fuels and cargo, or engaged in crisis response or humanitarian relief operations.
- fish-catching or fish-processing ships, covering a large range of ships engaged exclusively in fishing activities.
- wooden ships of a primitive build,
- ships not propelled by mechanical means, excluding however all sailing ships that are able to be mechanically propelled.
- ships owned or operated by a government and used only for non-commercial purposes.

Question 2.2: How does the Regulation distinguish between intra-EU voyages and voyages between EU/EEA ports and third-country ports (international voyages) or ports in an outermost region of an EU Member State?

The Regulation applies differently to the following three types of voyages (Article 2(1)):

- **Intra-EU Voyages:** The Regulation applies to ships in respect of the entirety of the energy used on voyages between ports under the jurisdiction of Member States.
- **Voyages to or from Outermost Regions:** For voyages that start or end in an outermost region under the jurisdiction of a Member State, the Regulation applies to ships in respect of one half of the energy used.
- **International Voyages:** For voyages between a port under the jurisdiction of a Member State and a port under the jurisdiction of a third country (or vice versa), the Regulation applies to ships in respect of one half of the energy used.

Question 2.3: Will the Regulation apply to EEA countries and ports (Iceland, Norway and Liechtenstein)?

The FuelEU Maritime Regulation is a text with European Economic Area (EEA) relevance, which means that, following incorporation into the EEA Agreement, the Regulation will apply to EU Member States and Iceland, Liechtenstein, and Norway (except Svalbard).

Question 2.4: Which intra-EU voyages can be excluded from the Regulation's requirements, and which conditions must be met for the respective exemptions to be granted?

The Regulation gives Member States the possibility to request exemption to certain intra-EU routes from its scope. These exemptions may apply to the energy used by ships in the following cases:

- Specific routes and ports served by passenger ships, other than cruiseships, connecting a port of a Member State with small islands of the same Member State with population under 200,000 as well as the stay within a port of that island,
- Routes linking different ports located in outermost regions as well as the stay within such a port.
- Passenger ships performing public service obligations/contracts between a port of a Member State that does not share a land border with any other Member State and ports of other Member States; specific routes served by passenger ships providing maritime transport services within the meaning of the EU "cabotage" rules[1] under public service obligations/contracts between the mainland and an island or the cities of Ceuta and Melilla of the same Member State;

The requests for these exemptions must be notified by Member States to the European Commission and will be published by the Commission in the Official Journal of the European Union. They are subject to a time limit, with an expiration date no later than December 31, 2029.

[1] Regulation (EEC) No 3577/92

Question 2.5: Will FuelEU Maritime Regulation reward the adoption of battery-electric technologies onboard ships, either in full-electric arrangements or hybrid-electric?

On-board electrical energy storage is part of the technology groups that are listed in Annex-III as Zero Emission Technologies. This means that electricity withdrawn from onboard batteries, at berth, can be used as alternative to Onshore Power Supply. This is especially relevant to ships under the scope of Article 6 FuelEU Maritime Regulation.

All-electric ships under the scope of FuelEU Maritime Regulation would also be rewarded with zero GHG intensity of the energy used onboard. This, resulting from the application of a zero Well-to-Tank emission factor to electricity supplied at berth when charging the batteries.

For hybrid-electric ships, charged at berth, the benefit would, similarly, come from the use of electric energy supplied with zero Well-to-Tank emission factor. To be noted however that the GHG intensity of the energy used onboard over the entire reporting period will be affected by the fuel choice made for the "non-electrical" part of the on-board energy system.

The zero Well-to-Tank emission factor applied to electricity supplied at berth represents a policy measure in FuelEU Maritime Regulation designed to incentivise use of OPS and electrification.

Question 2.6: Can shipowners use Carbon Capture and Storage (CCS) on board to comply? And how is CCS accounted under the FuelEU Regulation?

At present CCS is not accounted for in the FuelEU Regulation. It is only in the event of future technological progress concerning new GHG abatement technologies, such as onboard carbon capture, that the Commission might assess the possibility to propose some changes, if appropriate. For instance, those might 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, subject to the availability of a verifiable method for monitoring and accounting of the captured carbon.

Article 3 - Definitions

Article 3

Question 3.1: What does the “port of call” refer to exactly under the FuelEU Maritime Regulation and which types of stops are specifically excluded from this definition?

A ‘port of call’ means a port where ships stop to load or unload cargo or to embark or disembark passengers.

The following are not considered a ‘port of call’ (Article 3(10) FuelEU Maritime Regulation):

- The ship stops in the port only for the purpose of
    - refuelling,
    - obtaining supplies,
    - crew relief,
    - dry-dock,
    - making repairs to the ship and/or its equipment
    - taking shelter from adverse weather
- If the ship stops in the port because it is in need of assistance or in distress;
- If the stop is rendered necessary by search and rescue activities;
- If ship-to-ship transfers are carried out outside the port;
- If containerships stop in a neighbouring container transhipment port which is listed in the implementing act under Article 2(2) FuelEU Maritime Regulation.

Question 3.2: How is the energy used in non-EU “ports of transhipment” accounted under FuelEU? Is it counted as energy used at sea or excluded from the scope, as energy used in non-EU port?

In accordance with Article 3(10) FuelEU Maritime Regulation, neighbouring container transhipment ports are excluded from the definition of ports of call. Therefore, stops in ports of transhipment listed in the implementing act adopted pursuant Article 2(2) FuelEU Maritime Regulation do not count as stops in a ‘port of call’. If a stop in a port is not considered a ‘port of call’ then the activities in this port are regarded as part of the voyage. Therefore, the energy used by containerships during a stop in such ports needs to be reported as energy used at sea.

Question 3.3: Articles 3(25) and 3(26) FuelEU Maritime Regulation. What is the difference between ‘electrical power demand at berth’, defined in Article 3(25), and ‘established total electrical power demand of the ship at berth’, as defined in Article 3(26)? Why the need to define these two closely related concepts?

The concept of ‘electrical power demand at berth’ is relevant for the application of Article 6(1) FuelEU Maritime Regulation, where it is important to underline that electrical power to be supplied by shore-side electricity facilities in ports must be sufficient to meet the demand derived from onboard electrical consumers. The ‘electrical power demand at berth’ represents a variable value, depending on the power required by the different electrical consumers throughout the stay of the ship at berth.

The *‘established total electrical power demand of the ship at berth’* represents a fixed value which is equivalent to the maximum value of the ‘electrical power demand at berth’. This method allows to calculate estimate precisely the penalty for port calls that are found to be non-compliant.

The value of the ‘established total electrical power demand of the ship at berth’ must be included in the Monitoring Plan (Article 8(2)(e) FuelEU Maritime Regulation) and can be derived in two possible ways:

- **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 the reference for the above, 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;

Even though the electrical power demand at berth represents a value which is dependent on the ship type and specific hotel and service electrical loads associated to its operation at berth, the value derived through the second method described above typically leads to higher values for the ‘established total electrical power demand of the ship at berth.’

Article 4 - GHG intensity limit on energy used on board by a ship

Article 4

Question 4.1: Article 4(2) FuelEU Maritime Regulation Reference Value. How was the reference value of 91,16 grams of CO2 equivalent per MJ determined? Will this value be subject to revision?

The FuelEU Reference Value (FuelEU RV) has been determined based on the fuel consumption data monitored and reported in the framework of EU Monitoring, Reporting and Verification (MRV) Maritime Regulation (Regulation (EU) 2015/757). All ships reporting in THETIS-MRV in 2020 were considered in the calculation of the FuelEU RV. To the extent available, data on the different energy conversion technologies installed on board ships was considered, and the methodology in Annex-I of FuelEU Regulation used to calculate the reference GHG intensity for the energy used by all shops reporting under MRV in 2020. The Reference Value will not be subject to revision. It represents an important reference as the starting point for evaluation of GHG intensity reduction performance for all ships under the scope of FuelEU Maritime Regulation.

Question 4.2: Was the LNG fuelled fleet reporting in MRV Regulation in 2020 considered in the calculation of the Reference Value? How was the GHG intensity for these ships calculated?

Yes, the LNG fuelled fleet reporting in MRV Regulation in 2020 was considered in the Calculation of the Reference Value of 91,16 gCO_2e/MJ. The calculation of the GHG intensity of the LNG fuelled fleet took into consideration the different type of dual-fuel/gas engine installed onboard such ships. With that information it was then possible to apply different default methane slip values (Cslip) as listed in FuelEU Maritime Regulation Annex-II.

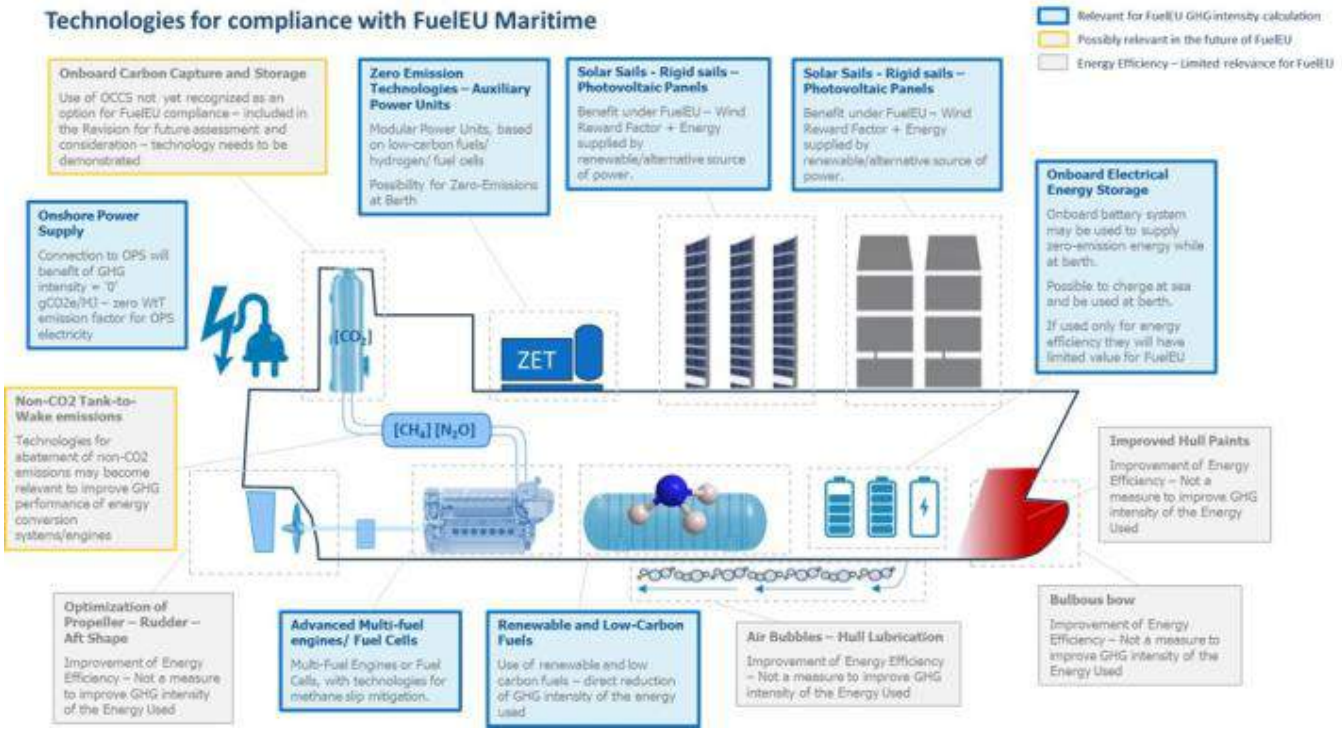
Question 4.3: Which technologies can contribute to the reduction of the GHG intensity of the energy used onboard ships? How do energy efficiency solutions contribute to FuelEU Maritime Regulation compliance?

FuelEU Maritime Regulation is a technology-neutral regulation which provides a performance goal-based framework allowing for different sustainable energy system combinations, including (but not limited to) renewable and low-carbon fuels, energy conversion systems, onshore power supply, or wind assisted propulsion.

Energy efficiency technologies, alone, are not directly relevant for the reduction of the GHG intensity of the energy used onboard. While they may have an impact in the FuelEU Compliance Balance calculation, they have no influence in the reduction of the GHG emissions per unit of energy used.

The figure below illustrates a group of technologies which can be directly linked to FuelEU Maritime Regulation compliance (in blue boxes), and some of those that may be considered primarily relevant for energy efficiency (in grey boxes).

Abatement technologies (for either CO2 or non-CO2 GHG emissions) may potentially become relevant in the future.



Question 4.4: Will Onboard Carbon Capture and Storage (OCCS) be a possible technology for the reduction of the GHG intensity of the energy used onboard?

Onboard Carbon Capture and Storage is not part of the technologies contributing to compliance under FuelEU Maritime Regulation.

FuelEU Maritime Regulation is primarily designed to promote the use of renewable and low-carbon fuels in shipping. The possibility to use onboard carbon capture and storage (OCCS) in support of a continuation of use of fossil fuels onboard ships. Notwithstanding this, OCCS may become an important technology, remarkably in the context of use of biogenic and synthetic renewable fuels, where OCCS may play an important role in the capturing and recycling of biogenic and synthetic renewable carbon.

The non introduction of OCCS in FuelEU Maritime Regulation was also due to the lack of maturity, evidence of demonstrated results and unavailability of an international framework to allow traceability and transparency for fate and long-term sequestration of onboard captured CO_2.

In the event of technological progress concerning OCCS, and in accordance with Article 30 of the FuelEU Maritime Regulation, 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.

Article 5 - Use of Renewable Fuels of Non-Biological Origin (RFNBO)

Article 5

Question 5.1: How does the Commission follow the share of RFNBO in the yearly energy used on board by ships, as outlined in Article 5(2) FuelEU Maritime Regulation?

The Commission monitors, calculates, and annually publishes the share of RFNBO in the yearly energy used on board by ships based on data recorded in the FuelEU database, with publication taking place at the latest 18 months after the end of each reporting period.

Question 5.2: Under what conditions does the subtarget for RFNBO not apply, and what factors might trigger this exemption? And, in case the RFNBO subtarget applies, under which conditions may ships be exempted to use RFNBOs?

The subtarget for RFNBO does not apply if there is evidence, following the Commission's assessment, of insufficient production capacity and availability of RFNBOs, uneven geographical distribution, or a too high price of those fuels, according to Article 5.

In case the RFNBO subtarget applies, as from 2034, it 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.Article 6 – Additional zero-emission requirements for energy used at berth.

Article 6 - Additional zero-emission requirements for energy used at berth

Article 6

Question 6.1: Do the additional requirements for zero-emissions at berth also require boilers to be switched off?

The requirements for zero-emissions at berth apply to all electrical power needs at berth. Thermal boilers, not powered by electricity, do not fall under the requirements for zero-emissions and do not have to be switched off. Ships operating gas or oil-fired boilers, for either hot water, vapour services or other purposes, at berth, will not have to switch them off.

Connection to OPS is intended to cover all 'electrical power demand at berth', which in accordance to Article 3(25) FuelEU Maritime Regulation means the demand for electricity of a ship at berth for meeting all energy needs based on electricity on board. Fuel consumption in boilers, while at berth, will nevertheless have to be reported for GHG intensity calculations, covering energy used in EU ports.

Question 6.2: Will the requirements for the use of OPS or zero emission technologies at berth (Article 6 FuelEU Maritime Regulation) apply to General Cargo ships carrying containers, e.g., General Cargo and Containers (Genco) and General Cargo, Containers and Roll-on/Roll-off (GenConRo)?

No. These requirements will apply only to ships carrying exclusively containers, as defined in Article 3(31) and passenger ships, as defined in Article 3(29) of the Regulation. Cruise Passenger ships as defined in Article 3(30) FuelEU Maritime Regulation, as a sub-type of Passenger ships, are also in the scope of this requirement.

Question 6.3: What criteria determine whether a ship should connect to an on-shore power supply?

Starting from 1 January 2030, containerships and passenger ships under the scope of Art. 2 FuelEU Maritime Regulation, at berth, moored at the quayside, in a port covered by the Article 9 of the AFIR Regulation must connect to on-shore power supply and use it for all of their electrical power demand at berth.

From 1 January 2035 onwards, the same rule applies to ships at berth in any port that develops OPS capacity.

In addition, from 1 January 2030 to 31 December 2034, Member States may apply the obligation for containerships and passenger ships under the scope of Art. 2 FuelEU Maritime Regulation, at berth, moored at the quayside, in a port (or parts of that port) not covered by the Article 9 of the AFIR Regulation.

Question 6.4: What are the exceptions to the obligation to connect to OPS?

Some situations do not require using on-shore power supply (OPS), as stated in Article 6(5) FuelEU Maritime Regulation. These exceptions are:

- Short stays of less than two hours moored at the quayside (calculated based on arrival and departure times, as per Article 15).
- When a zero-emission technology is used instead of OPS.
- Unplanned port calls due to unforeseen circumstances for reasons of safety or saving life at sea, not under the ship's control and not on a systematic basis.
- Inability to connect to OPS due to reasons like unavailability of OPS connection points in a port, insufficient available shore-power because of electrical grid stability issues (network provider limitations), or incompatibility of OPS connection between on board and shore side equipment (provided that the installation on board of the ship is certified in accordance with technical specifications set out in Annex II of the AFIR).
- Limited time during onboard energy generation is required due to emergencies representing immediate risk to life, the ship or the environment, or maintenance and functional tests carried out at the request of a competent authority or a recognised organisation undertaking a survey or inspection.

Question 6.5: If, due to unforeseen circumstances, an initially planned port call of less than 2 (two) hours takes longer than expected, and no OPS connection has been made, will that port call be considered non-compliant? If, for example, the total duration of the port call extends to 2 hours and 15min, how will the compliance of that port call without OPS be assessed? If the respective delay was motivated by unforeseen causes, or by third parties, how should a possible remedial penalty (...)

(...) be compensated?

The exception related to short stays at berth, of less than 2 hours (minimum time required for connection) is meant for quick stops, such as those performed during passenger ferry operations. The 2 hours limit is set as a reference time during which, due to connecting and disconnecting operations, the time effectively connected to shore-power is of minimum cost-benefit.

With the calculation of the time spent at berth based on arrival and departure times, following Article 15, any possible unexpected delay going beyond the 2-hour period would deem the exception in Article 6(5)(a) not applicable.

A ship that becomes aware of the possibility of staying longer than the required 2-hour exemption period, following conclusion that no other exception listed in Article 6(5) should consider requesting for an OPS connection in order to avoid the possibility of a penalty.

Regarding the possibility of a compensation from a 3rd responsible party/parties for the delay, such possibility will depend on the remedies available under national legislation.

Question 6.6: What are the zero-emission technologies that can be considered as alternative to the use of OPS?

The use of OPS reduces air pollution and direct/tailpipe GHG emissions from ships while at berth. Zero Emission Technologies allowing for an exception to connect to OPS, as per exception in Article 6(5)(b), would have to allow for an equivalent benefit in terms of air pollution and GHG emissions. Therefore, in accordance with Article 3 (7) FuelEU Maritime Regulation, zero-emission technologies that can exempt ships from the obligation to use OPS must not release the following greenhouse gases and air pollutants when used as an alternative for OPS: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulphur oxides (SO_X), nitrogen oxides (NO_X) and particulate matter (PM).

Annex III of the FuelEU Regulation provides a non-exhaustive table, identifying eligible zero-emission technologies, specifying both, the type of technology as well as the general requirements for their operation.

By means of delegated acts, the Commission is empowered to add other types of technologies that do not release the above-mentioned greenhouse gases and air pollutants as zero-emission technologies to this table. By means of implementing acts, the Commission will specify detailed criteria for acceptance of the technologies and the way they are operated to be considered as fulfilling the general requirements of zero-emission technologies provided for in Annex III (including the definition of system boundaries and certification requirements).

Question 6.7: What if a specific zero-emission technology proposed by an operator is not listed in Annex-III of the FuelEU Maritime Regulation?

Only the use of zero-emission technologies included in Annex-III and certified according to the rules in Article 6(7) will enable the application of the exception to connect to OPS described in Article 6(5)(b).

Power supplied by on-board technologies not identified in this table that achieve zero emissions, within the meaning of Article 3, point (7), can still 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.

Question 6.8: FuelEU Article 6(5)(f) refers to AFIR with respect to Technical Specification and Standards for OPS interoperability and interconnectivity. AFIR Annex II, point 5.1 on technical specifications of on-shore power supply (OPS) for seagoing ships, obliges OPS to comply with the technical specifications of standard IEC/IEEE 80005-1:2019/AMD1:2022. In case an OPS system does not comply with the required standard but works perfectly, does the manager have to dismantle it to build a (...)

(...) new OPS system which will be standard compliant but maybe not appropriate for that specific case? This could happen in some ports, especially for ferries with tailormade solutions.

International Standard IEC/IEEE 80005-1:2019/AMD1:2022 applies to all High-Voltage Shore Connection Systems. Sections 1 to 12 of the standard apply entirely to all types of HVSC systems, even if tailor-made for specific dedicated ship-shore arrangements, such as proprietary arrangements for regular call of same ship at same shore-power supply.

Interconnectivity arrangements (socket-plug connection) may differ depending on ship type, as explained in the normative Annexes of IEC/IEEE 80005-1. The described geometries/socket-plug arrangements for interconnectivity are defined strictly to ensure that different ships can connect to different ports OPS supply points. If a different geometry, of proprietary arrangement, in dedicated ship-shore arrangement, is defined and working well there is no need to change the connectivity arrangements. The system has, nevertheless, to comply with all provisions in Sections 1 to 12 of IEC/IEEE 80005-1, as they relate to Safety.

Existence of OPS system arrangements consisting of different technical interconnectivity details should not lead to market restrictions and hinder new entrants and ships. As long as Sections 1 to 12 of IEC/IEEE 80005-1 a certificate of compliance with the standard should be possible to issue. An example of such arrangements may be the introduction of an automated OPS system, involving unmanned connection operations and ship/port-specific socket-plug geometries.

To be noted that specific tailor-made OPS solutions would, in principle, cover the connection of specific ship-shore arrangements between ship and port/berth/terminal location. This is the specific case of Ro-Pax where fast turn-around times may lead to the development of fast-connection/disconnection systems.

Question 6.9: Are the exceptions to the requirement to connection to onshore power supply based on conditions at the port of call?

Some of the exceptions to the obligation to connect to onshore power supply, listed in Article 6(5), are related to the conditions at berth, at the port of call, notably:

- Unavailable OPS connection in the port, at the specific berthing position allocated by the port – Article 6(7)(d)
- Lack of sufficient, or sufficiently stable, power supplied from OPS – Article 6(7)(e)
- Incompatibility between port and ship OPS 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 of AFIR Regulation for the shore-connection systems of seagoing ships – Article 6(7)(f)

Question 6.10: Will exception to connect to OPS, based on unavailable OPS connection in port, insufficient shore-power power available or incompatibility, be applicable without limitations?

No. Limits to the application of the exception related to unavailable shore power in the port of call will be applied as from 1 January 2035.

In AFIR ports exceptions provided for in Article 6(5), points (d), (e) and (f) will be limited to:

- 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, or
- maximum of 10 port calls during the relevant reporting period, whichever is lower.

Where a company demonstrates 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), on the basis of the exchange of information provided for in paragraph 8, the limits will not apply.

Article 8 - Monitoring plan

Article 8

Question 8.1: What specific information must be included in the monitoring plan (MP)?

The FuelEU Monitoring Plan must include the following information:

- Ship’s type, name, IMO identification number, shipowner name and information of the shipping company (name, phone, email details of contact person), port of registry or home port
- Description of energy conversion systems installed onboard, related power capacity (in megawatts)
- For ships falling under some categories, a description of the standards and characteristics of equipment for connection to Onshore Power Supply (OPS) or a zero-emission technology.
- Description of planned sources of energy which will be used on board while in navigation and at berth.
- Description of procedures for monitoring the fuel consumption of the ship.
- Description of procedures used to monitor the completeness of the list of voyages.
- 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;
- Explanation of how the data is updated in the monitoring plan during the reporting period, including the procedures, systems, and responsibilities involved.
- Description of the method to be used to determine data that can be used for closing data gaps or for identifying and correcting data errors;
- Revision record sheet to record all details of the revision history;
- A revision record sheet to record all details of the revision history.
- Information on the ship’s ice class if the company requests to exclude additional energy used in ice conditions.
- Clear explanation how you will monitor the distance the ship travels in icy conditions in specific cases, and make sure there is a reliable procedure in place.
- Description of wind-assisted propulsion equipment for ships equipped with such technology.

Question 8.2: Will it be necessary to make separate monitoring plans for EU-ETS and FuelEU?

Yes. Two separate sets of required Monitoring Plan elements (in MRV and FuelEU) will, in practice require submission of two Monitoring Plans meeting requirements under both Regulations. Each submitted Monitoring Plan will follow independent workflow processes.

In practice, however, once uploaded in the FuelEU database, the Monitoring Plans will, together, allow for complementary submission of relevant data for both MRV/ETS and FuelEU. All monitored and recorded data under MRV will be used for FuelEU calculations, subject to confirmation by FuelEU Verifier, if different from the MRV Verifier.

Article 10 - Certification of fuels and emission factors

Article 10

Question 10.1: Will Mass Balance and Book & Claim (B&C) certification be possible for fuels eligible under FuelEU and listed in Article 10(1)?

FuelEU Maritime Regulation makes use of the relevant EU Renewable and Low-Carbon energy certification framework to specify the certification requirements for the renewable fuels, or low-carbon synthetic fuels.

A Mass Balance based certification is not only possible, but also the very principle that RED certification is based on, in accordance with the RED provisions for Fuel Certification (ref to Article 30 of Directive 2018/2001)

The Mass Balance method:

1. allows consignment renewable fuels (biofuels or RFNBO/RCF) with differing sustainability characteristics to be mixed,
2. requires information about the sustainability characteristics and sizes of the consignments referred to in point (1) to remain assigned to the mixture and,
3. provides for the sum of all consignments withdrawn from the mixture to be described as having the same sustainability characteristics, in the same quantities, as the sum of all consignments added to the mixture.

To be noted the concept of "mixture". The Mass Balance only allows mixtures/blends of fuels with similar/blendable characteristics. To this extent a bio-blend B30, e.g., consisting of Marine Diesel mixed with 30% HVO (Hydrotreated Vegetable Oil), could count with mass-balance for the certification of the HVO part.

RED allows for a fuel to be certified on a mass balance basis, even though the actual bio molecules are not to be delivered to the ship and are instead placed for other users to consume. The GHG intensity "credits" associated to the molecules are however traced and will only be counted once.

Book & Claim certification would allow the possibility for complete separation of sustainability certification credits to be separated from the fuel molecules and be traded globally. A 100% fossil fuel bunkered in EU could, through B&C, make use of sustainability certification from a biofuels or green renewable fuel produced anywhere around the World. This separation of fuel molecules from their sustainability characteristics would lead to high-risk potential for double-counting and erroneous claims of GHG reduction credits.

Whilst "Mass Balance" represents a core concept of RED certification, the **"book and claim" does not**. There is no regulatory support or relevant legal instrument which allows for "book and claim". Please see the table below with a comparison between the different tracking processes. RED applies "mass balancing".

Simplified diagram of "mass balancing" compared to other tracking processes:

Options for traceability chain	Information about the biomass properties ("certificate"/delivery slip) for every consignment	The biomass can be completely traced back to cultivation/origin	Complete separation of certified and non-certified biomass at one site
"book & claim" process	YES	NO	NO
"Mass balancing"	**YES**	**YES**	**NO**
"Identity preservation (hard/soft IP)"	YES	YES	YES

Question 10.2: Which emission factors should be applied for traditional bunker oil fossil fuels? Should fossil fuels also need to be certified under an accredited scheme (and certificate added to the BDN)? Or do they only need to be certified when other values than the default ones are being used (for WtT and TtW)?

The default emission factors to be used in calculation of the FuelEU GHG intensity of the energy used onboard ships, are specified in Annex II of the FuelEU Regulation. For traditional bunker oil fossil fuels, the distinction is made based on the grade as specified by ISO 8217.

Fossil fuels are not required to be provided with sustainability certification as they are out of the scope of any sustainability certification framework. Also, the complement to BDN mentioned in Annex-I of FuelEU is only applicable to fuels other than fossil fuels.

In addition, actual emission factor values for Well-to-Tank (WtT), and Tank-to-Wake (TtW) CO2 emissions from combustion, are not a possibility under FuelEU Maritime Regulation, as prescribed in Article 10, paragraphs 4 and 5, respectively.

Biofuels or synthetic fuels not meeting the requirements in the Renewable Energy Directive, Union legal acts concerning the internal markets in renewable and natural gases and in hydrogen or FuelEU Maritime Regulation, as applicable, will be given the default emission factor corresponding to the least favourable fossil fuel pathway for the type of fuels in question.

Question 10.3: Would ships making use only of fossil fuels be able to comply with FuelEU Maritime Regulation after 2025? How would the calculation of the GHG intensity of the energy used onboard ships result in the case only fossil fuels are used.

Compliance with FuelEU Maritime Regulation is not an exercise solely based on the choice of fuels to be used. It is also important to consider the use of onshore power supply, wind assisted propulsion, or even flexibility mechanisms.

If only fossil fuels are used by a ship during a reporting period, without any additional measure to reduce the GHG intensity of the energy used onboard, it is important to distinguish between oil fossil fuels and gaseous fossil fuels such as Liquefied Natural Gas (LNG) or Liquefied Petroleum Gas (LPG). While the use, alone, of fossil oil fuels, residual or distillate, will no longer allow for compliance for the period 2025-2029, the use of LNG or LPG may still allow for compliance, depending on the energy system used and type and amount of pilot fuel.

The default emission factors to be used in calculation of the FuelEU GHG intensity of the energy used onboard ships, are specified in Annex II of the FuelEU Regulation. For traditional bunker oil fossil fuels, the distinction is made based on the grade as specified by ISO 8217. For LNG the default emission factors are included also in Annex-II, being only possible to replace them by actual emission factors for the case of Tank-to-Wake non-CO2 emissions, subject to the provisions in FuelEU Maritime Article 10(6). LPG, included also in Annex-II.

Below, simplified calculations are provided to demonstrate how the use of specific fossil fuels would impact in the GHG intensity calculations of the energy used onboard. If the well-to-wake emission factors are determined based on the default values only, then the following values hold, per unit of energy:

HFO (ISO 8217 Grades RME to RMK):

$$13.5\frac{gCO2eq}{MJ} + 76.89\frac{gCO2}{MJ} + 0.0012 * 25\ \frac{gCO2eq}{MJ} + 0.0044 * 298\frac{gCO2eq}{MJ} = \mathbf{91.74}\ \frac{gCO2eq}{MJ}$$

LFO (ISO 8217 Grades RMA to RMD):

$$13.2\frac{gCO2eq}{MJ} + 76.85\frac{gCO2}{MJ} + 0.0012 * 25\ \frac{gCO2eq}{MJ} + 0.0044 * 298\frac{gCO2eq}{MJ} = \mathbf{91.39}\ \frac{gCO2eq}{MJ}$$

MDO and MGO (ISO 8217 Grades DMX to DMB):

$$14.4\frac{gCO2eq}{MJ} + 75.08\frac{gCO2}{MJ} + 0.0012 * 25\ \frac{gCO2eq}{MJ} + 0.0042 * 298\frac{gCO2eq}{MJ} = \mathbf{90.77}\ \frac{gCO2eq}{MJ}$$

Where, the different terms in the above formulas stand for:

- **1st term**: emission factor reflecting the Well-to-Tank (WtT) emissions,
- **2nd term**: emission factor for Tank-to-Wake (TtW) CO_2 emissions from use of the fuel onboard,
- **3rd term**: emission factor for TtW CH_4 emissions from use of the fuel onboard;
- **4th term**: emission factor for TtW N_2O emissions from use of the fuel onboard;

In the case of Liquefied Natural Gas (LNG), making use of a dual-fuel medium-speed engine, the term associated to emissions of uncombusted non-CO_2 emissions (Cslip) is to be added, with the following formula for the GHG intensity of the energy used onboard, again per unit energy (1MJ LNG à 0.0491g LNG):

LNG (with LNG Otto (dual fuel medium speed engine)):

$$18.5\frac{gCO2eq}{MJ}+\left(1-\frac{3.1}{100}\right)*\left(56.01\frac{gCO2}{MJ}+0*25\ \frac{gCO2eq}{MJ}+0.0022*298\frac{gCO2eq}{MJ}\right)+$$

$$\left(\frac{3.1}{100}\right)*(1)*(25)*\left(\frac{1}{0.0491}\right)=18.5+54.9+15.78=\mathbf{89.18}\ \frac{gCO2eq}{MJ}$$

Where, the different terms in the above formulas stand for:

- **1st term**: emission factor reflecting the Well-to-Tank (WtT) emissions,
- **2nd term**: Multiplication of mass of fuel (excluding slippage) by emission factors for Tank-to-Wake (TtW) CO_2 and non-CO_2 emissions from use of the fuel onboard,
- **3rd term**: Multiplication of mass of gaseous fuel slipped by emission factors/GWP for slipped gaseous fuel.

For the examples presented above and considering the GHG intensity target reduction for 2025 of 2%, we can conclude that a vessel operating on HFO, LFO or MDO/MGO, would not be able to meet the GHG intensity target of 89.34 *gCO2eq/MJ* (Reference Value of 91.16 *gCO2eq/MJ* reduced by 2%). A different conclusion stands for the LNG fuelled ship, using a dual fuel medium speed engine, which can be concluded, for 2025, to marginally compliant.

Question 10.4: Which default emission factors apply to VLSFO?

Default emission factors for fossil oil fuels, in FuelEU Maritime Regulation, are not attributed per sulphur content but, instead, according to their ISO 8217 grade.

Question 10.5: Can actual emission factors be used for fossil fuels, in replacement Which default emission factors can be replaced by actual ones?

Companies are not allowed to diverge from the default values in Annex-II for

- the Well-to-Tank (WtT) emission factors for fossil fuels (Article 10 (4)) and
- the Tank-to-Wake (TtW) CO_2 emission factors for fossil fuels (Article 10 (5)).

The possibility to diverge form default emission factors in Annex-II is granted in the situation highlighted in the table below:

Where can **actual values** be calculated?	Well-to-Tank (WtT)	Tank-to-Wake (TtW)			
		Combustion emission factors			Slippage
		CO_2	**CH_4**	**N_2O**	
Fossil	No (1)	No (3)	Yes (5)	Yes (5)	Yes (5)
Bio	Yes (2)	Yes (4)	Yes (5)	Yes (5)	Yes (5)
Synthetic	Yes (2)	Yes (4)	Yes (5)	Yes (5)	Yes (5)

(1) – WTT for fossil fuels – always DEFAULT.

(2) – WTT for bio/RFNBO RED/recast Gas Directive methodologies.

(3) –TTW CO2 emission factor fossil fuels - always default - Article 10 (5).

(4), (5) – ACTUAL VALUE possible if demonstrated by International Standard - Article 10, paragraph 5 and 6.

Question 10.6: How is a reduction of methane slip accounted for under the FuelEU Regulation?

Slippage from different gas/dual-fuel engines is expressed as default slippage emission factors, concretely as a % of the gaseous fuel emitted, non-combusted, by those engines.

Concretely, the table in Annex-II, containing default emission factors, identifies the part of fuel lost as fugitive and slipped emissions (Cslip) 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 in Annex-II is expressed in % of the mass of fuel used.

Since the slippage values are a characteristic of the energy converter/engine, and the possibility for improved emission performance should be rewarded, FuelEU Maritime Regulation opens the possibility to diverge from the default values for the tank-to-wake emission factors for slippage. The actual values would then need to be certified by means of laboratory testing or direct emissions measurements.

Relevant references for demonstration of actual emission factors for CH4, N2O and Cslip will be listed via Implementing Act, pursuant provision in Article 10(6).

Article 14 - Accreditation of verifiers

Article 14

Question 14.1: What standards do verifiers need to comply with in the scope of FuelEU Maritime Regulation?

General provisions focused on activities and accreditation of Verifiers are outlined in Chapter IV of the FuelEU Maritime regulation. General obligations and principles are described in Article 12 of the Regulation, whist Verification procedures are listed in Article 13, further complemented by an Implementing Act on Verification Activities, pursuant to Article 13, paragraph 5.

As regards the Implementing Act on Verification Activities for FuelEU Maritime, this secondary legal act will specify concrete standard procedures to be followed by verifiers operating under FuelEU, including competencies; assessment of the conformity of the monitoring plan and of the modified monitoring plan; risk assessment, including checks; 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.

In addition to the Verification Activities, also the Accreditation of Verifiers is subject of further secondary legislation, further supplementing the FuelEU Regulation with further methods and criteria of accreditation of verifiers. The methods and criteria specified in such delegated acts shall be based on the principles for verification provided in Articles 11, 12, and 13 FuelEU Maritime Regulation and internationally accepted standards.

Article 15 - Monitoring and recording

Article 15

Question 15.1: Can voyages be reported as a cumulative total under the EU MRV Regulation and the FuelEU Maritime Regulation, or must each voyage be reported individually?

Under the EU MRV Maritime Regulation, companies are required to monitor ship data both on a per-voyage basis (Article 9) and annually (Article 10). The annual ship-specific emissions report must contain aggregated data. Starting in 2025, for ships covered by the ETS Directive, companies are also required to submit company-level aggregated emissions data.

The FuelEU Maritime Regulation mandates that ships monitor and record data for each voyage (Article 15). This information is to be compiled in the ship-specific FuelEU Report on an annual basis. Based on this report, verifiers calculate different annual aggregates, such as the ship’s yearly average GHG intensity, following calculation methodology in Annex-I, and the ship’s compliance balance, as outlined in Article 16(4) FuelEU Maritime Regulation.

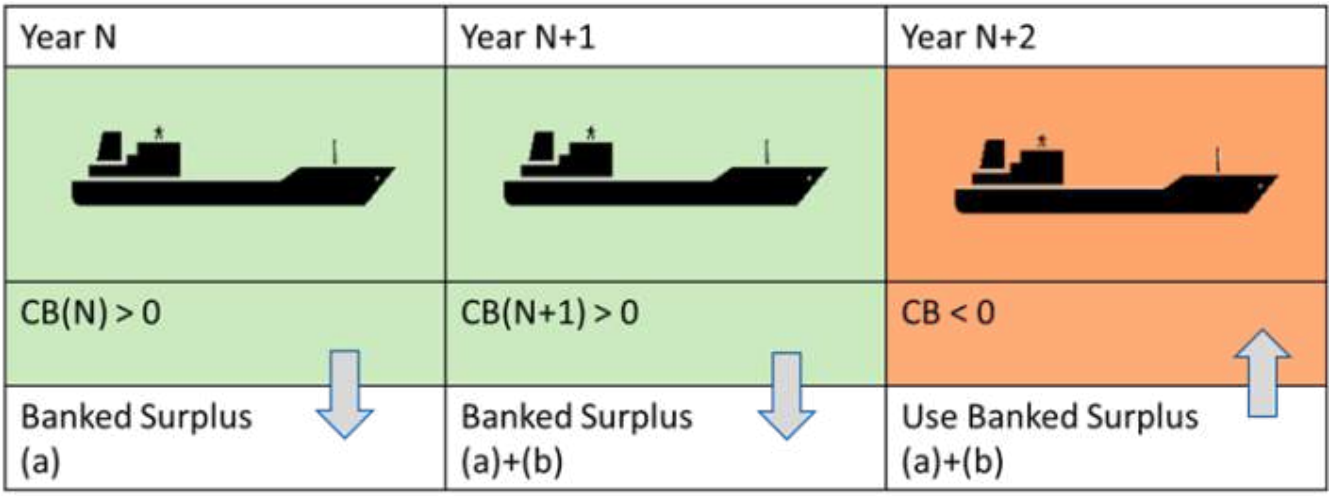
Article 20 - Banking and borrowing of compliance surplus between reporting periods.

Article 20

Question 20.1: How do banking and borrowing mechanisms function under Article 20(1) and 20(2) FuelEU Maritime Regulation? Will there be a general central registry for compliance units, and what are the specifics regarding trading and validity of compliance units?

Banking and borrowing represent two possible flexibility mechanisms available to companies under FuelEU Maritime Regulation, detailed under Article 20, paragraphs 1 and 2, respectively.

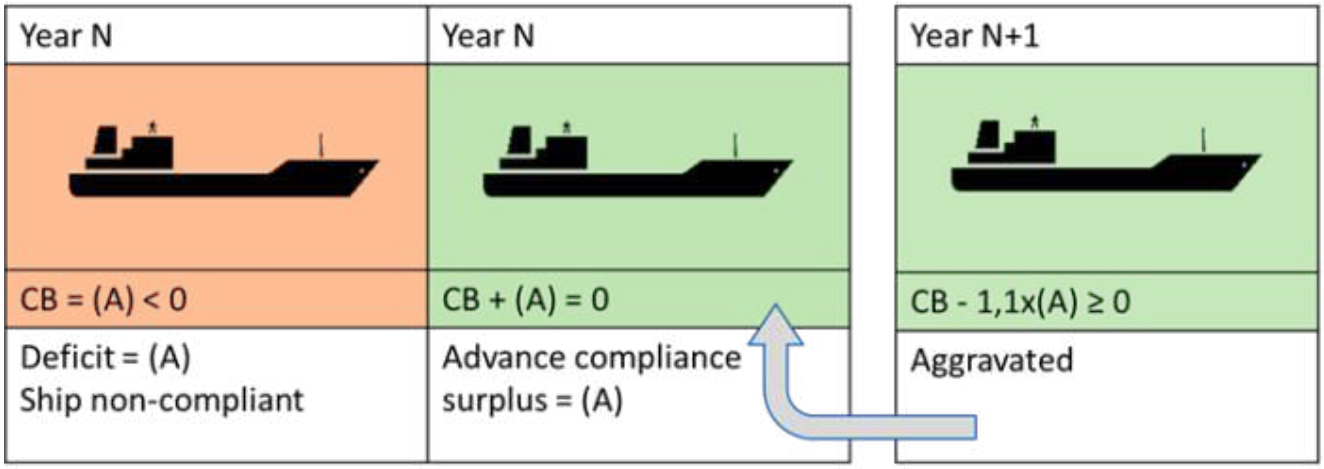
Banking: If, following a specific reporting period, the ship has positive compliance balance, i.e. if the calculated GHG intensity for the energy used onboard is lower than the required, the company may bank this compliance surplus to the following reporting period in the FuelEU database. The figure below illustrates how banking can take place



CB - Compliance Balance
(a) - Compliance Surplus for Year N
(b) - Compliance Surplus for Year N+1

Banking can take place in one, two or more successive years. Banked compliance surplus does not expire. If, for 2 or more successive years, the compliance balance is positive, the surplus gets successively banked, cumulatively, to the following reporting period.

Borrowing: If, for a specific reporting period, a ship has a compliance deficit (i.e. if the calculated GHG intensity for the energy used onboard is higher than the required), the company is allowed to borrow an advance compliance surplus of the corresponding amount from the subsequent future reporting period. This advance compliance surplus, borrowed from the next reporting period, must be of an exact amount corresponding to the compliance deficit calculated. In the accounts, borrowing is handled as follows: The deficit of the reporting period is balanced by means of the advance compliance surplus stemming from the subsequent reporting period, while the borrowed surplus plus a surcharge of 10% will be subtracted from the same ship's compliance balance of the subsequent reporting period. This is demonstrated in the image below.



There will be no central registry for compliance units, with the record of compliance being strictly made and registered in the FuelEU database in each ship account. These will be solely registered in a ship-specific file in the FuelEU database. Surplus units cannot be exchanged between ships, neither between ships of the same company nor between ships of different companies. Only through pooling it will be possible to make use of compliance surplus across with other ships.

A compliance unit is only generated for banking purposes, from the effective compliance balance generated by a specific ship. Once banked in the ship-specific FuelEU account, the compliance units do not expire.

Banking and borrowing are flexibility mechanisms available for both GHG intensity compliance and, if applicable and relevant, also for the RFNBO subtarget compliance.

Article 21 - Pooling of compliance

Article 21

Question 21.1: How is pooling defined under Article 21(1), and it is accessible for all ships within the FuelEU Maritime Regulation?

Pooling represents a flexibility mechanism embedded in the FuelEU Maritime Regulation. It is designed, in one hand, to reward overachievers, with positive Compliance Balances and, on the other hand, to give an opportunity to ships less able to find technical compliance options to comply with FuelEU Maritime Regulation targets. Unlike banking and borrowing, pooling is, by definition, a concept applicable to two ships or more.

The compliance balances for GHG intensity of the energy used onboard and, if applicable, for an RFNBO subtarget of two or more ships, may be pooled for the purposes of complying with the requirements of the Regulation.

Pooling comes with very concrete rules, as detailed in Article 21 of the Regulation:

- 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 the GHG intensity target and the RFNBO subtarget.
- To establish a pool, a company must register its intention in the FuelEU database,
- Pool details, including verifier selection, must be validated by all participating companies.

Pooling will be possible for all ships covered under the scope of the regulation, irrespective of ship type and size.

The possibility to pool will be available to all ships, depending on the availability of overcompliance/overachieving ships ready to give out their compliance surplus to pooling. The establishment of pools will have to be technically confirmed by the FuelEU database.

Question 21.2: Will there be a cost of pooling for ships with prior compliance deficit?

Pooling is a flexibility mechanism in FuelEU Maritime Regulation that allows the over-compliance 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.

FuelEU Maritime Regulation does not establish a cost for companies making use of pooling to comply. This is left to private agreements between companies that agreed to make part of a pool.

The validity of a pool is dependent on ensuring that a ship with a compliance deficit does not end up with a higher deficit. The pooling mechanism aims to balance compliance and potentially alleviate deficits collectively without additional cost implications for individual ships within the pool.

Question 21.3: How will pooling compliance be verified? Is there a template and timeline for when to register the intention of being part of a pool, and will each pool have an identification number?

Each pool must be overseen by a single verifier, and when ships from different companies are grouped into one pool, these companies must agree on a verifier to oversee their pooled compliance efforts.

Companies intending to participate in pooling must register this in the FuelEU database. The registration includes nominating a ship for pooling, specifying how the pool's total compliance balance is distributed among participating ships, and identifying the chosen verifier for the pool.

While there is no fixed deadline for indicating the intent to pool, the selected verifier must finalise and record the pool's composition and the specific compliance balance allocation to each ship by 30 April of the relevant verification period in the FuelEU database.

The FuelEU database will provide an environment where companies and verifiers can record the pooling related information.

Question 21.4: Who is entitled to be the verifier? Must it be the verifier that is already appointed for EU-MRV?

The verifier will need to be accredited according to the requirements that will be laid down in a delegated act. Verifier can be the same or different as for EU-MRV Regulation.

Article 23 - FuelEU penalties

Article 23

Question 23.1: What are the penalties for non-compliance, and which authority is responsible for their collection?

Penalties will be imposed on ships that:

- exhibit a compliance deficit for GHG intensity of the energy used onboard or, if applicable, for the RFNBO sub target, as of 1 June of the verification period (Article 23(2) FuelEU Maritime Regulation);
- have made at least one non-compliant port call during the reporting period (Article 23(5) FuelEU Maritime Regulation).

The company must pay the penalty by 30 June of the verification period. The administering state of the company ensures the payment of the penalty, without prejudice to possible contractual agreements between companies and commercial operators or fuel suppliers to handle the liability.

The method of penalty collection will be determined by the administering states.

In line with the EU ETS Directive, every company, including those not registered in an EU Member State, will be allocated to a corresponding administering authority in an EU Member State, based on the criteria outlined in Article 3gf of the EU ETS Directive.

Question 23.2: How is the penalty for each non-compliant port call determined, and what factors contribute to the calculation?

For each ship which made at least one non-compliant port call in the reporting period, the company has to pay a penalty by 30 June of the verification period.

The level of the penalty is determined by the multiplication of the following three factors:

- 1.5 Euro/kWh;
- total electric power demand of the ship at berth in kW (=highest value of the total demand for electricity of a ship at berth, including hotel and cargo handling workloads);
- number of non-compliant hours at berth (total number of hours rounded up to the nearest whole hour).

The second factor (total electric power demand) has to be reported as part of the monitoring plan, as outlined in Article 8 (3e) of the Regulation.

Question 23.3: How is the penalty for a GHG intensity compliance deficit determined, and what factors contribute to the calculation?

ANNEX IV B. of the FuelEU Maritime Regulation provides a formula for the calculation of the penalty. The level of the penalty is determined by the multiplication of the following three factors:

- the ship's total energy consumption in the reporting period (in MJ);
- amount of money per MJ energy consumed:

$$\frac{2{,}400\,\frac{Eur}{tonne\ VLSFO}}{41{,}000\,\frac{MJ}{tonne\ VLSFO}} = 0.0585\ Euro/MJ$$

- percentage by which the actual GHG intensity should have been reduced to meet the GHG intensity target.

Question 23.4: What are the consequences if a company has a compliance deficit for two consecutive reporting periods or more, and how does the penalty calculation change in such cases?

According to Article 23 FuelEU Maritime Regulation, if a company has a compliance deficit for two consecutive reporting periods or more, it faces an increased penalty, which is adjusted based on the duration of consecutive non-compliance.

Question 23.5: What are the consequences of failing to pay a penalty?

Consequences of failing to comply with the penalties include expulsion from ports, flag detentions, and potentially restricted access to ports in multiple Member States, based on Article 25 FuelEU Maritime Regulation.

Question 23.6: Who collects the FuelEU penalties, and how are the revenues from the FuelEU penalties used?

FuelEU Penalties, when determined and applied to a specific ship, will be collected by the administering State in respect of a company. Member States shall have in place 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.

According to Article 23, paragraph 11, of FuelEU Maritime Regulation, Member States shall endeavour to ensure that the revenue generated from the FuelEU penalties is used to support the deployment and the use of renewable and low-carbon fuels in the maritime sector by stimulating the production these fuels for the maritime sector, to support facilitating the construction of bunkering facilities or OPS infrastructure in ports, as well as supporting the development, testing and deployment of the most innovative technologies in the fleet to achieve significant emission reductions.

A reporting obligation is established in the FuelEU Maritime Regulation, starting from 30 June 2030, requiring Member States to make public a report on the use of revenues generated from the FuelEU 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.

Annex-I - Calculation of the GHG intensity of the energy used onboard

Annex-I

Question A.1: Can ships engaged in international voyages, and using renewable and low carbon fuels throughout their entire journey, allocate these fuels in the calculation of the GHG intensity for the corresponding Reporting Period?

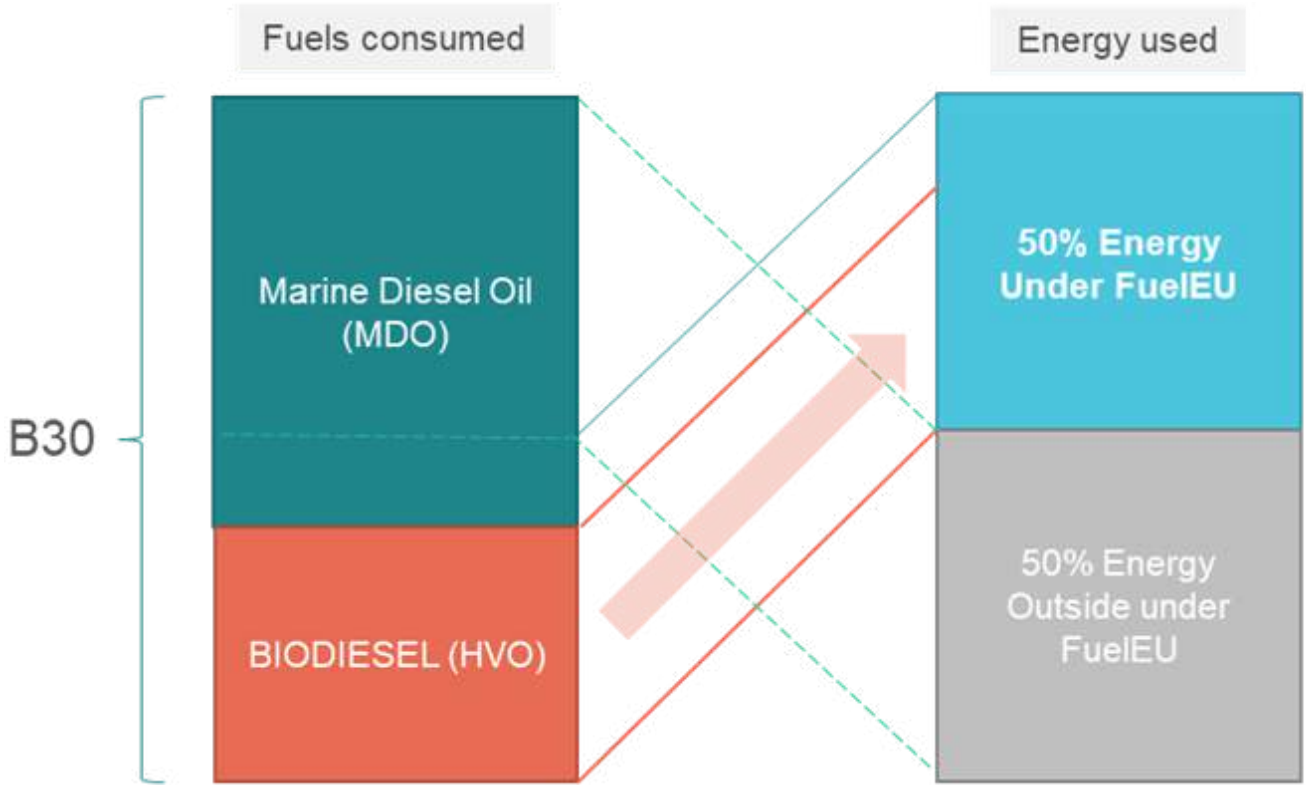
All renewable and low-carbon fuels, compliant with the relevant criteria under FuelEU Article 10, and used in international voyages, can be counted as contributing to the GHG intensity of half of the energy used during those voyages and, up to the maximum energy amount falling under the scope of FuelEU Maritime Article 2(1)(d). The same applies to similar fuels used in voyages arriving at or departing from a port of call located in an outermost region under the jurisdiction of a Member State, as per FuelEU Article 2(4).

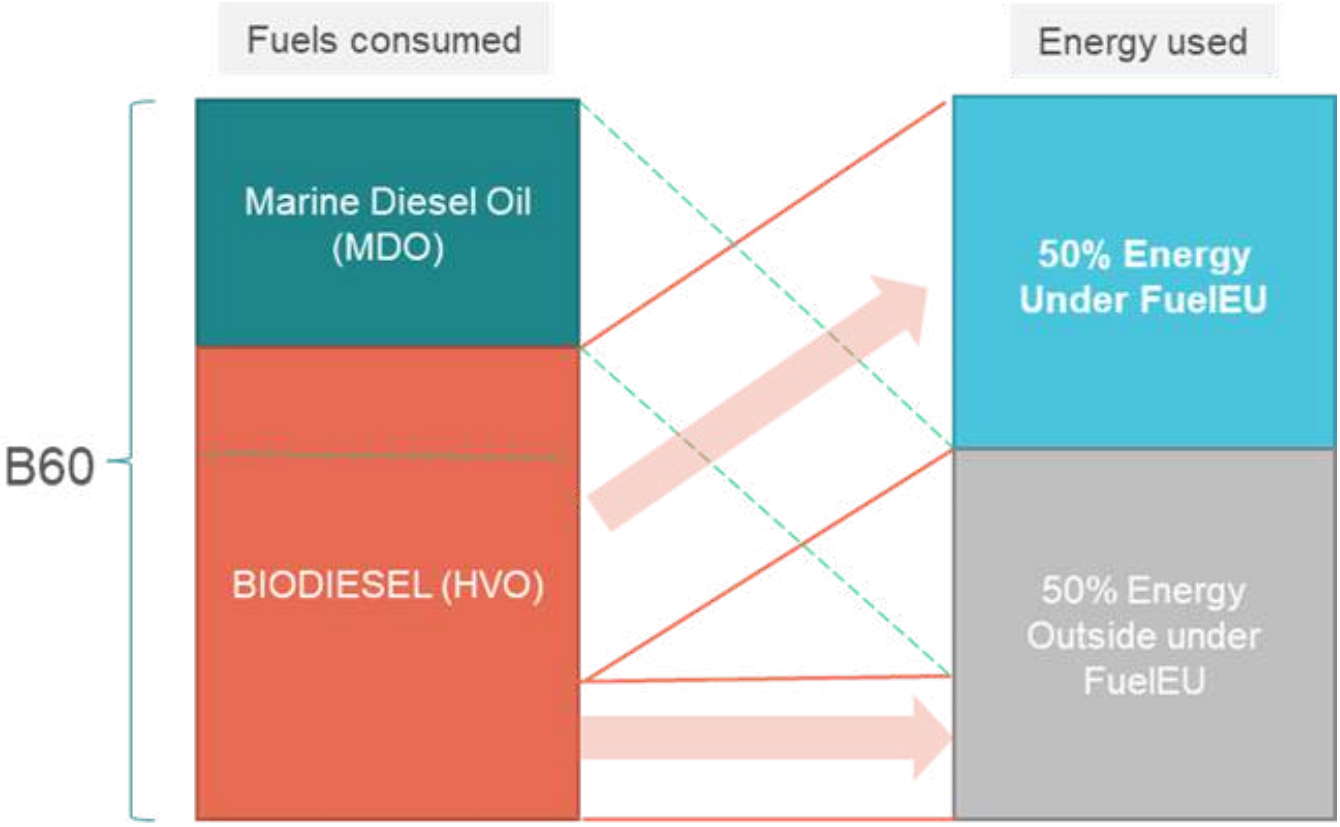
While reporting of fuel consumption is required on a "per voyage" basis, the calculation of the average yearly GHG intensity of the energy used onboard is performed on the total mass of fuel used per energy consumer, on an annual basis.

The following examples are presented:

1. **Use of bio-blend B30 (30% biodiesel + 70% fossil diesel)** – the whole biodiesel fraction can be counted to cover the energy used during an international voyage.
2. **Use of bio-blend B60 (60% biodiesel + 40% fossil diesel)** – part of the biodiesel fraction can be counted to cover the energy used during an international voyage, up to the maximum energy amount falling under the scope of the Regulation.

The figures below illustrate both cases, with B30 and B60 use, respectively.




Fuels consumed
Energy used
Marine Diesel Oil (MDO)
BIODIESEL (HVO)
B60
50% Energy Under FuelEU
50% Energy Outside under FuelEU

Question A.2: Does FuelEU Maritime Regulation rewards Wind-Assisted Propulsion (WAP) technologies? How can the installation of WAP effectively contribute to compliance with FuelEU Maritime?

A ship with installed wind-assisted propulsion technologies, such as kites, rigid sails, suction, or rotor sails, can benefit from a reward factor which effectively improves the annual average GHG intensity of the energy used onboard. This improvement can go up to 5%, depending on the ratio between the effective wind power (P_{wind}) and the installed propulsion power of the ship (P_{prop}).

The reward factor to be used, in case of WAP technology installation, is solely a function of the "P_{wind}/ P_{prop}" ratio, as defined in Annex-I of FuelEU, and demonstrated in the diagram below.

P_{prop}

$$GHG\ intensity = f_{wind} \times (WtT + TtW)$$

f_{wind} is calculated as P_{wind}/P_{prop} where P_{wind} is the effective power as calculated via MEPC.1/Circ.896 and P_{prop} corresponds to P_{ME} used in the EEDI or EEXI calculation (IMO resolution MEPC.364(79) or MEPC.333(76), respectively)

Reward factor (f_{WIND})	P_{WIND}/P_{PROP}
0,99	0,05
0,97	0,1
0,95	≥ 0,15

Installation of WAP systems can contribute to compliance with FuelEU through an effective reduction of the calculated annual GHG intensity of the energy used onboard. This, in itself, represents a way of supporting economic feasibility for WAP systems, reducing the need to invest in use of more expensive renewable and low-carbon fuels.

Question A.3: How is the P(wind) factor calculated? If more than one Wind Assisted Propulsion (WAP) system, will the P(wind) be the double?

The parameter defined as “available effective power of Wind Assisted Propulsion (WAP) systems” shall be calculated in accordance with the IMO 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).