Report on Onshore Power Supply (OPS) to support the implementation of FuelEU Maritime Regulation

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This document is part of a series produced for the Sustainable Alternative Power for Shipping (SAPS) sub-group of the European Sustainable Shipping Forum (ESSF). This document is prepared based on expert input that was gathered under a Taskforce that operated under the SAPS OPS (Onshore Power Supply) Workstream from March 2026 to June 2026.

The Taskforce held discussions with the aim to provide technical expertise relevant to the OPS related provisions of the FuelEU Maritime Regulation (Regulation (EU) 2023/1805).

This report does not reflect the official view of the European Commission and is not legally binding.

EUROPEAN SUSTAINABLE SHIPPING FORUM (ESSF)
Sub-group on Sustainable Alternative Power for Shipping (SAPS)
Workstream on OPS
Taskforce on FuelEU Updates

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List of abbreviations

Abbreviation	Definition
AFIR	Alternative Fuels Infrastructure Regulation
BOG	Boil-off gas
CARB	California Air Resources Board
CMS	Cable Management System
EIAPP	Engine International Air Pollution Prevention
ESSF	European Sustainable Shipping Forum
EU	European Union
GHG	Greenhouse gas
GT	Gross tonnage
Hz	Hertz
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IMO	International Maritime Organization
LNG	Liquefied natural gas
MARPOL	International Convention for the Prevention of Pollution from Ships
MCR	Maximum Continuous Rating
MEPC	Marine Environment Protection Committee
MSC	Maritime Safety Committee
MVA	Megavolt-ampere
OPS	Onshore Power Supply
Q&A	Questions and Answers
SAPS	Sustainable Alternative Power for Shipping
SOLAS	International Convention for the Safety of Life at Sea
TEN-T	Trans-European Transport Network
ZET	Zero Emission Technologies

1 Introduction

1.1 About this document

This document is intended to provide a better understanding of and assist in implementing the Onshore Power Supply (OPS) requirements that are laid down in the FuelEU Maritime Regulation.[1]

The Taskforce concentrated on the Regulation as adopted in 2023. By 2027, the Regulation will be evaluated and reviewed. The expert opinions and experiences of Taskforce members will also be used to identify the provisions of the FuelEU Maritime Regulation on OPS that might require deeper review. Where potential solutions, recommendations or good practices are presented, these reflect proposals or experiences raised during the Taskforce discussions and should not be understood as agreed Taskforce recommendations unless explicitly stated otherwise.

The primary audience for this document is companies and organisations operating ships that are required under the Regulation to use OPS in port. It is also relevant for ports, terminals, and electricity providers involved in facilitating OPS.

To improve readability, this document contains a set of icons. Below, these icons and their meaning are explained.

Passage from regulations: Passages directly taken from the specified Regulation. Possibly edited, which will be denoted by *[italics in brackets]*.

Problem highlighted by the Taskforce: The Taskforce identified several provisions within the FuelEU Maritime Regulation that warrant deeper review. However, the Taskforce has not reached a consensus on potential solutions.

Solution/good practices: The Taskforce highlighted several provisions of the FuelEU Maritime Regulation that require deeper review, and has provided potential solutions or good practices.

Example: To illustrate a point, Taskforce members have provided examples.

[1] 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, pp. 48–100, ELI: http://data.europa.eu/eli/reg/2023/1805/oj

Readers should note that this document does not replace the FuelEU Maritime Regulation, which remains the only legally binding text.

1.2 Taskforce composition

Taskforce meetings were chaired by the Port of Bilbao, and the European Commission (Directorate-General for Mobility and Transport) was present in all meetings. Further participants were representatives of shipping companies, ports, technology providers, EU Member State authorities and non-governmental organisations.

1.3 Relevant legislative frameworks

Several other pieces of legislation are relevant to the FuelEU Maritime Regulation in relation to OPS. This includes European regulations that are closely integrated with the FuelEU Maritime Regulation, as well as international frameworks which illustrate various approaches to OPS requirements at berth and may contribute to differences in legislative standards across jurisdictions. These were taken into account during the work of the Taskforce.

1.3.1 EU

FuelEU Maritime

Regulation (EU) 2023/1805 (FuelEU Maritime Regulation) was adopted on 13 September 2023 and entered into force twenty days after its publication in the Official Journal of the European Union on 22 September 2023. It applies from 1 January 2025, with the monitoring-plan requirements applying from 31 August 2024. The Regulation applies to all ships above 5,000 GT calling at EU ports, carrying passengers or cargo for commercial purposes, regardless of flag.

The Regulation is aimed at decarbonising the maritime sector, in line with the European Green Deal and the Fit for 55 package, which is the EU's set of policy proposals to achieve a 55% reduction in GHG emissions by 2030 compared to 1990 levels. The Regulation is set to do so by setting limits on the annual GHG intensity of the energy used on board ships, and by requiring containerships and passenger ships moored at the quayside in ports within scope to cover their electrical power demand at berth through OPS or other zero-emission technologies from 2030.

Additionally, two secondary acts are being prepared with relevance to OPS. First, the Implementing Act on communication on OPS.[2] Second, the Implementing Act on the criteria for the acceptance of zero-emission technologies for Annex III.[3]

AFIR

The Alternative Fuels Infrastructure Regulation (AFIR), Regulation (EU) 2023/1804, sets mandatory targets for Member States to deploy OPS infrastructure at EU ports by specified deadlines. AFIR and FuelEU Maritime are closely linked: AFIR creates the supply-side obligation for ports to install OPS infrastructure, while the FuelEU Maritime Regulation creates the demand-side obligation for ships to use it. AFIR Annex II also provides the technical standards to which OPS equipment must adhere.

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2 For more information on the Implementing act on communication on OPS, please refer to: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13951-Decarbonising-the-shipping-sector-information-on-the-use-of-onshore-power-supply-Art-6-8-FuelEU-Maritime-Reg-_en

3 For more information on the Implementing act on the criteria for the acceptance of zero-emission technologies for Annex III, please refer to: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14494-FuelEU-Maritime-Regulation-criteria-for-zero-emission-technologies_en

While AFIR is referenced here for context, it falls outside the scope of this document, which focuses exclusively on the FuelEU Maritime Regulation. AFIR is currently under review, and the call for evidence closed in April. The Commission plans to adopt the reviewed AFIR by the fourth quarter of 2026.[4]

[4] For more information on the review status of AFIR, please refer to: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/16672-Review-of-EU-rules-on-alternative-fuels-infrastructure_en

2 OPS connection point exemptions

Starting in 2030, the FuelEU Maritime Regulation mandates that ships at berth connect to OPS. Specifically, this holds for containerships and passenger ships that are moored at the quayside in a port of call. This obligation only holds for ports included in Article 9 of AFIR – mainly TEN-T maritime ports with enough port calls or cargo transfer. From 2035, the obligation will also apply to other ports within the EU that have OPS available, even if they are not covered by Article 9 of AFIR. EU Member States may decide to introduce this requirement in these other ports as early as 2030 if they consult with relevant stakeholders first.

A port of call is defined as a port where ships stop to load or unload cargo or to embark or disembark passengers. Stops solely for other purposes, such as refuelling, resupplying, relieving crew, and repairs, do not count as a port of call. For exact definitions of OPS, containerships, passenger ships, and a port of call, refer to FuelEU Maritime Regulation Articles 3(24), 3(29), 3(30), and 3(10), respectively.

FuelEU Maritime Regulation Article 3(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 refueling, 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 transhipment port listed in the implementing act adopted pursuant to Article 2(2);

The FuelEU Maritime Regulation provides several exemptions to the obligation to connect to OPS. These exemptions, alongside the section of this chapter where these exemptions are addressed, can be found in Table 2.1.

Table 2.1 Overview of exemptions to the OPS obligation in FuelEU Maritime Article 6(5), and where to locate them in this document

Article	Exemption	Relevant section in this document
Article 6(5)(a)	Moored at the quayside for less than two hours	Section 2.1
Article 6(5)(b)	Use an approved ZET instead	Section 3.1.2, 2.7
Article 6(5)(c)	Emergency port stops	Sections 2.5 & 2.6
Article 6(5)(d)	OPS connection points are unavailable	Sections 2.2 & 2.3
Article 6(5)(e)	Connecting to OPS risks the electrical grid stability	Section 3
Article 6(5)(f)	Incompatibilities with OPS, despite adhering to technical standards	Section 2.4
Article 6(5)(g)	Emergencies and force majeure	Sections 2.5 & 2.6
Article 6(5)(h)	Maintenance and testing of onboard energy generation	-

Taskforce members noted a need for a clear overview of the exemptions from the obligation to use OPS, and considered that additional exemptions may be needed in certain situations beyond those already set out in Article 6(5) of the FuelEU Maritime Regulation. The Taskforce members also noted uncertainty around how force majeure or a state of emergency should be demonstrated.

2.1 Short port stays (<2 hours at berth)

Under FuelEU Maritime Regulation Article 6(5)(a), the zero-emission requirements for energy used at berth do not apply to ships that “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”.

The Taskforce members requested clarification on the exact definition of "two hours” and which party is responsible for keeping time. Due to cultural differences, some may interpret 2:59 as falling within the two-hour window. Questions were also raised about the required level of precision, for example, whether 2:01 qualifies as exceeding the threshold.

Additionally, the Taskforce members noted practical concerns with the two-hour timeframe. Connecting can generally only begin after mooring is complete, for both safety and practical reasons, as the mooring crew is typically also responsible for handling the OPS connection. Similarly, OPS must be disconnected before unmooring begins. Combined with other operational steps, this leaves limited time for actual power supply, despite considerable effort put into connecting to OPS. Actual connection and disconnection times may vary depending on the vessel, port, equipment, procedures, frequency of calls and operational experience.

The Taskforce members also noted practical concerns with the two-hour timeframe in relation to pilotage and tug assistance. In practice, OPS must be disconnected before a ship leaves the berth, even if the pilot or tug has not yet arrived. It remains unclear how this intervening period without OPS should be counted for the purpose of the two-hour threshold.

2.2 OPS-availability on a per-port, per-terminal, or per-berth basis

A key question in implementing the FuelEU Maritime Regulation is the level at which OPS availability is assessed: per port, per terminal, or per berth. This distinction has practical consequences for both ships and port operators. If OPS availability is assessed at the port or terminal level, this may create situations where a ship is assigned to a berth without OPS but is legally still subject to the zero-emission requirements for energy used at berth because OPS connections are available elsewhere in the terminal or port. As ships typically do not have final say on which berth they are assigned to, some Taskforce members considered berth-level availability to be the most meaningful approach for compliance purposes.

OPS-availability on a per-port, per-terminal, or per-berth basis: The Taskforce members found it unclear if OPS availability is assessed on a per-port, per-terminal, or per-berth basis. As ships typically do not have final say on which berth they are assigned to, some Taskforce members considered a per-berth approach the most meaningful for compliance purposes.

Lack of clarity on regulation

Taskforce members noted a lack of clarity in the Regulation and supporting documentation on treating OPS availability on a per-port, per-terminal, or per-berth basis.

Under FuelEU Maritime Regulation Article 6(5)(d), the zero-emission requirements for energy used at berth do not apply when no OPS connection point is available. Additionally, the Commission's Q&A website on FuelEU considers the "inability to connect to OPS due to reasons like unavailability of OPS connection points in a port" as a possible exception to the obligation to connect to OPS. In both cases, unavailability is considered on a per-port basis.

FuelEU Maritime Regulation Article 6(5)(d): *[zero-emission requirements for energy used at berth shall not apply to ships that]* are unable to connect to OPS due to the unavailability of OPS connection points in a port;

Level of assessment on shore-side obligations for OPS infrastructure

The Taskforce members also raised the question of whether a port's shore-side obligation for providing OPS infrastructure is considered on a per-port, per-terminal, or per-berth basis. Port calls tend to be concentrated in a select number of terminals. Therefore, by equipping only these terminals with OPS, the majority of all port calls can be done at OPS-equipped terminals. The Taskforce members noted uncertainty on whether the remaining terminals, which handle only a minority of port calls, are also required to be equipped with OPS.

AFIR Article 9(1)(a): *[Member States shall take the necessary measures to ensure that by 31 December 2029]* TEN-T core maritime ports and TEN-T comprehensive maritime ports for which the annual number of port calls of ships that are moored at the quayside, averaged over the last three years, by seagoing container ships above 5 000 gross tons is above 100 are equipped to provide each year shore-side electricity supply for at least 90 % of the total number of port calls of seagoing container ships above 5 000 gross tons that are moored at the quayside at the maritime port concerned;

2.3 OPS equipment failure

OPS equipment may be damaged or otherwise rendered unusable. The Taskforce members found that ships and ports should be both exempt from their OPS obligation while repairs last, which can take up to several months.

Similarly, some Taskforce members also noted instances of poorly maintained OPS equipment on board certain vessels. They find that inoperability due to improper maintenance should not be granted an exemption but note uncertainty as to who decides when maintenance is done improperly.

Repair schedules: In China, OPS-usage is exempted for the duration of repairs on necessary equipment. However, a repair schedule must be submitted to the authorities and adhered to. This ensures repairs do not take needlessly long, but still allows flexibility when equipment must be repaired.

2.4 OPS incompatibility

Situations may arise where OPS systems are technically compliant but incompatible with a specific vessel in practice. To an extent, this is already covered by Article 6(5)(f) of the FuelEU Regulation, which states that the zero-emissions requirements at berth do not apply to ships that are not compatible with the OPS connection point, as long as they adhere to the specification laid out in AFIR. AFIR, in turn, refers to the International Electrotechnical Commission (IEC) and the Institute of Electrical and Electronics Engineers (IEEE) standards: IEC/IEEE 80005-1:2019 and IEC 62613-1:2019.

However, even when all OPS equipment is compliant with these standards, there may still be incompatibilities. For instance, the Cable Management System (CMS) may be insufficient in relation to the pier length, especially considering tidal height differences, or may be obstructed by berth geometry in other ways. Mooring lines and caps have been noted to be in the way of a CMS when said CMS is not pre-positioned before a ship's mooring.

FuelEU Maritime Regulation Article 6(5)(f): *[zero-emission requirements for energy used at berth shall not apply to ships that]* 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;

AFIR Annex II 5.1: Shore-side electricity supply for seagoing ships, including the design, installation and testing of the systems, shall comply at least with the technical specifications of standard IEC/IEEE 80005-1:2019/AMD1:2022 for high-voltage shore connections.

AFIR Annex II 5.2: Plugs, socket-outlets and ship couplers for high-voltage shore connection shall comply at least with the technical specification of standard IEC 62613-1:2019.

Taskforce members noted that differences in electrical frequency between ships and shore-side systems may create compatibility challenges. This issue is not limited to a single vessel segment and may require appropriate technical solutions, either on board or on shore, depending on the specific configuration.

2.5 Unforeseen port call

Article 3(10) of the FuelEU Maritime Regulation defines a 'port of call'. By extension, port stops that are excluded from this definition do not have an obligation of zero emissions at berth in the first place. When a ship does stop at a 'port of call', Article 6(5)(c) of the FuelEU Maritime Regulation provides further exemptions in emergency conditions.

FuelEU Maritime Regulation Article 6(5)(c): *[zero-emission requirements for energy used at berth shall not apply to ships that]* 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);

However, the Taskforce members noted uncertainty on when the nature of such an unscheduled port call changes. For example, this may occur when a ship decides to load or unload cargo or to embark or disembark passengers, even though the port stop was initially unscheduled. This may also occur when an emergency stop is used to perform routine maintenance.

2.6 Adverse weather conditions requiring thrusters at berth

Weather conditions may require the deployment of thrusters while at berth. In practice, OPS is not used in those situations. The Taskforce considered doing so both unsafe and impractical, and the power draw would be much higher than what OPS can typically provide. However, the Regulation does not clearly provide an exemption in this case. Article 6(5)(g) of the FuelEU Maritime Regulation provides exemptions in emergency situations, but it is unclear to what extent adverse weather conditions are seen as an emergency.

FuelEU Maritime Regulation Article 6(5)(g): *[zero-emission requirements for energy used at berth shall not apply to ships that]* 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;

2.7 LNG Boil Off Gas

Taskforce members noted safety concerns and differences in the legislative approach towards managing LNG Boil Off Gas (BOG) between Europe, China, and California. Under normal operations, some LNG naturally boils off and can be consumed for energy. If this BOG is not consumed, then it builds up in the tanks, leading to increased pressure and safety concerns. The Taskforce members identified this topic as technically complex and warranting further technical evidence, validation and discussion before broader policy conclusions could be drawn, particularly given the uncertainty regarding the number and characteristics of vessels potentially affected. As such, the content of this section should be taken as an input into these discussions, and not an agreed-upon conclusion.

BOG buildup is especially an issue on older ships using Membrane or Type-B LNG storage tanks. Some Taskforce members estimated that roughly a few hundred ships fall under those categories. Ships ordered after the FuelEU Maritime Regulation typically use Type C storage tanks and are better at handling boil-off gas. In addition, older ships (approximately pre-2012) typically do not carry onboard reliquification equipment and are therefore more limited in their options to process BOG. However, they also warned that they do not consider reliquification (retrofit or new build) to be a suitable solution to at-berth BOG handling. Instead, these Taskforce members concluded that the only viable solution to BOG buildup is to burn it in a boiler-generator combo. For context, they noted that managing BOG buildup generally requires handling approximately 35–50 kg of LNG per hour.

BOG buildup typically becomes an issue when ships call at several ports in quick succession. This leaves insufficient time at sea to reduce accumulated BOG. This becomes especially pressing after three to four consecutive port stops. Moreover, due to the repetitive nature of liner schedules, the issue often becomes most apparent at the same port within a service loop.

Some Taskforce members discussed the possibility of a certification scheme for LNG-fuelled vessels in relation to BOG. However, concerns were raised that ship crews are not specialised gas experts, and such a certification scheme would therefore place undue responsibilities on crews that they are ill-equipped to handle.

Cost-levelling penalty between LNG BOG and OPS: Some Taskforce members stressed that safety considerations were the key concern; financial gain was not a motivating factor. However, they acknowledged that LNG BOG is typically cheaper than OPS. An option presented during the discussions was to introduce a dedicated penalty for LNG BOG usage, to match the cost levels of OPS. Such a mechanism would replace the current FuelEU Maritime Regulation penalty for using LNG BOG. No common position was reached on such an approach.

Regulatory approaches to OPS and LNG-fuelled vessels outside the EU, including in China, were also discussed by Taskforce members. However, further assessment would be needed before drawing direct comparisons with the FuelEU Maritime framework.

One Taskforce participant reported ongoing discussions with the California Air Resources Board (CARB) regarding whether certain LNG-fuelled vessels could qualify under an Emission Reduction Strategy within California's At-Berth Regulation in circumstances where connection to shore power is not feasible. No conclusion from those discussions was reported to the Taskforce.

Under FuelEU Maritime, LNG boil-off gas is not treated as a zero-emission energy source equivalent to OPS electricity. The Taskforce discussions highlighted that the treatment of LNG BOG at berth therefore warrants further technical and regulatory assessment.

3 Electricity consumption and availability

Article 6(5)(e) of the FuelEU Maritime Regulation exempts ships from their obligation to connect to OPS if the stability of the electrical grid is at risk. The Taskforce members noted a lack of clarity on whether this refers to the electric grid stability of the ship, or on the shore side.

For both ship-side and shore-side electricity consumption, the Taskforce members noted additional points.

FuelEU Maritime Regulation Article 6(5)(e): *[zero-emission requirements for energy used at berth shall not apply to ships that]* 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;

3.1 Ship-side electricity consumption

3.1.1 Ship-side grid stability

When a ship requires more power than an OPS connection point is rated for, the shortfall in power risks destabilising the ship's electrical grid. Even when the ship's power demand falls within the connection point's rated capabilities, the onshore power supply may not be able to provide up to the rated power level, and existing alert systems are typically not fast enough for timely implementation of backup solutions. The Taskforce members raised questions about compliance obligations in such scenarios. Some Taskforce members noted that at-berth energy consumption generally remains stable and that peaks in power demand are typically planned, while others reported cases of significant unplanned fluctuations in power demand, depending on ship type and operations.

These issues were less noted in the cruise industry. Cruise ship-applicable OPS connection points have an IEC-mandated minimum rating of 16 MVA, which is more than the typical hotel load of a cruise ship. Although cruise ships are growing in size, and therefore in energy consumption, advancements in energy efficiency are also being noted across the fleet.

Some ports have resolved these issues in practice by dedicating more transformers to a single OPS connection point, at the cost of availability at other OPS points.

3.1.2 Partial ZET coverage

The Taskforce members requested clarification regarding situations in which ZET (other than OPS) offer only limited coverage. The Taskforce members observed that ZET-coverage is not simply a binary matter; rather, partial ZET-coverage of the at-berth power draw may occur. However, the Regulation requires full compliance. If the entire electrical power demand at berth is not met by ZET, the exemption under Article 6(5)(b) no longer applies. As a result, the penalty outlined in Article 23(5) must be paid over the full electrical power demand at berth, rather than just the portion of power demand not covered by ZET.

FuelEU Maritime Regulation Article 6(5)(b): *[zero-emission requirements for energy used at berth shall not apply to ships that]* 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;

FuelEU Maritime Regulation Article 23(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.

Some Taskforce members also noted specific practical concerns with charging onboard batteries at berth. Onboard batteries are a form of ZET. However, the current IEC standards for OPS are not designed with support for battery charging. Therefore, the OPS-connection points typically do not support sufficient power demand. Additionally, ships that intend to charge their batteries using OPS anyway are not directly supported in doing so, and need to carry all relevant equipment onboard, with the corresponding additional costs.

3.1.3 Power demand at berth calculated through MCR versus historical data

One Taskforce member argued that the penalty for not using OPS is too high, as the Regulation bases this of “the established total electrical power demand of the ship at berth”. This is in turn defined by SOLAS Regulation 40 and 41 and approved by the ship’s flag administration or a recognised organisation. Lacking this, 25% of the ship’s Maximum Continuous Rating (MCR) is taken instead.

However, this Taskforce member was concerned that these figures are too high and do not reflect ongoing efforts in energy efficiency. For cruise ships, they find that this method overestimates the actual power demand by upwards of 70%. Instead, the Taskforce member recommended that “the established total electrical power demand of the ship at berth” may be calculated based on historical data. Other Taskforce members stressed that any alternative methodology should preserve a sufficiently strong incentive to connect to OPS rather than making non-compliance economically preferable. No common position was reached on an alternative penalty calculation methodology.

FuelEU Maritime Regulation Article 8(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;

SOLAS Chapter II.1 Regulation 40:

1. Electrical installations shall be such that:
    1. all electrical auxiliary services necessary for maintaining the ship in normal operational and habitable conditions will be ensured without recourse to the emergency source of electrical power;
    2. electrical services essential for safety will be ensured under various emergency conditions; and
    3. the safety of passengers, crew and ship from electrical hazards will be ensured.

[continued]

SOLAS Chapter II.1 Regulation 41:

1. A main source of electrical power of sufficient capacity to supply all those services mentioned in regulation 40.1.1 shall be provided. This main source of electrical power shall consist of at least two generating sets.
2. The capacity of these generating sets shall be such that in the event of any one generating set being stopped it will still be possible to supply those services necessary to provide normal operational conditions of propulsion and safety. Minimum comfortable conditions of habitability shall also be ensured which include at least adequate services for cooking, heating, domestic refrigeration, mechanical ventilation, sanitary and fresh water.

[continued]

3.2 Shore-side electricity availability

3.2.1 Shore-side grid stability

The power demand of a ship can, in some cases, exceed what the local shore-side grid can handle. As electrification continues throughout the EU, including in connection with the deployment of OPS, some Taskforce members warned that shore-side grid capacity and stability may become an increasing concern. Similar challenges concerning electricity grid capacity are addressed in the Electrification Action Plan of the European Commission.[5]

Depending on the specific segment of the shipping industry, schedules may be made up to 18 months in advance, as is the case for cruise ships. This forward visibility allows ports and grid operators to forecast peak and trough electricity demand associated with OPS usage accurately. Additionally, agreements with energy providers may help; mutual guarantees where energy providers commit to delivering a certain amount of power, while energy consumers commit to purchasing a defined quantity.

[5] European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions*: Electrification Action Plan, COM(2026) 595 final, Brussels, 17 July 2026. Available at: EUR-Lex - 52026DC0595 - EN - EUR-Lex

Taskforce members also noted operational success when shipping companies are required to inform the port at least 48 hours ahead of time of the expected power requirements. The port then forwards this information to the energy provider, who can then anticipate this demand.

3.2.2 *Energy pricing*

Energy scarcity, particularly during peak periods, may in some circumstances contribute to high OPS electricity prices. During the Taskforce discussions, some members raised concerns regarding electricity costs and the structure and transparency of OPS pricing. Some Taskforce members raised the possibility of a price-based threshold or mechanism in circumstances where OPS electricity prices become particularly high. Other members opposed price-based exemptions, arguing that they could weaken the predictability of the OPS obligation and the investment case for OPS infrastructure. No common position was reached on a price-based exemption mechanism.

Some Taskforce members argued that OPS users should have access to electricity pricing conditions comparable to those available to other large industrial consumers, given their significant consumption volumes and usage guarantees. Concerns were also raised by some members regarding potential monopoly or near-monopoly conditions in the provision of OPS. Greater transparency and comparability of OPS pricing structures were discussed as possible ways of improving visibility of the different components of OPS costs.

Energy pricing structure: Some Taskforce members raised concerns regarding electricity costs, pricing structures and potential monopoly conditions in OPS provision. Greater transparency and comparability of OPS pricing structures were discussed as possible ways of addressing these concerns. Similar concerns are echoed in a recent European Parliament study, which concludes that OPS is often provided under monopoly or near-monopoly conditions and that current tariff structures can reduce price transparency and comparability, creating a risk of unreasonable pricing.[6]

Transport Malta reported positive experience with Power Purchase Agreements between the port and shipping companies as a means of providing greater predictability and transparency regarding OPS electricity costs and demand, while noting that the duration of such agreements may be constrained by volatility in energy markets. OPS pricing structures and transparency are being considered further within the dedicated ESSF SAPS Task Force on OPS Pricing Transparency.

[6] FIER Sustainable Mobility & Sustainable Ships, *Pricing of E-Charging for Electric Cars and Onshore Power Supply in Ports*, Study requested by the European Parliament's Committee on Transport and Tourism (TRAN), Policy Department for Transport, Employment and Social Affairs, European Parliament, Brussels, May 2026, PE 759.345. Available at: https://www.europarl.europa.eu/RegData/etudes/STUD/2026/759345/CASP_STU(2026)759345_EN.pdf.

4 Conclusion

This document has examined key challenges in the implementation of the OPS requirements under the FuelEU Maritime Regulation, drawing on the input received from the ESSF SAPS OPS Taskforce of FuelEU Updates. While the Regulation establishes a clear objective of reducing emissions at berth through the use of OPS or other zero-emission technologies for the vessels and port calls within its scope from 2030, the findings presented in this document demonstrate that further clarification and, in some cases, targeted refinement will be essential to ensure consistent and effective application across the European Union.

Chapter 2 shows that key concepts underpinning the OPS obligation warrant deeper review. This includes how OPS availability should be assessed, particularly the distinction between port-, terminal-, and berth-level availability. It also includes the scope of exemptions under Article 6(5), and how these apply in practice to situations such as short port stays, equipment failure, technical incompatibility, and unforeseen circumstances. The chapter ends with a section on LNG BOG.

Chapter 3 shows that OPS cannot be considered in isolation from the wider energy system; both ship-side and shore-side constraints play a central role. These include limits in connection capacity, risks to grid stability, and the availability of sufficient electrical power. In addition, the treatment of partial ZET coverage remains unclear. The current framework does not account for situations where only part of the at-berth power demand can be met by ZET. Finally, energy pricing and pricing transparency were among the issues discussed by Taskforce members, with differing views expressed on whether and how electricity prices should affect the OPS obligation.

In particular, Taskforce members were looking for certainty on the provision of clear and operationally grounded guidance through implementing acts and interpretative documents, as well as consideration of identified issues. Addressing these points will be essential to achieving the Regulation’s environmental objectives while safeguarding its practicality and acceptance among stakeholders.

Taskforce discussions also highlighted the importance of maintaining an appropriate balance between addressing genuine operational or technical difficulties and preserving the effective deployment and use of OPS. While targeted clarification or refinement may be necessary where implementation reveals circumstances that were not sufficiently anticipated by the existing framework, such measures should not unduly weaken the demand-side obligation established by the FuelEU Maritime Regulation. Maintaining a credible, predictable and stable framework for OPS use is important to support the effective utilisation of infrastructure deployed under AFIR and to provide confidence for the significant investments being made by ports, terminal operators, electricity providers, shipping companies and other stakeholders. Any refinement should therefore remain targeted and proportionate to the specific implementation issue identified, while preserving the Regulation's environmental objectives.