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1 INTRODUCTION

1.1 Background

This report has been prepared at the request of the Irish Maritime Development Office (IMDO) which is a statutory office within the Marine Institute and operates under the aegis of the Department of Transport.

This report reviews the key considerations in the provision of OPS at Shannon Foynes Port (SFC).

1.2 Scope

This report will look at the following:

a. Current and expected regulatory requirements relating to the provision and use of OPS
b. Electrical load associated with the use of OPS
c. The impact of OPS provision on the existing electrical infrastructure
d. The impact of OPS provision on the existing civil infrastructure
e. Capital cost associated with the deployment of OPS
f. Operating cost associated with the deployment of OPS
g. Conclusions and recommendations

1.3 Benefits Resulting from the use of OPS

The 'fit for 55' package, presented by the EU in July and December 2021, is designed to realise the European Climate Law objectives: climate neutrality by 2050 and a 55 % reduction of net greenhouse gas (GHG) emissions by 2030, compared with 1990 levels.

The use of OPS in port settings is one of a number of measures put forward for the maritime transport sector to help meet the aforementioned objectives. These measures are summarised as follows:

- Measures to ensure that the greenhouse gas intensity of fuels used by the shipping sector will gradually decrease over time, by 2% in 2025 to as much as 80% by 2050.
- A special incentive regime to support the uptake of the so-called renewable fuels of non-biological origin (RFNBO) with a high decarbonisation potential.
- An exclusion of fossil fuels from the regulation's certification process
- An obligation for passenger ships and containers to use onshore power supply for all electricity needs while moored at the quayside in major EU ports as of 2030, with a view to mitigating air pollution in ports, which are often close to densely populated areas.
- A voluntary pooling mechanism, under which ships will be allowed to pool their compliance balance with one or more other ships, with the pool as a whole, having to meet the greenhouse gas intensity limits on average.
- Time limited exceptions for the specific treatment of the outermost regions, small islands, and areas economically highly dependent on their connectivity.
- Revenues generated from the regulation's implementation ('Fuel EU penalties') should be used for projects in support of the maritime sector's decarbonisation with an enhanced transparency mechanism.
- Monitoring of the regulation's implementation through the Commission's reporting and review process.

While the primary objective of utilising OPS is to assist in the drive for climate neutrality, their use has the following additional benefits.

- The improvement of air quality within and around the port through reduction in ship-generated pollutants including carbon dioxide (CO_2), nitrogen oxides (NO_X), sulphur oxides (SO_X), particulate matter (PM) or other substances associated with onboard combustion processes.
- Reduction in CO_2 emissions (if the OPS electricity is mostly sourced from blue / green electrical production sources (including biomass, hydro or renewables).
- Noise reduction onboard, within the port and the surrounding area.
- Improved working conditions both onboard and within the port area.
- Competitive advantage towards sustainable shipping and ports.

2 REGULATORY REQUIREMENTS

2.1 OPS Regulations

The following is a summary of the regulations and directives relating to the provision and use of OPS.

- 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.
- Fit for 55 Package (Dec. 2021): Incorporating 13no Interlinked Proposals to Revise Existing EU Climate and Energy Laws, and 6no Proposals for New Legislation
- 2014/94/EU (Oct. 2014): Directive of the European Parliament and of the Council on the Deployment of Alternative Fuels Infrastructure.
- MSC.1/Circ. 1675 (June 2023): International Maritime Organisation – Interim Guidelines on Safe Operation of Onshore Power Supply Service in Ports for Ships Engaged on International Voyages
- IEC/IEEE 80005-1 (2019): Utility Connections in Port – Part 1 – High Voltage Shore Connection Systems – General Requirements
- IEC/IEEE 80005-2 (2016): Utility Connections in Port – Part 2 – High and Low Voltage Shore Connection Systems – Data Communication for Monitoring and Control

2.2 Current Regulations – Summary of OPS Related Requirements

The following are the key requirements of the current regulations in relation to OPS.

a. FuelEU Maritime Initiative: Provisional Agreement to Decarbonise the Maritime Sector

The FuelEU maritime initiative is part of the Fit for 55 package. Presented by the European Commission on 14 July 2021 and finalised on 13 September 2023, the package aims to enable the EU to reduce its net greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels and to achieve climate neutrality in 2050.

The new rules will apply from 1 January 2025, apart from articles 7 (Monitoring Plan) and 8 (Modifications to the Monitoring Plan) which will apply from 31 August 2024.

The initiative notes "*an obligation for passenger ships and containers to use onshore power supply for all electricity needs while moored at the quayside in major EU ports as of 2030, with a view to mitigating air pollution in ports, which are often close to densely populated areas".*

b. Regulation (EU) 2023/1805: Regulation of the European Parliament and of the Council on the Use of Renewable and Low-Carbon Fuels in Maritime Transport, and Amending Directive 2009/16/EC

The following paragraphs relating to OPS are copied from PE-CONS 26 / 23. Where applicable, exemptions from the requirement to use OPS are shown high-lighted.

(37) *The obligation for ports to provide on-shore power supply (OPS), laid down in Regulation (EU) 2023/1805, should be matched by a corresponding obligation set out in this Regulation for ships to connect to OPS infrastructure while moored at the quayside, in order to ensure the effectiveness of that infrastructure and avoid the risk of stranded assets.*

(38) *The use of OPS abates air pollution produced by ships and reduces the amount of GHG emissions generated by maritime transport. OPS represents an increasingly clean power supply available to ships, in view of the growing shares of renewables and fossil-free energy sources in the Union electricity mix. While only the provision on OPS connection points is covered by Directive 2014/94/EU, the demand for, and as a result the deployment of, that technology have remained limited. Therefore, specific rules should be established to mandate the use of OPS by containerships and passenger ships, since those are the ship categories that produce the highest amount of emissions per ship while moored at the quayside, according to the data collected within the framework of Regulation (EU) 2015/757 in 2018.*

(39) *In addition to OPS, other technologies might be capable of offering equivalent environmental benefits in ports.* ***When the use of an alternative technology is demonstrated to be equivalent to the use of OPS, a ship should be exempted from the obligation to use OPS****.*

(40) *Different OPS projects and solutions have been tested for ships at anchorage, but there is currently no mature and scalable technical solution available. For that reason,* ***the obligation to use OPS should be, in principle, limited to ships moored at the quayside.*** *Nevertheless, the Commission should regularly reassess the situation, with a view to extending that obligation to ships at anchorage, when the necessary technologies are sufficiently mature. In the meantime, Member States should be allowed to impose, in certain cases, the obligation to use OPS on ships at anchorage, for example in ports that are already equipped with such technology or are located in areas where any pollution should be avoided.*

(41) ***Exceptions from the obligation to use OPS should also be provided for a number of objective reasons,*** *subject to verification by the competent authority of the Member State of the port of call or any duly authorised entity, after consulting relevant entities where appropriate.* ***Such exceptions should be limited to unscheduled port calls, which are not made on a systematic basis, for reasons of safety or saving life at sea, to short stays of ships moored at the quayside of less than two hours as this is the minimum time required for connection, to cases of unavailability or incompatibility of OPS, to the use of onboard energy generation under emergency situations and to maintenance and functional tests.***

(42) *In ports falling under the requirements of Article 9 of Regulation (EU) 2023/1805, exceptions applicable in the event of unavailability or incompatibility of OPS should be limited after shipowners and port operators have had sufficient time to make the necessary investments, in order to provide the necessary incentives for those investments and avoid unfair competition. Ship operators should plan carefully their port calls to make sure that they can carry out their activities when moored at the quayside without emitting air pollutants and GHG, in order to protect the environment in coastal areas and port cities. A limited number of exceptions applicable in the event of unavailability or incompatibility of OPS should be provided for to cater for situations where OPS was not provided, for reasons beyond the control of the ship operator. In order to mitigate the risk of stranded assets, incompatibility of OPS infrastructure on board and at berth as well as alternative fuel demand and supply imbalances, frequent consultation meetings between relevant stakeholders should be organised to discuss and take decisions on requirements and future plans.*

43) *The requirement for ports to provide OPS, laid down in Regulation (EU) 2023/1805, takes into account the types of ships served and the respective traffic volumes of maritime ports. The requirement for ships to connect to OPS should not apply to ships when calling at ports that are not covered by the OPS requirement set out in that Regulation, unless the port has OPS installed and available at the visited quayside, in which case the ship should be required to connect to OPS from 1 January 2035.*

(44) *Considering the positive effects of the use of OPS on local air pollution and the need to incentivise the uptake of that technology in the short term, the carbon intensity of the production of the electricity supplied at berth should be counted as zero. The Commission should envisage the possibility to take into account the actual GHG emissions related to the electricity delivered through OPS at a later stage.*

(45) *The implementation of this Regulation should take due account of the diverse governance models for ports across the Union, in particular as regards the responsibility for issuing a certificate exempting a ship from the obligation to connect to OPS.*

(46) *Coordination between ports and ship operators is crucial to ensure smooth connection procedures to OPS in ports. Ship operators should inform the ports they call at about their intention to connect to OPS and about the amount of power needed during the given call, in particular when it exceeds the estimated needs for that ship category.*

47) ***From 2035, the number of exceptions granted under this Regulation from the obligation to connect to OPS, which apply to certain cases where the ship is unable to connect to OPS, should be limited per ship during a reporting period. To ensure fair treatment of ships and to reflect the differences in their operating profiles, the number of exceptions should reflect the frequency of their port calls but should never amount to more than ten port calls per reporting period****. However, a ship should not be penalised and port calls should not be counted against the maximum number of exceptions where, prior to arrival to a port, the ship has requested to connect to OPS and that request has been accepted by the port or the duly authorised entity, but*

the ship is unable to connect to OPS, and it is able to demonstrate that it could not have reasonably known it would be unable to connect to OPS.

(48) *A robust and transparent monitoring, reporting and verification system should be put in place by this Regulation in order to trace compliance with its provisions. Such system should apply in a non-discriminatory way to all ships and require third party verification in order to ensure the accuracy of the data submitted within that system. In order to facilitate achieving the objective of this Regulation, any data already reported for the purposes of Regulation (EU) 2015/757 should be used, when necessary, for verifying compliance with this Regulation in order to limit administrative burden imposed on companies, verifiers and competent authorities.*

(61) *A FuelEU penalty should be imposed also for each non-compliant port call. That FuelEU penalty should be proportionate to the cost of using the electricity at sufficient level, should have a dissuasive effect as regards the use of more polluting energy sources and should be expressed in a fixed amount in EUR, multiplied by the established total electrical power demand of the ship at berth and by the total number of hours, rounded up to the nearest whole hour, spent at berth in non-compliance with OPS requirements.*

Chapter 1 - General Provisions - Article 1 - Subject Matter and Objective

This Regulation lays down uniform rules imposing:

(a) *a limit on the greenhouse gas (GHG) intensity of energy used on board by a ship arriving at, staying within or departing from ports under the jurisdiction of a Member State; and*

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

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

Chapter 1 - General Provisions - Article 3 – Definitions

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

(10) *'port of call' means a port where ships stop to load or unload cargo or to embark or disembark passengers with the exclusion of stops for the sole purposes of refuelling, obtaining supplies, relieving the crew, going into dry-dock or making repairs to the ship, its equipment or both; stops in port because the ship is in need of assistance or in distress; ship-to-ship transfers carried out outside ports; stops for the sole purpose of taking shelter from adverse weather or rendered necessary by search and rescue activities; and stops of containerships in a neighbouring container transhipment port listed in the implementing act adopted pursuant to Article 2(2);*

Chapter II – Requirements for Energy Used on Board by Ships - Article 6 – Additional Zero-Emission Requirements for Energy Used at Berth

1. *From 1 January 2030, a ship moored at the quayside in a port of call which is covered by Article 9 of Regulation (EU) 2023/1805 and which is under the jurisdiction of a Member State shall connect to OPS and use it for all its electrical power demand at berth.*

2. *From 1 January 2035, a ship moored at the quayside in a port of call which is not covered by Article 9 of Regulation (EU) 2023/1805, which is under the jurisdiction of a Member State and where the quay is equipped with available OPS, shall connect to that OPS and use it for all its electrical power demand at berth.*

3. *From 1 January 2030 and until 31 December 2034, and after consulting relevant stakeholders, including, where appropriate, the managing body of the port, a Member State may decide that a ship moored at the quayside in a port of call under its jurisdiction which is not covered by Article 9 of Regulation (EU) 2023/1805, or in certain parts of such port, shall connect to OPS and use it for all its electrical power demand at berth. The Member State shall notify its decision imposing such requirement to the Commission a year prior to the application thereof. Such decision must apply from the beginning of a reporting period. The Commission shall publish the information in the*

Official Journal of the European Union and make publicly available an updated list of the ports concerned. Such list shall be easily accessible.

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

   (a) *containerships.*

   (b) *passenger ships.*

5. *Paragraphs 1, 2 and 3 shall not apply to ships that:*

   (a) *are moored at the quayside for less than two hours, calculated on the basis of time of arrival and time of departure monitored and recorded in accordance with Article 15;*

   (b) *use zero-emission technologies which comply with the general requirements for such technologies provided for in Annex III and are listed and specified in the delegated and implementing acts adopted in accordance with paragraphs 6 and 7 of this Article, for all their electrical power demand at berth, while moored at the quayside;*

   (c) *due to unforeseen circumstances beyond the control of the ship, have to make an unscheduled port call, which is not made on a systematic basis, for reasons of safety or saving life at sea, other than those already excluded under Article 3, point (10);*

   (d) *are unable to connect to OPS due to the unavailability of OPS connection points in a port;*

   (e) *are unable to connect to OPS because exceptionally the electrical grid stability is at risk, due to insufficient available shore-power to satisfy the ship's required electrical power demand at berth;*

   (f) *are unable to connect to OPS because the shore installation at the port is not compatible with the onboard on-shore power equipment, provided that the installation for shore-connection on board the ship is certified in accordance with the technical specifications set out in Annex II to Regulation (EU) 2023/1805 for the shore-connection systems of seagoing ships;*

   (g) *for a limited period of time, require the use of onboard energy generation, under emergency situations representing immediate risk to life, the ship or the environment or for other reasons of force majeure;*

   (h) *while remaining connected to OPS, for a period of time limited to what is strictly necessary, require the use of onboard energy generation for maintenance tests or for functional tests carried out at the request of an officer of a competent authority or the representative of a recognised organisation undertaking a survey or inspection.*

Chapter VI – Delegated and Implementing Powers and Final Provisions – Article 30 – Reports and Review

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

c. 2021/0223 (COD): Proposal for a Regulation of the European Parliament and of the Council on the Deployment of Alternative Fuels Infrastructure, and repealing Directive 2014/94/EU of the European Parliament and of the Council

1.2 For waterborne transport, this initiative delivers on the clear requirement of the European Green Deal to oblige docked ships to use shore-side electricity. It is fully complementary to Fuel EU maritime initiative by ensuring that sufficient shore-side electricity supply is installed in ports to provide electricity while passenger ships (including ro-ro passenger ships, high speed passenger craft and cruise ships) and container vessels are at berth and accommodating the demand for decarbonised gases (i.e. bio-LNG and synthetic gaseous fuels (e-gas). For the case of passenger ships, the different ship categories vary in their power demand characteristics while at berth, which leads to different investment needs at port. This needs to be combined with the different operational characteristics of ports, including layouts and terminals. For this reason, a further

distinction is made on passenger ships compared to the FuelEU maritime initiative in identifying two categories, that of ro-ro passenger ships and high-speed passenger vessels, and that of other passenger ships, notably cruise ships. Together with the FuelEU maritime initiative it therefore contributes to overcoming the current "chicken-and-egg" issue, which has meant that the very low demand for ship operators to connect to the electric grid while at berth has made it less attractive for ports to invest in shore-side electricity. Limited introduction of On-shore power supply OPS in ports risks disturbing the level playing between ports, in particular for early investors, as not OPS equipped vessels could shift their traffic. It is therefore important that minimum requirements be set for maritime ports across the whole TEN-T network.

5.2 Articles 9 and 10 set out provisions for Member States to ensure installation of a minimum shore-side electricity supply for certain seagoing ships in maritime ports and for inland waterway vessels. The articles also define further the criteria for exempting certain ports and set requirements to ensure a minimum shore-side electricity supply.

(32) Shore-side electricity facilities can serve maritime and inland waterway transport as clean power supply and contribute to reducing the environmental impact of seagoing ships and inland waterway vessels. Under the FuelEU maritime initiative, ship operators of container and passenger ships need to comply with provisions to reduce emissions at berth. Mandatory deployment targets should ensure that the sector finds sufficient shore-side electricity supply in TEN-T core and comprehensive maritime ports to comply with those requirements. The application of these targets to all TEN-T maritime ports should ensure the level playing field between ports.

(33) Container ships and passenger ships, being the ship categories, which are producing the highest amount of emissions per ship at berth, should as a priority be provided with shore-side electricity supply. In order to take into account power demand characteristics while at berth of different passenger ships, as well as port operational characteristics, it is necessary to distinguish between the passenger ship requirements for ro-ro passenger ships and high-speed passenger vessels, and those for other passenger ships.

(34) These targets should take into account the types of vessels served and their respective traffic volumes. ***Maritime ports with low traffic volumes of certain ship categories, should be exempted from the mandatory requirements for the corresponding ship categories based on a minimum level of traffic volume, so as to avoid underused capacity being installed. Similarly, the mandatory targets should not aim to target maximum demand, but a sufficiently high volume, in order to avoid underused capacity and to take account of port operational characteristics.*** *Maritime transport is an important link for the cohesion and economic development of islands in the Union. Energy production capacity in these islands may not always be sufficient to account for the power demand required to support the provision of shore-side electricity supply. In such a case, islands should be exempted from this requirement unless and until such an electrical connection with the mainland has been completed or there is a sufficient locally generated capacity from clean energy sources.*

Article 9 – Targets for Shore-Side Electricity Supply in Maritime Ports

1. Member States shall ensure that a minimum shore-side electricity supply for seagoing container and passenger ships is provided in maritime ports. To that end, Member States shall take the necessary measures to ensure that by 1 January 2030:

(a) TEN-T core and TEN-T comprehensive maritime ports whose average annual number of port calls over the last three years by seagoing container ships above 5000 gross tonnes, in the previous three years, is above 50 have sufficient shore-side power output to meet at least 90% of that demand;

(b) TEN-T core and TEN-T comprehensive maritime ports whose average annual number of port calls over the last three years by seagoing ro-ro passenger ships and high-speed passenger craft above 5000 gross tonnes, in the previous three years, is above 40 have sufficient shore-side power output to satisfy at least 90% of that demand;

(c) TEN-T core and TEN-T comprehensive maritime ports whose average annual number of port calls over the last three years by passenger ships other than ro-ro passenger ships and high-speed passenger craft above 5000 gross tonnes, in the previous three years, is above 25 have sufficient shore-side power output to meet at least 90% of that demand.

2. *For the determination of the number of port calls the following port calls shall not be taken into account:*

   (a) port calls that are at berth for less than two hours, calculated on the basis of hour of departure and arrival monitored in accordance with Article 14 of the proposal for a Regulation COM(2021)562;

   (b) port calls by ships that use zero-emission technologies, as specified in Annex III of the proposal for a Regulation COM(2021)562;

   (c) unscheduled port calls for reasons of safety or saving life at sea.

3. *Where the maritime port of the TEN-T core network and the TEN-T comprehensive network is located on an island which is not connected directly to the electricity grid, paragraph 1 shall not apply, until such a connection has been completed or there is a sufficient locally generated capacity from clean energy sources.*

2.3 OPS Regulations – Summary of Key Dates

The following is a summary of the key dates to be met to comply with current OPS directives and regulations.

Reference Document	Requirement	Due Date
FuelEU Maritime Initiative	Passenger ships and container ships **(over 5,000 GT)** to use OPS for all electricity needs while moored at the quayside in major EU ports as of 2030.	2030
Regulation (EU) 2023/1805 – Clause 43	The requirement for ships to connect to OPS should not apply to ships when calling at ports that are not covered by the OPS requirement set out in that Regulation, unless the port has OPS installed and available at the visited quayside, in which case the ship should be required to connect to OPS from 1 January 2035.	Jan. 1st 2035
Regulation (EU) 2023/1805 – Article 6	From 1 January 2030, a container ship or passenger ship moored at the quayside in a port of call which is covered by Article 9 of Regulation (EU) 2023/1805 and which is under the jurisdiction of a Member State shall connect to OPS and use it for all its electrical power demand at berth.	Jan. 1st 2030
Regulation (EU) 2023/1805 – Article 6	From 1 January 2035, a container ship or passenger ship moored at the quayside in a port of call which is not covered by Article 9 of Regulation (EU) 2023/1805, which is under the jurisdiction of a Member State and where the quay is equipped with available OPS, shall connect to that OPS and use it for all its electrical power demand at berth.	Jan. 1st 2035
Regulation (EU) 2023/1805 – Article 6	From 1 January 2030 and until 31 December 2034, and after consulting relevant stakeholders, including, where appropriate, the managing body of the port, a Member State may decide that a container ship or passenger ship moored at the quayside in a port of call under its jurisdiction which is not covered by Article 9 of Regulation (EU) 2023/1805, or in certain parts of such port, shall connect to OPS and use it for all its electrical power demand at berth.	Jan. 1st 2030
2021/0223 (COD) – Article 9	Member States shall ensure that a minimum shore-side electricity supply for seagoing container and passenger ships is provided in maritime ports. To that end, Member States shall take the necessary measures to ensure that by 1 January 2030: (a) TEN-T core and TEN-T comprehensive maritime ports whose average annual number of port calls over the last three years by seagoing container ships above 5000 gross tonnes, in the previous three years, is above 50 have sufficient shore-side power output to meet at least 90% of that demand;	Jan. 1st 2030

Reference Document	Requirement	Due Date
	(b) TEN-T core and TEN-T comprehensive maritime ports whose average annual number of port calls over the last three years by seagoing ro-ro passenger ships and high-speed passenger craft above 5000 gross tonnes, in the previous three years, is above 40 have sufficient shore-side power output to satisfy at least 90% of that demand; (c) TEN-T core and TEN-T comprehensive maritime ports whose average annual number of port calls over the last three years by passenger ships other than ro-ro passenger ships and high-speed passenger craft above 5000 gross tonnes, in the previous three years, is above 25 have sufficient shore-side power output to meet at least 90% of that demand.	

Table 1: Summary of Key Dates

2.4 OPS Regulations – Summary of Exemptions

The following is a summary of the exemptions applicable to current OPS directives and regulations.

Reference Document	Exemptions / Exceptions
Regulation (EU) 2023/1805 – Clause 39	When the use of an alternative technology is demonstrated to be equivalent to the use of OPS, a ship should be exempted from the obligation to use OPS.
Regulation (EU) 2023/1805 – Clause 40	The obligation to use OPS should be, in principle, limited to ships moored at the quayside.
Regulation (EU) 2023/1805 – Clause 41	Exceptions from the obligation to use OPS should also be provided for a number of objective reasons, subject to verification by the competent authority of the Member State of the port of call or any duly authorised entity, after consulting relevant entities where appropriate. Such exceptions should be limited to unscheduled port calls, which are not made on a systematic basis, for reasons of safety or saving life at sea, to short stays of ships moored at the quayside of less than two hours as this is the minimum time required for connection, to cases of unavailability or incompatibility of OPS, to the use of onboard energy generation under emergency situations and to maintenance and functional tests.
Regulation (EU) 2023/1805 – Clause 47	From 2035, the number of exceptions granted under this Regulation from the obligation to connect to OPS, which apply to certain cases where the ship is unable to connect to OPS, should be limited per ship during a reporting period. To ensure fair treatment of ships and to reflect the differences in their operating profiles, the number of exceptions should reflect the frequency of their port calls but should never amount to more than ten port calls per reporting period.
Regulation (EU) 2023/1805 – Article 3 - Clause 10	'Port of call' means a port where ships stop to load or unload cargo or to embark or disembark passengers with the **exclusion** of stops for the sole purposes of refuelling, obtaining supplies, relieving the crew, going into dry-dock or making repairs to the ship, its equipment or both; stops in port because the ship is in need of assistance or in distress; ship-to-ship transfers carried out outside ports; stops for the sole purpose of taking shelter from adverse weather or rendered necessary by search and rescue activities; and stops of containerships in a neighbouring container transhipment port listed in the implementing act adopted pursuant to Article 2(2).

Reference Document	Exemptions / Exceptions
Regulation (EU) 2023/1805 – Article 6 - Clause 5	The requirement for container ships and passenger ships to use OPS shall not apply to ships that: (a) are moored at the quayside for less than two hours, calculated on the basis of time of arrival and time of departure monitored and recorded in accordance with Article 15; (b) use zero-emission technologies which comply with the general requirements for such technologies provided for in Annex III and are listed and specified in the delegated and implementing acts adopted in accordance with paragraphs 6 and 7 of this Article, for all their electrical power demand at berth, while moored at the quayside; (c) due to unforeseen circumstances beyond the control of the ship, have to make an unscheduled port call, which is not made on a systematic basis, for reasons of safety or saving life at sea, other than those already excluded under Article 3, point (10); (d) are unable to connect to OPS due to the unavailability of OPS connection points in a port; (e) are unable to connect to OPS because exceptionally the electrical grid stability is at risk, due to insufficient available shore-power to satisfy the ship's required electrical power demand at berth; (f) are unable to connect to OPS because the shore installation at the port is not compatible with the onboard on-shore power equipment, provided that the installation for shore-connection on board the ship is certified in accordance with the technical specifications set out in Annex II to Regulation (EU) 2023/1805 for the shore-connection systems of seagoing ships; (g) for a limited period of time, require the use of onboard energy generation, under emergency situations representing immediate risk to life, the ship or the environment or for other reasons of force majeure; (h) while remaining connected to OPS, for a period of time limited to what is strictly necessary, require the use of onboard energy generation for maintenance tests or for functional tests carried out at the request of an officer of a competent authority or the representative of a recognised organisation undertaking a survey or inspection.
2021/0223 (COD) – Clause 34	Maritime ports with low traffic volumes of certain ship categories, should be exempted from the mandatory requirements for the corresponding ship categories based on a minimum level of traffic volume, so as to avoid underused capacity being installed. Similarly, the mandatory targets should not aim to target maximum demand, but a sufficiently high volume, in order to avoid underused capacity and to take account of port operational characteristics.
2021/0223 (COD) – Article 9 – Cl. 34	For the determination of the number of port calls the following port calls shall not be taken into account:
	(a) port calls that are at berth for less than two hours, calculated on the basis of hour of departure and arrival monitored in accordance with Article 14 of the proposal for a Regulation COM(2021)562;
	(b) port calls by ships that use zero-emission technologies, as specified in Annex III of the proposal for a Regulation COM(2021)562;
	(c) unscheduled port calls for reasons of safety or saving life at sea.

Table 2: Summary of Exemptions

3 PORT USAGE

The following table summarises the annual average number of vessels using SFP over the three-year period 2021 to 2023.

Vessel Type	Vessel Size (GT)	Average Number of Visits per Year	Average Time Spent in Port (Hours)
Oil Tankers			
Oil Tankers	<5,000	13	22
Oil Tankers	<10,000	4	22
Oil Tankers	>10,000	25	34
Chemical / Product Tankers			
Chemical / Product Tankers	<5,000	22	24
Chemical / Product Tankers	<10,000	1	8
Chemical / Product Tankers	>10,000	4	78
Bulk Carriers			
Bulk Carriers	<50,000	37	88
Bulk Carriers	>50,000	0	0
General Cargo			
General Cargo	<25,000	199	45
General Cargo	>25,000	0	0
Container Vessels			
Container Vessels	<10,000	0	0
Container Vessels	<50,000	0	0
Cruise Ships			
Cruise Ships	<50,000	2	12
Cruise Ships	<100,000	0	0
Cruise Ships	<150,000	0	0
Total - Annual Average		**307 no.**	
NOTES			

Table 3: Port Usage

4 OPS LOAD ESTIMATE

Note: *This section should be read in conjunction with* ***Appendix A*** *– Shannon Foynes Port – OPS Study – Load Estimate.*

4.1 Overview of Existing Medium Voltage Distribution Network

SFPC have a total of 17no metered ESB supplies in the greater Foynes area. Of these supplies, 12no are to premises spread across the port area. The local MV (medium voltage) network of the ESB operates at 10kV.

SFPC have no significant electrical loads with the result that all of the ESB connections are at low voltage (230V single phase / 400V three phase).

In the context of OPS, there are a number of shortcomings associated with the existing distribution network. These include:

- Currently there are no significant electrical loads within the port area. In the context of the existing low load profile, the anticipated OPS load will add substantial load to the local ESB network. This is likely to require substantial works by the ESB with associated substantial cost.
- Currently SFPC have no MV power supplies in place. The installation of OPS will necessitate the provision of MV power supplies operating at either 10kV or 20kV. This in turn will necessitate the provision of ESB substations, SFPC MV / LV switchroms and associated switchgear and cabling.

4.2 Berthing Facilities Requiring OPS Provision

Current legislation stipulates that ports used by container vessels and passenger ships of greater than 5,000 GT must have OPS provision in place to serve such vessels from January 2030.

As outlined at Table 3 above, SFP hasn't had any container vessel or Ro Ro Pax vessel traffic and very limited cruise ship traffic here to fore. This however will change with plans in place to develop a container handling business within the port.

The following items are noted in regard to container vessels and cruise ships from the SFPC Vision 2041 Strategic Review of September 2022.

a. East Jetty:
   - The East Jetty is being upgraded to enable container services with a capacity of 42,000 TEU's per annum.
   - Container operations will take place at Berths 5 and 6 and is expected to be operational from 2024.

b. Foynes Deepwater Port:
   - A deepwater port is proposed to be developed on Foynes Island. With a targeted throughput of 190,000 TEU's, the facility could handle up to 10% of Ireland's projected 2040 container volumes.
   - Phase 1 of this project is due to be complete by 2028 and will incorporate an 800m quay with a link bridge to the main port.

     400m of the proposed quay and the associated hardstanding will be dedicated to container services.

     The quay will be able to accommodate a single neo-Panamax vessel (80,000 GT to 120,000 GT) or two Feeder Max vessels (5,000 GT to 10,000 GT).
   - Phase 2 of the Foynes Deepwater Port entails an additional 400 m of quay length and hardstanding, thereby making space for a fourth berth and increasing the quay length to 1,200m
   - Phase 3 of the development would see a further expansion of the quay from 1,200m long to 1,900m long.
   - There is currently no timeline in place for Phases 2 & 3 of the project.

c. Cruise Ships:

- It is expected that any cruise vessels visiting SFP will be anchored in proximity to the Port of Foynes with tender vessels used to move passengers to the Port. This is to prioritise quayside availability for cargo operations, while keeping the cruise vessel in more optimal position within the Estuary to reduce their transit times and provide proximity to any re-fuelling options.

Notwithstanding the stated intent of the ports masterplan that visiting cruise ships would anchor rather than berth, current cruise ship traffic (<10no visits per year) is such that OPS provision is exempted 'so as to avoid underused capacity being installed' (from 2021/0223 COD – Clause 34).

The proposal to have container handling facilities in place at existing Berths 5 & 6 from 2024 and at the future deepwater berth from 2028, will necessitate the provision of OPS by 2030 and by extension, the provision of ESB substations and SFPC switchrooms with associated switchgear and cabling, at both locations.

4.3 OPS Load – Impact on Existing ESB Network

The findings of the OPS Study load schedule included at Appendix A are summarised in the following table.

Scenario	Description	Existing MIC (MW)	Existing Max Demand (MW)	Diversified OPS Load (MW)	Projected Max Demand (MW)
EXISTING BERTH CAPACITY - BERTHS 5 & 6					
1.00	**Typical Berthing Scenario**				
1.01	Container Vessels: 1no of 2no berths in use by a vessel of <50,000 GT (1.20MW)	0.35	0.25	1.20	1.45
1.02	RoRo Pax Vessels	NA	NA	NA	NA
1.03	Cruise Ships	NA	NA	NA	NA
	Sub-Total			**1.20**	**1.45**
2.00	**Worst Case Berthing Scenario**				
2.01	Container Vessels: 2no of 2no berths in use by vessels of <50,000 GT (1.20MW each)	0.35	0.25	2.40	2.65
2.02	RoRo Pax Vessels	NA	NA	NA	NA
2.03	Cruise Ships	NA	NA	NA	NA
	Sub-Total			**2.40**	**2.65**
FUTURE BERTH CAPACITY – BERTHS 5 & 6 + FUTURE DEEPWATER BERTHS DWB.1 & DWB.2 (Note 2)					
3.00	**Typical Berthing Scenario**				
3.01	Container Vessels: 2no of 4no berths in use by 1no vessel of <10,000 GT (0.90MW) and 1no vessel of <50,000 (1.20MW)	0.35	0.25	2.10	2.35
3.02	RoRo Pax Vessels	NA	NA	NA	NA
3.03	Cruise Ships	NA	NA	NA	NA
	Sub-Total			**2.10**	**2.35**

Scenario	Description	Existing MIC (MW)	Existing Max Demand (MW)	Diversified OPS Load (MW)	Projected Max Demand (MW)
4.00	**Worst Case Berthing Scenario**				
4.01	Container Vessels: 4no of 4no berths in use by 2no vessels of <10,000 GT (0.90MW each), 1no vessel of <50,000 GT (1.20MW and 1no vessel of >50,000GT (2.40MW)	0.35	0.25	5.40	5.65
4.02	RoRo Pax Vessels	NA	NA	NA	NA
4.03	Cruise Ships	NA	NA	NA	NA
	Sub-Total			**5.40**	**5.65**
	NOTES				
1	Max demand values are not available for the existing 12no ESB supplies serving the SFP port area. It has been assumed for the purposes of this study, that the max demand is of the order of 70% of the total MIC.				
2	The SFPC Vision 2041 Strategic Review of September 2022, envisages container handling at existing Berths 5 & 6 from 2024 and at a proposed deepwater berth from 2028. The 'future berth capacity' details noted above include for the use of the additional deepwater berth by 2028 and a future deepwater berth post 2028.				

Table 4: OPS Impact on ESB Supply

4.4 ESB Supply

As outlined in Table 4 above, the EU requirement to provide OPS for use by container vessels, RoRo pax vessels and cruise ships from January 2030, will add a significant electrical load to the SFPC distribution network (5.40MW in a worst-case scenario).

The existing ESB distribution network operates at 10kV. Typically, 10kV distribution networks are used to serve loads of up to 5MW. In this regard, the ESB will need to review the following to decide whether the addition of the anticipated OPS load will necessitate a change from 10kV to 20kV distribution:

- Max demand on the existing network
- Spare capacity on the existing network

We have initiated contact with ESB Networks with a view to getting an opinion as to which of the 10kV / 20kV options is likely to be adopted and an indication of the anticipated cost of the required upgrade works.

Pending feedback from ESB Networks, we propose that an order of magnitude cost allowance of €500,000 be included for the upgrade works necessary to serve the anticipated OPS load.

Regardless of whether the voltage of the upgraded ESB Networks supply will be 10kV or 20kV, substantial investment will be required by both ESB Networks and SFPC in respect of civil works (trenching, cable ducting, ESB substations, SFPC MV switchrooms etc.) and electrical works (MV cable, MV switchgear, MV / LV transformers etc.).

5 ELECTRICAL INFRASTRUCTURE

5.1 Existing MV Switchgear - Overview

Note: *This section should be read in conjunction with MV schematic IE000678-RPS-02-XX-DR-E-ED0001.*

Currently all ESB Network supplies to SFPC premises / facilities are low voltage supplies operating at 230V single phase and 400V three phase.

OPS power will necessitate the provision of MV supplies sized to serve the anticipated load increase resulting from the addition of OPS, STS cranes, reefer refrigeration, EV charging etc., with associated requirements for:

- ESB substations and associated switchgear
- SFPC switchrooms and associated switchgear
- MV cabling and associated cable trenching and cable draw chambers etc.

It is envisaged that dedicated substations and switchrooms will be required to serve the OPS infrastructure for the following berths:

- East Jetty – Existing berths 5 & 6
- Foynes Island Deepwater Port – Proposed deepwater berths DWB1 & DWB2

5.2 East Jetty – Works Required to Facilitate OPS Provision

Note: *This section should be read in conjunction with MV schematic IE000678-RPS-02-XX-DR-E-ED0001.*

In the absence of any existing MV infrastructure, the following is a summary of the electrical works necessary to accommodate the provision of OPS.

a. Switchgear:
   - Primary switchboard: 20kV rated, five cubicle switchboard with 5no circuit breakers serving the incoming ESB supply (1no), supply and return legs of an MV ring main network (2no) and 2no spare.
   - RMU: 20kV rated seven cubicle ring main unit with 2no switches (incoming and outgoing connections to MV ring main network) and 5no circuit breakers (MV/LV transformer T1, STS Crane No.1, STS Crane No.2, Berth 5 & 6 OPS equipment & 1no spare).
   - MV/LV transformer T1
   - LV distribution board MDB1 (serving switchrooms, site lighting etc.)
   - Berth 5 & 6 OPS switchgear
   - Berth 5 & 6 OPS outlets

b. Cable:
   - 20kV rated cable serving RMU
   - 20kV rated cable serving transformer T1
   - 20kV rated cable serving Berth 5 & 6 OPS switchgear
   - 20kV rated cable serving Berth 5 & 6 OPS outlets
   - LV cable serving MDB1
   - LV cable serving Berth 5 & 6 OPS outlets

5.3 Foynes Island Deepwater Port - Works Required to Facilitate OPS Provision

Note: *This section should be read in conjunction with MV schematic IE000678-RPS-01-XX-DR-E-ED0001.*

In the absence of any existing MV infrastructure, the following is a summary of the electrical works necessary to accommodate the provision of OPS.

While the schedule below includes for the electrical infrastructure required to the serve the new facility, is it assumed that all but the OPS related elements will be provided within the scope of the main project. The OPS elements are shown in red text.

a. Switchgear:
   - RMU: 20kV rated seven cubicle ring main unit with 2no switches (incoming and outgoing connections to MV ring main network) and 5no circuit breakers (MV/LV transformer T2, STS Crane No.1, STS Crane No.2, berths DWB1 & DWB2 OPS equipment & 1no spare).
   - MV/LV transformer T2
   - LV distribution board MDB2 (serving switchrooms, site lighting etc.)
   - DWB1 & DWB2 OPS switchgear
   - DWB1 & DWB2 OPS outlets

b. Cable:
   - 20kV rated cable serving transformer RMU
   - 20kV rated cable serving transformer T2
   - 20kV rated cable serving DWB1 & DWB2 OPS switchgear
   - 20kV rated cable serving DWB1 & DWB2 OPS outlets
   - LV cable serving MDB2
   - LV cable serving DWB1 & DWB2 OPS outlets

6 CIVIL INFRASTRUCTURE

6.1 Civil Works Overview

Note: *This section should be read in conjunction with the indicative cable management layouts IE000678-RPS-02-XX-DR-E-EK0003 and IE000678-RPS-02-XX-DR-E-EK0004.*

Currently all ESB Networks power supplies to SFPC premises / facilities are at low voltage (230V / 400V).

The OPS installation required to serve the proposed container vessel berths will necessitate the provision of MV supplies which in turn will necessitate the provision of ESB substations, SFPC switchrooms, modular OPS equipment switchrooms and associated cable duct trenching and cable draw chambers etc.

Given the size of the projected OPS load (4.20MW), it is anticipated that a new MV ESB substation and SFPC switchroom will be provided to serve the existing East Jetty berths (no.5 & no.6) and that this SFPC switchroom will subsequently be used to provide an MV power supply to a second SFPC switchroom for the proposed Foynes Island Deepwater Port.

The interface between the proposed East Jetty and Foynes Island switchrooms will entail the provision of cable ducts and cable draw chambers sized to accommodate both the cables associated with the anticipated works and allowance for future works. It is assumed that this interface will be provided within the scope of the main Deepwater Port project.

6.2 East Jetty

Note: *This section should be read in conjunction with the indicative cable management layout IE000678-RPS-02-XX-DR-E-EK0003.*

The following civil works are anticipated in respect of the provision of OPS units for the existing berths No.5 & No.6 at East Jetty:

- New electrical utilities building incorporating an ESB substation and SFPC MV/LV switchroom
- Base for containerised / modular OPS Equipment Switchroom (to accommodate the OPS switchgear, transformers, frequency converters etc.)
- Flush formed pockets at the quay edge (to accommodate OPS JB's).
- Flush formed crane pits (to accommodate an interface with STS cranes).
- Cable ducting to provide an interface between the existing ESB Networks infrastructure and the proposed ESB substation.
- Cable ducting and associated cable draw chambers to provide an interface between the ESB substation, SFPC switchroom and OPS equipment switchroom.
- Cable ducting and associated cable draw chambers to provide an interface between the OPS equipment switchroom and the flush formed OPS JB pockets in the existing quay.

6.3 Foynes Island Deepwater Port

Note: *This section should be read in conjunction with the indicative cable management layout IE000678-RPS-02-XX-DR-E-EK0004.*

The following civil works are anticipated in respect of the provision of OPS units for the DWB1 & DWB2 container vessel berths at the proposed Foynes Island Deepwater Port.

While the schedule below includes for the civil infrastructure required to the serve the electrical infrastructure for the new facility, is it assumed that all but the OPS related elements will be provided within the scope of the main Deepwater Port project. The OPS elements are shown in red text.

- Base for containerised / modular SFPC MV/LV switchroom.
- Base for containerised / modular OPS Equipment Switchroom.

- Flush formed pockets at the quay edge (to accommodate OPS JB's).
- Flush formed crane pits (to accommodate an interface with STS cranes).
- Cable ducting and associated cable draw chambers to provide an interface between the proposed SFPC switchrooms at East Jetty and the Foynes Island deepwater berth.
- Cable ducting and associated cable draw chambers to provide an interface between the OPS equipment switchroom and the flush formed OPS JB pockets in the proposed quay.

7 OPS OPEX COST

7.1 OPS - Annual Electricity Use

The chart included below shows the current annual electricity use, prospective annual OPS electricity use and a combination of the two for the existing East Jetty and the proposed Foynes Island Deepwater Port. All values are in megawatt hours.

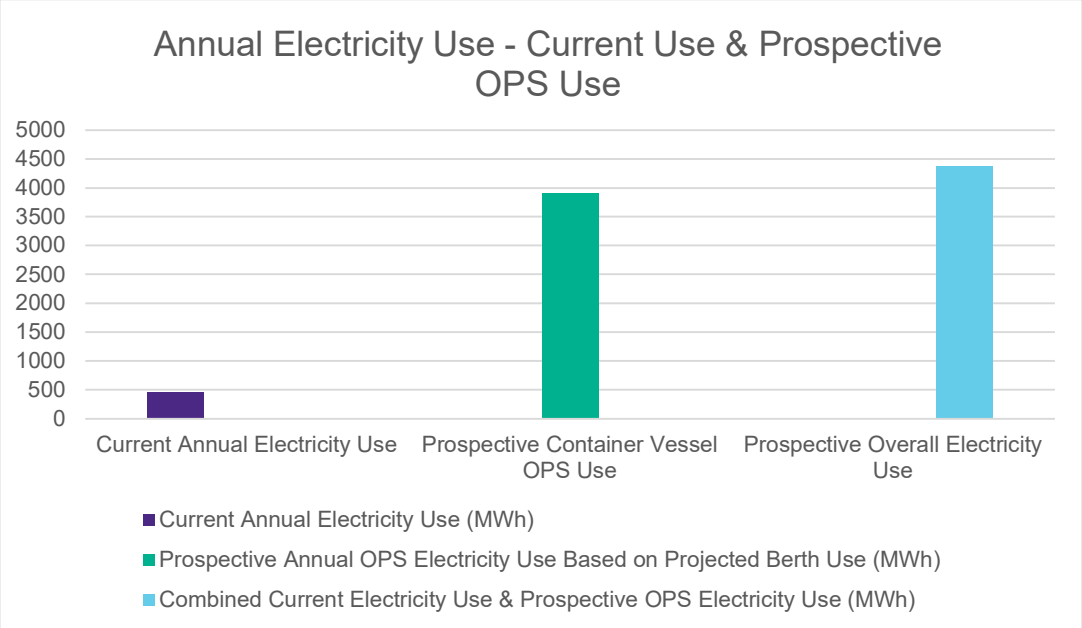
While the East Jetty is a multi-modal facility capable of accommodating several vessel types, the OPS electricity use values used in the chart relate specifically to container vessels.

The current annual electricity use relates to the 12-month period extending from April 2023 to March 2024 and the prospective OPS electricity use is based on projected annual average berth use, calculated using the following data from the SFPC Vision 2041 Strategic Review of September 2022.

Foynes East Jetty - Projected Vessel Numbers: The SFPC Vision 2041 Strategic Review of Sept 2022 is projecting annual container traffic of 42,000 TEU's from the year 2024. This business will be based on Feeder Max type vessels operating at Berths 5 & 6. It is assumed for the purposes of this study that the projected capacity will be delivered using 21no vessel visits at an average of 2,000 TEU's each.

Foynes Deepwater Berth - Projected Vessel Numbers: The SFPC Vision 2041 Strategic Review of Sept 2022 is projecting annual container traffic of 190,000 TEU's from the year 2028 at the proposed deepwater berth. It is assumed for the purposes of this study that this business will be based on Feeder Max type vessels (60,000 TEU's / 30 vessels at an average of 2,000 TEU's), Panamax type vessels (60,000 TEU's / 20 vessels at an average of 3,000 TEU's) and Neo-Panamax type vessels (70,000 TEU's / 8 vessels at an average of 8,500 TEU's) operating at the proposed deepwater facility.

Please refer to Appendix B for a detailed breakdown of electricity use in the existing Shannon Foynes Port area.



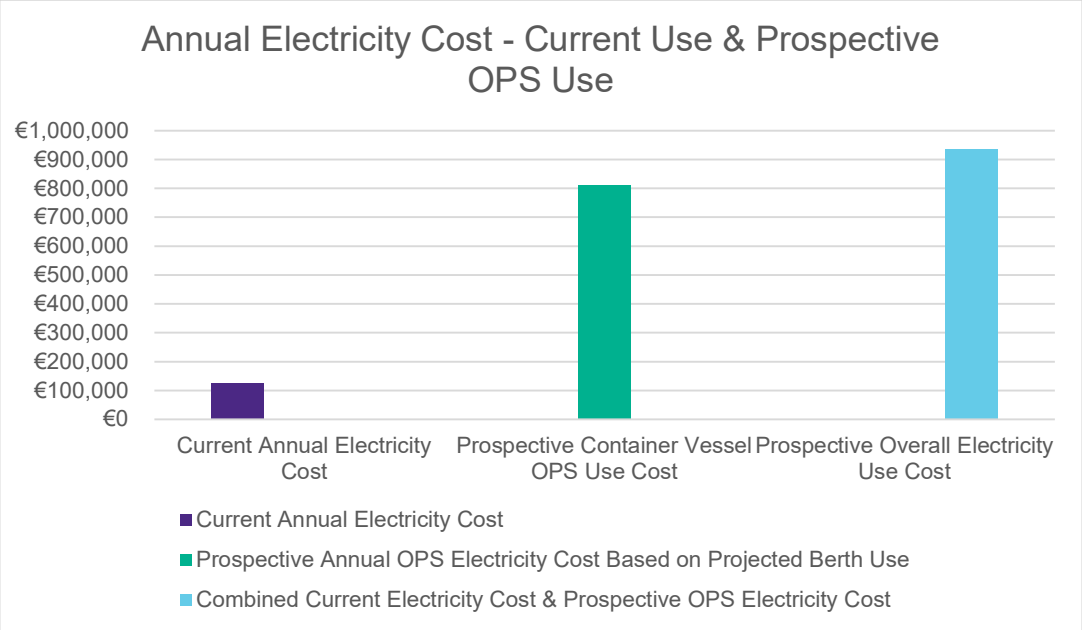
7.2 OPS - Annual Electricity Cost

The chart included below shows the current annual electricity cost, prospective annual OPS electricity cost and a combination of the two for the existing East Jetty and the proposed Foynes Island Deepwater Port.

While the East Jetty is a multi-modal facility capable of accommodating several vessel types, the OPS electricity cost figures used in the chart relate specifically to container vessels.

The current annual electricity cost relates to the 12-month period extending from April 2023 to March 2024 and the prospective OPS electricity cost is based on the projected annual average berth use detailed at Section 7.1 above.

Please refer to Appendix B for a detailed breakdown of electricity costs in the existing Shannon Foynes Port area.



7.3 OPS - Annual Operating Costs

An indicative breakdown of the annual operating costs associated with OPS provision and use is included in Table 5 below.

Item	Description of Works	Nett Amount	Contingency	Total Amount
1.00	**Container Vessels**		**(Note 1)**	
1.01	OPS equipment electricity usage costs (Refer to Appendix B)	€810,050.00	20%	€972,060.00
1.02	OPS equipment depreciation allowance (@5% of €9,220,000 installed cost)	€461,000.00	20%	€553,200.00
1.03	OPS equipment maintenance cost (Maintenance contract based on quarterly visits)	€10,000.00	20%	€12,000.00
1.04	OPS equipment connection costs (Based on two electricians for two hours at €60/hr for each of 79no vessels berthing per year)	€18,960.00	20%	€22,752.00
1.05	OPS equipment disconnection costs (Based on two electricians for two hours at €60/hr for each of 79no vessels berthing per year)	€18,960.00	20%	€22,752.00
	Total (Excl. VAT)	**€1,318,970.00**		**€1,582,764.00**

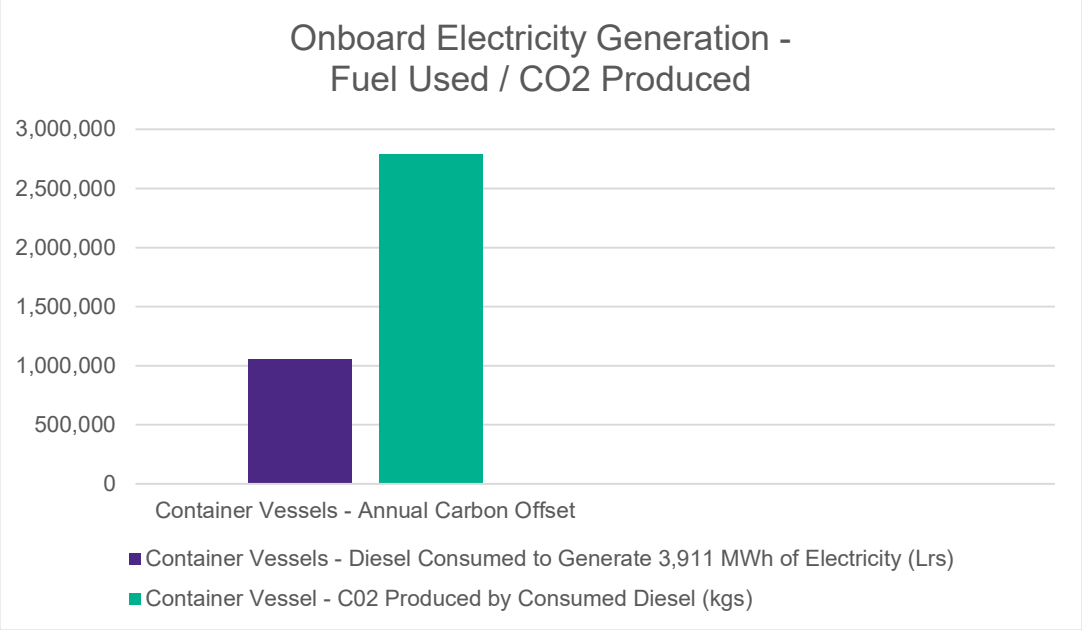
NOTES	
1	Contingency included to cover unforeseen items, price escalation etc.

Table 5: OPS – Annual Operating Costs

7.4 OPS - Annual Carbon Offset

The amount of diesel fuel used to produce one megawatt of electricity is of the order of 270L/hr with each litre producing 2.64kgs of CO_2, equating to 713kg of CO_2/MWh of electricity.

The chart included below shows both the amount of fuel consumed and the associated CO_2 released by vessel generators while at berth in Shannon Foynes Port over an average year.



8 COST ESTIMATE

Note: *This section should be read in conjunction with Appendix C - OPS Study - Cost Estimate.*

Item	Description of Works	Nett Amount	Contingency	Total Amount
1.00	**Shannon Foynes Port**			
1.01	Civil Works	€1,815,500.00	20%	€2,178,600.00
1.02	Electrical Works	€1,796,300.00	20%	€2,155,560.00
1.03	OPS Equipment	€9,220,000.00	20%	€11,064,000.00
1.04	ESB Networks (Note 1)	€500,000.00	20%	€600,000.00
	Total (Excl. VAT)	**€13,331,800.00**		**€15,998,160.00**

NOTES

1	Order of magnitude cost.
2	Contingency included to cover unforeseen items, price escalation etc.

Table 6: Cost Estimate Summary

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 ESB Network Upgrade

The provision of OPS power at the existing East Jetty and the proposed Foynes Island Deepwater Port will see the MIC required from the ESB increase from the current level of 0.35MW to a projected level of 4.45MW. The latter value excludes the power requirement associated with loads such as ship-to-shore cranes, reefer refrigeration, EV charging etc.

This level of MIC increase will necessitate significant upgrade of the existing MV network with associated substantial cost.

It is recommended that SFPC engage early with the ESB to establish the extent of the upgrade work that needs to be done on the local network, the timelines for same and the associated cost.

9.2 East Jetty

ESB supplies within the existing port area are all at low voltage.

MV supplies will be required to serve the proposed OPS equipment. This will necessitate significant capital investment by SFPC in relation to the following works:

a. Civil Works:
   - ESB Substation
   - SFPC MV / LV switchroom
   - Base and steel supports for containerised OPS equipment switchroom
   - Trenching & cable ducting
   - Flush formed pockets for OPS outlets

b. Electrical Works:
   - ESB capital contribution
   - MV switchgear
   - MV / LV transformer
   - LV switchgear
   - MV / LV cabling
   - Switchroom M&E services

It is recommended that SFPC progress the necessary works to design and construction stage to ensure that works can be in place and operational for the January 2030 deadline.

9.3 Foynes Island Deepwater Port

It is anticipated that power to the proposed Deepwater Port will be served from the MV infrastructure proposed for the East Jetty.

Currently it is envisaged that the Deepwater Port will be operational by 2028. In this regard, it is recommended that the civil and electrical infrastructure required to facilitate the provision of OPS be included within the scope of the Deepwater Port development.

9.4 OPS Equipment

OPS equipment vendors have advised that with all major European ports facing the same 2030 deadline for the provision of OPS power, the lead time on OPS equipment is currently running at twelve to eighteen months depending on the complexity of the system proposed.

In the context of extended OPS equipment deliveries, it is recommended that a programme be prepared to detail the works that need to be put in place to achieve completion of the proposed OPS installations in the lead up to 2030.

10 ACKNOWLEDGEMENTS

RPS would like to thank the following SFPC personnel for their assistance in the preparation of this OPS FES Report.

- John Carlton
- Liam Griffin

Appendix A
OPS Study Load Estimate

Appendix B
Electrical Usage Summary

Appendix C
OPS Study Cost Estimate

Appendix D
Drawing Schedule

The following drawings are appended to this report:

Drawing No	Description	Status / Rev.
IE000678-RPS-02-XX-DR-E-ED0001	Shannon Foynes Port - Proposed MV Schematic	A1 / P01
IE000678-RPS-02-XX-DR-E-EK0001	Shannon Foynes Port - Indicative OPS Layout - Sheet 1 of 2	A1 / P01
IE000678-RPS-02-XX-DR-E-EK0002	Shannon Foynes Port - Indicative OPS Layout - Sheet 2 of 2	A1 / P01
IE000678-RPS-02-XX-DR-E-EK0003	Shannon Foynes Port - Indicative Cable Management Layout - Sheet 1 of 2	A1 / P01
IE000678-RPS-02-XX-DR-E-EK0004	Shannon Foynes Port - Indicative Cable Management Layout - Sheet 2 of 2	A1 / P01