



European flagship Action for cold ironING in ports



Co-financed by the Connecting Europe  
Facility of the European Union

# Results of EALING Activity 1 - Harmonised framework for the electrification of participating TEN-T maritime ports

## EALING Mid-Term Event

29 April 2022

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**Activity 1. Introduction**

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**Activity 1. Executive Report on Ports Questionnaire**

**3**

**Activity 1. Milestone 4**

**4**

**Activity 1. Milestone 6 (next step)**

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# Activity 1. Introduction

## MILESTONES

- M1 - Activity 1 Kick-off Meeting ✓
- M2 - Workshop on the technical, legal and regulatory framework for the implementation of OPS in EU ports ✓
- M3 - Activity 1 Progress Meeting ✓
- M4 - Detailed Analysis on the existing national / port regulations directly or indirectly related to shore side electricity supply completed ✓
- M5 - Activity 1 Final Meeting
- M6 - Final recommendations for a harmonised framework on OPS in EU ports completed

## DELIVERABLES

- Report on the Detailed Analysis on the existing national/port regulations related to shoreside electricity supply.
- Report on final recommendations for a harmonised framework on OPS in the EU ports.

# 2

## **Activity 1. Executive Report on Ports Questionnaire**

Results of the Survey on OPS at European Ports

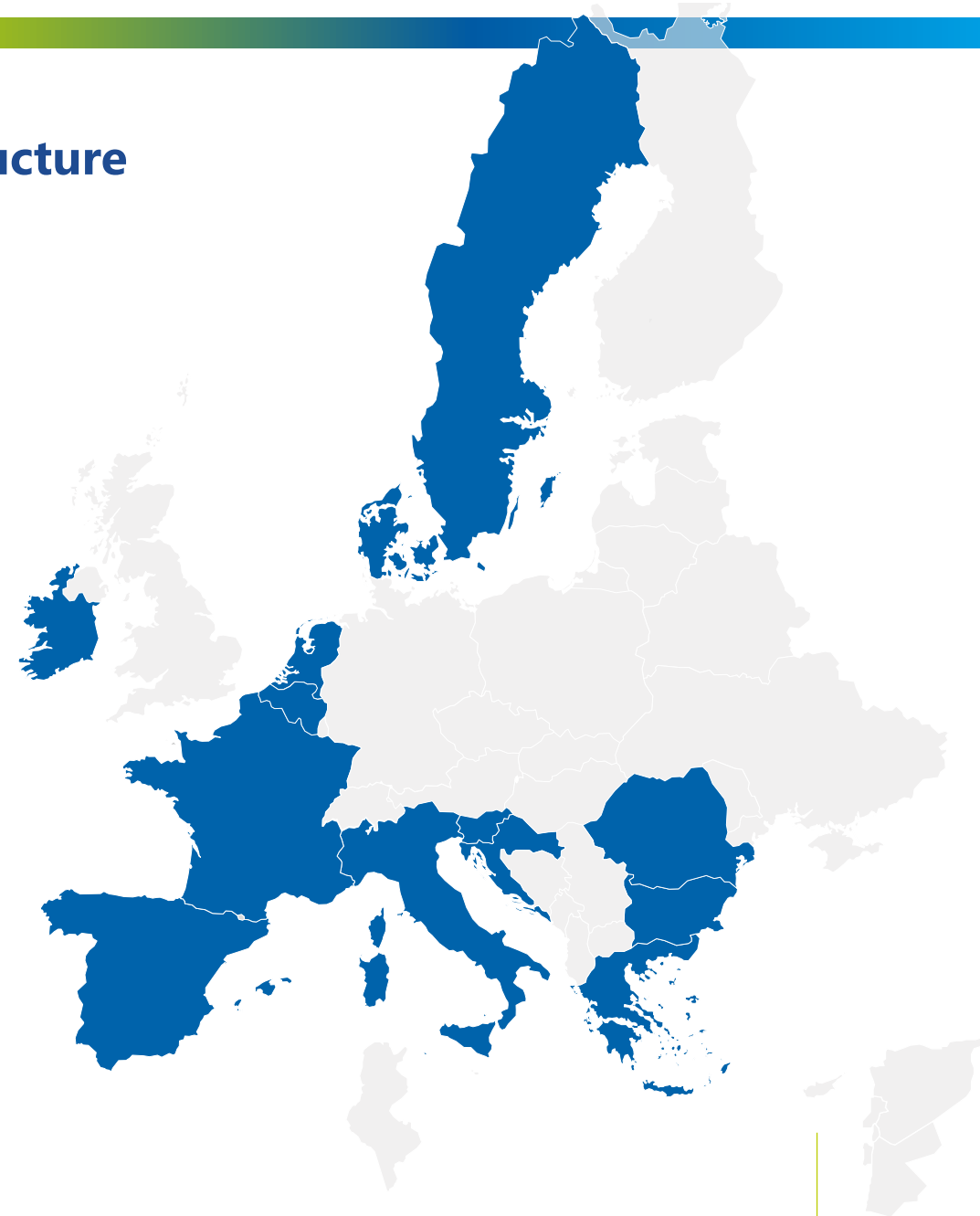
## Discovering the Port Questionnaire - structure

The objective has been to gather information on the status of OPS infrastructure in EU ports and on the technical, regulatory, administrative, and other related aspects that affect its implementation.

The questionnaires were sent through different channels to more than 200 EU ports. They were completed between May and June 2021, although the process was reopened in September to allow additional ports to collaborate.

In total, **54 EU ports participated in this activity.**

The analysis presented in this executive summary is based solely and exclusively on the responses of the participating ports.



## Discovering the Port Questionnaire - structure

### A - GENERAL INFORMATION

*It provides information to know the type of port or terminal under study (traffic type, governance model, etc.).*

### B - TECHNICAL ASPECTS RELATED TO OPS

*It includes technical data regarding the status of OPS implementation in the participating ports.*

### C - SPECIFIC REGULATORY AND ADMINISTRATIVE ASPECTS

*It collects information on the relevant regulatory aspects at EU / national level and administrative procedures.*

### D - OTHER ASPECTS (SUCH AS FINANCING, BUILDING FACILITIES AND RESOURCES)

*It provides information on other related aspects, such as financing or incentives schemes, barriers at construction level, and training needs and profiles.*

### E - ADDITIONAL INFORMATION

*It includes additional information freely provided by the respondent.*

## List of the surveyed ports

NAME OF THE PORTS	COUNTRY	TOTAL SURVEYED PORTS
ALGECIRAS, BARCELONA, CEUTA, FERROL, GIJÓN, HUELVA, LAS PALMAS DE GRAN CANARIA, MÁLAGA, MOTRIL, PALMA, SANTANDER, VALENCIA	SPAIN	12
ANCONA, BARI, BRINDISI, CHIOGGIA, LA SPEZIA, LIVORNO, MONFALCONE, NOGARO, ORTONA, PESARO, TRIESTE	ITALY	11
ALEXANDROUPOULIS, CHANIA, IGOUMENITSA, MYKONOS, PATRAS, PIRAEUS, RAFINA	GREECE	7
AVEIRO, CANIÇAL E PORT SANTO, FIGUEIRA DA FOZ, FUNCHAL, LEIXOES, LISBON, PORTOS DOS AÇORES	PORTUGAL	7
CONSTANTZA, MANGALIA, MIDIA	ROMANIA	3
BOURGAS, VARNA	BULGARIA	2
AARHUS, RONNE	DENMARK	2
SETE, TOULON	FRANCE	2
DUBLIN, GALWAY	IRELAND	2
ANTWERPEN	BELGIUM	1
PLOCE	CROATIA	1
MALTA FREEPORT	MALTA	1
AMSTERDAM	THE NETHERLANDS	1
KOPER	SLOVENIA	1
KAPELLSSKAR, NORVIK, NYNASHAMN, STOCKHOLM	SWEDEN	1

**54** ports surveyed, from  
15 EU Member States

E

D

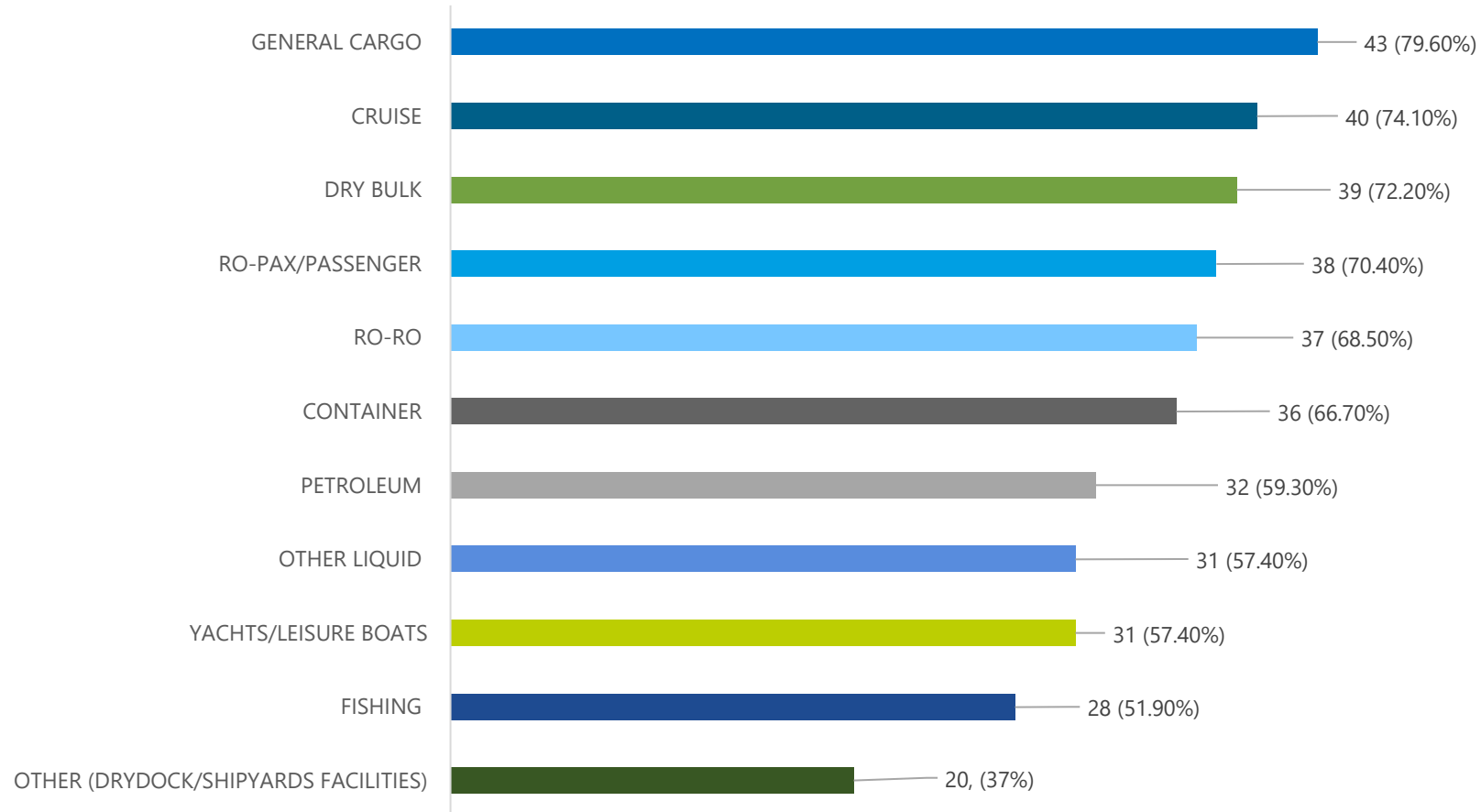
C

B

A - GENERAL INFORMATION



## Classification of the ports surveyed by type of traffic



Note: Question addressed to all the participating ports. 54 replies, multiple choice.

E

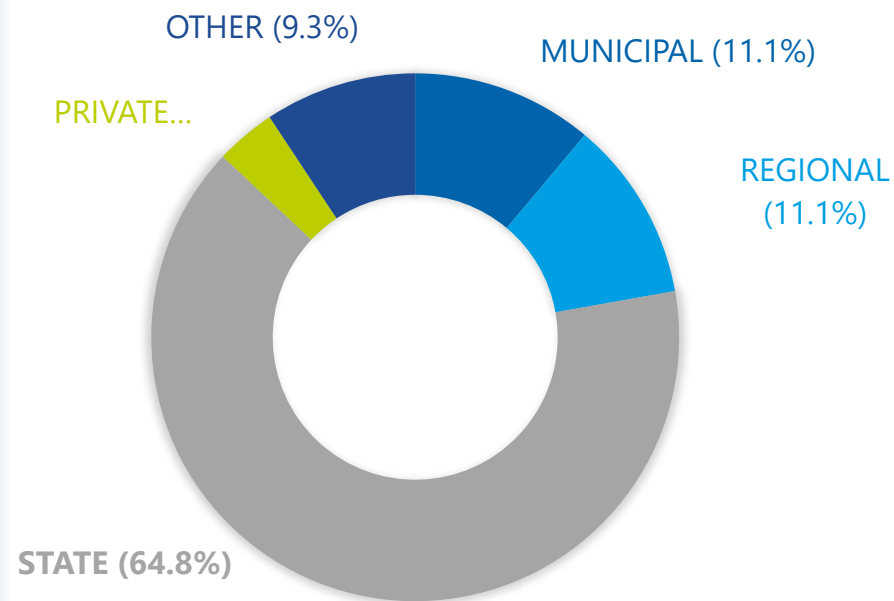
D

C

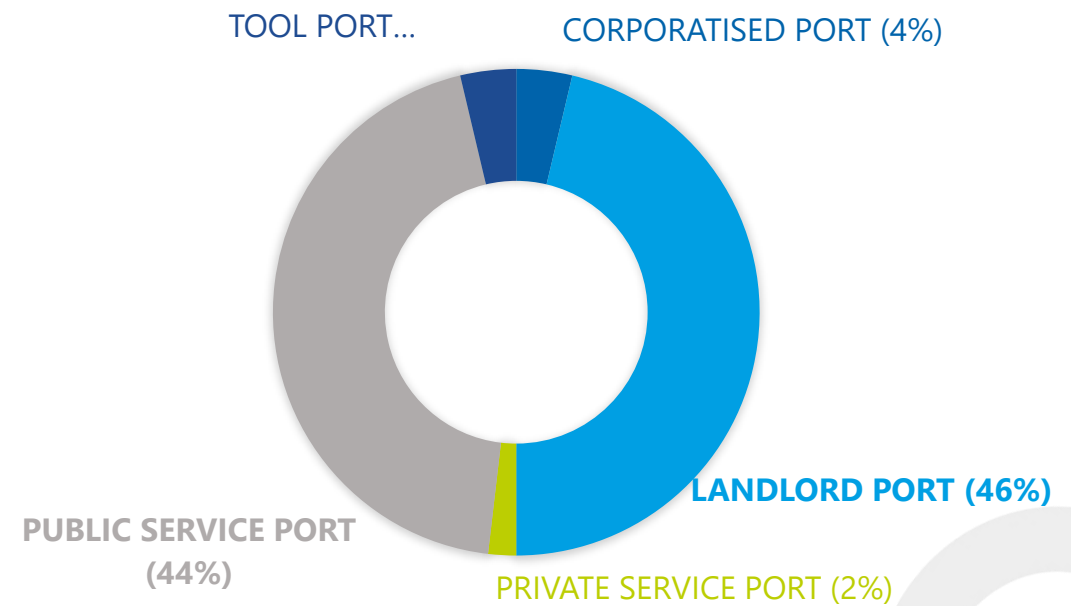
B

A - GENERAL INFORMATION

## Classification of the ports surveyed by type of ownership and governance model



**Port Ownership**

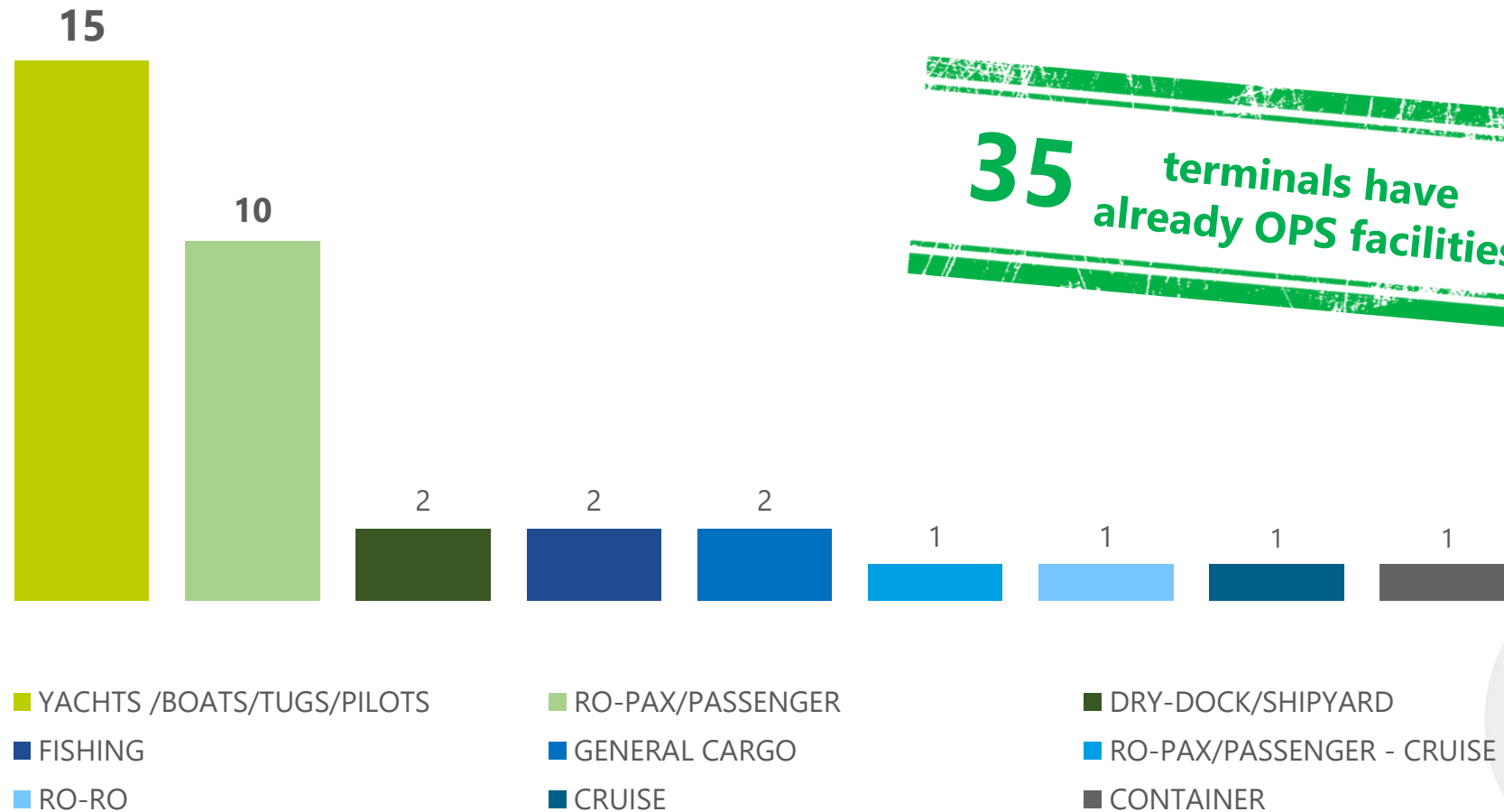


**Port Governance model**

Note: Question addressed to all the participating ports. 54 replies.

- A - GENERAL INFORMATION
- B
- C
- D
- E

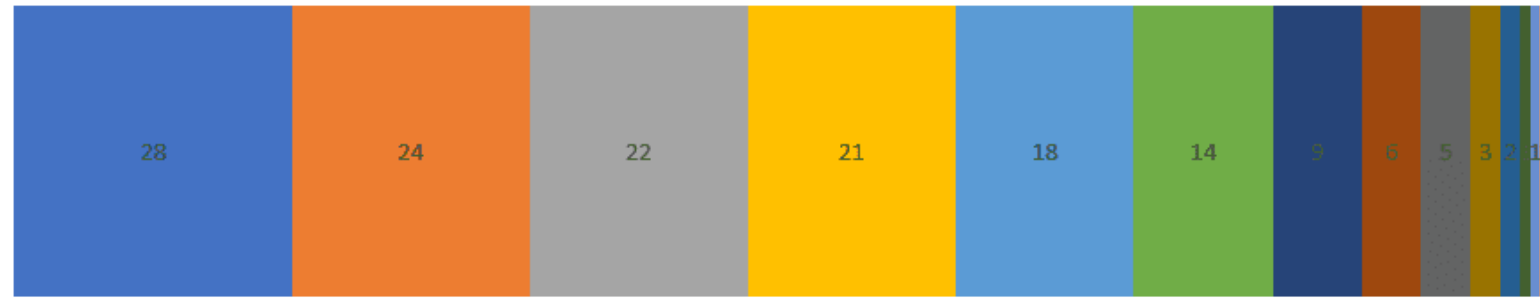
### Number of TERMINALS where OPS is available



Note: Question addressed to ports with OPS. 12 replies, multiple choice.

## Number of TERMINALS where OPS will be available in the next 5 years

**155** Terminals with OPS facilities planned



- CONTAINER
- GENERAL CARGO
- RO-PAX/PASSENGER
- CRUISE
- RO-RO
- DRY BULK
- OTHER LIQUID
- PETROLEUM
- YACHTS /BOATS/TUGS/PILOTS
- RO-PAX/PASSENGER - CRUISE
- RO-PAX/PASSENGER/RO-RO/CRUISE
- DRY-DOCK/SHIPYARD
- CONTAINER/RO-RO/RO-PAX/PASSENGER
- RO-PAX/PASSENGER - RORO

CONTAINER	28
GENERAL CARGO	24
RO-PAX/PASSENGER	22
CRUISE	21
RO-RO	18

Note: 33 replies, multiple choice.

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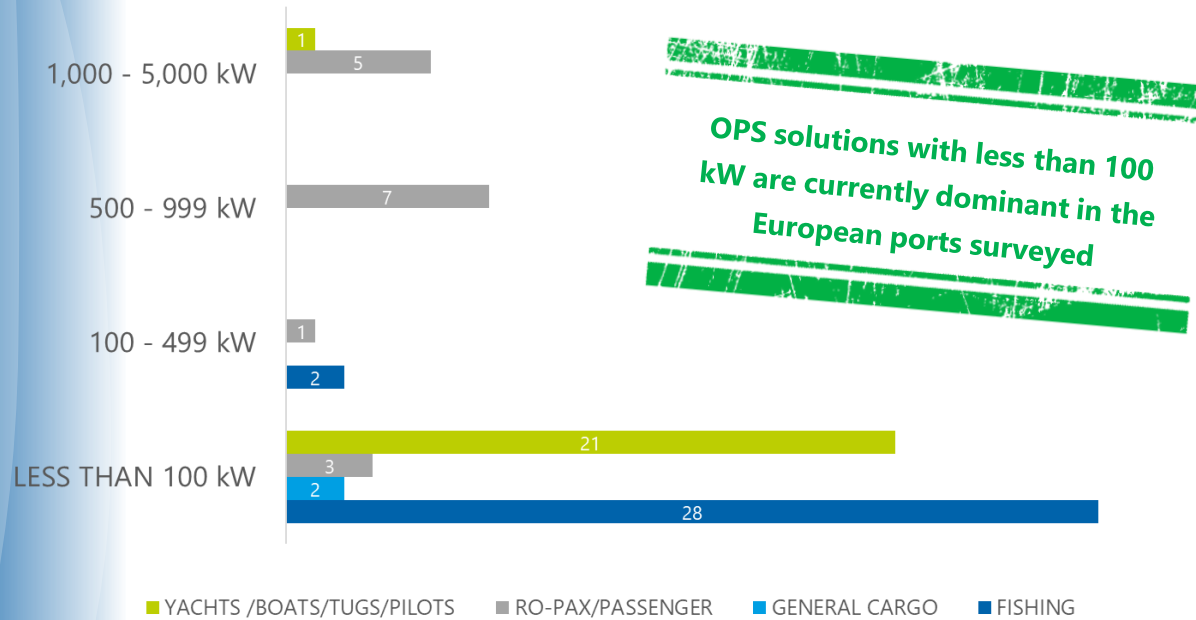
C

B - TECHNICAL ASPECTS RELATED TO OPS

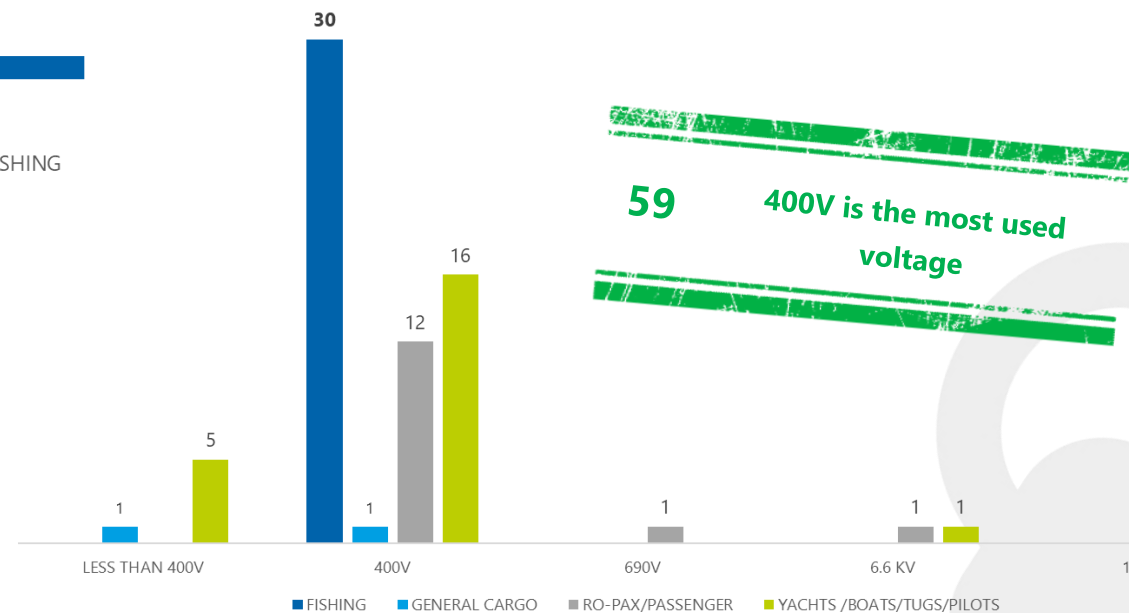
A



## Power in kW per type of terminal with OPS



## Average Voltage per type of terminal with OPS



Note: Question addressed to ports with OPS. 13 replies, multiple choice.

E

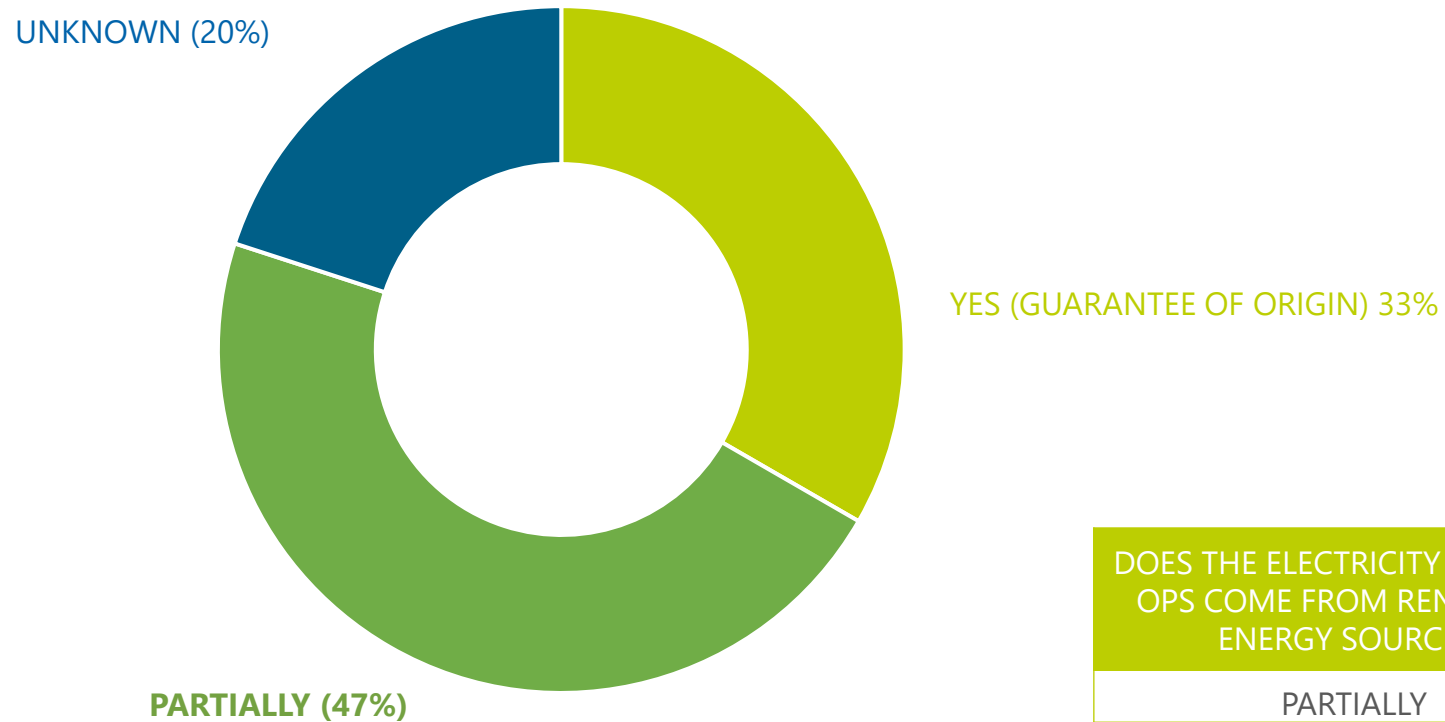
D

C

B - TECHNICAL ASPECTS RELATED TO OPS

A

## Renewable energy use for OPS

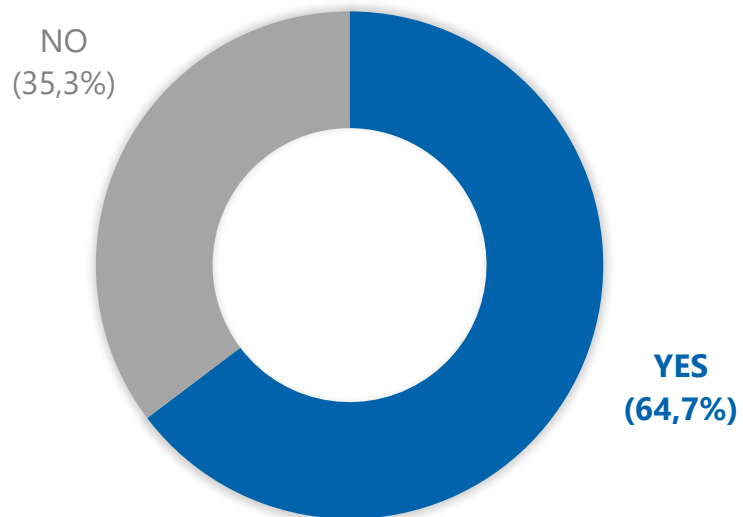


DOES THE ELECTRICITY USED FOR OPS COME FROM RENEWABLE ENERGY SOURCES?	TOTAL
PARTIALLY	7
YES (GUARANTEE OF ORIGIN)	5
UNKNOWN	3

Note: Question addressed to ports with OPS facilities. 15 replies.

► Ports with OPS:

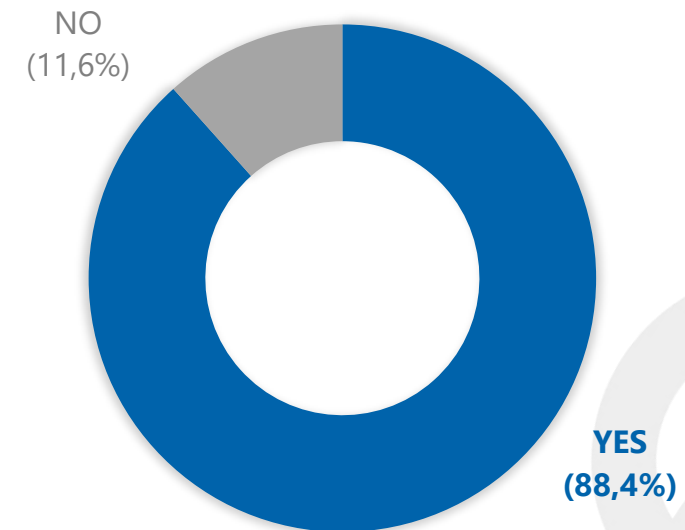
The ports participating in the questionnaire were asked whether they had **to upgrade and/or invest in the electricity network** to meet the expected demand.



Note: 17 replies

► Ports with planned OPS:

The ports participating in the questionnaire were asked whether they will have **to upgrade and/or invest in the electricity network** to meet the expected demand.



Note: 43 replies

## Main technical/operational/financial difficulties in planning and implementing OPS solutions

- 1** **Cost of installations** compared with cost of operation, cost of electrical power and economic viability of the service, lack of pricing and taxing framework
- 2** Status and capacity of the port electricity grid (power constraints, etc.)
- 3** Lack of technical and operational expertise about shore side electricity for ports (implementation). Estimation of the power demands in the ports, in particular per hours for different size of ships (different technical solutions and standards (i.e. 50 Hz or 60 Hz, 11 kV or 6.6 kV) for different types of berths/ships)
- 4** Defining role / responsibility / expectations of stakeholders, and split incentives
- 5** Lack of legislative drivers for OPS installation and operation (regulation of the service)
- 6** Selection of the service operator

Note: Open question.

E

D

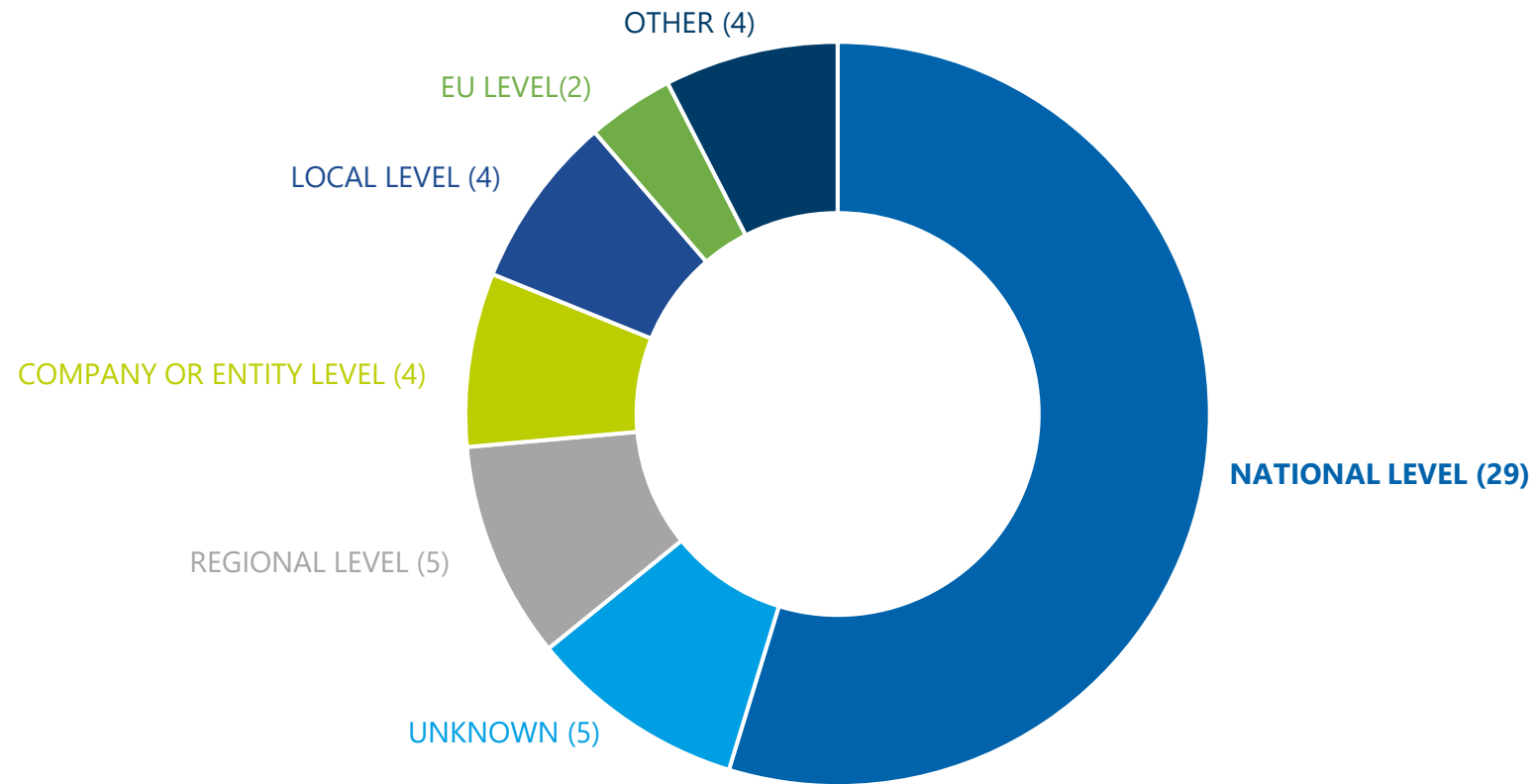
C

B - TECHNICAL ASPECTS RELATED TO OPS

A



## Level at which difficulties are encountered in relation to regulation



Note: Question addressed to all the participating ports. 53 replies.

E

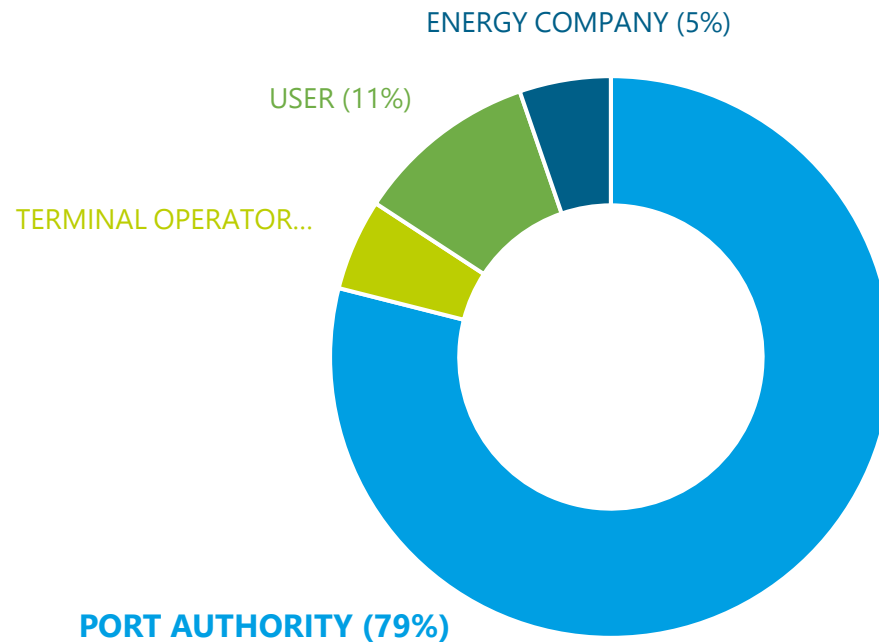
D

C - SPECIFIC REGULATORY AND ADMINISTRATIVE ASPECTS

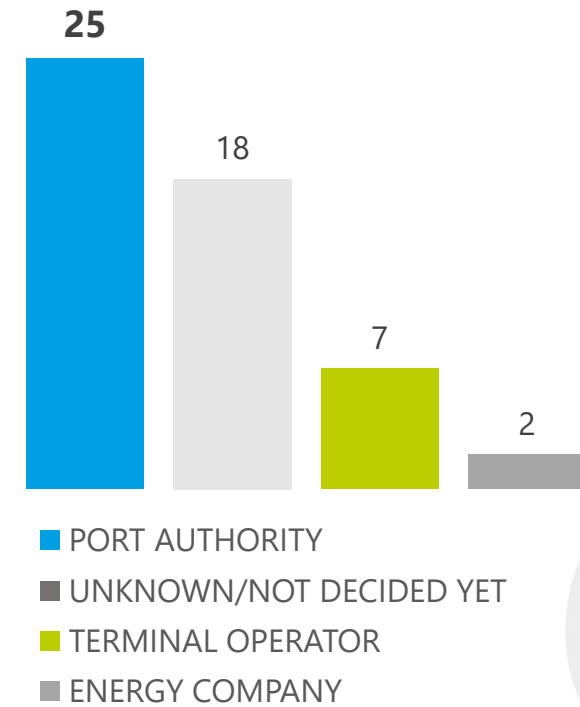
B

A

### Management of the service in the ports with existing OPS facilities



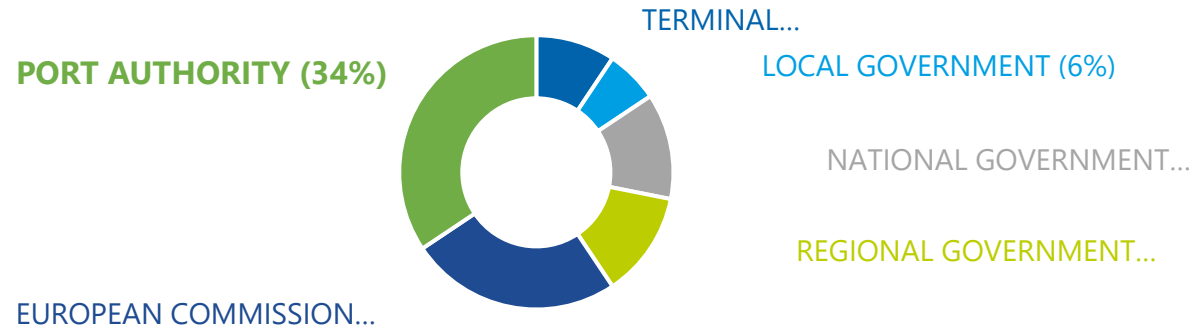
### Management of the service in the ports with expected OPS facilities



Note: Question addressed to ports with OPS facilities.

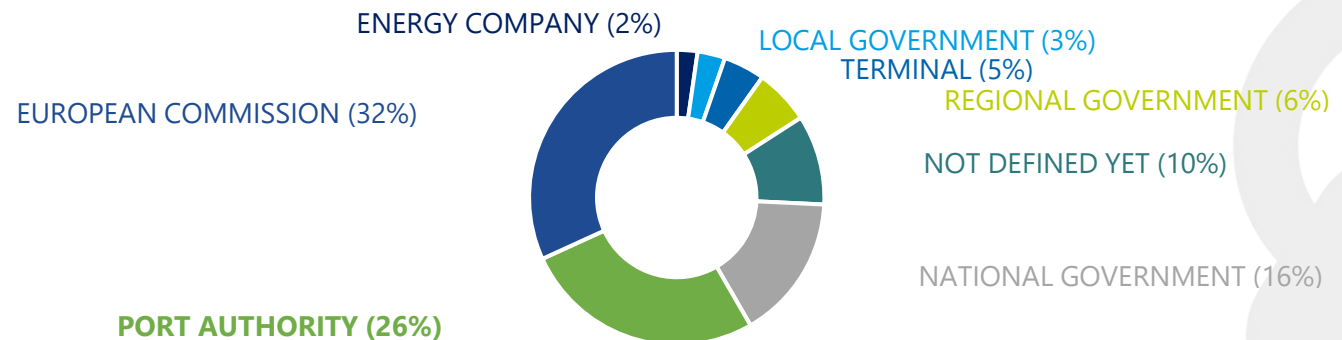
## Sources of funding used to carry out the investments in the ports with OPS facilities

Note: Question addressed to ports with OPS facilities. 17 replies.



## Sources of funding that will be used to carry out future OPS investments

Note: Question addressed to all the participating ports. 51 replies.



## Main training needs for OPS operations

### For Port Authorities (management)

- Financing of the installation
- Regulatory standards
- Safety and security
- Other aspects related to OPS systems and connections onboard the ship

### For the operator of the OPS facilities (operations)

- Safety and security
- Electrical knowledge (including risk assessment, electrical loading)
- Synchronization between shore and ship [plug-in/plug-out]
- Maintenance and efficient use of OPS facilities

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## Activity 1. Milestone 4

## Milestone 4. Detailed analysis on the existing national/port regulations directly or indirectly related to shore side electricity supply

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International Regulatory Framework  
For Onshore Power Supply

❑ IEC/ISO/IEEE 80005  
International  
Standards

❑ International  
verification and  
certification of OPS  
installations

❑ IMO Guidelines – a  
focus on ship side

## European Regulatory Framework For Onshore Power Supply

### ❑ **Overview of the current European context :**

- the European Green Deal,
- the 2030 Climate target plan,
- Sustainable and Smart Mobility Strategy ,
- Fit for 55 package, Efficient & Green Mobility package.

### ❑ **Forthcoming EU regulations affecting the maritime and port sectors:**

- Revision of the Alternative Fuels Infrastructure Regulation,
- FuelEU Maritime, Revision to the EU Emission Trading Scheme ,
- Revision of the Energy Taxation Directive, Revision to the Effort Sharing Regulation ,
- Amendment of the Renewable Energy Directive,
- Amendment of the Renewable Energy Directive.

### ❑ **Other EU regulations and recommendations in force affecting OPS implementation:**

- EU Directive 2005/33/EC on the sulphur content of marine fuels
- Commission Recommendation 2006/339/EC on the promotion of shoreside electricity for use by ships at berth in Community ports
- Commission Communication (2007) 575 on an integrated maritime policy for the European Union
- EU Directive 2008/50/EC on ambient air quality and cleaner air for Europe.



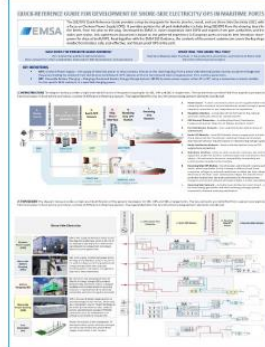


## European Regulatory Framework For Onshore Power Supply

### EMSA Guidelines:

## Shore-Side Electricity Guidance

### Presentation to the EALING Project

Documents			Contents																																																		
 <p><b>PART1</b> Equipment &amp; Technology</p> <p><b>OBJECTIVE:</b> Introduction and Overview of Equipment and Technologies available SSE infrastructure projects</p>	 <p><b>PART2</b> Planning, Operations and Safety</p> <p><b>OBJECTIVE:</b> Support to Project, Implementation and Operation of SSE facilities. Safety Assessment</p>	 <p><b>QUICK-GUIDE</b> Quick-Reference Guide on SSE development</p> <p><b>OBJECTIVE:</b> Provide “pocket-guide” support on development of SSE projects</p>																																																			
					<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #0070C0; color: white;">Part</th> <th style="background-color: #0070C0; color: white;">Chapters</th> <th style="background-color: #0070C0; color: white;">Section</th> <th style="background-color: #0070C0; color: white;">Title</th> </tr> </thead> <tbody> <tr> <td rowspan="3" style="background-color: #FFD700; text-align: center;">1</td> <td rowspan="3" style="background-color: #D9E1F2; text-align: center;">A. Technology</td> <td style="background-color: #D9E1F2;">1</td> <td>Scope and Applicability</td> </tr> <tr> <td style="background-color: #D9E1F2;">2</td> <td>Shore-Side Electricity – Overview</td> </tr> <tr> <td style="background-color: #D9E1F2;">3</td> <td>Equipment &amp; Technology</td> </tr> <tr> <td rowspan="14" style="background-color: #90EE90; text-align: center;">2</td> <td rowspan="2" style="background-color: #D9E1F2; text-align: center;">B. SSE Options</td> <td style="background-color: #D9E1F2;">1</td> <td>Shore Side Electricity Options</td> </tr> <tr> <td style="background-color: #D9E1F2;">2</td> <td>Regulatory Framework</td> </tr> <tr> <td rowspan="2" style="background-color: #D9E1F2; text-align: center;">C. Governance</td> <td style="background-color: #D9E1F2;">3</td> <td>Responsibilities</td> </tr> <tr> <td style="background-color: #D9E1F2;">4</td> <td>Ships</td> </tr> <tr> <td rowspan="3" style="background-color: #D9E1F2; text-align: center;">D. Planning</td> <td style="background-color: #D9E1F2;">5</td> <td>Planning, Constraints and Feasibility</td> </tr> <tr> <td style="background-color: #D9E1F2;">6</td> <td>Compatibility Assessment</td> </tr> <tr> <td style="background-color: #D9E1F2;">7</td> <td>Documents &amp; Quality Management</td> </tr> <tr> <td rowspan="2" style="background-color: #D9E1F2; text-align: center;">E. Operation</td> <td style="background-color: #D9E1F2;">8</td> <td>Operation Guidelines for OPS</td> </tr> <tr> <td style="background-color: #D9E1F2;">9</td> <td>Operation Concept for SBC</td> </tr> <tr> <td rowspan="3" style="background-color: #D9E1F2; text-align: center;">F. Safety</td> <td style="background-color: #D9E1F2;">10</td> <td>Safety Systems</td> </tr> <tr> <td style="background-color: #D9E1F2;">11</td> <td>Risk Assessment</td> </tr> <tr> <td style="background-color: #D9E1F2;">12</td> <td>Risk Management</td> </tr> <tr> <td rowspan="2" style="background-color: #D9E1F2; text-align: center;">G. Competencies</td> <td rowspan="2" style="background-color: #D9E1F2; text-align: center;">13</td> <td style="background-color: #D9E1F2;">13</td> <td>Competencies, Qualification and Training</td> </tr> <tr> <td style="background-color: #D9E1F2;">14</td> <td>Certification, Testing &amp; Commissioning</td> </tr> </tbody> </table>	Part	Chapters	Section	Title	1	A. Technology	1	Scope and Applicability	2	Shore-Side Electricity – Overview	3	Equipment & Technology	2	B. SSE Options	1	Shore Side Electricity Options	2	Regulatory Framework	C. Governance	3	Responsibilities	4	Ships	D. Planning	5	Planning, Constraints and Feasibility	6	Compatibility Assessment	7	Documents & Quality Management	E. Operation	8	Operation Guidelines for OPS	9	Operation Concept for SBC	F. Safety	10	Safety Systems	11	Risk Assessment	12	Risk Management	G. Competencies	13	13	Competencies, Qualification and Training	14	Certification, Testing & Commissioning
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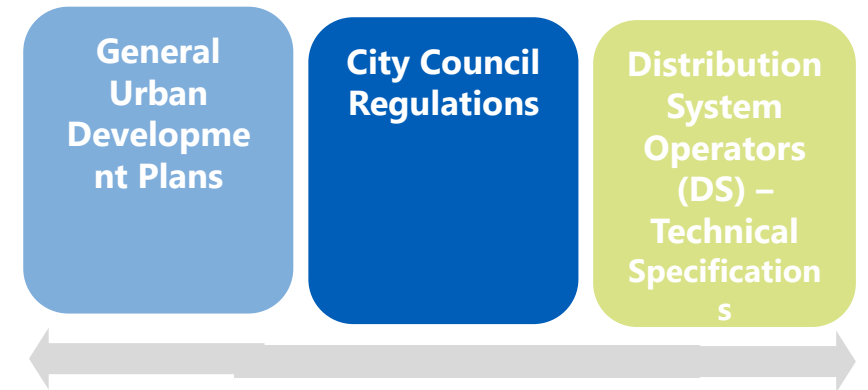
## National, Regional, and Local Regulatory Framework For Onshore Power Supply in EALING Ports:

Detailed analysis on the existing national/port regulations directly or indirectly related to shore side electricity supply

### National and Regional Regulatory Framework



### Local Regulatory Framework



#### 16 EU ports:

- Port of Valencia (Spain)
- Port of Barcelona (Spain)
- Port of Huelva (Spain)
- Port of Gijon (Spain)
- Port of Venice and Chioggia (Italy)
- Port of Ancona (Italy)
- Port of Trieste & Monfalcone (Italy)
- Port of Burgas (Bulgaria)
- Port of Varna (Bulgaria)
- Port of Constanta (Romania)
- Port of Piraeus (Greece)
- Port of Rafina (Greece)
- Port of Koper (Slovenia)
- Port of Leixoes (Portugal)
- Ports of Açores (Portugal)
- Port of Dublin and / or Cork (Ireland)



## National, Regional, and Local Regulatory Framework For Onshore Power Supply in EALING Ports:

Detailed analysis on the existing national/port regulations directly or indirectly related to shore side electricity supply

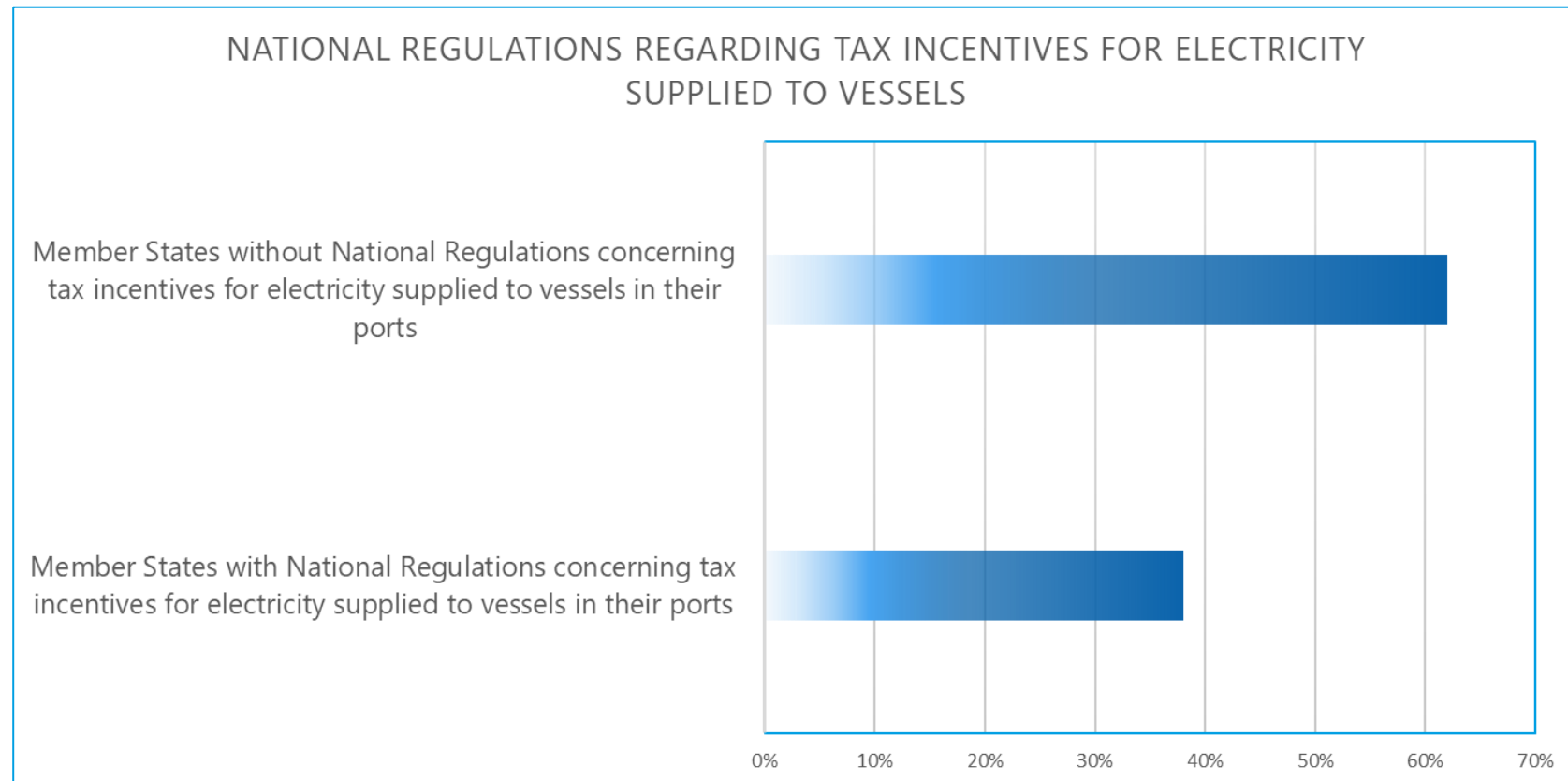
### Comparative analysis between EALING countries

	SPAIN	GREECE	ITALY	ROMANIA	BULGARIA	SLOVENIA	IRELAND	PORTUGAL
<b>LOCAL REGULATIONS</b>								
Urban Development Plans & City Regulations	✓	✓	✓	✓				✓
Technical specifications related to electrical installations	✓		✓					
<b>REGIONAL REGULATIONS</b>								
Port structure and administrative issues, such as contracting power supply and infrastructure works		✓	✓	✓				✓
Power supply and electricity distribution	✓		✓	✓				✓
Environmental impact, noise pollution, etc.	✓	✓	✓					
Industrial installations, especially electricity transmission and distribution facilities	✓			✓				
Safety and security measures, including occupational risks prevention	✓		✓	✓				✓
<b>NATIONAL REGULATIONS</b>								
Port structure and administrative issues, such as contracting power supply and infrastructure works	✓	✓	✓	✓	✓	✓	✓	
Power supply and electricity distribution	✓	✓	✓	✓	✓	✓	✓	✓
Environmental impact, noise pollution, etc.	✓	✓	✓	✓	✓	✓	✓	✓
Industrial installations, especially electricity transmission and distribution facilities	✓	✓	✓	✓		✓	✓	
Safety and security measures, including occupational risks prevention	✓	✓	✓	✓	✓	✓		

## National, Regional, and Local Regulatory Framework For Onshore Power Supply in EALING Ports:

Detailed analysis on the existing national/port regulations directly or indirectly related to shore side electricity supply

### Comparative analysis between EALING countries



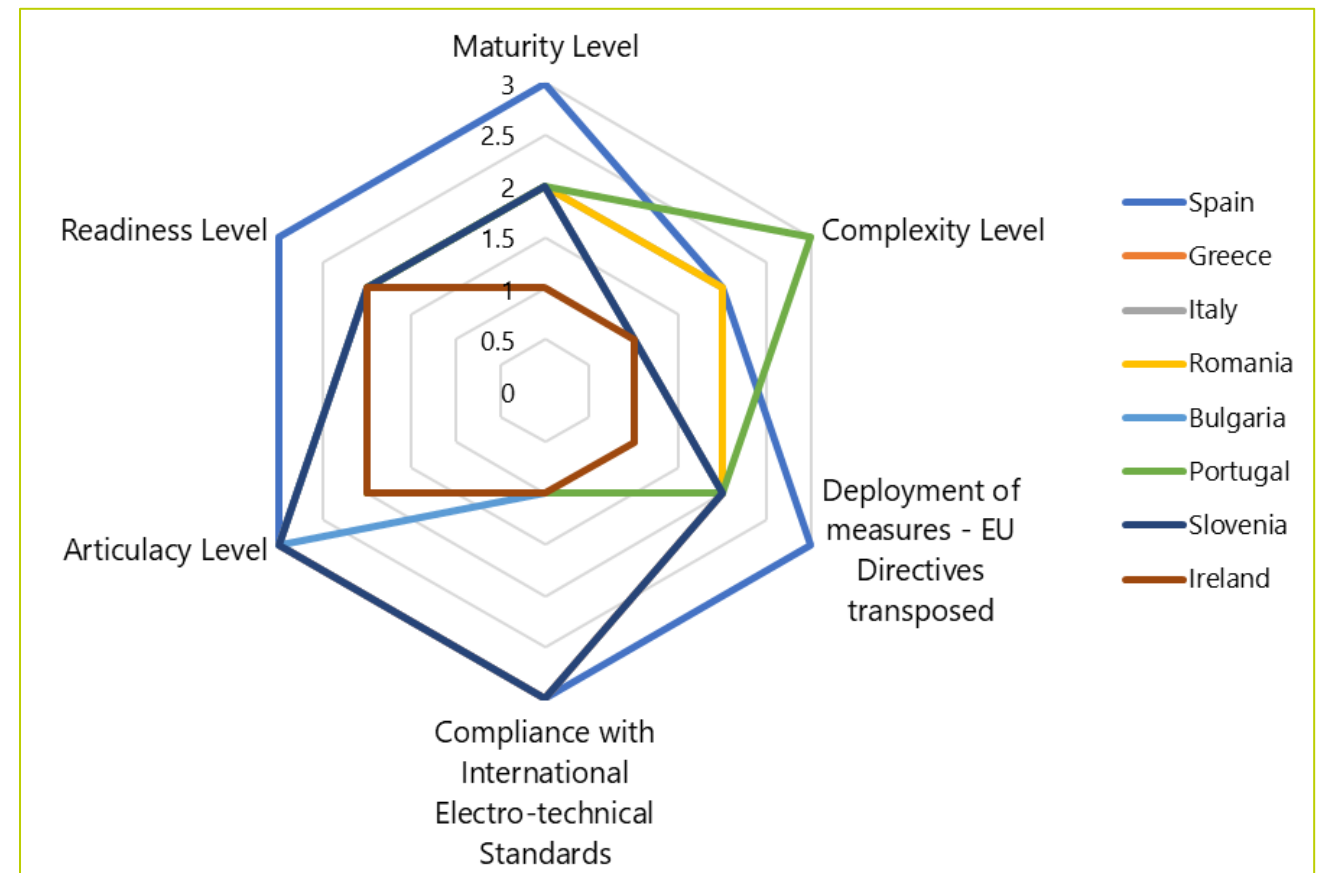


## National, Regional, and Local Regulatory Framework For Onshore Power Supply in EALING Ports:

Detailed analysis on the existing national/port regulations directly or indirectly related to shore side electricity supply

### Qualitative analysis

The comparative and qualitative analysis results revealed that the Member States of Spain and Greece seem to have a more mature regulatory framework at a national level, with minor shortcomings.



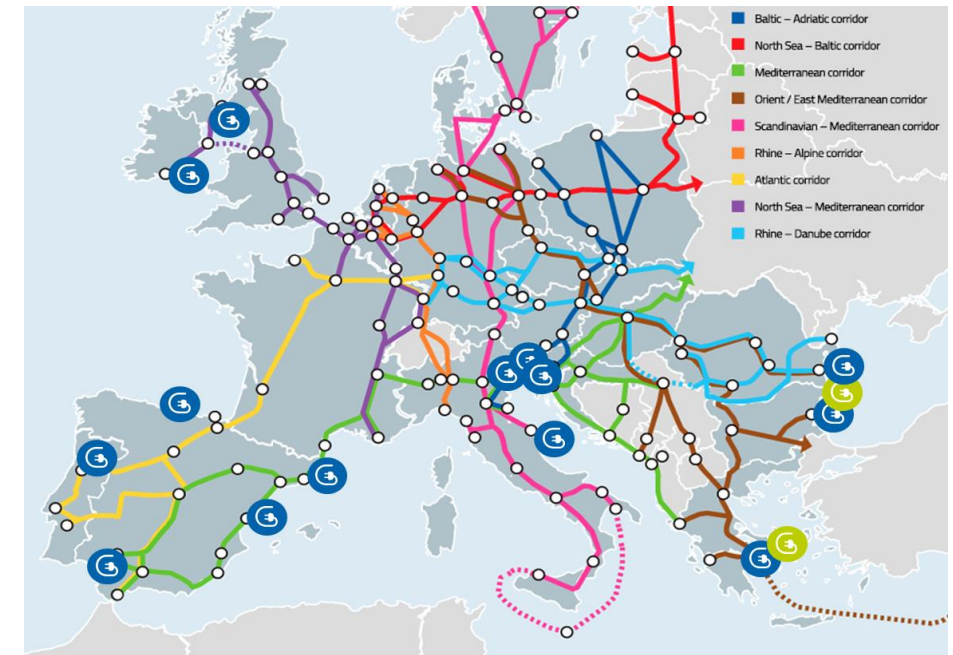
## National, Regional, and Local Regulatory Framework For Onshore Power Supply in EALING Ports:

Detailed analysis on the existing national/port regulations directly or indirectly related to shore side electricity supply

### Qualitative analysis

Italy, Bulgaria, Romania, Slovenia, and Portugal are in order characterised as the Member States with an adequate level of maturity.

In general, for implementing a harmonised framework boosting the development of OPS in ports of the TEN-T Network, the initiatives should focus on **eliminating the gaps in national legislations** in these under-study fields, **facilitating the participation of port authorities in the development and operation of their electricity distribution system** that will provide the required quantities of electricity to their own end users through the issuance of regulations applied to all EU ports, **and incentivising them with tax exemptions or reduced tax rates to the consumed electricity for vessels calling at them.**



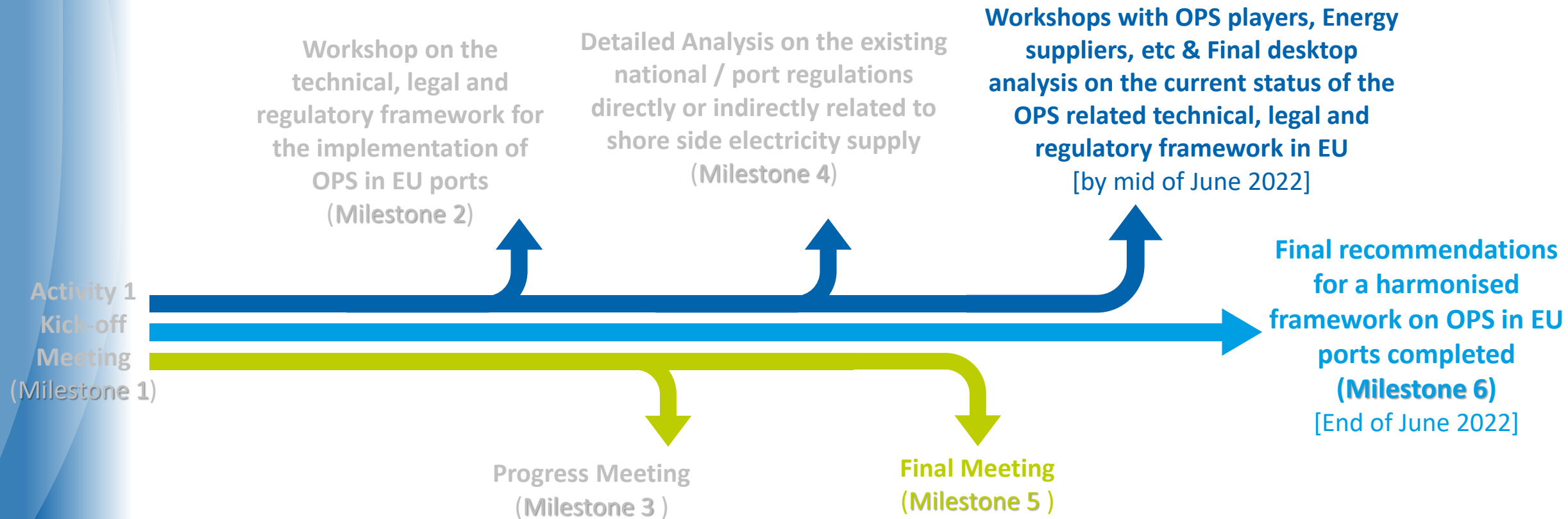


4

**Next steps**



## Timeline of Activity 1



## Milestone 6. Final recommendations for a harmonized framework on OPS in EU ports

[to be submitted by end of June 2022]

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# Thanks!



European flagship Action for cold ironING in ports

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