



European flagship Action for cold ironING in ports

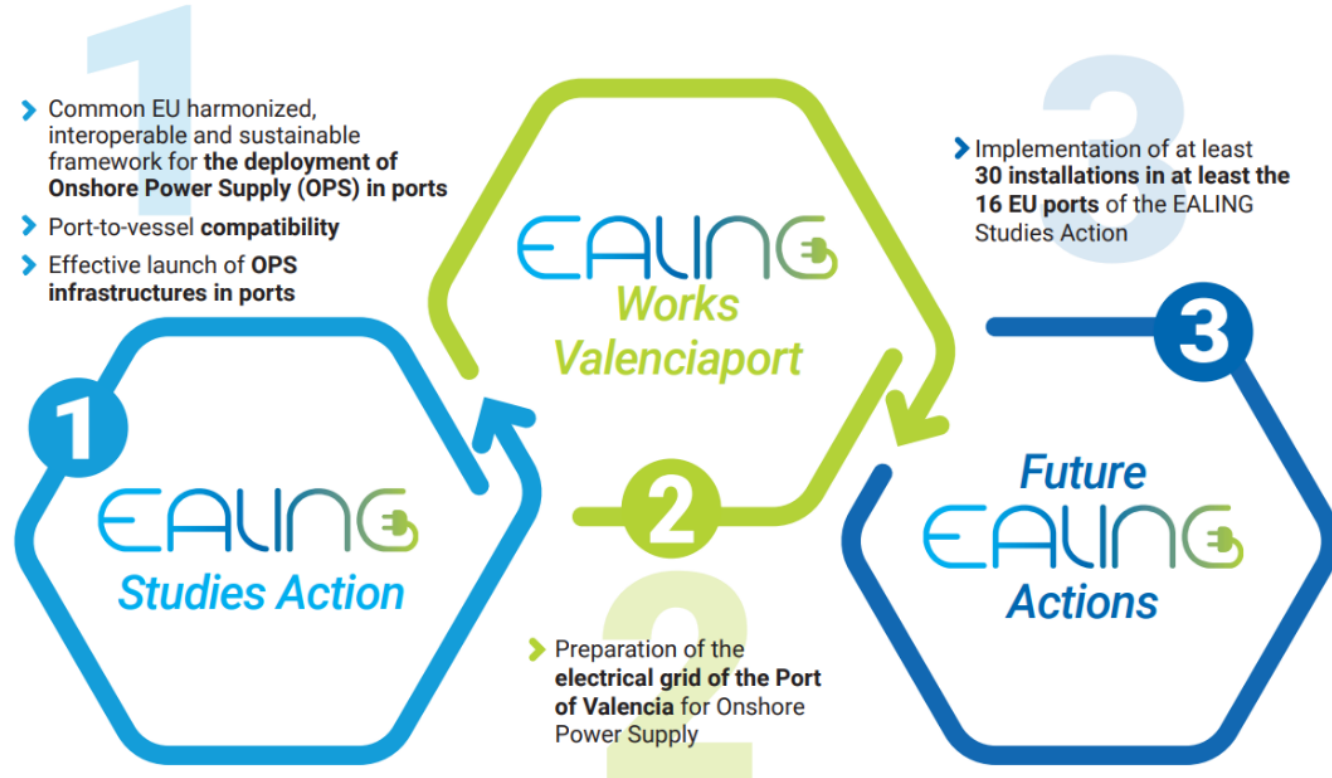
# EALING General Overview

IAPH Sustainability Awards 2024



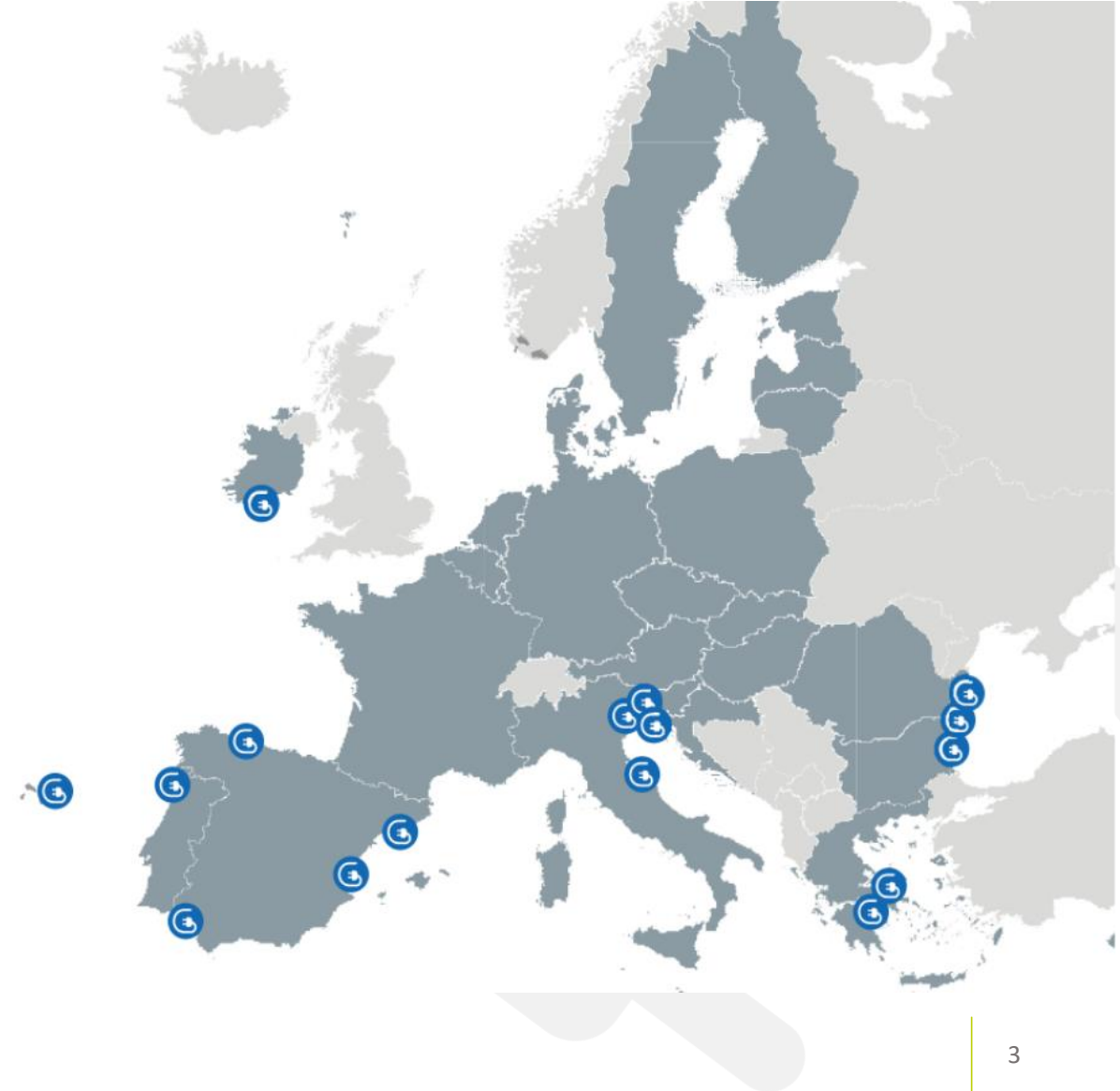
# European Flagship Action for Cold Ironing in Ports

Accelerate the effective deployment of OPS solutions in EU maritime ports



## PARTNERS & LOCATION

- **13 Port Authorities** (Valencia, Barcelona, Huelva, Gijón, Venice&Chioggia, Trieste&Monfalcone, Ancona, Piraeus, Rafina, Koper, Constanta, Leixoes, Açores)
- **2 Port & Maritime Public Institutions** (Bulgarian Ports Infrastructure Company (→ ports of Burgas, Varna); Marine Institute (→ port of Cork))
- **7 Port & Shipping related entities** (Fundación Valenciaport, Circle, Ocean Finance, Symbios Funding & Consulting, Protasis, Hydrus Engineering, Fincantieri SI)



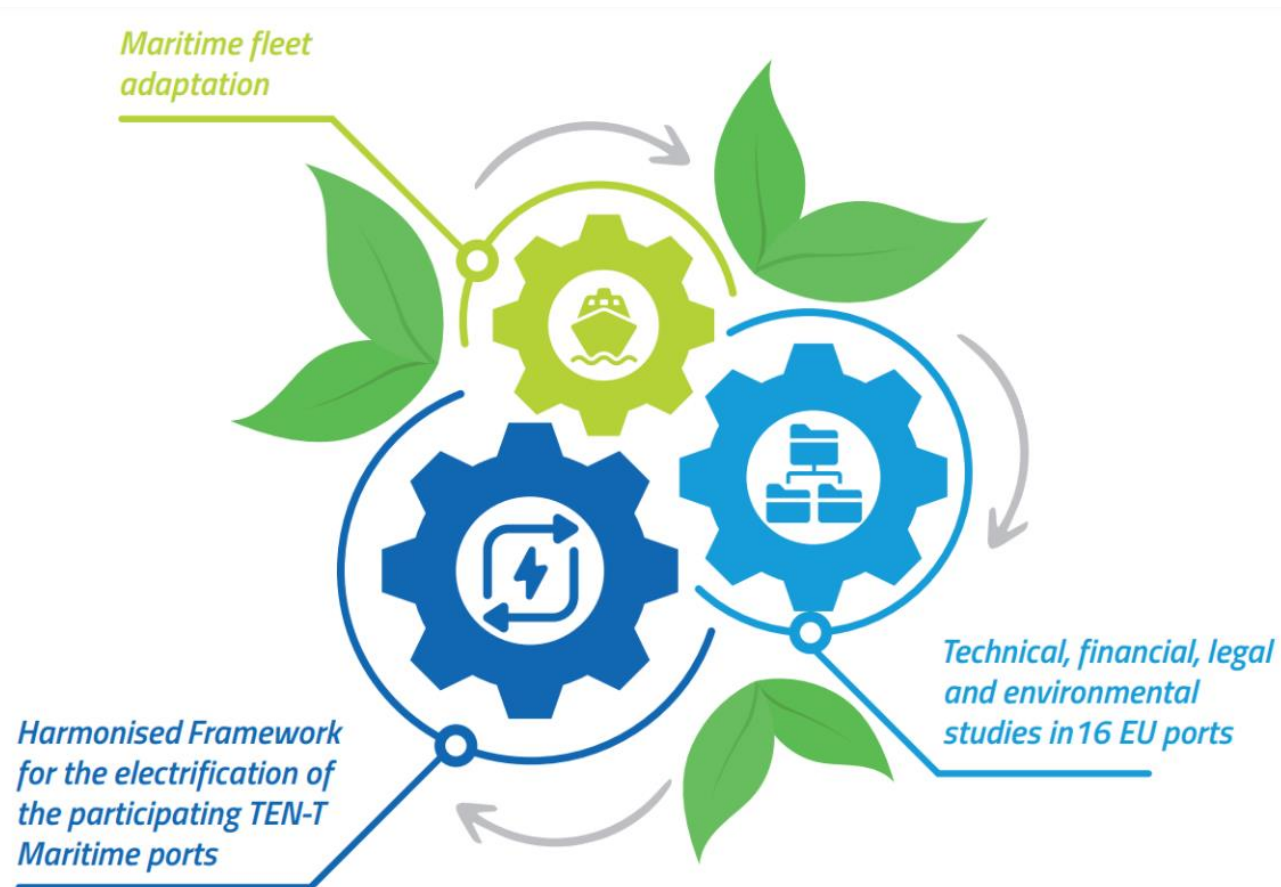
## MAIN PROJECT DATA

- **CEF call:** Motorways of the Sea (wider benefit)
- **Grant Agreement:** 2019-EU-TM-0234-S
- **Project duration:** June 2020 – December 2023  
(GA signed in November 2020)
- **Total budget:** 6.960.240 € (50% funded)

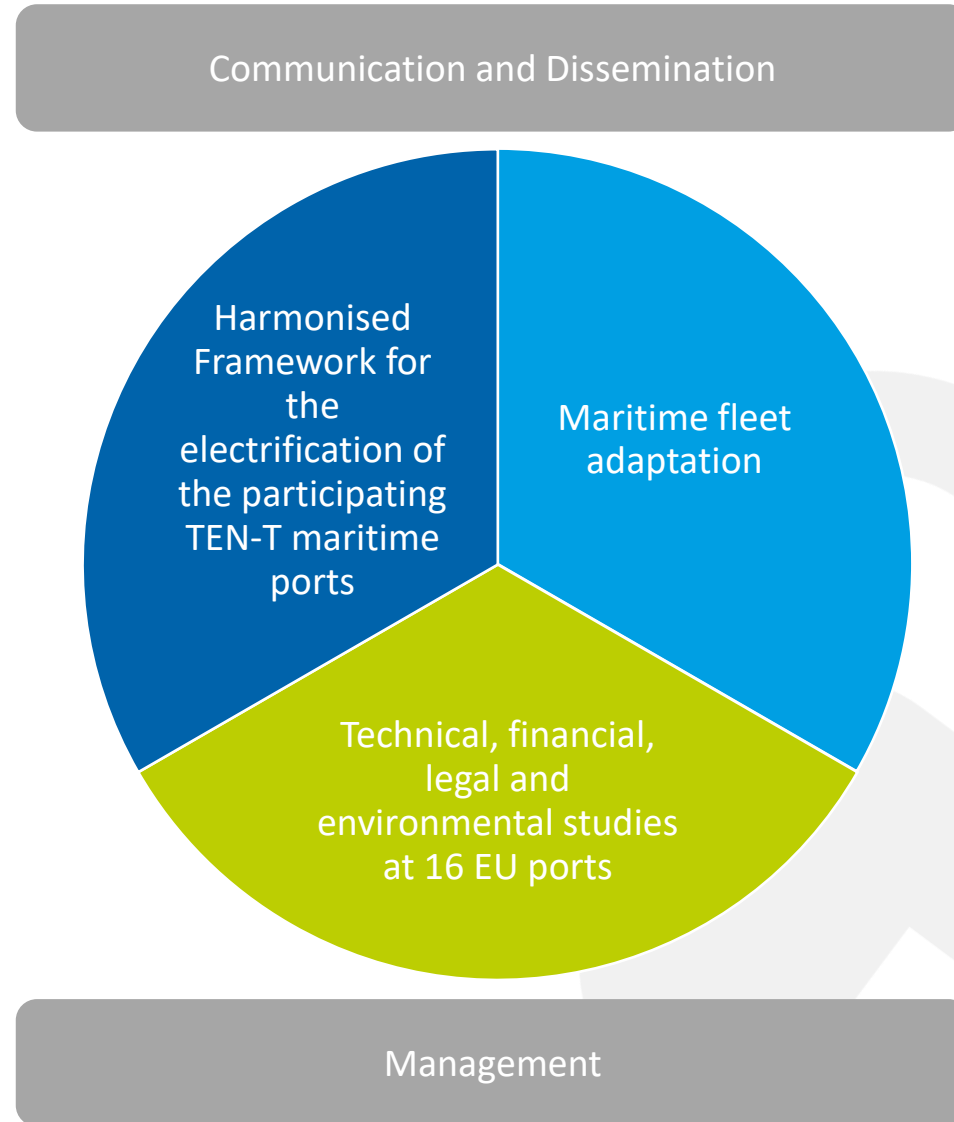


## OBJECTIVES

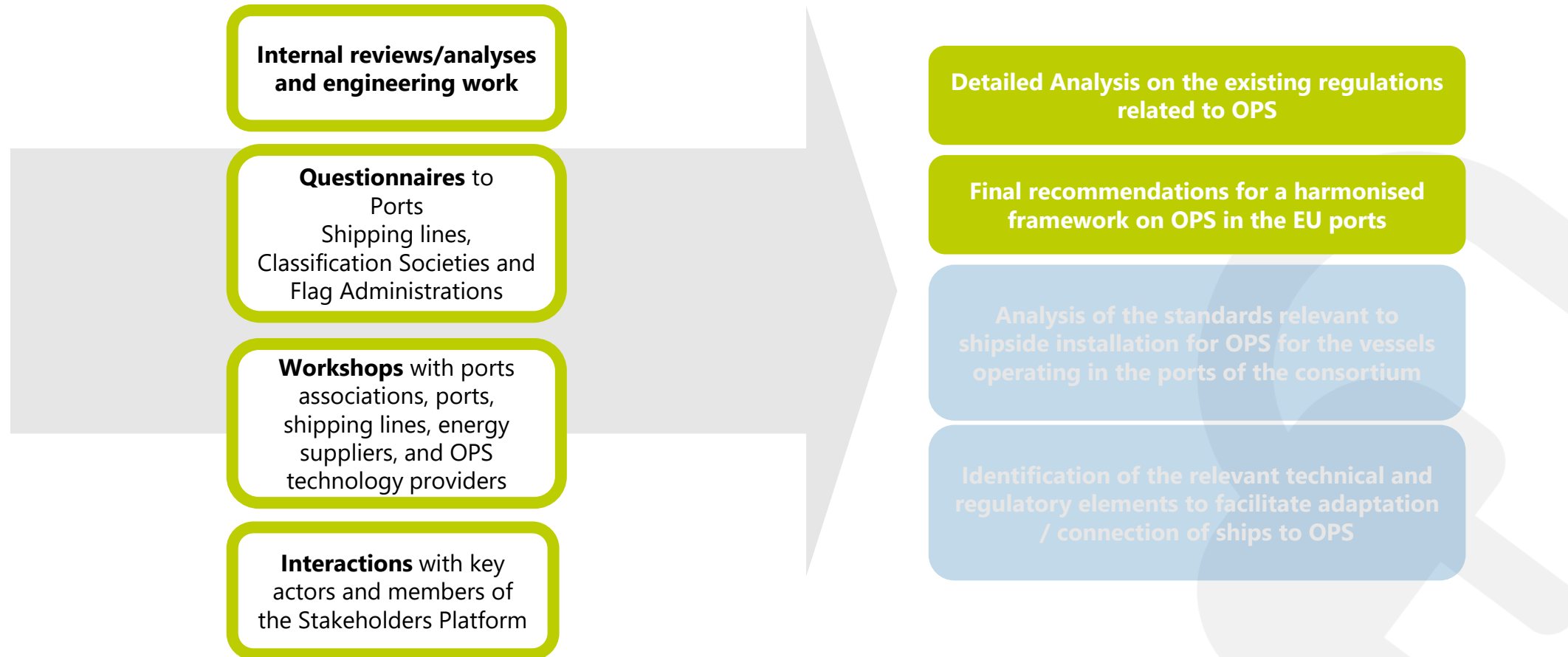
- Bringing forward a **common harmonised and interoperable framework** to facilitate the implementation phase of OPS infrastructures in the ports of the consortium
- Facilitating the **port to vessel compatibility in the TEN-T Maritime Network**, for vessels calling at the ports of the consortium
- Leading all the **technical, financial, legal and environmental studies** necessary to launch the works for OPS equipment and infrastructure after the end of the Action



# PROJECT STRUCTURE



## HARMONISED FRAMEWORK FOR THE ELECTRIFICATION OF THE PARTICIPATING TEN-T MARITIME PORTS



## HARMONISED FRAMEWORK FOR THE ELECTRIFICATION OF THE PARTICIPATING TEN-T MARITIME PORTS

### → Detailed Analysis on the existing regulations related to OPS

- INTERNATIONAL REGULATORY FRAMEWORK (standards, classification societies class notations, IMO)
- EUROPEAN REGULATORY FRAMEWORK (existing and future regulations affecting OPS, EMSA)
- NATIONAL, REGIONAL AND LOCAL REGULATORY FRAMEWORK - EALING PORTS:

Port structure and administrative issues

Power supply and electricity distribution

Environmental impact & Noise Pollution

Industrial installations

Safety and security measures, including occupational risks prevention

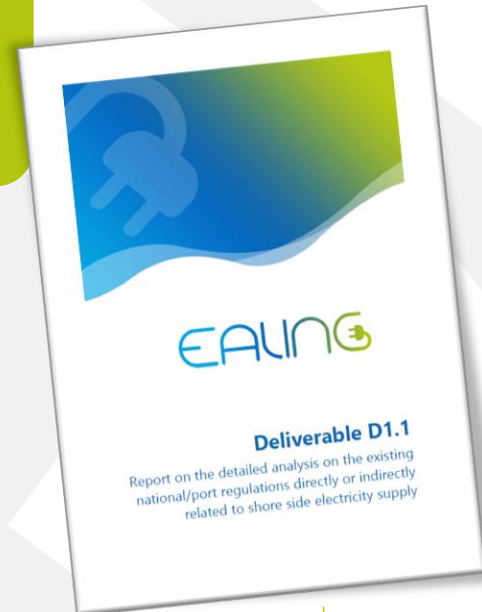
*Fields under study for the comparative analysis at national and regional level*

General Urban Development Plans

City Council Regulations

Distribution System Operators (DSO) - Technical Specifications -

*Fields under study for the comparative analysis at local level*

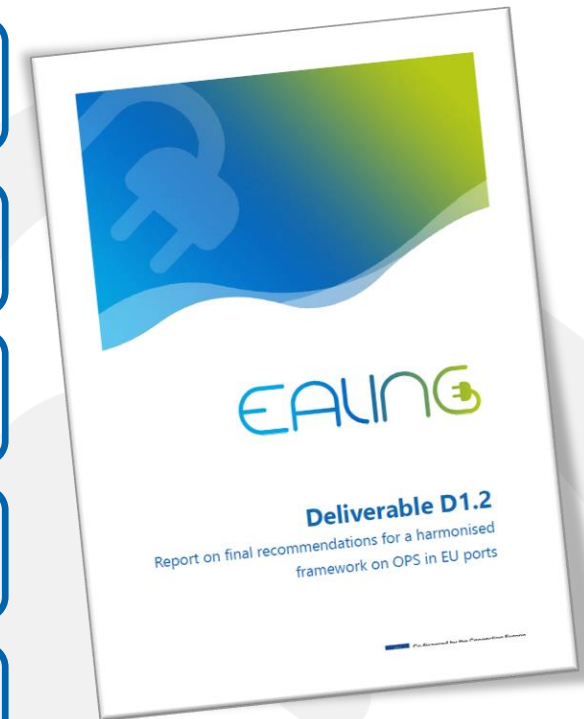




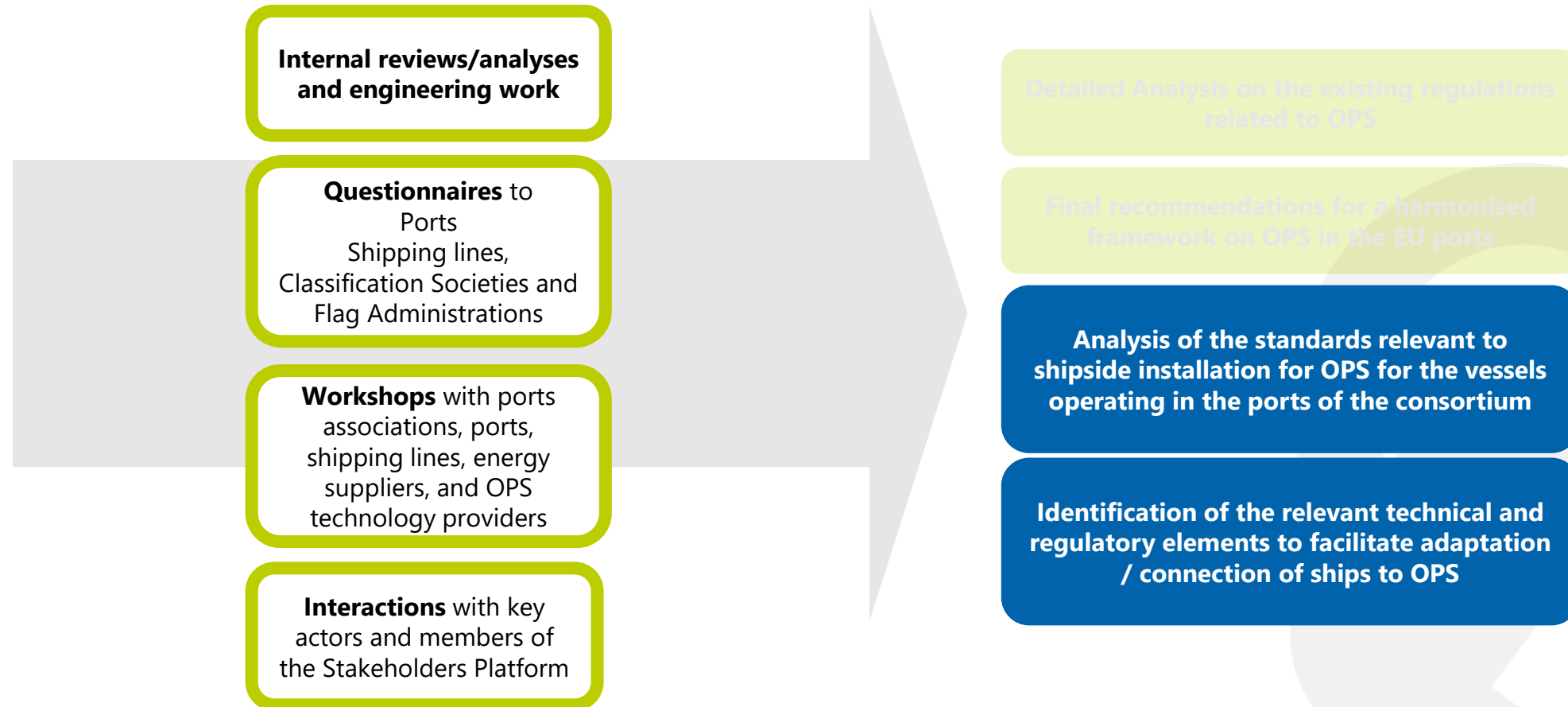
## HARMONISED FRAMEWORK FOR THE ELECTRIFICATION OF THE PARTICIPATING TEN-T MARITIME PORTS

→ **Final recommendations for a harmonised framework on OPS in EU ports** → 40 recommendations

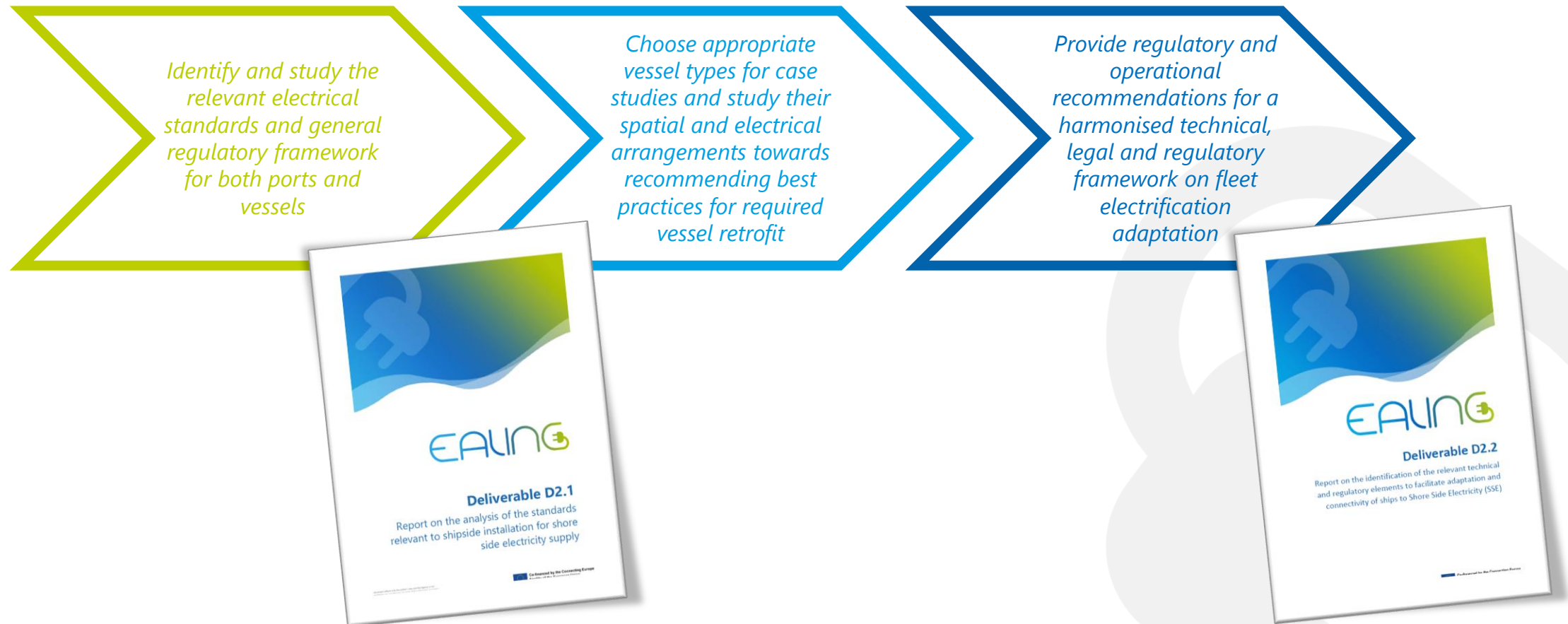
POLICY & LEGAL	Responsibilities of the different actors, administrative burden, public funding, tax exemptions, involvement of port authorities in the development and operation of the electricity distributions systems
ECONOMIC	Cost-Benefit Analysis, demand studies, funding mechanisms, specific rates, energy communities, price of energy
SOCIAL	Interaction with stakeholders, public involvement, working groups, training for port workers, new professional profiles
TECHNICAL	Technical harmonisation, tender processes, IEC/IEEE 80005, training, regulatory sandboxes, demand assessment studies, load forecasting models, public repositories of OPS-ready vessels, etc.
ENVIRONMENTAL	Environmental certificates, technical specifications (THETIS MRV and IMO DCS), Clean Shipping Index (CSI)



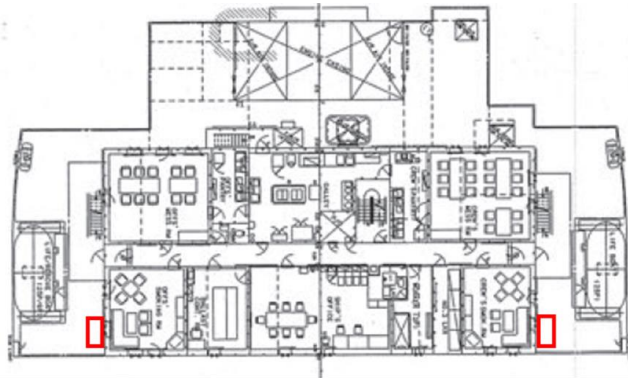
## MARITIME FLEET ADAPTATION



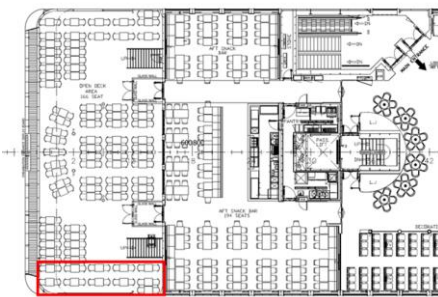
## MARITIME FLEET ADAPTATION



## MARITIME FLEET ADAPTATION



Proposed arrangement for the socket boxes



Receiving point possible installation space

a/a	Vessel type	Capacity	Power requirement (based on ELA)	Distribution system	Frequency
1	Cruise Ship	140,000 GT	>1 MVA	11 kV	60 Hz
2	RoPax	18,600 GT	>1 MVA	380 V	50 Hz
3	Containership	10,000 TEU	>1 MVA	6.6 kV	60 Hz
4	Bulk Carrier	87,000 DWT	<1 MVA	440 V	60 Hz
5	Tanker	50,000 DWT	>1 MVA	440 V	60 Hz

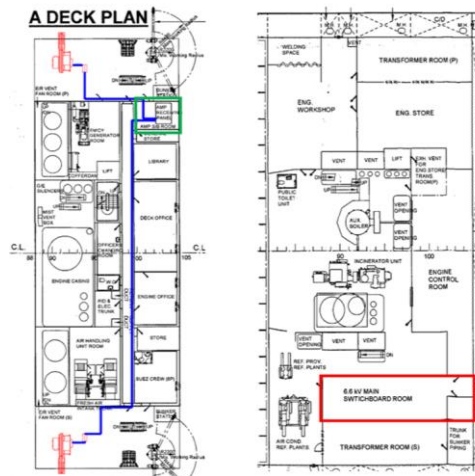


Figure 93 Plan view of the A deck in the accommodation area

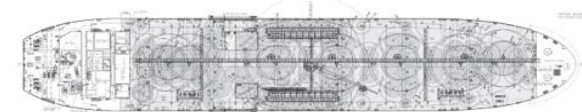


Figure 94 Plan view of the upper deck, showing the dangerous areas marked with grey color.

## TECHNICAL, FINANCIAL, LEGAL AND ENVIRONMENTAL STUDIES PERFORMED AT THE 16 PARTICIPATING EU PORTS

### Technical studies for the electrification infrastructure of the participating TEN-T maritime ports.

- Front-end engineering design studies.
- Additional technical studies necessary for the projected works.

**Environmental studies**, the content and scope of which have depended on the final needs of each port.

- authorisations from the competent authorities for the construction of the future SSE facilities.



### Clean Power Supply Plans

at port level to ensure the integration of SSE as key part of the environmental strategy in each of the EALING ports.

**Tender documentation** for the construction works of the future SSE installations.



**Cost-Benefit Analyses** to evaluate the future SSE installations in terms of financial and socio-economic performance.

Review and analysis of the available **financial and blending schemes** to finance the infrastructures.

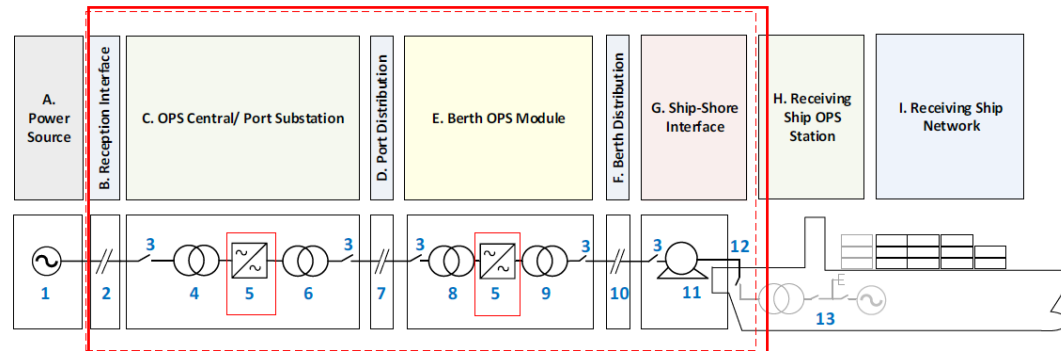


## TECHNICAL AND FEED STUDIES

→ **FRONT-END ENGINEERING DESIGN (FEED) STUDIES** to enable ports to launch the works phase after the completion of the Action.

They include:

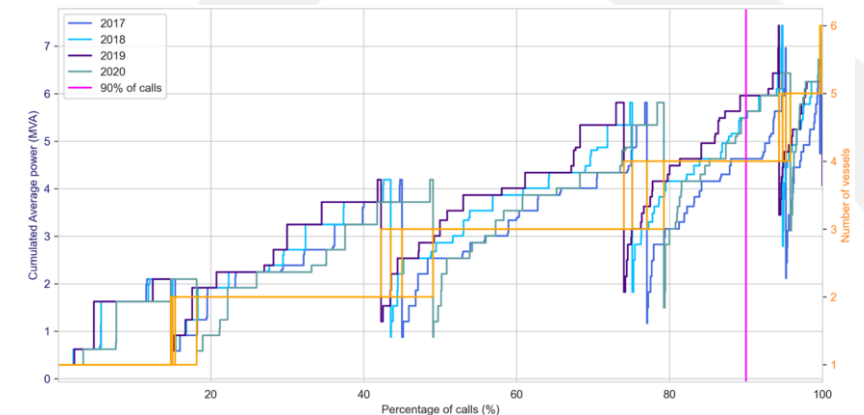
- Technical specifications for the systems:
  - Shore connection substations (switchgears; transformers; frequency converters; protection, control and monitoring systems; SCADA)
  - Cable management systems
- Costs estimation



Scope of Applicability of the EMSA Guidance

→ **OTHER NECESSARY TECHNICAL STUDIES** (additional studies performed by some of the ports)

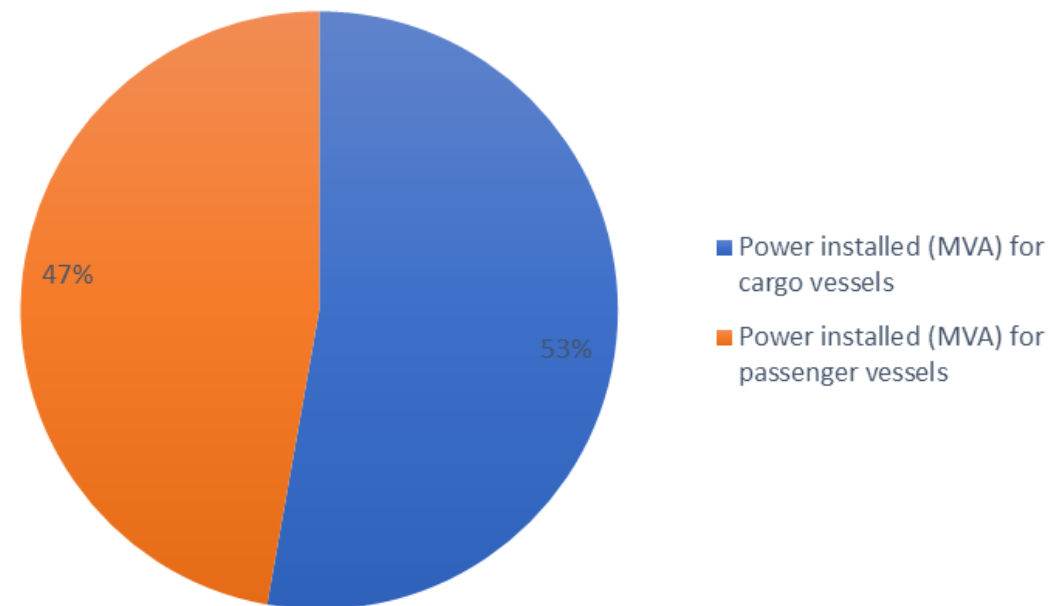
- SSE demand analyses
- Studies of grid capacity of the port
- Roadmaps for the electrification of the quays
- Operational model studies for the SSE systems



## TECHNICAL AND FEED STUDIES

## SOME GLOBAL FIGURES:

- 16 EU PORTS
- More than **245 MVA** of nominal power to be installed



## ENVIRONMENTAL STUDIES

- Environmental Studies performed in the 16 EALING ports

Risk analysis matrix		IMPACT		
		Minor	Moderate	Significant / Adverse
LIKELIHOOD	Rare			
	Moderate			
	Almost certain			

- None of the future SSE infrastructures is subject to Environmental Impact Assessment



## CLEAN POWER SUPPLY PLANS

DEVELOPMENT OR UPDATING OF THE **CLEAN POWER SUPPLY PLANS** OF THE PORTS

- Energy consumption in the port: current situation / origin of the energy
  - Port Authority
  - Terminals
  - Ships
  - Other facilities/services
- Future energy demand
- Planned actions to cover the future energy needs → **Integration of SSE as a crucial part of the port's emission reduction strategy.**

## TENDER DOCUMENTATION

PREPARATION OF THE **TENDER DOCUMENTS** FOR THE PROPOSED SSE INVESTMENTS.

## COST-BENEFIT ANALYSES AND FINANCIAL BLENDING SCHEMES

- Cost Benefit Analysis (CBA) to assess the financial and economic performance of the future SSE infrastructures, including monetised environmental externalities, and to enable the investment decisions.

### **SOME GLOBAL FIGURES FROM THE 16 PORTS:**

- More than **2.7 million tonnes of CO<sub>2</sub>eq, 32,000 tonnes of NO<sub>x</sub>, 8,000 tonnes of SO<sub>x</sub> and 1,600 tonnes of PM<sub>x</sub>** avoided.
  - More than **225 M€ in CAPEX** from all the FEED Studies performed.
  - **Average of 920 k€ per MVA** installed.
- Proposal of suitable investment schemes based on the specific features of the SSE investments proposed.

# COMMUNICATION, DISSEMINATION & STAKEHOLDERS ENGAGEMENT



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## Technical Studies for the port of Valencia

Executive Summary



Executive summaries of the results of the technical studies conducted by the 16 EU participating ports:



## COMMUNICATION, DISSEMINATION & STAKEHOLDERS ENGAGEMENT

**Project Executive summary,** including port sheets with the main results of the studies performed by the 16 EU participating ports.



## COMMUNICATION, DISSEMINATION & STAKEHOLDERS ENGAGEMENT

### EALING events

- 4 Workshops:
  - Port associations
  - Shipping companies
  - Energy suppliers
  - Solution providers
  
- 1 Mid-term Communication Event
  
- 16 local workshops
  
- 3 Stakeholders workshops
  
- 1 Final Communal event



*Stakeholders workshop*



*Final Event*



*Local workshop*

## COMMUNICATION, DISSEMINATION & STAKEHOLDERS ENGAGEMENT

### External events

- CEF Days (2024)
- Greenport Congress & Cruise (2023)
- MedCruise General Assembly in Burgas (2023)
- SEAFUTURE – Green & Blue Innovation Hub (2023)
- Baltic and Black Sea Ports & Shipping Conference (2023)
- Mediterranean Ports and Shipping (2023)
- Electrification, Fuel Cell & Battery for Marine Vessels conference (2023)
- OSCE Working Group (2023)
- SIL International Congress (2023)
- HEV-TCP Task 47: Zero-Carbon Freight from Port Electrification (2022)
- EOPSA Conference (2022)
- Transport Research Arena (2022)
- BiLOG – Logistics & Maritime Forum (2022)
- Adriatic Sea Forum (2022)
- EALING Project at the TOC Europe (2022)
- Connecting EU Insights (2021)
- Workshop 4 Ports (2021)
- European Ports Forum (2021)
- Baltic Ports Conference (2021)



*Greenport Congress*



*TRA Conference*



*Medcruise General Assembly*

# COMMUNICATION, DISSEMINATION & STAKEHOLDERS ENGAGEMENT

## Papers and articles

The EALING project's recommendations for a harmonised implementation framework for onshore power supply facilities in European ports

### Cold ironing for all

by Reza Karimpour, Senior Research Consultant in Maritime and Port Projects, Circle Group, and Ignacio Benitez, R&D Engineer in Energy and Sustainability, Fundación Valenciaport

European Flagship Action for Cold Ironing in Ports (EALING) is a 36-month-long project, co-funded through the Connecting Europe Facility (CEF), tasked with leading all the necessary technical, environmental, socio-economic, and financial studies to accelerate the preparation works towards setting up onshore power facilities in at least 16 EU ports spread across different European seas. The initiative's goal is also to work on an EU-harmonised and interoperable electrification framework.

The EALING consortium, wanting to contribute to moving the needle on the deployment of shore-side electricity (SSE) solutions in EU seaports, has intensively worked with

shipping and port stakeholders to identify the main obstacles they face when implementing SSE as well as to propose recommendations for a harmonised framework.

To that end, the project partners have carried out a PESTLE analysis studying how the various political, economic, sociological, technological, legal and environmental factors slow the uptake of SSE infrastructure in Europe.

#### Policy & legal

In December 2019, the European Commission (COM) presented the European Green Deal. In its communication, the EU executive stressed, among other things, the need to accelerate the shift to sustainable and smart mobility, as transport accounts for a quarter of the EU's greenhouse gas (GHG) emissions (and growing), with maritime responsible for 3-4%. Since then, COM has been working on several strategies and regulations to

reach the goal of climate neutrality by 2050. Regarding the EU strategies and rules related to SSE – such as the 2030 Climate Target Plan, Sustainable and Smart Mobility Strategy, the Fit for 55 Package, and the Efficient & Green Mobility Package – EALING's research leads to the following political & legal recommendations. First, simplify and harmonise the administrative burden at

the national, regional and local levels (resulting from applying the regulations) to build and operate SSE infrastructures. Second, increase the intensity of public funding (e.g., revenues raised via the EU Emission Trading System, EU ETS, could be used to fund SSE installations). Third, include tax exemption for electricity provided to vessels at berth in the revised Energy Taxation Directive.

#### Technical

From a technical perspective, SSE projects aim to provide a controlled interface between

the power supply (from the utility grid or distributed power/increased generation) to ships at berth.

Regarding technical recommendations, the views of different stakeholders

36 | Baltic Transport Journal | 1/2023

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Transport Research Arena (TRA) Conference

Ealing project - Exploratory analysis of the future implementation of Onshore Power Supply facilities in European ports and relevant technical aspects for Port Authorities

Jorge M. Lara López<sup>a</sup>, Reza Karimpour<sup>b</sup>, Rocio Garcia Molina<sup>a</sup>, Alexio Picco<sup>d\*</sup>

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#### Abstract

The EALING Global Project is a flagship initiative that expresses the need to accelerate the effective deployment of Onshore Power Supply (OPS) solutions in the EU maritime ports. Within this framework, Ealing Studies Action, co-financed by the Connecting Europe Facility of the European Union, aims to implement the first phase of the Global Project. One of the first tasks carried out in the Action has been to prepare a questionnaire that has been filled in by 54 EU maritime ports with the objective of gathering information on the status of OPS infrastructure in EU ports and on the technical, regulatory, administrative, and other related aspects that affects its implementation. The main results of the questionnaire are presented in this paper.

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Peer-review under responsibility of the scientific committee of the Transport Research Arena (TRA) Conference

Keywords: Onshore Power Supply; Electrification; Zero-emission ports

#### 1. Overview and motivation

In the European Green Deal context, the EALING Studies Action (hereafter, also called EALING) is part of the EALING Global Project, which aims to accelerate the deployment of Onshore Power Supply (OPS) in at least 16 EU maritime ports. (More info: <https://ealingproject.eu>). The Global Project consists of different Actions summarized in Fig. 1:

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Peer-review under responsibility of the scientific committee of the Transport Research Arena (TRA) Conference

TRA Conference

#### PAPER

Recommendations For a Harmonised Framework on OPS in EU Ports

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Jorge Lara  
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Ocean  
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#### BIOGRAPHIES

Rocio Garcia holds a degree in Engineering and a Master's Degree in Port Management and Intermodal Transport. She has more than 15 years of experience in the management of R&D&I projects. Currently, she is coordinating the EALING and EALINGWorks Valenciaport Actions, initiatives funded by the Connecting Europe Facility (CEF) programme to support the deployment of shore side electricity solutions in EU ports.

Ignacio Benitez holds a PhD in Control Systems Engineering, with more than 10 years of experience in the development of R&D projects related to smart electricity grids and the integration in the power grid of renewable energy sources and energy storage. In year 2021 joined Fundación Valenciaport, to work in projects related to shore power supply and lowering the carbon footprint at the maritime sector.

Jorge Lara holds a Business Degree and a Master's Degree in Economic Internationalisation, and a Master's Degree in Port Management and Intermodal Transport from ICADE Business School. He has more than 10 years of experience in the development of innovation projects focused on sustainability topics related to alternative fuels, circular economy and Sea Traffic Management.

Reza Karimpour holds a Master's Degree in Maritime Affairs from the World Maritime University (WMU) and a PhD from the University of Genova, where his doctoral thesis was focused on Shore Side Electricity in Italian ports. Beyond his academic pursuits, Reza is a senior consultant in Maritime and Port at MagellainCircle, where he has contributed to several maritime research projects, including the EALING project.

Nikolaos Moutsios holds an MSc in New Technologies in Shipping Management and Logistics from the University of the Aegean and a BSc in Law from the Aristotle University of Thessaloniki. He has more than seven years of professional experience working as a legal and financial expert with a focus on port regulations and financial studies, innovative blending schemes concerning the development of alternative fuel infrastructure, and innovative technologies promoting eco-friendly transportation systems in the maritime and urban transport sectors.

GreenPort Congress & Cruise



## COMMUNICATION, DISSEMINATION & STAKEHOLDERS ENGAGEMENT

### Website & Social Media

- **53 news published:** Project Workshops, Webinars, Questionnaires, Events participation, Downloadable materials, EALING events
- Files download: **198 users downloaded contents**

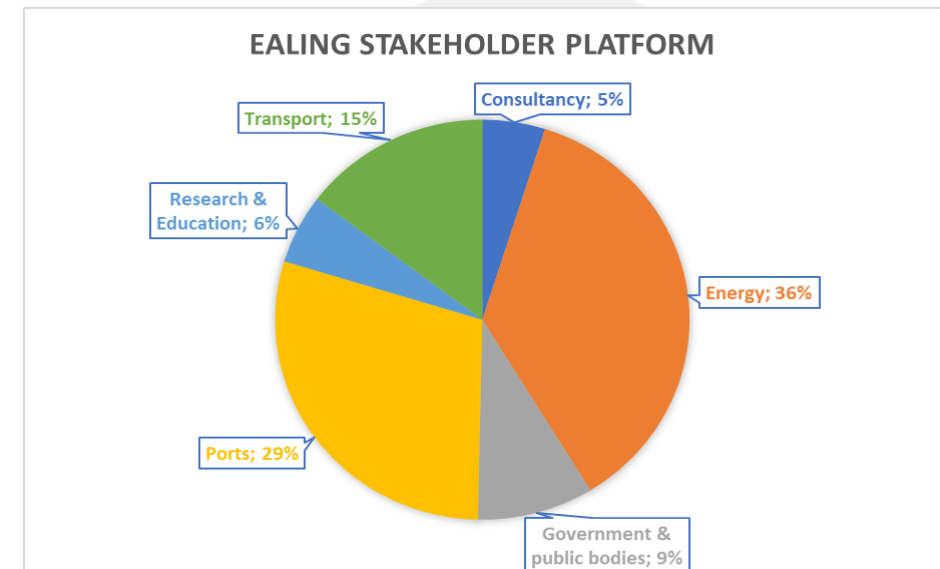
### Bulletin

- Every six months
- Distributed through official project channels to more than 1,200 industry players, via partners' Network and via Connecting EU Hub to more than 7,500 operators in the ports and logistics industry.



### Stakeholders Platform

- **227 members**





# Thanks!



European flagship Action for coLd ironING in ports

Rocío García Molina

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**Discover more at**

[www.ealingproject.eu](http://www.ealingproject.eu)



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