



European flagship Action for cold ironING in ports

Energy efficiency in ports: The “European flagship action for cold ironing in ports” project findings and results

Working Group Meeting

OSCE project Promoting Green Ports and Connectivity

Jorge Lara

29th March 2023

1

EALING Overview

2

EALING Main results

3

To know more...



EALING Overview

Global Project

“European flagship Action for coLD ironING in ports”

MAIN OBJECTIVE:
To accelerate the effective deployment of OPS solutions in EU maritime ports

- Common EU harmonized, interoperable and sustainable framework for **the deployment of Onshore Power Supply (OPS) in ports**
- Port-to-vessel **compatibility**
- Effective launch of **OPS infrastructures in ports**

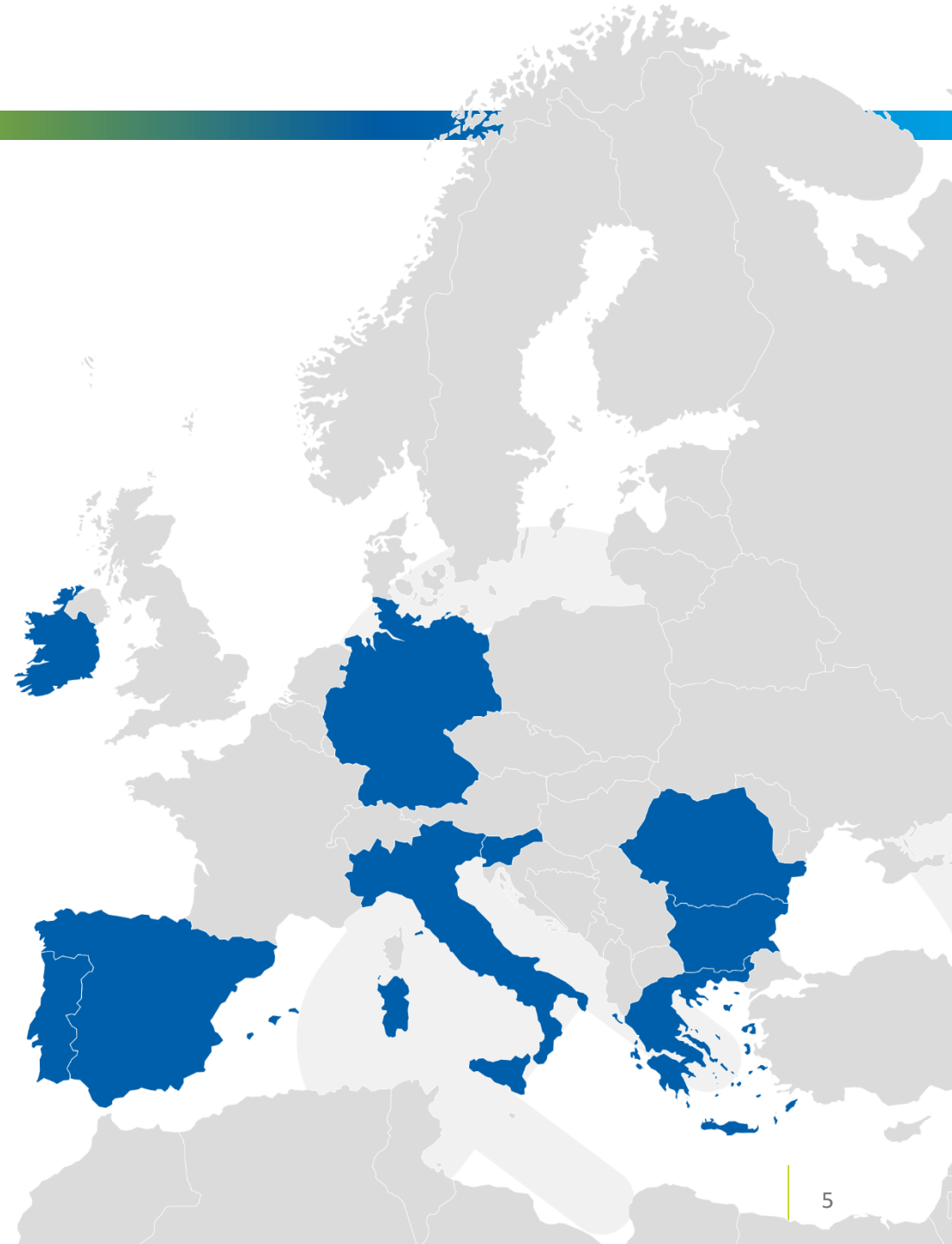
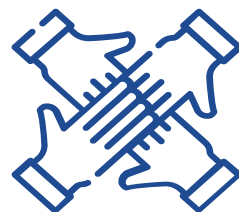
- Implementation of at least **30 installations in at least the 16 EU ports** of the EALING Studies Action



Partners and location

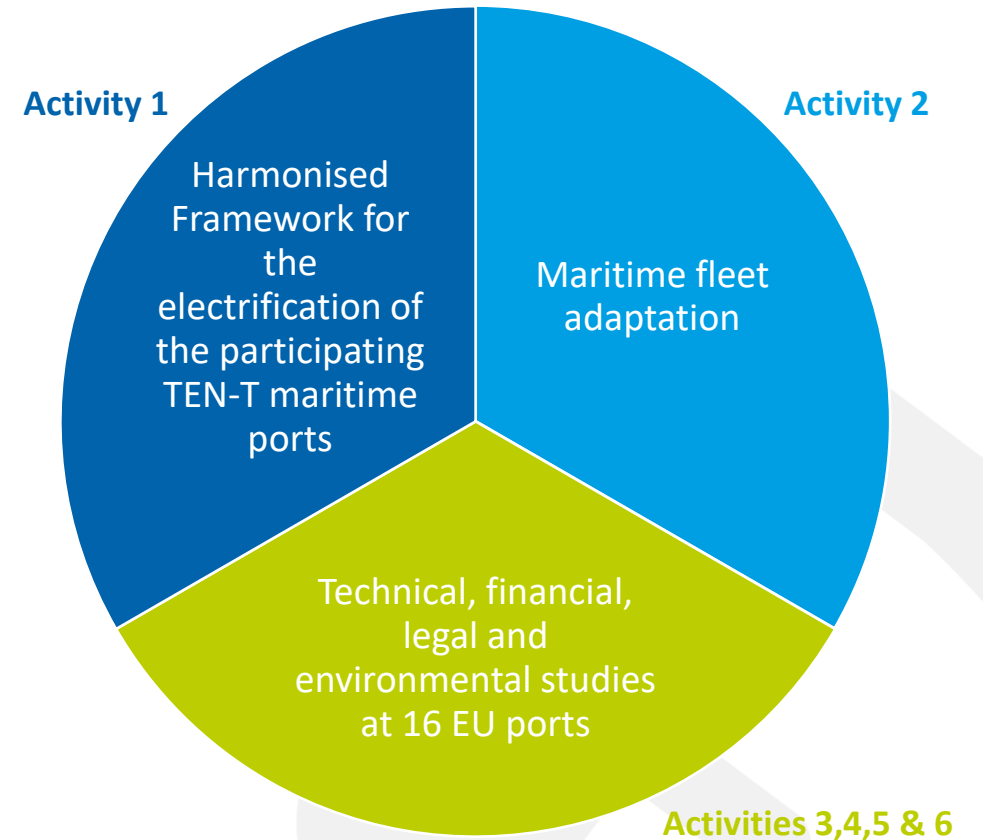
22 Beneficiaries from 9 EU Member States:

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



Objectives & structure

- **ACTIVITY 1:** Ensuring that a **common harmonised and interoperable framework** is brought forward, in line with the EU technical, legal and regulatory framework, in order to facilitate the implementation phase of OPS infrastructure in the ports of the consortium
- **ACTIVITY 2:** Ensuring the **port to vessel compatibility in the TEN-T Maritime Network**, for vessels calling at the ports of the consortium
- **ACTIVITIES 3 TO 6:** 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



2

EALING MAIN RESULTS



ACTIVITY 1: Harmonised Framework for the electrification of the participating TEN-T maritime ports

Detailed Analysis on the existing regulations related to OPS



Deliverable D1.1

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

TABLE OF CONTENTS

Executive Summary.....	9
1 Introduction.....	10
2 International regulatory framework for Onshore Power Supply	12
2.1 INTERNATIONAL TECHNICAL STANDARDS.....	12
2.2 INTERNATIONAL VERIFICATION AND CERTIFICATION OF OPS INSTALLATIONS	15
2.3 IMO GUIDELINES - A FOCUS ON SHIP SIDE	16
3 European regulatory framework for Onshore Power Supply	18
3.1 OVERVIEW OF THE CURRENT EUROPEAN CONTEXT.....	18
3.2 FORTHCOMING EU REGULATIONS AFFECTING THE MARITIME AND PORT SECTORS	21
3.3 OTHER EU REGULATIONS AND RECOMMENDATIONS IN FORCE AFFECTING OPS IMPLEMENTATION	31
3.4 EMSA GUIDELINES - A FOCUS ON SHORE SIDE	34
4 National, regional and local regulatory framework for Onshore Power Supply in Ealing ports.....	39
4.1 DESCRIPTION OF THE NATIONAL, REGIONAL, AND LOCAL REGULATIONS AFFECTING THE PORTS OF THE CONSORTIUM.....	39
4.1.1 SPANISH PORTS.....	41
4.1.2 GREEK PORTS.....	58
4.1.3 ITALIAN PORTS.....	67
4.1.4 ROMANIAN PORTS.....	88
4.1.5 BULGARIAN PORTS.....	100
4.1.6 SLOVENIAN PORTS.....	115
4.1.7 IRISH PORTS.....	119
4.1.8 PORTUGUESE PORTS.....	124
4.2 ANALYSIS AND COMPARISON.....	134
4.2.1 OVERALL STATUS OF THE EALING COUNTRIES.....	134
4.2.2 COMPARATIVE ANALYSIS BETWEEN EALING COUNTRIES	143
4.2.3 QUALITATIVE ANALYSIS BETWEEN EALING COUNTRIES	150
5 Conclusion	157
ANNEXES - REFERENCES.....	158

Final recommendations for a harmonised framework on OPS in the EU ports



Deliverable D1.2

Report on final recommendations for a harmonised framework on OPS in EU ports

TABLE OF CONTENTS

EXECUTIVE SUMMARY	8
1 SCOPE OF THE REPORT.....	9
2 POLICY AND LEGAL SCOPES.....	10
2.1 OVERVIEW OF CURRENT AND FORTHCOMING EU REGULATIONS	10
2.2 OUTLOOK OF RELEVANT EUROPEAN ORGANISATIONS	14
2.3 MAIN FINDINGS FROM THE DETAILED ANALYSIS OF EXISTING NATIONAL/REGIONAL/LOCAL REGULATION IN EALING PORTS.....	18
2.4 RECOMMENDATIONS FOCUSED ON THE POLICY AND LEGAL SCOPE.....	21
3 TECHNICAL SCOPE.....	23
3.1 OVERVIEW OF THE TECHNICAL WORK PERFORMED BY EUROPEAN AND INTERNATIONAL BODIES AND THE MAIN CHALLENGES HIGHLIGHTED.....	23
3.2 OUTLOOK OF THE ENERGY SUPPLIERS AND MAIN CHALLENGES HIGHLIGHTED	26
3.3 OUTLOOK OF THE SOLUTION PROVIDERS AND MAIN CHALLENGES HIGHLIGHTED.....	28
3.4 MAIN CHALLENGES HIGHLIGHTED BY PORT AUTHORITIES.....	30
3.5 RESULTS OF THE EALING PORT AND SHIPPING QUESTIONNAIRES: MAIN TECHNICAL CHALLENGES HIGHLIGHTED.....	31
3.6 RECOMMENDATIONS FOCUSED ON THE TECHNICAL SCOPE.....	32
4 ECONOMIC SCOPE	37
4.1 OVERVIEW OF THE SSE EUROPEAN MARKET	37
4.2 MAIN FINDINGS RELATED TO THE ECONOMIC SCOPE.....	42
4.3 RECOMMENDATIONS FOCUSED ON THE ECONOMIC SCOPE.....	51
5 ENVIRONMENTAL SCOPE	53
5.1 OUTLOOK OF GREEN ENERGY PRODUCTION FOR SSE.....	53
5.2 OVERVIEW OF ENVIRONMENTAL ASPECTS REGARDING SSE INSTALLATIONS.....	54
5.3 ENVIRONMENTAL CERTIFICATES AND MONITORING AND REPORTING SCHEMES	55
5.4 ENVIRONMENTAL LEGAL FRAMEWORK AFFECTING THE CONSTRUCTION AND OPERATION OF SSE INSTALLATIONS.....	58
5.5 RECOMMENDATIONS FOCUSED ON THE ENVIRONMENTAL SCOPE.....	60
6 SOCIAL SCOPE.....	61
6.1 OVERVIEW, FINDINGS, AND CHALLENGES RELATED TO THE SOCIAL SCOPE.....	61
6.2 RECOMMENDATIONS FOCUSED ON THE SOCIAL SCOPE.....	65
REFERENCES.....	66

ACTIVITY 1: Harmonised Framework for the electrification of the participating TEN-T maritime ports

Recommendations – policy and legal scope

- Simplify and harmonise administrative burden at the national, regional, and local levels (resulting from regulation application) to build and operate SSE infrastructures.
- Facilitate the involvement of port authorities in the development and operation of their electricity distribution system to provide the necessary quantities of electricity to their end-users.
- Increase the intensity of public funding. In this sense, the revenues raised via EU ETS could be used to fund SSE installations.
- Include tax exemption for electricity provided to vessels at berth in the revised Energy Taxation Directive.

ACTIVITY 1: Harmonised Framework for the electrification of the participating TEN-T maritime ports

Topic	Recommendations – technical scope
SSE connection at vessels	<ul style="list-style-type: none"> • There should be some standardisation or guidelines regarding the position of the SSE connection for each type of vessel. • Appropriate training is needed, especially on safety aspects regarding shore-ship compatibility • There is a need for technical and regulatory harmonisation when implementing SSE connection on board. <p>IMO guidelines under preparation are expected to provide support on these issues.</p>
Tender processes	<ul style="list-style-type: none"> • Mandating joint ventures in the tender processes may not be a good approach. • Experts should validate the feasibility; requirements do not need to be very detailed.
Regulations and standards	<ul style="list-style-type: none"> • Promoting regulatory sandboxes that allow designing and testing SSE services . • Improving the international standard for Shore Connection (IEC/IEEE 80005), example including Shore side Battery Charging and Shore Power Banking.
Assessment of power demand	<ul style="list-style-type: none"> • Load forecasting models will be needed . • Define proper power demand values to size the SSE infrastructure: Load forecasting models, and energy survey-based power demand estimation will be needed.

ACTIVITY 1: Harmonised Framework for the electrification of the participating TEN-T maritime ports

Recommendations – economic scope

- Develop a Cost-Benefit Analysis before implementing any SSE infrastructure to avoid the misallocation of limited resources .
- Consider the following aspects in any feasibility study): demand evaluation; customized/tailored contract; electricity pricing and opportunities; competitors; market and financial evaluation; evaluation of economic cost-benefit; and impact assessment of shore side electricity in port/local economic profile.
- Create additional funding mechanisms (e.g., maritime fund under the EU ETS) to cover a bigger part of the needed investments. Existing mechanisms (Connecting Europe Facility, Recovery Funds) are not sufficient to reach the desired deployment.
- Increase the percentage of funding in existing mechanisms. 30-40% is still too little for the important investments needed in European ports.
- Have a permanent and comprehensive EU-wide tax exemption for the use of SSE in ports under the Energy Taxation Directive, which would put it on an equal footing with electricity generated on board ships and produced from tax-free marine fuel combustion.
- Encourage the application of port fee rebates for shipping companies at the ports at the EU level.

ACTIVITY 1: Harmonised Framework for the electrification of the participating TEN-T maritime ports

Recommendations – environmental scope

- Promote the creation of an environmental certificate addressed to shipping lines, focused on the use of electricity when at berth, following the example of ESI, Green Award, CSI, or Blue Angel label, etc.
- Encourage the registration of ships in the Clean Shipping Index (CSI) for vessels equipped with SSE so that to rebates in the participating European ports.

Recommendations – social scope

- Incentivise, at the European Commission level, interaction, and collaboration between all the stakeholders, especially the shipping companies, port authorities, solution providers .
- Involve the public in the port's plans for the provision of SSE, and enhance public awareness of benefits of SSE.
- Create at the port level a specific working group involving all the operational stakeholders to ensure the proper coordination and management of the facilities.
- Work closely with universities and vocational training centres to cover the training profiles needed for SSE operations.

ACTIVITY 2: Maritime fleet adaptation

OBJECTIVE 1

Analyse the standards relevant to shipside installation for OPS for the vessels operating in the ports of the consortium.

Harmonise the port to vessel compatibility in each of the ports of the consortium

OBJECTIVE 2

Identify technical and regulatory elements to facilitate the connection of ships to OPS

Provide operational recommendations, taking IMO guidelines as a reference, for a harmonized framework on fleet electrification adaptation, leading to a final proposal to IMO.



Deliverable D2.1

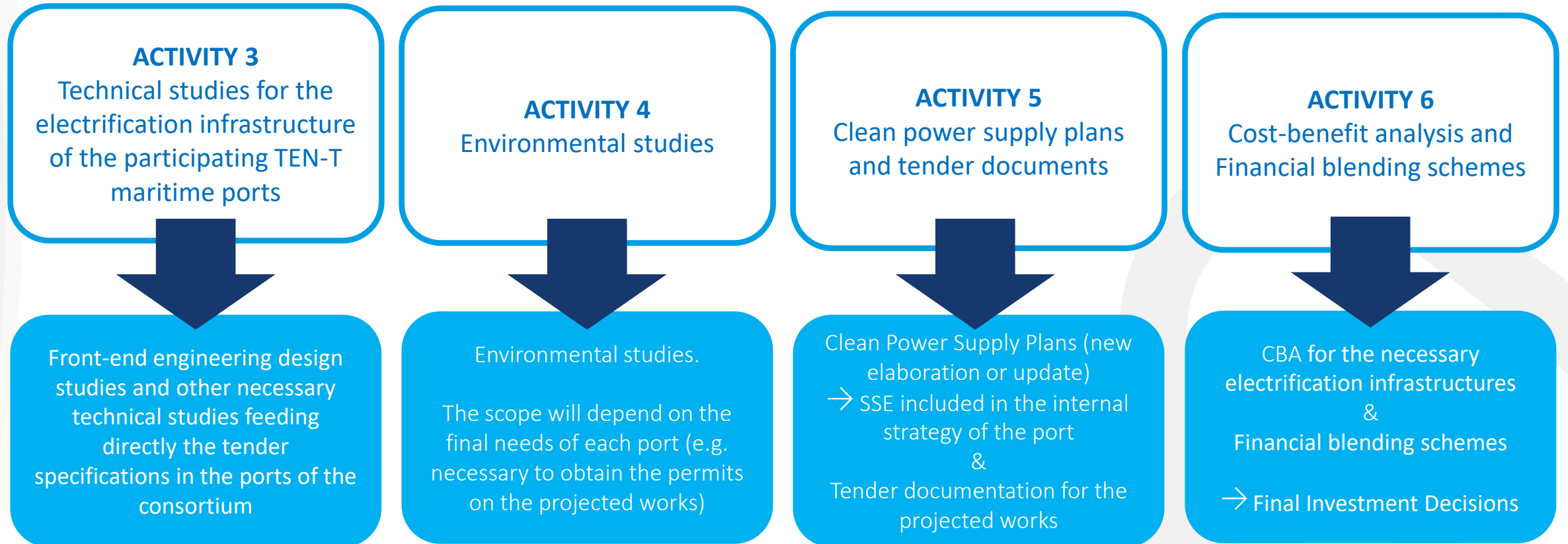
Report on the analysis of the standards relevant to shipside installation for shore side electricity supply

The document reflects only the author's view and the Agency is not responsible for any use that may be made of the information contained therein.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	7
1 INTRODUCTION	8
1.1 OBJECTIVES OF THE ACTIVITY	8
1.2 OBJECTIVES OF THE DELIVERABLE	9
2 REGULATORY FRAMEWORK – SHIPSIDE INSTALLATION AND REQUIREMENTS	11
2.1 BREAKDOWN OF THE EXISTING REGULATORY FRAMEWORK RELATED TO SHORE SIDE ELECTRICITY	11
2.2 ANALYSIS OF THE EXISTING REGULATORY FRAMEWORK RELATED TO SHORE SIDE ELECTRICITY	13
2.2.1 INTERNATIONAL REGULATORY FRAMEWORK	14
2.2.2 EUROPEAN REGULATORY FRAMEWORK	15
3 TECHNICAL & OPERATIONAL GUIDELINES/ STANDARDS – SHIPSIDE INSTALLATION AND REQUIREMENTS	20
3.1 BREAKDOWN OF THE EXISTING TECHNICAL AND OPERATIONAL GUIDELINES/STANDARDS RELATED TO SHORE SIDE ELECTRICITY	20
3.1.1 STANDARDS	20
3.1.1.1 IEC/ISO/IEEE 80005	20
3.1.1.2 IEC 60092, ELECTRICAL INSTALLATIONS IN SHIPS	24
3.1.1.3 IEC 61363-1, ELECTRICAL INSTALLATIONS OF SHIPS AND MOBILE AND FIXED OFFSHORE UNITS	25
3.1.1.4 IEC 62613, PLUGS, SOCKET-OUTLETS AND SHIP COUPLERS FOR HIGH-VOLTAGE SHORE CONNECTION SYSTEMS (HVSC-SYSTEMS)	25
3.1.2 EUROPEAN & INTERNATIONAL ENTITIES' GUIDELINES	26
3.1.2.1 IMO	26
3.1.2.2 IEEE - INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS	26
3.1.2.3 EMSA	27
3.1.2.4 CENELEC	27
3.1.2.5 IET	28
3.1.3 CLASSIFICATION SOCIETIES	29

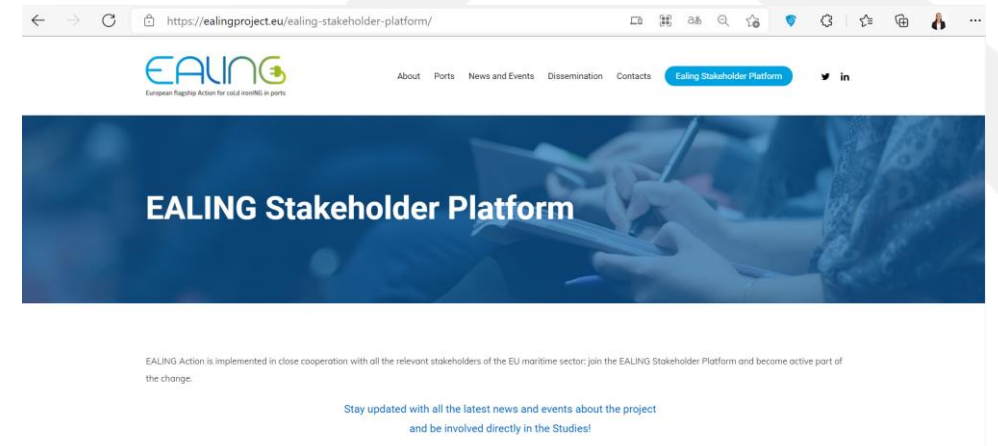
ACTIVITIES 3, 4, 5 and 6: Technical, financial, legal and environmental studies at 16 EU ports



3
TO KNOW MORE...

EALING deliverables, newsletter, video

- **EALING DELIVERABLES:** [Dissemination – Ealing Project](#)
- **EALING BULLETIN** is the periodic project newsletter: 3 issues sent out and [available for download on the website](#). Dissemination to a database of 5,000 targeted stakeholders, social media community and project partners
- **EALING PROJECT VIDEO:** [European Flagship Action For Cold Ironing in ports - EALING Project - YouTube](#)



Ealing Stakeholder Platform – Ealing Project

Thanks!



European flagship Action for coLd ironING in ports

Jorge Miguel Lara López

jlara@fundacion.valenciaport.com

Discover more at

www.ealingproject.eu



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