



European flagship Action for cold ironING in ports



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

HEV-TCP Task 47 : Zero-Carbon Freight from Port Electrification Kick-Off Event

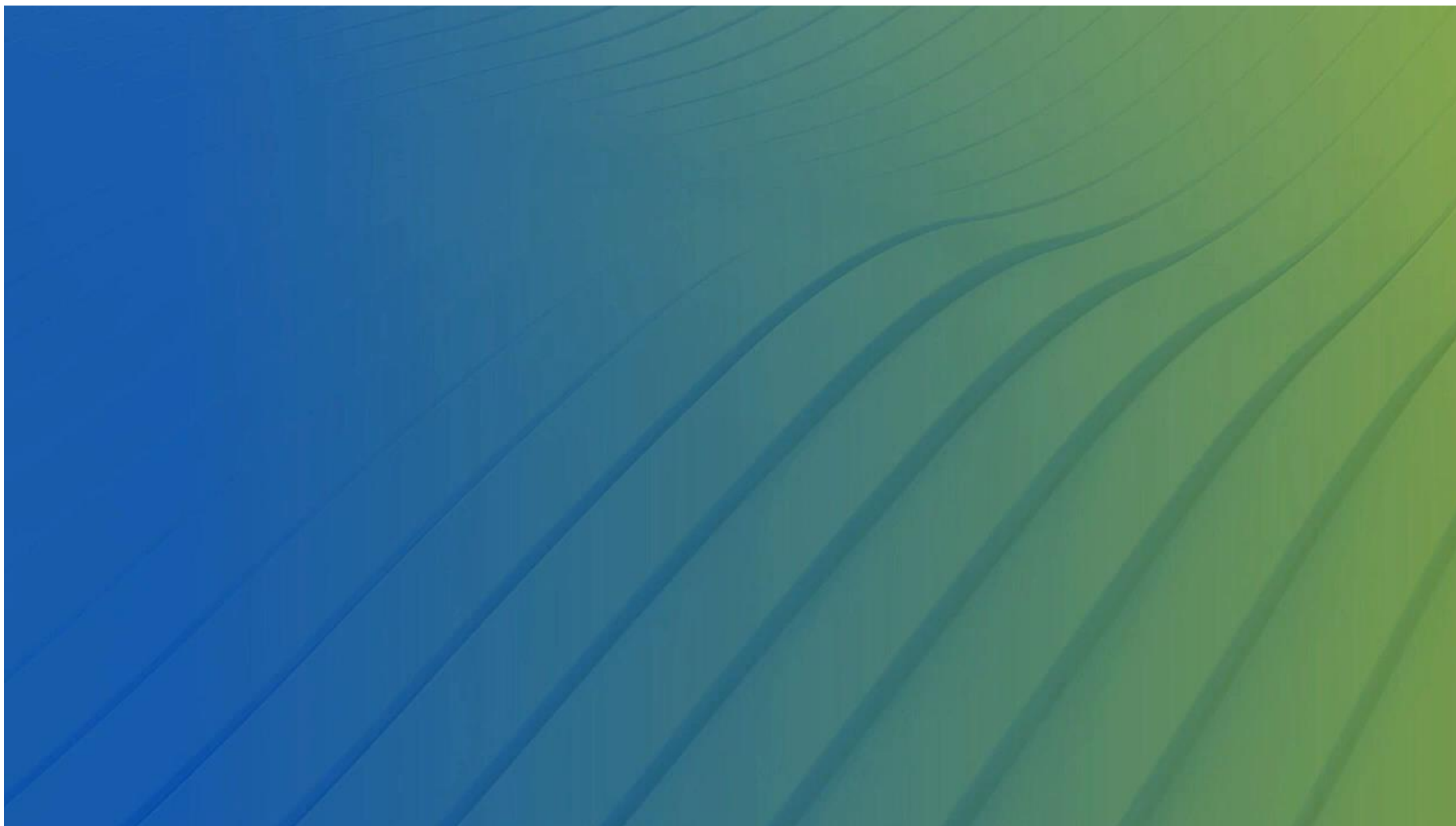
EALING Project

**Activity 1: Recommendations for a harmonised framework on OPS in EU ports, &
Activity 3 FEED Studies**

29th November 2022



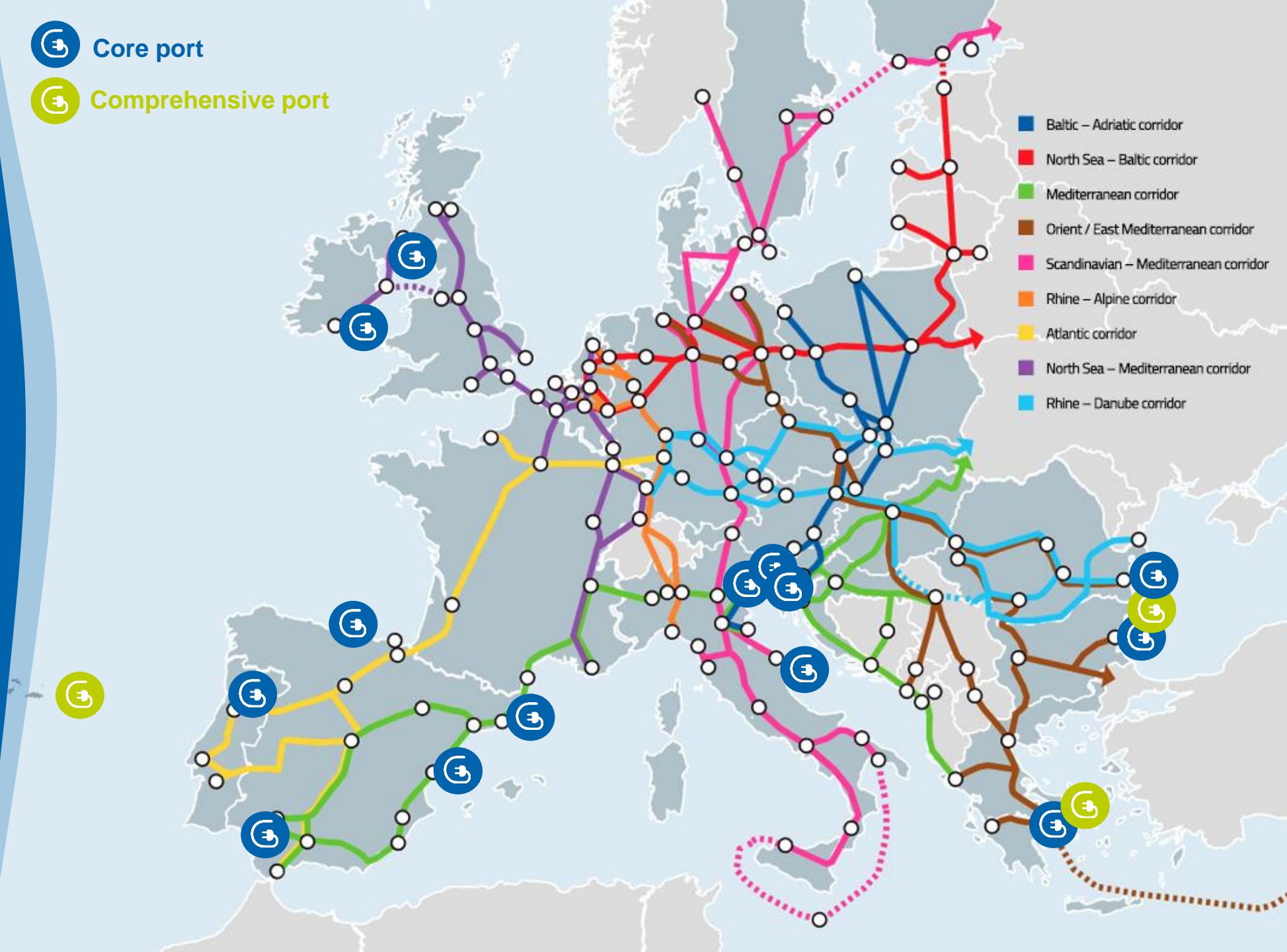
EALING video



-  Core port
-  Comprehensive port

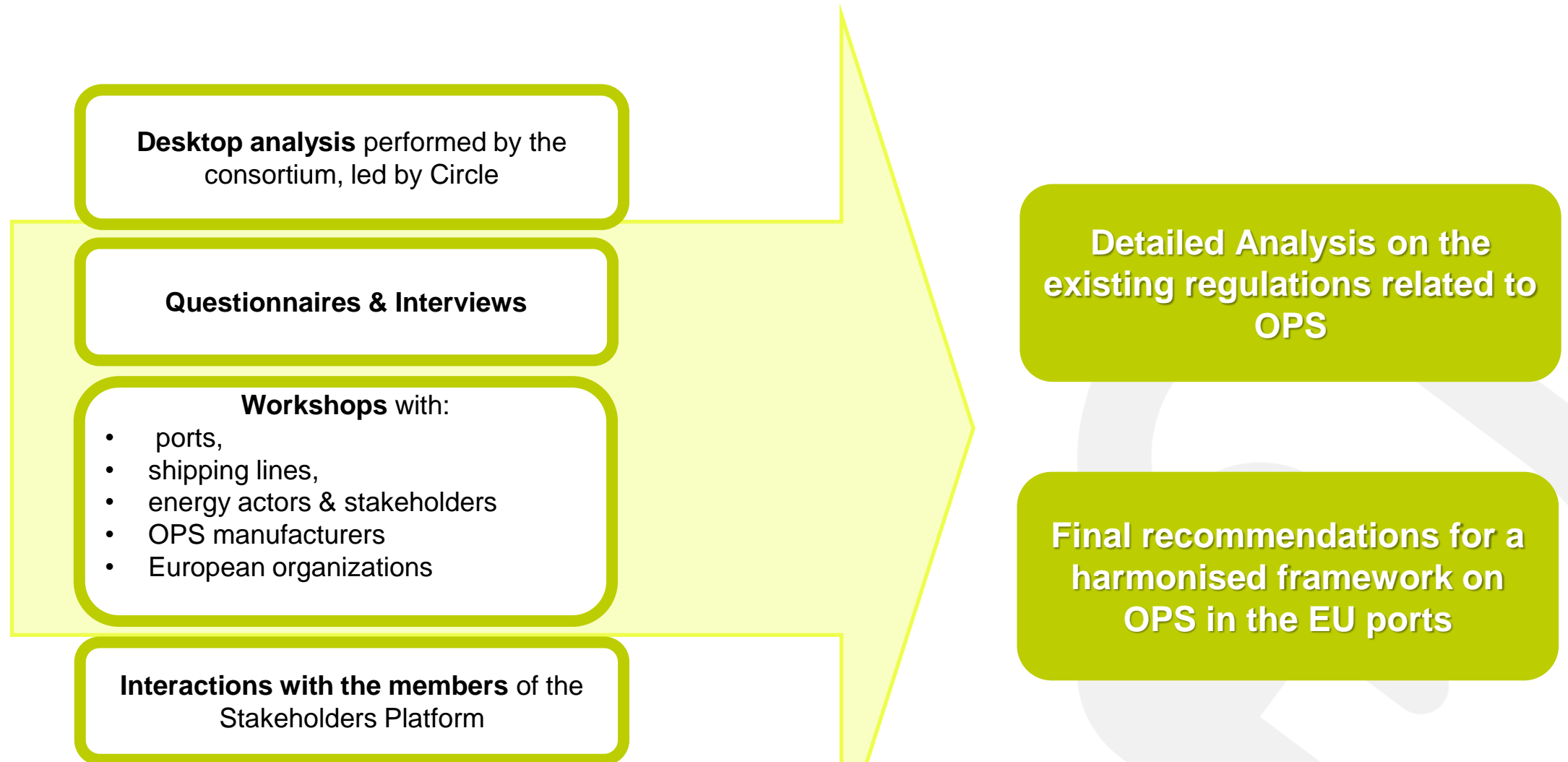
16 EU ports:

- 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)



Activity 1

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



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

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.

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

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

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Note: the following slides contain some of the recommendations collected from key EU port and shipping stakeholders and the EALING consortium partners to bring forward the deployment of SSE infrastructures in European ports.

The report including the full compilation of the recommendations will be published on the EALING website in the following days.

Recommendations – policy and legal scope

- Simplify and harmonise administrative burden at the national, regional, and local levels .

- Facilitate the involvement of port authorities in developing and operating their electricity distribution system .

- Increase the intensity of public funding.

- Include “tax exemption” for electricity provided to vessels at berth in the revised Energy Taxation Directive.

Recommendations – technical scope

Tender
processes

- Mandating joint ventures in the tender processes may not be a good approach.
- Experts should validate the feasibility (studies); requirements do not need to be very detailed.

Regulations and
standards

- Improving the international standard for Shore Connection (IEC/IEEE 80005), example including Shore side Battery Charging and Shore Power Banking.

Assessment of
power demand

- 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.

Recommendations – economic scope

- Develop a Cost-Benefit Analysis before implementing any SSE infrastructure to avoid the misallocation of limited resources .
- Consider 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.
- Encourage the application of port fee rebates for shipping companies at the ports at the EU level.

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 3

Objectives

- Execute the detailed technical design studies for the electrification infrastructure necessary for the ports of the consortium.
- The implementation of front-end engineering design (FEED) studies providing the fully defined engineering package needed to enable ports launching the works phase right after the end of the Action.
- FEED studies will include:
 - ✓ specifications for main primary and secondary equipment
 - ✓ cost estimation for procurement and erection of the future cold ironing and electric bunkering infrastructure
 - ✓ technical design studies providing planning design, final specifications for equipment and infrastructure, and final budget.

Electrical studies-Tasks

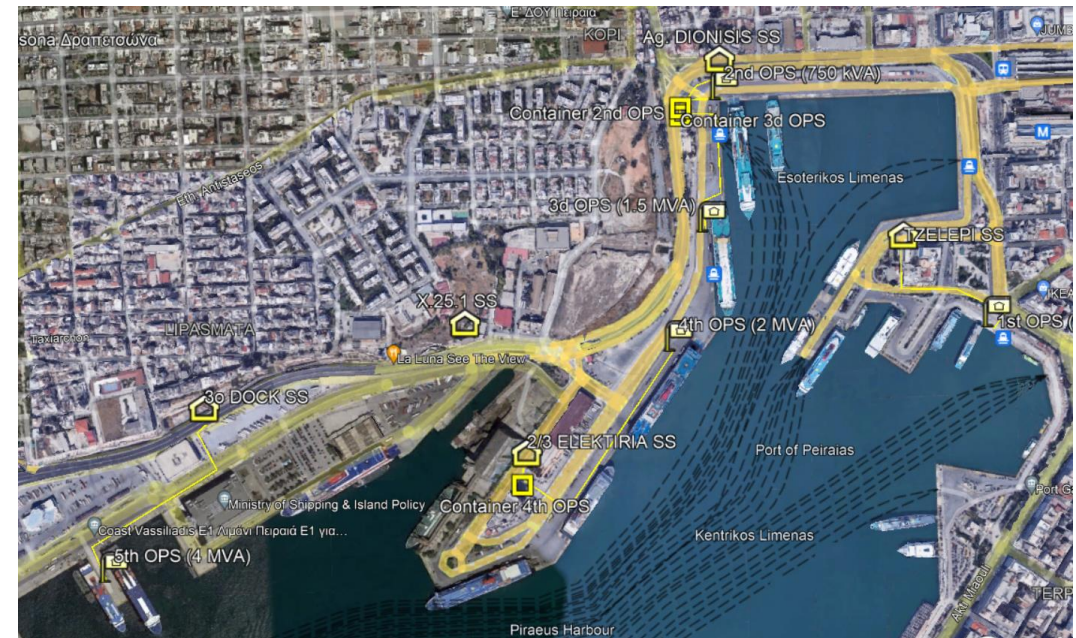
- **Design study** of the port electrical system expansion, to ensure robust power supply to the port network
- **Load flow analysis**, to ensure efficient operation and size properly power equipment, in terms of continuous ratings
- **Short circuit study**, to size properly power equipment, in terms of short-circuit withstand and breaking capability
- General **design of protection and interlock schemes**, to ensure secure operation upgraded port network
- General **design of the substation automation system** (SAS), to ensure complete control and monitoring of the upgraded port network
- **Cost estimation**, to provide a budget for equipment procurement, erection works and required detailed studies
- Study of the proper **CMS** for each case.

Activity 3. FEED Studies

Progress of the FEED Studies for the port of Piraeus, Rafina, Constanta, Burgas and Varna.

FEED Studies for the port of Piraeus

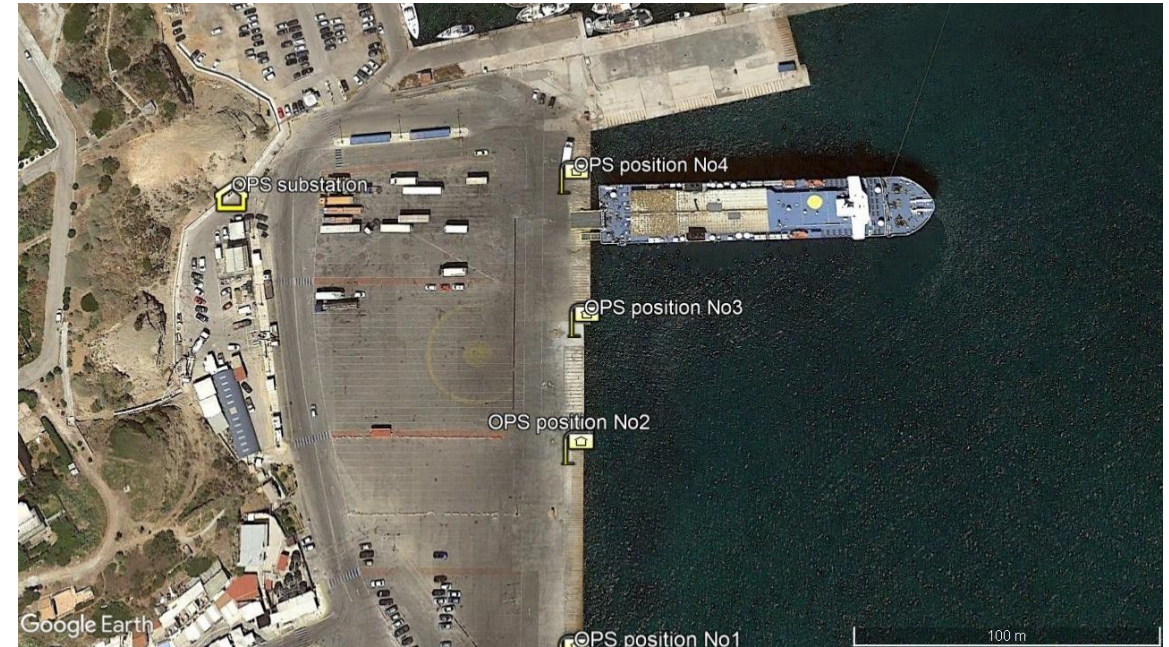
- Total Power: 13.5 MVA
- Installation of MV Panels, TRs & F.C.
- Containerized Solution
- Existing Building



ACTIVITY 3.- Technical studies for the electrification infrastructure of the participating TEN-T maritime ports		
OPS points	Power (MVA)	Serving Vessels
1	0.5	Passenger - RoRo
2	1	Passenger - RoRo
3	4	Passenger - RoRo
4	4	Passenger - RoRo
5	4	Passenger - RoRo

FEED Studies for the port of Rafina

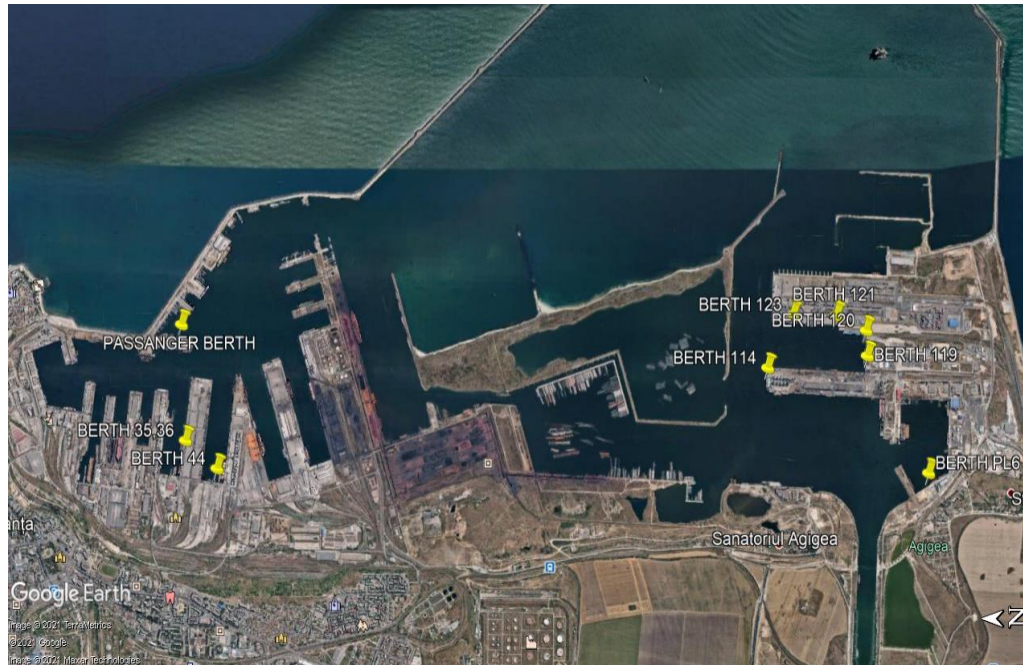
- Main cold ironing Substation
- Building 200 m²
- Total Power 6 MVA
- 4 HVSC positions (1.5 MVA)



Activity 3. FEED Studies

SSE points	Power (MVA)	Serving Vessels
1	1.5	Passenger-RoRo
2	1.5	Passenger-RoRo
3	1.5	Passenger-RoRo
4	1.5	Passenger-RoRo

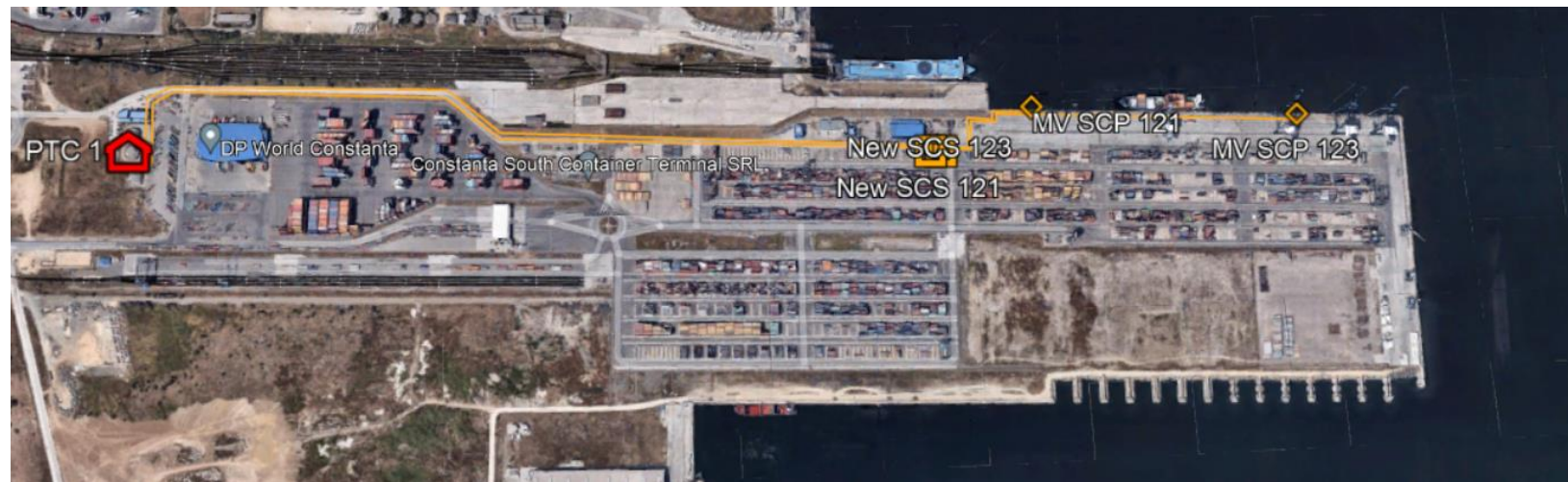
FEED Studies for the port of Constanta



ACTIVITY 3.- Technical studies for the electrification infrastructure of the participating TEN-T maritime ports		
OPS points	Power (MVA)	Serving Vessels
1	5	Container
2	1	Ro-Ro
3	1	Ro-Ro
4	5	Passenger
5	3	Bulk
6	5	Container
7	1	Multipurpose
8	1	Multipurpose
9	1	Multipurpose
10	5	LNG

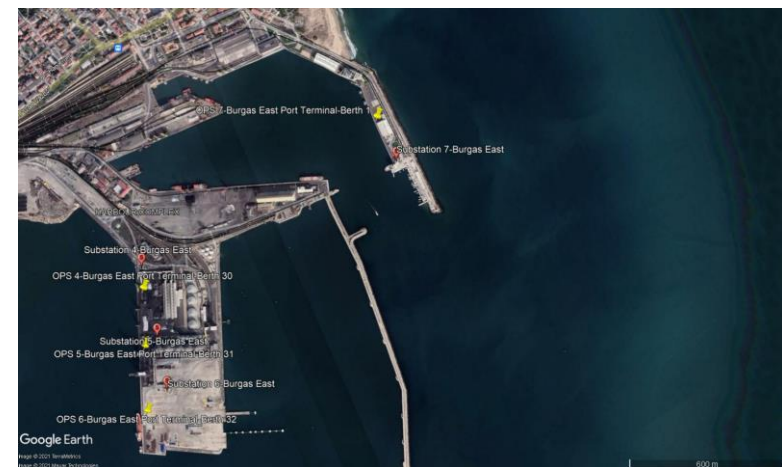
Berth 121 & 123

- Container Ships
- 2 HVSC positions (5 MVA)
- PTC1 S/S
- CMS from the ships to shore



FEED Studies for the port of Burgas

Activity 3. FEED Studies		
SSE points	Power (MVA)	Serving Vessels
Burgas East		
1	2.5	General Cargo/Container
2	2.5	General Cargo/Container
3	2.5	General Cargo/Container
4	7.5	General Cargo/Container
Burgas West		
1	2.5	General Cargo/Container
2	2.5	General Cargo/Container
3	2.5	General Cargo/Container
4	7.5	General Cargo/Container
Passenger		
1	16	<u>Passenger Vessel</u>



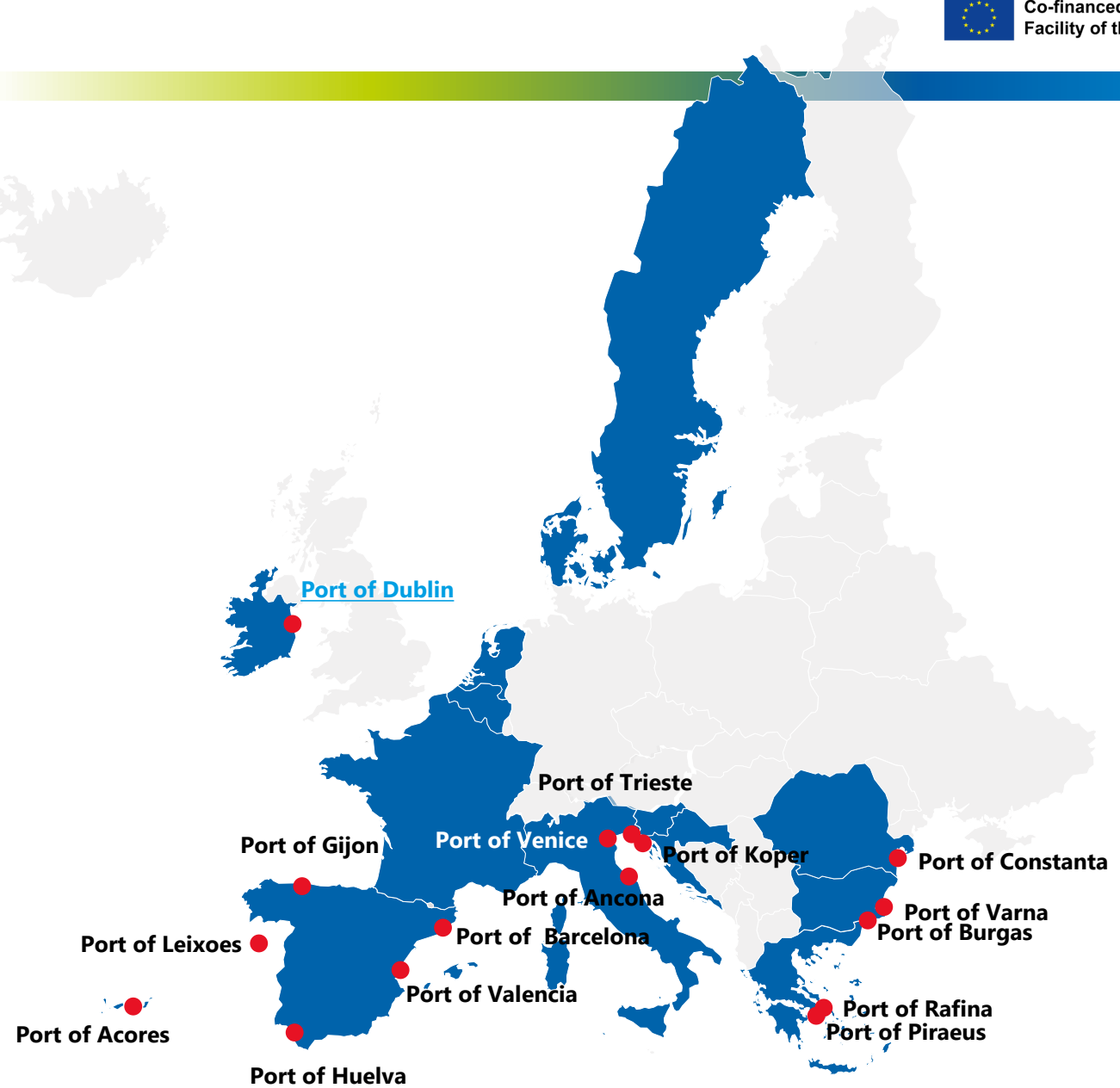
FEED Studies for the port of Varna

Activity 3. FEED Studies		
SSE points	Power (MVA)	Serving Vessels
Varna East		
1	2	General Cargo/Container
2	2	General Cargo/Container
3	1.5	General Cargo/Container
Varna West		
1	3	General Cargo/Container
2	1	General Cargo/Container
3	1	General Cargo/Container
4	1	General Cargo/Container
5	3	General Cargo/Container





Activity 3. FEED Studies for the ports of the Consortium



FEED Studies for the port of Ancona, Italy



ACTIVITY 3.- Technical studies for the electrification infrastructure of the participating TEN-T maritime ports		
OPS points	Power (MVA)	Serving Vessels
1	70 kW	offshore supply vessels
2	70 kW	offshore supply vessels
3	70 kW	offshore supply vessels
4	28 kW	research boat
5	3-4	pilot units
6	3-4	tug boats
7	3-4	service boats (eg boats dedicated to waste collection)

FEED Studies for the port of Barcelona, Spain



ACTIVITY 3.- Technical studies for the electrification infrastructure of the participating TEN-T maritime ports		
OPS points	Power (MVA)	Serving Vessels
1	3.5	Containership
2	3.5 or 7	Containership
3	16	Passenger
4	16	Passenger
5	16	Passenger
6	16	Passenger
7	16	Passenger
8	3	Ropax/Ferry

FEED Studies for the port of Valencia, Spain



ACTIVITY 3.- Technical studies for the electrification infrastructure of the participating TEN-T maritime ports		
OPS points	Power (MVA)	Serving Vessels
1	7.5	Containership
2	7.5	Containership
3	16	Passenger
4	16	Passenger
5	4	Ropax/Ferry
6	3	Ropax/Ferry

Thanks!



European flagship Action for coLd ironING in ports

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Discover more at

www.ealingproject.eu



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