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# EXPERIENCE OF THE VALENCIAPORT CLUSTER IN INNOVATION PROJECTS: SOME EXAMPLES OF COLLABORATION

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The knowledge centre for the leading port cluster in the Mediterranean.
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# WHO WE ARE

Fundación Valenciaport is a centre for **Applied Research, Innovation** and **Training**, serving the port-logistics cluster.

It is an initiative of the Port Authority of Valencia, bringing together key companies, universities and institutions in the port community.

Since its creation, it has developed projects in more than sixty countries, mainly in the Mediterranean, the rest of Europe, Asia and Latin America.

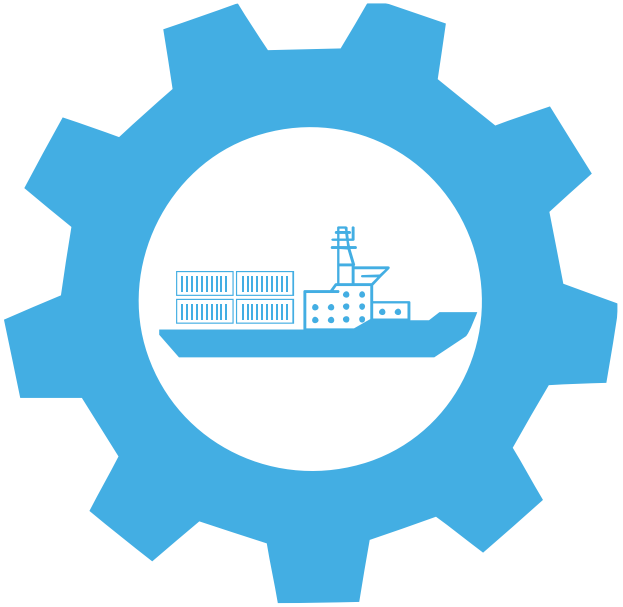
# KNOWLEDGE AREAS

- Port-Maritime market
- Port planning and management
- Port logistics
- Digital transformation
- Sustainability and energy transition
- Security and protection
- Integration between the port and the city

# CONTENTS:

1. Who we are
2. Examples of successful collaboration projects
3. Ongoing collaborations
4. The future of the network

# SUCCESSFUL PROJECTS CARRIED OUT SO FAR…



## RETROFITTING OF PORT EQUIPMENT AND VESSELS TO CLEANER FUELS AND ENERGIES

# RETROFITTING OF PORT EQUIPMENT & SHIPS

## STUDIES

EfiCont

COSTA

BunkerLogix

## STUDIES & PILOTS

Green Cranes

SEAterminals

gainn 4MoS

gainn 4Ship Innovation

CORE LNGas hive

H2 PORTS

& more upcoming on H2 and other clean energies

## ROLL-OUT

hive2 Green & Smart Links

hive2

& more work in progress

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# EXAMPLES OF ONGOING COLLABORATIONS

## SUSTAINABILITY INNOVATION PROJECTS

# MEASURING REAL TIME EMISSIONS

Green C Ports

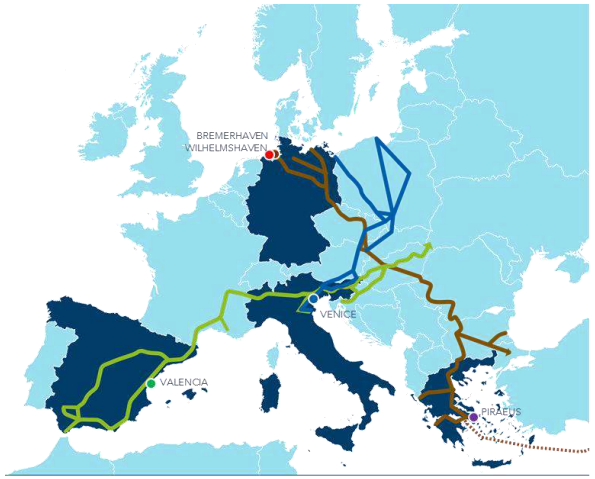
Co-financed by the Connecting Europe Facility of the European Union

## Internal Users

Port Strategy Management Team
Port Operations and Exploitation
Port Environmental Affairs Team

## External Users

Shippers
Terminal Operators
Trucking Companies
Freight Forwarders
Sea Carriers
Harbour Master
City Council
Neighbourhoods
Citizens




**A3** Information Reporting

**A2**
- Business Intelligence
- Big Data Analyses
- AI Predictive Modelling

Case studies

1. Decreasing port traffic congestion
2. Improving maritime accessibility to ports
3. Improving air quality in ports & port neighbouring areas
4. Reducing noise in ports and port neighbouring areas
5. Forecasting ship-to-shore crane productivity
6. Measuring real-time emissions along a transport chain

**A1** PORT ENVIROMENTAL PLATFORM

Sensor Network | PMIS | PCS | TOS

## Green C-Ports' Case Studies

1. Decreasing port traffic congestion
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# MEASURING REAL TIME EMISSIONS

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Green Ports

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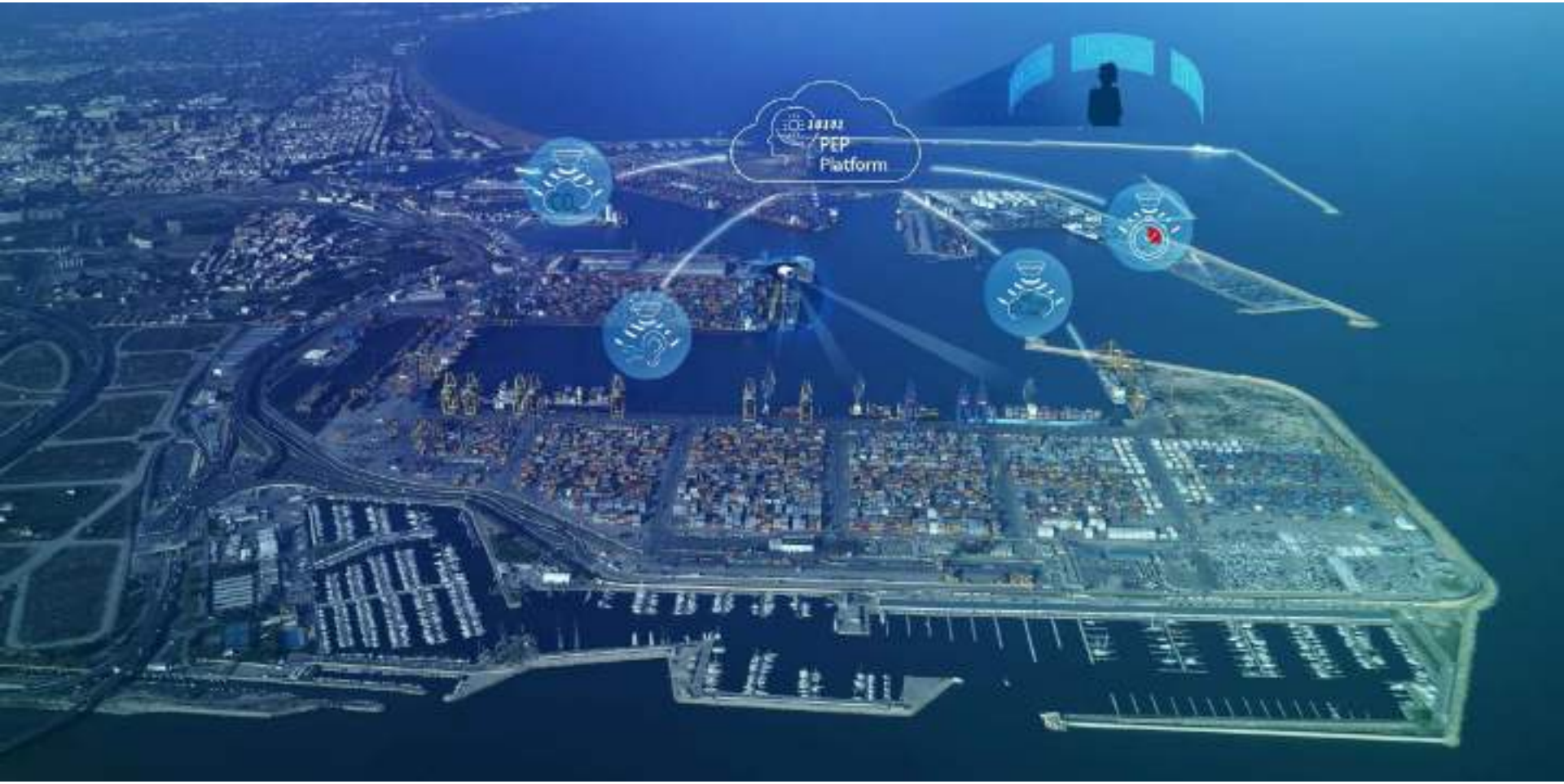
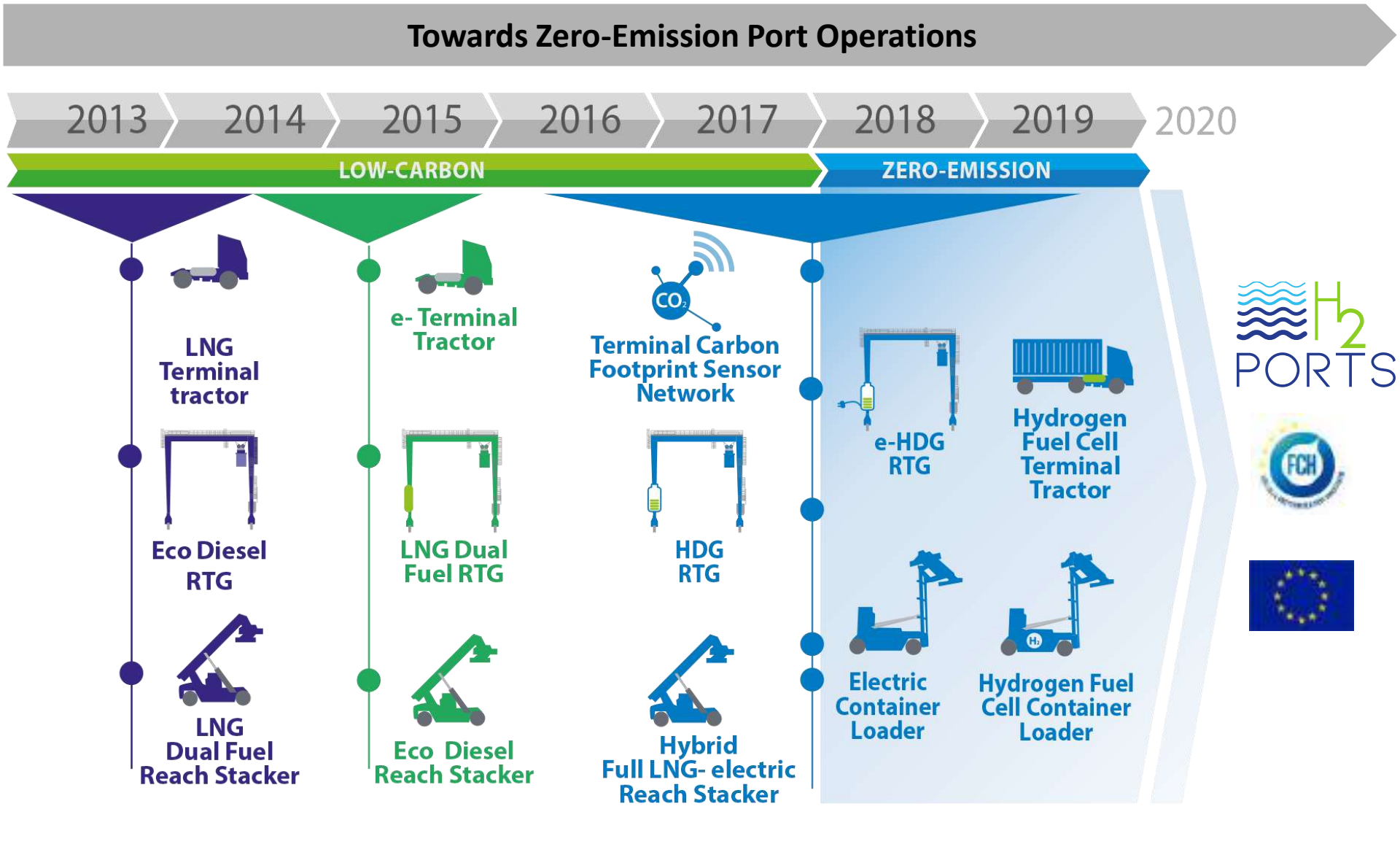


# RETROFITTING OF PORT EQUIPMENT



# RETROFITTING OF PORT EQUIPMENT

H2 PORTS Implementing Fuel Cells and Hydrogen Technologies in Ports

FCH FUEL CELLS AND HYDROGEN JOINT UNDERTAKING

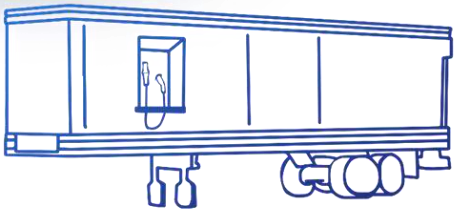
Port of Valencia

### Reach Stacker in MSC Terminal

- FC: 90-120 kW
- 2 years / 5000 h of operation

### Mobile HRS

- Hydrogen supply logistics at ports
- Port regulatory framework
- Safety procedures



### Yard Tractor in Valencia Terminal Europa

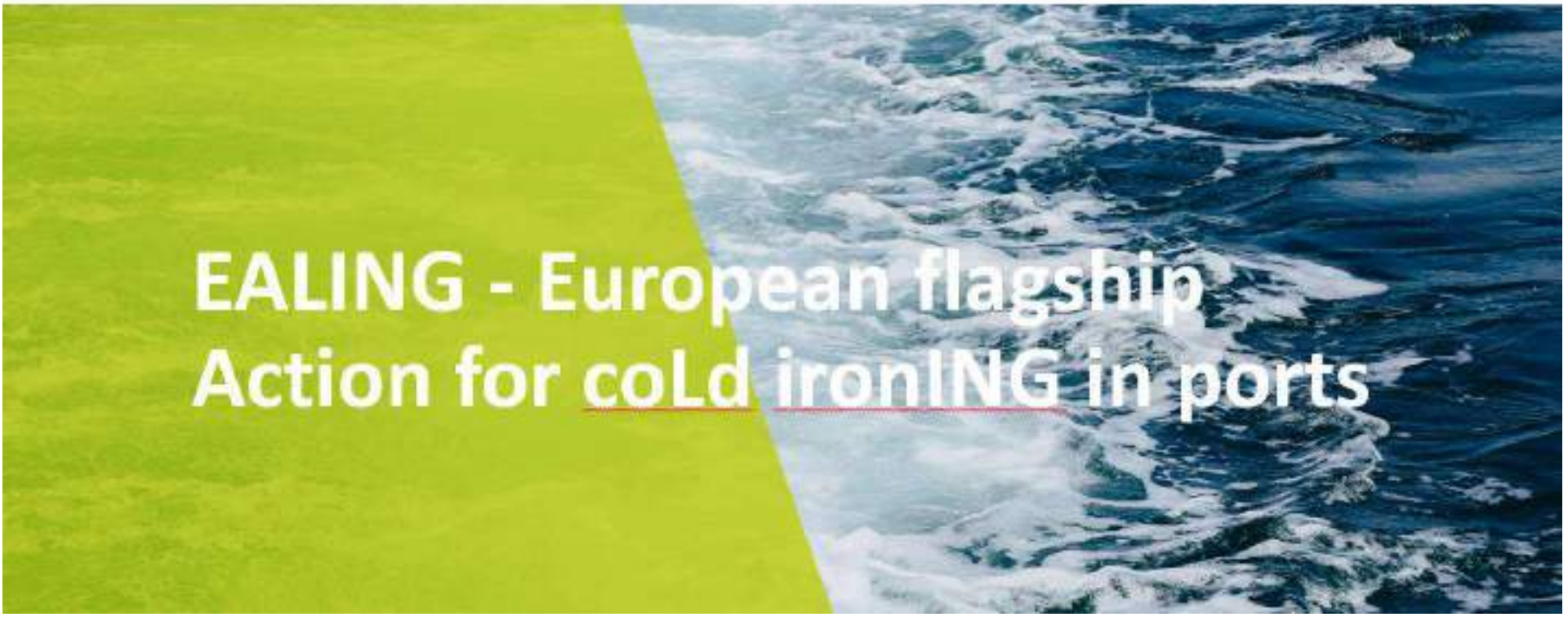
- FC: 85 kW
- 2 years / 5000 h of operation

First application of hydrogen technologies in port handling equipment in Europe

### General features

- Total Budget: 4,117,197.5 EUR
- Duration (4 years ): 2019-2023

Partners: Fundación Valenciaport, valenciaport Autoridad Portuaria de Valencia, GRIMALDI GROUP, msc Terminal Valencia S.A.U, HYSTER-YALE GROUP, BALLARD, ATENA Future Technology, Centro Nacional del Hidrógeno, enagas


EALING - European flagship
Action for coLd ironING in ports

# EALING Action (2019-EU-TM-0234-S) – Objectives

**To implement the first phase of the Global Project.**

## Specific objectives:

- 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;
- Ensuring the **port to vessel compatibility in the TEN-T Maritime Network,** for vessels calling at the ports of the consortium;
- Leading all the necessary **technical, financial, legal and environmental studies** to prepare and accelerate the effective launch of cold ironing and electric infrastructure and equipment in the ports.

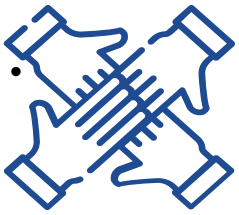
# Consortium

- **22 Beneficiaries from 9 EU Member States:**

o **12 TEN-T Port Authorities** (Valencia, Barcelona, Huelva, Gijón, Venice&Chioggia, Trieste&Monfalcone, Ancona, Piraeus, Koper, Rafina, Leixoes, Açores)

o **3 Port & Maritime Public Institutions** (Bulgarian Ports Infrastructure Company, National Company Maritime Ports Administration SA Constanta; Marine Institute (Ireland))

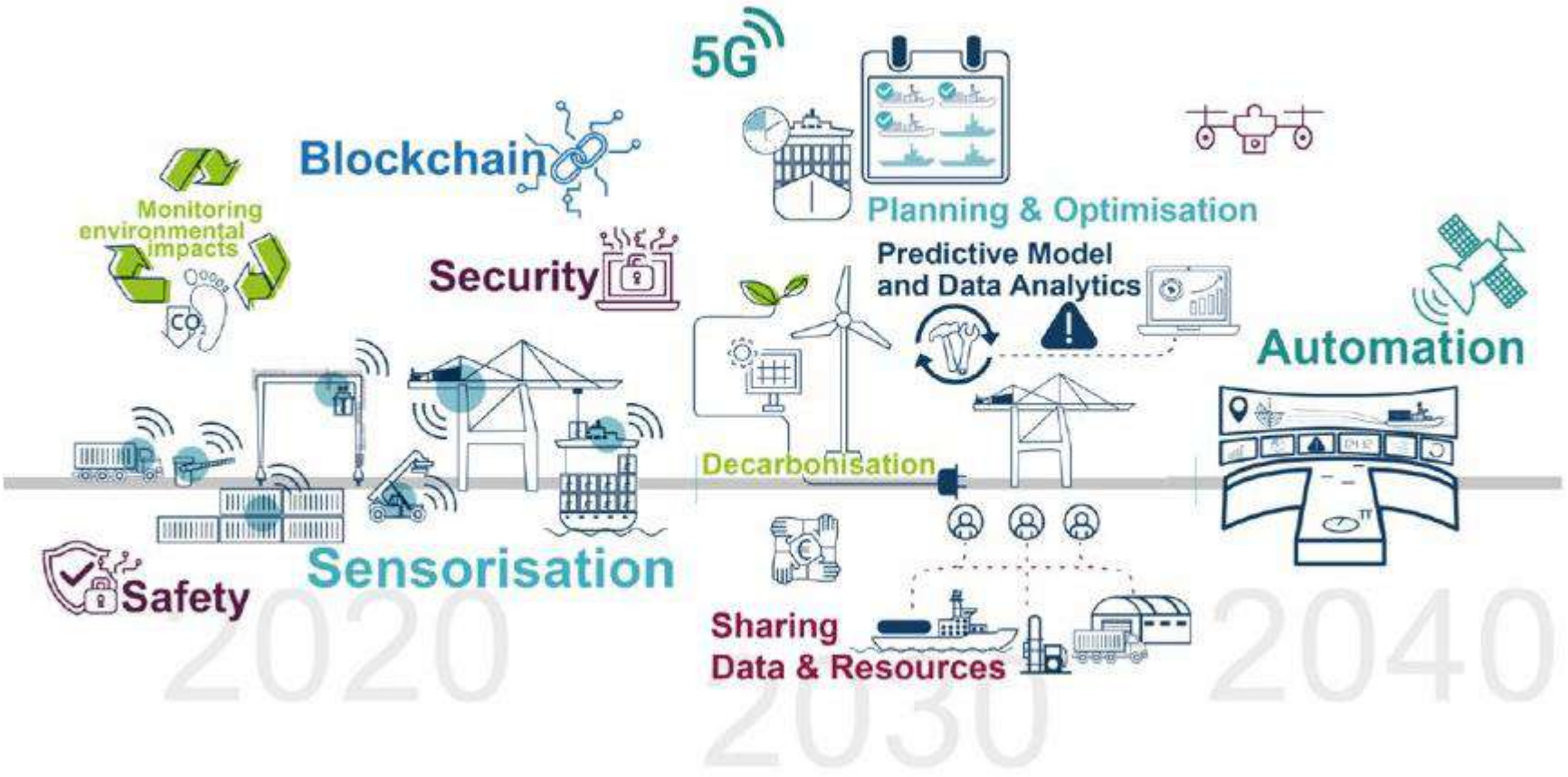
o **7 Port & Shipping Technical and Consulting Companies** (Fundación Valenciaport, Circle, Ocean Finance, Symbios Funding & Consuting, Protasis, Hydrus Engineering, Fincantieri SI)



- **+ Close cooperation with all the relevant stakeholders of the EU maritime sector**, in particular:
  - EU Coordinator for Motorways of the Sea
  - DG MOVE
  - Port & Maritime associations: ESPO, ECSA European Community Shipowners' Associations, MED ports ASSOCIATION

# EXAMPLES OF ONGOING COLLABORATIONS

## SMART PORTS



# I-TERMINALS: Digital platform for the Terminals 4.0

iTerminals 4.0

Application of Industry 4.0 Technologies towards Digital Port Container Terminals

TERMINAL LINK · KONECRANES · RBS · PSA · HYSTER-YALE · KALMAR · ZPMC · CARGOTEC · BOLLORÉ · prodevelop · TBA

valenciaport

Autoridad Portuaria de Valencia

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Co-financed by the European Union

Connecting Europe Facility

## Benefits derived from digitisation of port container operations:

**Operational Efficiency:** iTerminals 4.0 will enable real time machine-to-machine communication to detect operational bottlenecks and facilitate decision making to remove them at the right moment.

**Operational Safety:** iTerminals 4.0 will enhance situational awareness based on reliable positioning/detection of machines and persons. This concept is currently widely applied in other industrial sectors but never implemented on container terminals.

**Operational Sustainability:** iTerminals 4.0 will allow real-time calculation of the carbon footprint generated in container terminals, assigning to each manipulated container a unique carbon footprint value generated during its handling.

**Operational Maintenance:** iTerminals 4.0 will improve maintenance management by enabling digital transmission of failure codes to the maintenance areas, thus facilitating better predictive maintenance and increasing efficiency of operations.

*Enhancing rail interoperability with TAF TSI standards*



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# Barriers to overcome in the development of the smart port

Despite the advantages that the concept of smart port theoretically implies, there are a number of barriers and challenges that must be taken into consideration.

| | |
|---|---|
| Investment required | The implementation of technologies related to the smart port requires a significant economic investment in infrastructure, equipment, software, personnel and training |
| Change management | Changes related to technological innovations, new economic approaches, greater inter-business cooperation and new corporate cultures require organizations to learn and manage innovation change. |
| Social rejection | The use of new technologies can lead to a reduction in jobs, which can result in cases of occupational hazards and social rejection. Organizations should promote strategies to prevent possible risks and promote collaboration between technologies and people. |
| Technological challenges | Organizations and their workers must be able to master the continuous technological change. For this, it is necessary to implement and verify the technology through pilots, concept tests and prototypes. |
| Cybersecurity | In the face of cybernetic vulnerability and distrust, organizations must implement and configure security measures to protect against cyber attacks, thus generating confidence for technological development. |
| Collaborative work | For the implementation of technologies to be optimal, there must be collaboration at the intra and inter-business level. Institutions and people must collaborate to promote technological development. |
| Qualified personnel | The emergence of new solutions entails a demand for qualified personnel in new areas such as data analysis, cybersecurity, etc. It is necessary to find trained personnel to use new technologies within the port-logistics sector. |

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The experience so far has been very positive...
DOCKSTHEFUTURE
defining the concept of "Port of the future"
... and it could only be the tip of the iceberg


THANK YOU VERY MUCH FOR YOUR ATTENTION!
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