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

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CONTENTS:

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

1. Who we are
2. Environmental challenges of the port
3. Successful projects carried out
4. The path ahead: future actions
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.
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1. Who we are
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SUCCESSFUL PROJECTS CARRIED OUT SO FAR...

RETROFITTING OF PORT EQUIPMENT AND VESSELS TO CLEANER FUELS AND ENERGIES
RETROFITTING OF PORT EQUIPMENT & SHIPS

STUDIES
- EfisCon
- Green Cranes
- CSA
- BunkerLogix

STUDIES & PILOTS
- gainn.4MoS
- gainn.4Ship Innovation
- SEAterminals
- CORE LNGas hive

ROLL-OUT
- hive2
- H2 PORTS
- & more work in progress
- & more upcoming on H2 and other clean energies
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EXAMPLES OF ONGOING COLLABORATIONS

SUSTAINABILITY
INNOVATION
PROJECTS
1. Decreasing port traffic congestion
2. Improving maritime accessibility to ports
3. Improving air quality in ports and 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

**Green C-Ports’ Case Studies**

1. Decreasing port traffic congestion
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3. Improving air quality in ports and port neighbouring areas
4. Reducing noise in ports and port neighbouring areas
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6. Measuring real-time emissions along a transport chain
MEASURING REAL TIME EMISSIONS
Green Technologies and Eco-efficient Alternatives for Cranes and Operations at Port Container Terminals

Towards Zero-Emission Port Operations

RETROFITTING OF PORT EQUIPMENT


LOW-CARBON  ZERO-EMISSION

- LNG Terminal tractor
- Eco Diesel RTG
- LNG Dual Fuel RTG
- LNG Dual Fuel Reach Stacker
- e-Terminal Tractor
- LNG Fuel RTG
- HDG RTG
- Eco Diesel Reach Stacker
- Hybrid Full LNG-electric Reach Stacker
- Terminal Carbon Footprint Sensor Network
- e-HDG RTG
- Electric Container Loader
- Hydrogen Fuel Cell Container Loader
- Hydrogen Fuel Cell Terminal Tractor
GREEN TECHNOLOGIES AND ECO-EFFICIENT ALTERNATIVES FOR CRANES AND OPERATIONS AT PORT CONTAINER TERMINALS

RETROFITTING OF PORT EQUIPMENT

Implementing Fuel Cells and Hydrogen Technologies in Ports

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:
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:
I-TERMINALS: Digital platform for the Terminals 4.0

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

Benefits derived from digitalisation and TAF TSI standard:

- Improving communications among all stakeholders in terms of speed and quality.
- Enhancing management of railway operations in a safer way.
- Enhancing more efficient processes by better planning in intermodal agreements.
- Including operational tools in each company.
- Increasing rail competitiveness.
- Reducing road congestion by shifting cargo to rail transport.

Digitalisation in rail freight transport with TAF TSI standard
Interoperability Directive 758/2016

Safety Management Systems digitisation

Enhancing rail interoperability with TAF TSI standards
Co-financed by the Connecting Europe Facility of the European Union
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.

<table>
<thead>
<tr>
<th>Investment required</th>
<th>The implementation of technologies related to the smart port requires a significant economic investment in infrastructure, equipment, software, personnel and training.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change management</td>
<td>Changes related to technological innovations, new economic approaches, greater inter-business cooperation and new corporate cultures require organizations to learn and manage innovation change.</td>
</tr>
<tr>
<td>Social rejection</td>
<td>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.</td>
</tr>
<tr>
<td>Technological challenges</td>
<td>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.</td>
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<td>Cybersecurity</td>
<td>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.</td>
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<tr>
<td>Collaborative work</td>
<td>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.</td>
</tr>
<tr>
<td>Qualified personnel</td>
<td>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.</td>
</tr>
</tbody>
</table>
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The experience so far has been very positive...

... and it could only be the tip of the iceberg
THANK YOU VERY MUCH FOR YOUR ATTENTION!

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