Port IoT for Environmental Leverage

Vision: A **Port** of Future in which **small and medium ports** are also **innovators** in terms of **environmental sustainability**

Mission: To bring the **Sustainable** Ports of the Future paradigm to the **complete spectrum** of ports

PIXEL: Port IoT for Environmental Leverage

TOPIC: MG-7-3 – The Port of the future

Duration: May 2018 – April 2021 (36 months)

15 partners from 7 countries

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Equilibrium between environmental action and costs

Reduction of **environmental impact** of port activities (e.g. greenhouse gases for 15-20%)

Increase of **renewables energy uptake** in use-cases at small, medium and large ports

Adoption of a **Port Environmental Index** as a **global quantitative measure** to monitor and act on own environmental footprint

Reduction of **operational and infrastructural costs** with better Port-City integration

Improvement of logistics through data analytics over **waiting time for vessels**, **on-time performance**

Heterogeneous information hub tailored for the interoperability in building over the limited data **interchange of Port Community Systems** (PCS)

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PIXEL – Where IoT meets the Port of the Future

Secure IoT solutions for port ecosystem operations

Business intelligence w/ predictive analytics

Environmental awareness with actionable tool: PEI

Addressing **medium and small ports with scalability** to big ports

Focusing on **port-city ecosystem challenges**

Measure Green Policy **PEI**

Existing sensors connected

Integrations with PCS

Open IoT Platform

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Why do you need a **Port Environmental Index**?

Today's environmental challenges are rising to fit the real global needs, enhanced by legislation and standards. Ports need clear understanding of their **overall environmental performance**

Ports can **optimise their use of resources** to include the appropriate monitor of environmental-related activity and act on it

PEI is a global indicator of the impact in ports that permits the ports to have a **real-time measure of their environmental footprint and to plan actions** to reduce it to desired levels

1 Air quality	2 Energy consumption	3 Noise	4 Relationship with local community
5 Ship waste	6 Port development (land related)	7 Climate change	8 Water quality
9 Dredging operations	10 Garbage / Port waste	**Top 10 environmental priorities of European ports for 2018**	

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What is this **Port Environmental Index**?

PEI relies on a **baseline of IoT data sources** that enable the interoperable data collection with needed frequency (some of it real-time)

It is a **composite environmental index**, i.e., a mathematical aggregation of a set of indicators.

Combines different environmental indices - **environmental Key Performance Indicators** (eKPIs) - into a single metric using a specific mathematical algorithm.

Emissions to the atmosphere

Emissions of wastewater

Noise emissions

Production of waste

Light pollution

Odour emissions

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Port Environmental Index **in PIXEL**

- PEI will be using the **PIXEL baseline infrastructure** to enable small and medium ports for environmental awareness and action

- The modularity of PIXEL will suit port-cities of different sizes, natures and needs **towards the Port of the Future**

- The costs of environmental assessment and action are covered by the investment on the **improvement and optimization of port operations**

Diffusion
Bring the relevant information to the subscriber through the relevant channel
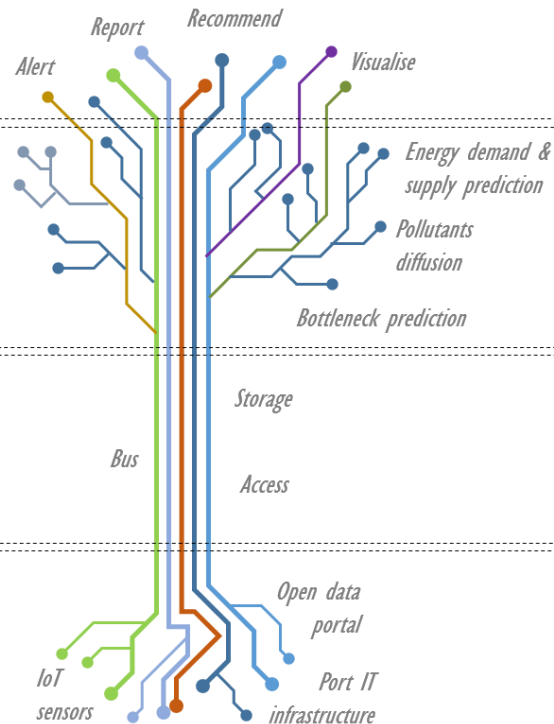
Monitoring & Modelling
Convert raw data to useful information about today and model port activities to predict future impact

Management
Support data processing through an open, robust and modular platform

Acquisition
Collect heterogeneous data from multiple sources through live data stream connectors

Alert · Report · Recommend · Visualise

Energy demand & supply prediction

Pollutants diffusion

Bottleneck prediction

Storage

Bus

Access

Open data portal

IoT sensors

Port IT infrastructure

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