

# 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



# 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)**

# PIXEL – Where IoT meets the Port of the Future

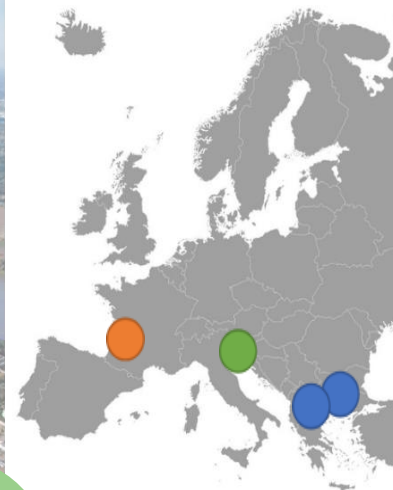
**Secure IoT solutions** for port ecosystem operations

**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*

# 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



# 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*

# Port Environmental Index in PIXEL

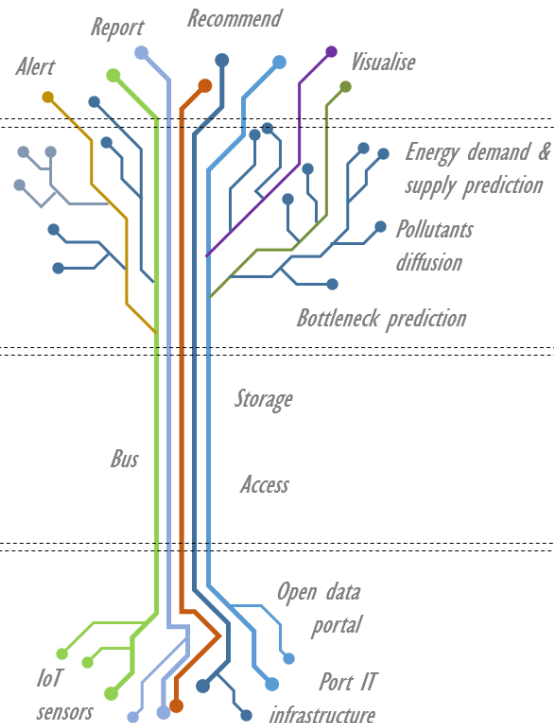
PEI will be using the **PIXEL baseline infrastructure** to enable small and medium ports for environmental awareness and action

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

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