PortForward
Sustainable Port Operations

TRA2020 Webinar “The Future of Ports”

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PortForward
Main objectives

**Smart Port Solutions**
employing ICT solutions to improve information flows between ports and port communities

**Green Port Solutions**
Adopting green technologies to reduce the environmental impacts of port operations and save resources

**Interconnected Port Solutions**
Combining different modes of transport integrating of different technologies to better monitor and control freight flows
PortForward
Project overview

- Project duration
  - July 1, 2018 – December 31, 2021
    (42 Months)

- Project Budget
  - €4,994,311
But what is PortForward
A picture for a thousand words – Technical Architecture / Value Proposition
How does PortForward work

Close cooperation between ports and research partners
How does PortForward work

Use case oriented approach
Use Case Vigo - Green Yard Scheduler

What is the Problem, we are looking at

01. Container pre-marshalling

Reorder containers in the storage yard to eliminate relocations during peak hours

02. Container positioning

Assign slots to inbound and outbound containers in the storage yard

03. Yard crane scheduling

Determine the allocation and scheduling of terminal operations to yard cranes
Use Case Vigo - Green Yard Scheduler

Bringing Sustainability into the equation

Yard crane allocation and schedule
End Position of containers

Terminal Operating System

Export, import, and inspection containers flow
Housekeeping operations

Green Yard Scheduler

Yard crane scheduling module

Start & end position of containers

Container pre-marshalling module
Use Case Vigo - Green Yard Scheduler
Developing the LCA Baseline Scenario – Environmental Indicators first
Use Case Vigo - Green Yard Scheduler
Developing the LCA Baseline Scenario

Carbon footprint: 45.549 kg CO₂ eq. / TEU

21.308 kg CO₂ eq. 14.161 kg CO₂ eq. 4.584 kg CO₂ eq. 4.048 kg CO₂ eq. 1.448 kg CO₂ eq.

47% 31% 10% 9% 3%
Use Case Vigo - Green Yard Scheduler

Preliminary calculations and simulations

01 Container pre-marshalling

Energy savings can be achieved without disrupting the operational efficiency of the terminal

4-6% energy reduction

02 Container positioning

The performance- and sustainability-oriented objectives conflict with each other

13-34% energy reduction in expense of soaring reshuffles

03 Yard crane scheduling

The performance- and sustainability-oriented objectives conflict with each other

Up to 38% energy reduction in expense of greater delays

The PortForward project receives funding in the European Commission’s Horizon 2020 Research Program under Grant Agreement Number 769267

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Use Case Vigo - Green Yard Scheduler

Trade offs are necessary based on strategic direction

Trade-off between energy consumption and number of container reshuffles

Trade-off between energy consumption and total tardiness of jobs
More information

The PortForward website

Visit us at:

[www.portforward-project.eu](http://www.portforward-project.eu)

Social media:

[portforward-project](https://twitter.com/portforward-project)
[@portforward_eu](https://twitter.com/portforward_eu)

Get the latest project news, access to project dissemination materials and public deliverables.
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