

# Off-grid cost of solar-powered container terminals in European ports



## Overview

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How can ports reduce the dependence on grid-supplied electricity?

To minimize the dependence on grid-supplied electricity, ports are also investing in renewable generation notably PV solar on warehouse roofing and parking areas. Energy storage is also needed to optimize utilization of in-port generation and avoid curtailment when generation exceeds the available demand.

How much energy do EU ports use?

Major EU ports in 2019, demanding nearly 5.9 terawatt-hours of energy; nearly 70% of this energy demand came from TEN-T network ports. The most energy-consuming ship types were tankers.

How can ports reduce energy costs?

ESSOP has explored two ways in which ports can minimize their energy costs by using energy storage: • Optimising how to use PV solar generation to offset grid electricity. The wholesale price of energy varies every half-hour, and on a time-of-day tariff this variation is passed onto users.

Do container ships have shore power?

What is more, only a limited number of container ships are currently equipped with shore power facilities. Together with the ports of Bremen, Hamburg, Haropa and Rotterdam, Port of Antwerp-Bruges is committed to providing shore power for the largest container ships by 2028.

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### European ports unplugged: The state of shore ...

Because they spend significantly more time at berth, cruise ships produce more than six times more port-side emissions than ...

### Greening container terminals: An innovative and cost ...

The motivation for this new storage system is to reduce energy demand at ports by avoiding direct solar radiation on a significant portion of reefer containers in the port, meaning ...

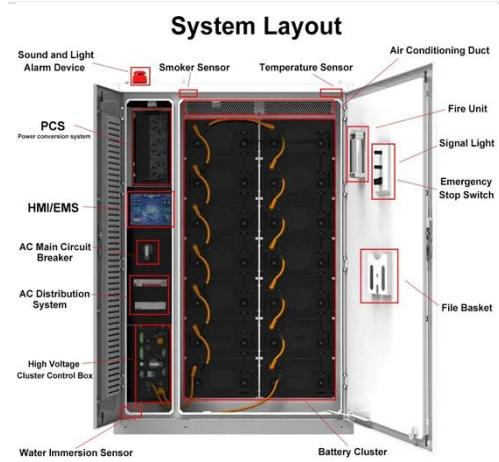


### ENERGY STORAGE FOR PORT ELECTRIFICATION

To minimize the dependence on grid-supplied electricity, ports are also investing in renewable generation notably PV solar on warehouse roofing and parking areas. Energy ...

### Good Practices

The high upfront costs are delaying the transition to zero-emission vehicles (Morris, C., 2023). A TCO comparison analysis by APM Terminals & DP World, (2023) suggests that ...



### **Shore power, environmentally-friendly supply of electricity**

At the present time, very few terminals in Europe provide working shore power installations for deep-sea container shipping. Implementing this is complex and there are still various hurdles ...

### **With new EU funding, Northern European ...**

Four Northern European ports have been granted EU funding for projects to reduce emissions from containerships moored at their quays.



### **European ports unplugged: The state of shore power... , T& E**

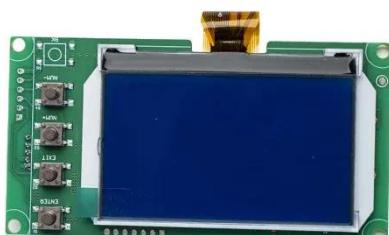
Because they spend significantly more time at berth, cruise ships produce more than six times more port-side emissions than container ships. In 2023, Carnival's

3,500 ...



## **Shore power needs and CO<sub>2</sub> emissions reductions of ...**

Introduction In July 2023, the Council of the European Union adopted two new regulations within the "Fit for 55" package: the FuelEU Maritime regulation and the Alternative ...



## **With new EU funding, Northern European ports to enable ...**

Four Northern European ports have been granted EU funding for projects to reduce emissions from containerships moored at their quays.

## **Shore power, environmentally-friendly supply ...**

At the present time, very few terminals in Europe provide working shore power installations for deep-sea container shipping. Implementing this is ...



- IP65/IP55 OUTDOOR CABINET
- OUTDOOR CABINET WITH AIR CONDITIONER
- OUTDOOR ENERGY STORAGE CABINET
- 19 INCH

## Overview of Ports' Sustainable & Shore Power Ambitions

Cruise and container vessels are the primary target for most ports' regulations and EU will start taxing vessels via EU ETS from next year onwards. While moored, 100 [kW] of ...

## Green Terminals: Pioneering Energy Efficiency ...

With the rising concern over climate change and the escalating costs of energy, ports and terminals worldwide are recognising ...



## Green Terminals: Pioneering Energy Efficiency for a ...

With the rising concern over climate change and the escalating costs of energy, ports and terminals worldwide are recognising the urgent need to

prioritise energy efficiency ...



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### **Energy management and stochastic operations planning for ...**

Rising energy expenses, the shift towards renewable sources, and grid congestion considerably affect the operations of container terminals. To tackle these challenges, it is ...



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