

Cost of 20kW Solar-Powered Container Terminals in Russian Ports

How many energy storage devices can a port configure?

Energy storage devices are limited in the amount of power they can store and charging power cannot exceed their maximum storage capacity. In this paper, it is assumed that if the port chooses to configure its energy storage devices, it can only select one type of energy storage device and will not choose more than that.

How does port throughput affect energy supply?

Generally, the port throughput is assumed to increase year by year, with the highest port load demand observed in the last year of the planning period. If the planned PRES can meet the reliability requirements of energy supply in the final year, it is expected to be sufficient for the other years as well.

How many TEUs a year can a port carry in 2022?

The port carried a throughput of 2.5 million TEUs annually in 2022 and is expected to grow at 3% per year in the future. The port has a planned, maximum throughput capacity of 3.5 million TEUs. The future container throughput and total load demand are estimated with the observed, historical data, as shown in Fig. 6.

What happens if the number of PV panels exceeds a threshold?

However, once the number of PV panels exceeds a certain threshold, the excess renewable energy cannot be utilized by the port, increasing the cost of power abandonment and causing the ROI to decline gradually.

Implementing energy management in ports and coordinating energy supply, energy demand, and renewable energy uptake are crucial measures for port authorities to address ...

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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 a ...

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