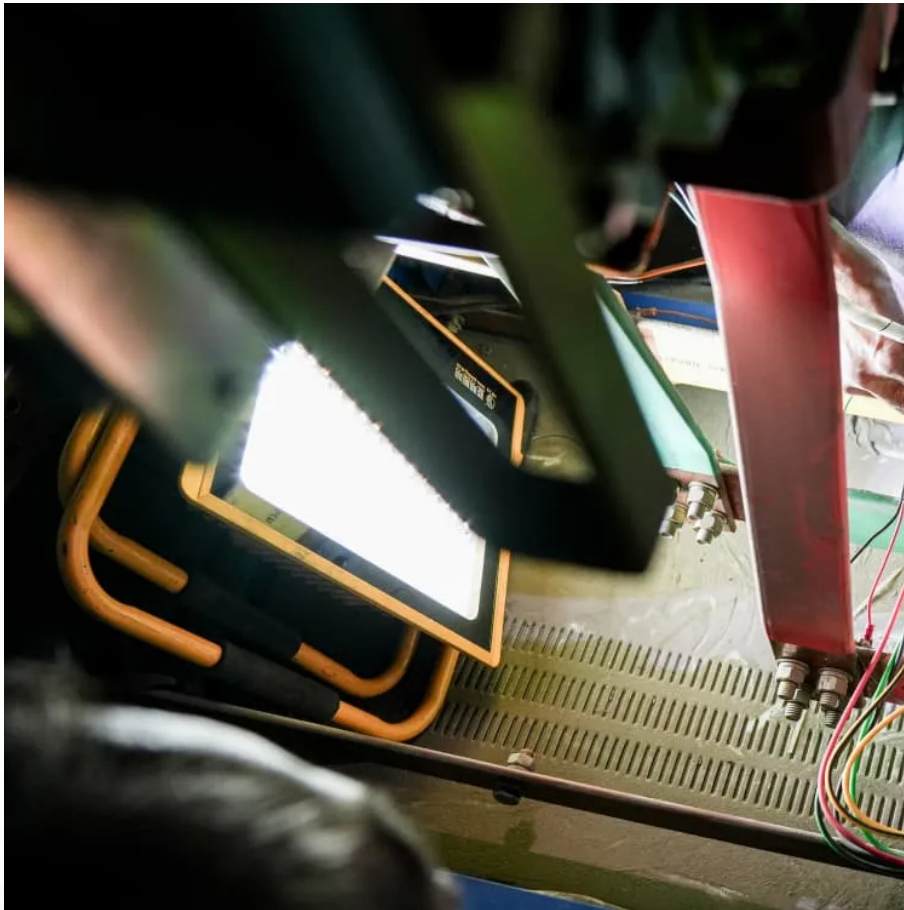


Portable energy storage power conversion rate





Overview

What is a utility-scale portable energy storage system (PESS)?

In this work, we first introduce the concept of utility-scale portable energy storage systems (PESS) and discuss the economics of a practical design that consists of an electric truck, energy storage, and necessary energy conversion systems.

Can portable energy storage systems complement transmission expansion?

Portable energy storage systems can complement transmission expansion by enabling fast, flexible, and cost-efficient responses to renewable integration that is crucial for a timely and cost-effective energy transition.

Can Utility-scale portable energy storage be used in California?

We introduce the potential applications of utility-scale portable energy storage and investigate its economics in California using a spatiotemporal decision model that determines the optimal operation and transportation schedules of portable storage.

How can energy storage improve the economic viability of energy storage?

Improving the economic viability of energy storage with smarter and more efficient utilization schemes can support more rapid penetrations of renewables and cost-effectively accelerate decarbonization.

What is the cost of transportation energy consumption?

We use a \$20/h labor cost in the case studies. The energy consumption during transportation is less than 2 kWh/mile, which translates to 50 kWh/h given a 25 mile/h speed. Considering that the PESS always charges at low prices, e.g., below \$20/MWh, the cost of transportation energy consumption is less than \$1/h. So, c TRA is set to \$20/h.

What is the energy level of storage at time H?



The energy level of storage at time h , E_h , is a function of the energy level at time $h - 1$ and the charging/discharging schedules at time h , where p is the self-discharge rate, and η is the charge/discharge efficiency. We set p to 0 and η to 95% in our case studies. The energy level of storage cannot exceed its capacity, E_{MAX} or drop below zero.



Portable energy storage power conversion rate



[Portable energy storage power conversion rate requirements](#)

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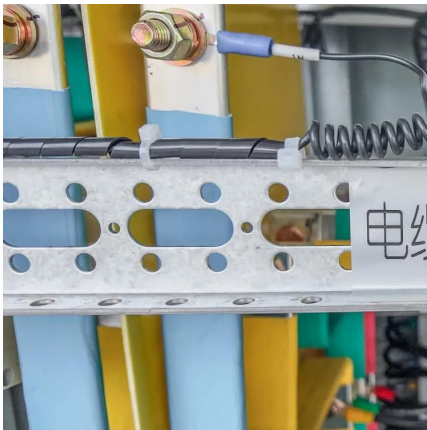
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