

## ContainerPower Energy Solutions

# Precisely control energy storage prices



## Overview

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Can a neural network predict energy storage state-of-charge levels?

The proposed approach uses a neural network to directly predicts the opportunity cost at different energy storage state-of-charge levels, and then input the predicted opportunity cost into a model-based arbitrage control algorithm for optimal decisions.

How good is our energy storage model compared to perfect foresight?

Our method achieves 65% to 90% profit compared to perfect foresight in case studies using different energy storage models and price data from New York State, which significantly outperforms existing model-based and learning-based methods.

How to predict opportunity value (cost) at different energy storage SoC levels?

Our approach is to predict the opportunity value (cost) at different energy storage SoC levels and use the predicted values to optimize arbitrage decisions using observed prices and the energy storage model. We will present the arbitrage formulation and then define the learning problem to predict the opportunity value in this section.

Are battery energy storage systems the cornerstone of a decarbonized power system?

With technological advances and a decarbonization target in 2030 , battery energy storage systems are becoming the cornerstone flexibility resource in future decarbonized power systems to balance electricity supply and demand

Are battery electricity storage systems a good investment?

This study shows that battery electricity storage systems offer enormous deployment and cost-reduction potential. By 2030, total installed costs could fall between 50% and 60% (and battery cell costs by even more), driven by

optimisation of manufacturing facilities, combined with better combinations and reduced use of materials.

How does energy storage arbitrage work?

Energy storage arbitrage by charging during low price periods and discharging during high price periods, earning revenues while aiding power system operations based on price signals.

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