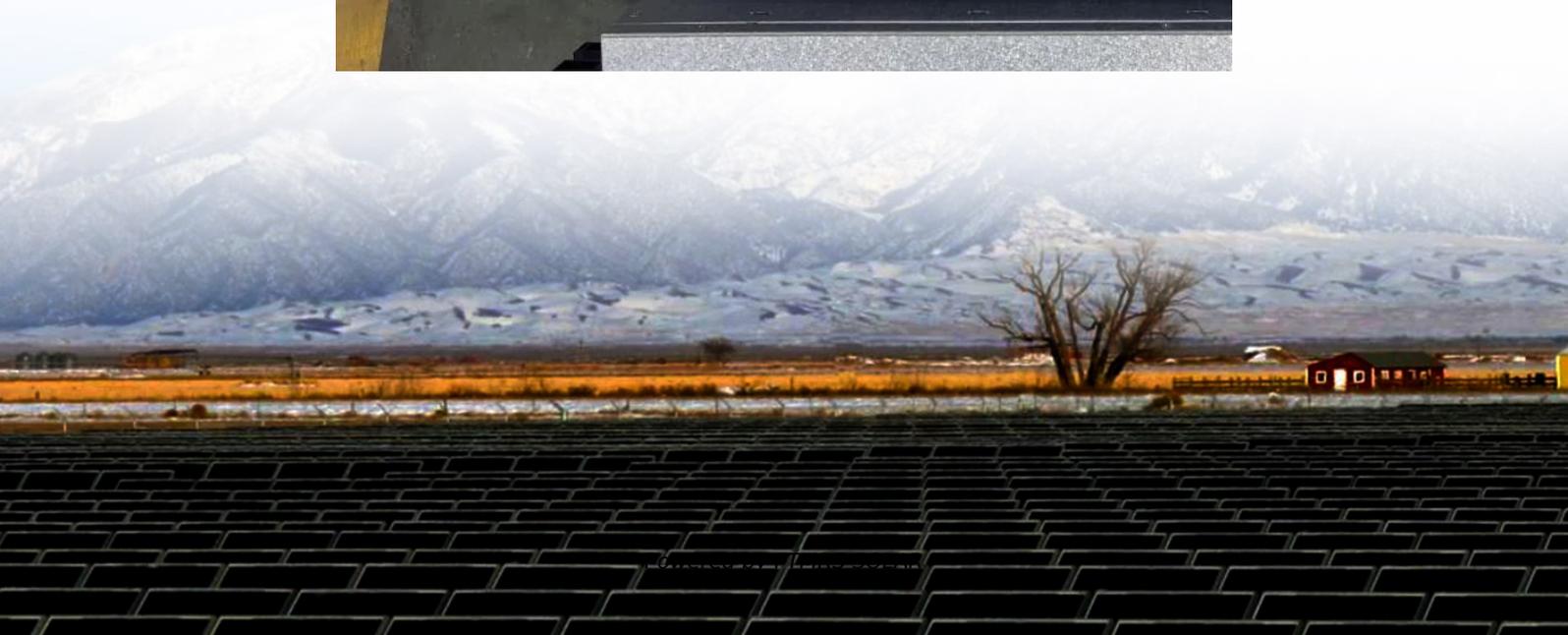


# Zero-carbon grid energy storage





## Overview

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How long does a grid need to store electricity?

First, our results suggest to industry and grid planners that the cost-effective duration for storage is closely tied to the grid's generation mix. Solar-dominant grids tend to need 6-to-8-h storage while wind-dominant grids have a greater need for 10-to-20-h storage.

Does a zero-emissions western North American grid provide a value for long-duration storage?

This study models a zero-emissions Western North American grid to provide guidelines and understand the value of long-duration storage as a function of different generation mixes, transmission expansion decisions, storage costs, and storage mandates.

Are distributed generation and storage alternatives to grid capacity enhancement?

Distributed generation, storage, demand response and energy efficiency as alternatives to grid capacity enhancement. *Energy Policy*, 67: 222–231  
Raeispour M, Atrianfar H, Davari M, Gharehpetian G B (2022). Fault-tolerant, distributed control for emerging, VSC-based, islanded microgrids—An approach based on simultaneous passive fault detection.

Does a 2050 decarbonized grid reduce marginal price of electricity?

In summary, our results show that a 2050 decarbonized grid with greater storage energy capacity would reduce daily and seasonal variability in the marginal price of electricity while also reducing the marginal price of electricity across all regions and times of the day.



## Zero-carbon grid energy storage

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