

# LONG-DURATION ENERGY STORAGE ASSESSMENT

## Executive Summary



### Finding #1

Energy storage systems with a 12-hour storage duration operating over a 24-hour charging/discharging cycle mitigated daily fluctuations in loads and resource variability.

### Finding #2

Renewable energy needs to be carefully balanced with storage to achieve desired clean energy targets.

### Finding #3

The peak load on the Bulk Electric System shifted from around 4:00 p.m. to around 1:00 p.m. due to the increased storage-charging load during midday when abundant solar energy is available. This increased clean energy exports from renewable-rich regions to neighboring regions to support midday storage charging. This might result in transmission enhancements necessary to support increased inter-regional transfers.

This assessment examined how—with 12-hour duration energy storage—an 80–90% clean energy future with high electrification load can be achieved and what effect this might have on the reliability of the BPS.

## ABOUT THE LONG-DURATION ENERGY STORAGE ASSESSMENT

The Long-Duration Energy Storage (LDES) Assessment was developed to assess whether long-duration energy storage could mitigate challenges in reaching a higher than 80% clean energy future, such as the need to add a very large capacity of renewables.

## WHY DOES THIS MATTER?

As the bulk power system (BPS) moves to a higher clean energy future with high electrification, energy storage technology will be an important part of the resource mix to balance demand and operational flexibility. Higher renewable penetration adds more variability to the system and, therefore, requires the use of technologies such as energy storage to fill the gap when renewable energy is not available.

[Read the report](#)

[Hear the podcast](#)

WECC recommends working with vendors to expand the capabilities of existing tools to enable the modeling of energy storage systems with charging/discharging cycles longer than 24 hours.

WECC also recommends assessing ways in which LDES systems may mitigate reliability risks associated with extreme natural events and during prolonged periods of solar or wind unavailability.

