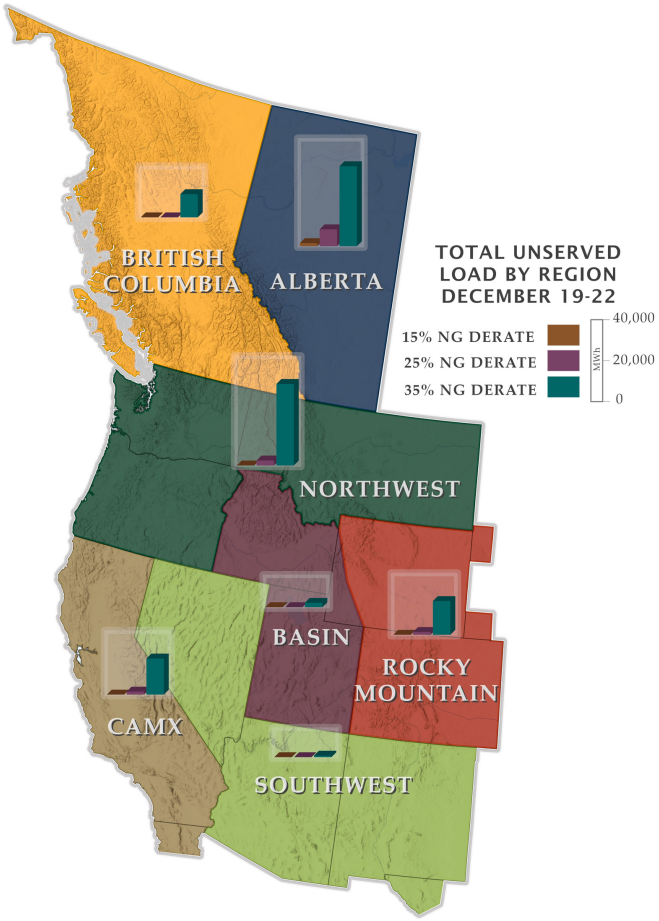
WECC STUDY PROGRAM 2023

YEAR 10 EXTREME COLD WEATHER EVENT

LEARN MORE REPORT

https://www.wecc.org/Administrative/Grid%20Forming%20Inverter%20Study%20Report%202023.pdf#2023StudyProgram



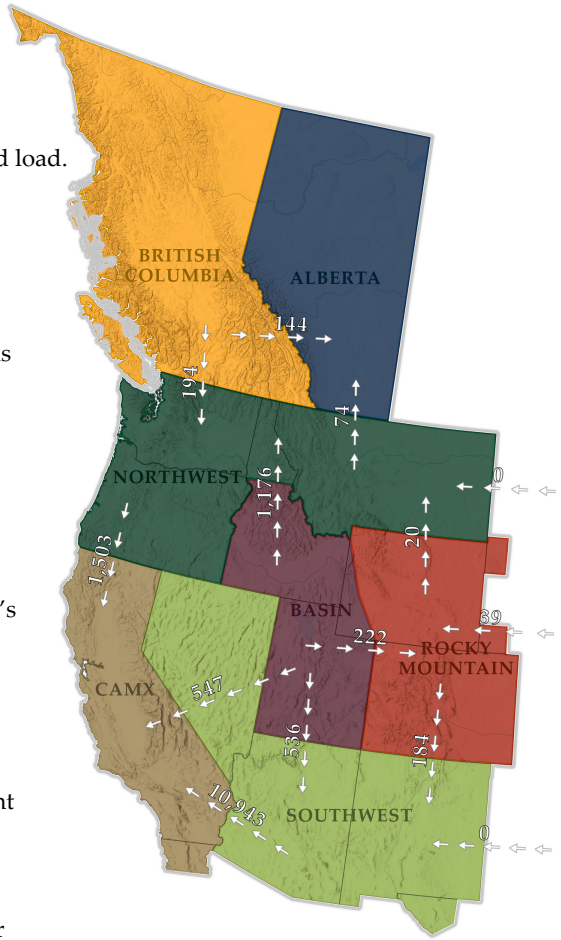
OBJECTIVES

As extreme weather events increase in frequency and intensity, WECC works to understand how they might affect the reliability of the Western Interconnection. This study evaluates the potential reliability effects of an extreme cold weather event set 10 years in the future, given current resource and load projections and trends in extreme weather. The study answered two questions:

- What is the potential effect of natural gas derates during the event?
- What parts of the interconnection are most susceptible to an extreme cold event?

APPROACH

WECC used the December 21–26, 2022, extreme cold weather event as its model for this analysis. Starting with the 2032 Anchor Data Set—a stakeholder-vetted compilation of load, resource, and transmission information—WECC extrapolated data from the cold weather event and applied it to the year 2032. This included increasing load by 10%, decreasing wind and solar output, and doubling the forced outage rate for resources. WECC ran the simulation at three natural gas derate levels to determine whether a lack of natural gas led to unserved load.



FINDINGS & RECOMMENDATIONS

The interconnection relies on natural gas during extreme weather events. When natural gas generators were taken offline, there was unserved load.

- Recommendations: The West should maintain datasets to study extreme weather conditions and correlate detailed weather data with electric system data, such as generation and load data, to facilitate weather event studies.

While unserved load was observed when battery storage was dispatched, the timing of unserved load was heavily influenced by the battery charging pattern simulated in WECC's model.

- Recommendation: WECC should implement software enhancements to help analyze battery storage operation more realistically.

Transmission flowed from south to north more often than usual during the simulated event to serve load in the northern part of the interconnection where temperatures plummeted furthest.

- Recommendation: WECC and industry should model new transmission projects under various scenarios to better understand the reliability implications of reverse transmission flows.

WECC