

GLACIER BESS

Capacity

2MW / 4MWh

Location

Glacier, Washington

PROJECT CASE STUDY

A Landmark Demonstration of Resilient Energy Storage and Islanding Control in Rural Washington



About the Client

Puget Sound Energy (PSE) is Washington State's largest investor-owned electric and gas utility, serving more than 1.2 million electric and 900,000 natural-gas customers across the Puget Sound region. A longtime innovator in grid modernization, PSE has explored advanced storage, microgrid, and distributed-energy solutions to enhance reliability, flexibility, and sustainability throughout its service area.

The Challenge: Laying the Foundation for Battery Storage in Michigan

The small mountain community of Glacier, Washington sits near Mount Baker at the far end of PSE's Kendall-Glacier 55kV transmission line, serving roughly 1,048 customers. Dense forests and heavy snow frequently damaged lines, creating one of PSE's least reliable feeders with nearly three outages per year averaging over seven hours each.

Because traditional infrastructure upgrades would have been costly and logistically difficult, PSE sought an innovative approach to strengthen service at the grid's edge, support a nearby run-of-river hydro plant and assess the operational value of intelligent battery storage and islanding control.

Client

Puget Sound Energy

Role

System Integrator

Commissioned

2017

Market

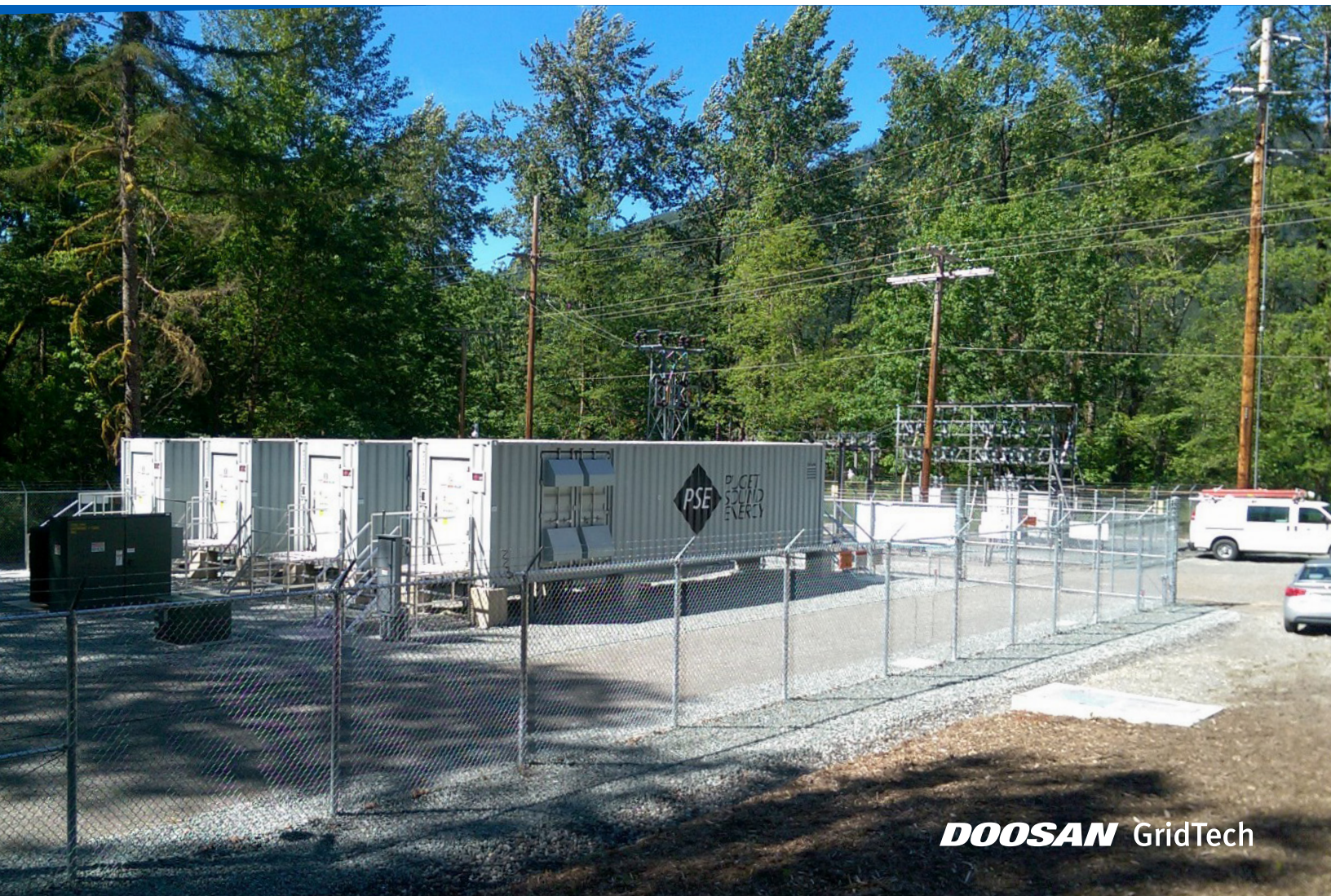
Northwest

Doosan GridTech's Solution

PSE partnered with Doosan GridTech to design and integrate a 2MW / 4MWH BYD lithium-ion energy storage system at the Glacier Substation, the utility's first large-scale demonstration of automated islanding control.

Core Solution Elements

- **Battery System:**
 - 2MW / 4MWH BYD lithium-ion battery configured for daily cycling and backup operation.
- **Intelligent Controller:**
 - The Doosan GridTech Intelligent Controller® (DG-IC®) orchestrated battery dispatch, voltage management, and transitions between grid-connected and islanded modes.
- **Operational Modes and Use Cases:**
 - Energy shifting from peak to off-peak periods.
 - System-capacity and frequency-response support.
 - Distribution-level load following and voltage control.
 - Deferred infrastructure upgrades through localized capacity relief.
 - Automatic restoration of critical loads during grid outages.
 - Microgrid functionality allowing limited islanded operation while maintaining the nearby hydro station online.





Outcomes and Impact

During its active years, the Glacier BESS:

- Successfully demonstrated automated islanding and seamless grid reconnection.
- Provided localized grid support, improving power quality and service continuity.
- Allowed continued renewable generation during upstream outages.
- Delivered operational insights into control logic, DER integration, and the economics of rural microgrids.
- Helped defer costly transmission upgrades by supplying temporary capacity and voltage stability.

The results positioned PSE as one of the earliest U.S. utilities to validate a fully integrated energy storage and control solution in a remote, weather-challenged location.

Why This Project Matters

The Glacier BESS validated the potential of battery storage to enhance reliability and resiliency in rural communities. It proved that intelligent controls, specifically the DG-IC®, could unify energy shifting, voltage support, and islanding functions within a single adaptive platform.

While the physical system is being retired, its technical legacy endures as one of the first real-world examples of how distributed storage can extend the reach of reliable, renewable power at the edge of the grid.