



DEPLOYMENT OF BATTERY STORAGE FOR ENERGY SECURITY AT PINE POINT SCHOOL

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PROJECT PROFILE

Topic / Vertical: Grid Integration and Field Validation
Strategic Pathway: Stabilize, Optimize
Project start and finish: FY22-FY26

PROBLEM

Remote communities in rural areas face many reliability challenges when it comes to power. These communities need power systems that can maintain operations during outages while reducing long-term electricity costs.

The White Earth Nation community of Pine Point, Minnesota experience these challenges due to winter weather exposure and high winter loads.

Energy storage is a key option for addressing this broader problem because it can support outage ride-through, improve use of on-site variable generation, and increase operational flexibility, leading to greater resilience.



Fig. 1. Pine Point School (White Earth Reservation)

APPROACH

- To improve resilience for the Pine Point community during power outages, a microgrid resilience hub solution was developed in partnership with 10Power, 8th Fire, Ziegler Energy Solutions, ELM Microgrid, and Pacific Northwest National Laboratory for the Pine Point School. The school will serve as physical site that will operate to provide electricity, heating and other critical services.
- The project deployed a battery energy storage system with variable generation to demonstrate how such as system at a resilience hub could improve system reliability, support local grid infrastructure, reduce electricity costs, and support the community during power outages.
- Sandia National Laboratories provided technical support on system design, a thorough safety codes and standards (NFPA 855) review, collaboration with contractor for safety codes compliance and implementation of safety best practices from past demonstration deployments.

RESULTS

The Pine Point installed a battery energy storage system with variable generation at the Pine Point School to create a resilience hub.

Installed system includes:

- 500 kW / 2,760 kWh battery energy storage system
- 500 kW variable generation

The system is designed to:

- Power the building during power outages
- Recharge from variable generation under favorable conditions
- Reduce utility costs during normal operation

The project is expected to provide the schools with **gross savings of approximately \$1,325,000** over 25 years while providing resilience services to the community at the same time.



Fig. 1. Battery Energy Storage System at Pine Point School

CONCLUSIONS & IMPACT

- Energy storage can be used to establish resilience hubs that provide power during outages to maintain critical loads and services while also providing cost savings to the host facility and increasing energy affordability. Pine Point demonstrates these use cases through the installation of this system.
- Sandia's collaboration with the project team and factory acceptance testing site visit to the battery vendor's facility broadened understanding of the status of the industry in regard to how systems are being built to meet BESS safety codes and standards.

FUTURE DIRECTIONS

- The next steps for this project will focus shift from deployment to long-term operation. This project will serve as a model for future projects on the White Earth Nation. Data for the operational system will be collected to evaluate system performance. Lessons learned from the deployment and data collected will be used to inform future battery energy storage deployments.
- Long-term ownership will reside with the White Earth Tribe while operations and maintenance will be handled through a joint venture between 10Power and 8th Fire.
- The BESS manufacturer has expressed interest in joining the IEEE energy storage standards committee as an industry partner to further engage in and contribute to future codes and standards.

This material is based upon work supported by the U.S. Department of Energy, Office of Electricity (OE), Energy Storage Division.