

Evaluating powerful batteries for modular grid energy storage

October 24 2014, by Stephanie Holinka



Sandia National Laboratories has begun lab-based characterization of TransPower's GridSaver, the largest grid energy storage system analyzed at Sandia's Energy Storage Test Pad in Albuquerque. Credit: David Rosewater

Sandia National Laboratories has begun lab-based characterization of TransPower's GridSaver, the largest grid energy storage system analyzed at Sandia's Energy Storage Test Pad in Albuquerque, N.M.

Project lead David Rosewater said Sandia will evaluate the 1 megawatt, lithium-ion grid [energy storage system](#) for capacity, power, safety and reliability. The lab also will investigate the system's frequency regulation, which grid operators need to manage the moment-to-moment differences between electrical supply and demand.

"Independent evaluations provide valuable feedback for industry efforts to standardize metrics for characterizing and reporting reliability, safety and performance. Companies need the standards to develop large procurement goals for grid energy storage because they must be able to compare performance and cost," said Rosewater.

The data generated from characterizing a large system like GridSaver will improve operational models, identify technology or research gaps and provide feedback to manufacturers to improve system performance, reliability and safety. Additional specific tests will help validate Sandia's grid energy storage characterization protocols, which have been developed jointly by industry and the national labs, as pre-standards to measure and express energy storage system performance.

"Industry needs these standards and they don't yet have them. The protocol will give us critical information that can be used to compare flow battery systems, lead-acid battery systems, lithium-ion systems and flywheel systems on an even field, apples to apples," Rosewater said.

Utilities and other electricity and transmission providers and regulators often require that equipment be proven safe and reliable before it is permitted to operate on the electric grid. However, energy storage manufacturers and integrators are often unable to afford or provide the

logistics necessary for this long-term testing and monitoring.

Sandia's Energy Storage Test Pad and Energy Storage Analysis Laboratory test facilities validate manufacturers' specifications of [energy storage devices](#) through characterization and application-specific cycle testing. They can also help users evaluate system parameters, including storage device efficiency, performance to specifications, reliability and balance of plant operation.

Rosewater said national, state and local policies that push for a cleaner, more secure electric grid are driving significant increases in variable renewable generation, but that makes the job of operators much more difficult. Storage helps to mitigate that variability, when it's safe, reliable, sustainable and cost-effective.

"Developing an energy [storage system](#) involves the complex integration of many components beyond just the battery, including sophisticated power electronics and controls—often communications. Sandia is assessing the entire system," said Imre Gyuk, energy storage program manager in the Department of Energy's Office of Electricity Delivery and Energy Reliability. The office has identified four challenges to the widespread deployment of energy storage: the cost of energy storage technologies (including manufacturing and grid integration), validated reliability and safety documentation, an equitable regulatory environment and industry acceptance.

"Third-party evaluation of large systems like TransPower's GridSaver can help break down the barriers to grid [energy storage](#) proliferation," Rosewater said.

Provided by Sandia National Laboratories

Citation: Evaluating powerful batteries for modular grid energy storage (2014, October 24)
retrieved 3 May 2024 from

<https://phys.org/news/2014-10-powerful-batteries-modular-grid-energy.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.