OREGON ENERGY STORAGE WORKSHOP
White Stag Building
70 NW Couch St., Portland, OR
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ROUND TABLE TOPIC: SEAMLESS INTEGRATION INTO UTILITY SYSTEMS

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Desired Outcome: Discuss the technical challenges in deploying energy storage systems and optimizing them to accomplish their desired use cases. Learn about emerging efforts to develop and promote technology standards for energy storage, and identify opportunities and suggested solutions to overcome technical challenges.

Background: Grid-connected energy storage promises large potential benefits. And yet, before energy storage can deliver on its promise, electric utilities and their suppliers must solve significant technical problems. Many of these problems come down to lack of standardization. Currently, utility-grade energy storage systems are project-specific, one-off solutions, built using proprietary components that are not modular or interoperable. Connecting these proprietary systems with key utility Operational Technology and/or Information Technology systems (e.g. Supervisory Control and Data Acquisition (SCADA)/grid control systems, power scheduling systems, etc.) is difficult. Without established standards, components and systems offer their own proprietary connectors, and the process of plugging them together must be repeated for each new project.

This session is intended for engineers, utility executives, and policy leaders who want to contribute to the evolution of energy storage technology and enable scalable, interoperable systems.

Preliminary Questions:

- What do you think are the top technical hindrances to Oregon utilities deploying energy storage systems?
- What are the technical challenges to widespread deployment of multiple energy storage assets (e.g. storage at every substation)?
- What do you see as the key next steps in the further development of energy storage technology in regards to its integration and deployment within Oregon utilities?
- Is interoperability with other grid assets technically important? What are the technical challenges to achieving interoperability?
- How do you foresee the interaction between Information Technology, Operational Technology, and energy storage assets?
The purpose of this roundtable was to identify opportunities and suggest solutions to overcome technical challenges in deploying and optimizing energy storage systems to accomplish their desired use cases. This high-level report summarizes discussion during the roundtable without attributing specific comments to any particular participant. This summary does not represent the views of Oregon Department of Energy or the Public Utility Commission of Oregon; rather, it encapsulates an afternoon of problem solving motivated discussion by stakeholders on overcoming technical challenges and seamless integration of energy storage following the workshop panels in the morning.

Overall, the roundtable participants addressed the many technical and mechanical issues associated with the integration of grid-connected energy storage systems in their discussions. Roundtable discussion revealed agreement that these issues could begin to be solved by (1) standardizing communication requirements between components of energy storage systems and (2) standardizing communication within the utility through vendors, utilities, and balancing authorities.

Additionally, new technology used to integrate energy storage should be repeatedly tested to ensure that the various components are interoperable and communicating properly with one another. Repeated testing may also ensure that future maintenance and safety issues could be realized and addressed before the technology is widely installed. For example, lithium batteries
have components considered to be hazardous substances. When these batteries are installed, the utility will need a hazardous material management plan, requiring open communication with local fire departments and emergency response units.

Four preliminary solutions were discussed by roundtable participants. First, energy storage technology standards should be certified before a system is installed. A certifying organization could also develop standards for communication between different levels of control and between different levels of authority. Second, utilities implementing energy storage technology should include specific standards in their project outlines and require companies seeking to do business with the utility to follow those standards. An example of project standards exists in the current Snohomish County project, which requires that all vendors standardize their systems before joining the project. Third, a utility and any industry standard certification organization should include representation from and be informed by all sectors that may be involved in the energy system. Representatives should include information technology, operations, dispatch, and any other necessary sectors. Fourth, in order to efficiently manage load and energy storage assets, larger balancing authorities must be able to tap into energy storage assets. In order to do this, consistent communication standards within and between these balancing authorities will be paramount.

While widespread usage of multiple energy storage assets is not yet being seen across the grid, utilities have seen some changes associated with seamless integration of energy storage technology. Roundtable participants discussed that many utilities and vendors are voluntarily upgrading their communication operating systems. This is a step toward standardizing system communication. Also, utilities are watching California’s utilities closely to learn how to optimize energy storage integration. In California, “smart” inverters were installed with distributed solar
systems to help manage energy on the system. Similarly, installation of smart inverters in Oregon could assist with technical challenges for energy storage integration. Also, installation of smart-inverters at the front end of energy storage integration could help prevent large expenditures at the back end.

The roundtable participants concluded that integration of energy storage technology is possible, but it will not happen immediately. There is still a need for testing of new technologies, determining what technology is best suited for an application or utility, and standardization of communication and safety protocols. The next steps in the integration process should focus on standardization, optimization, and communication.