In fall 2014, the PUD installed the first of several energy storage systems that aim to transform the marketplace and how utilities manage grid operations. Located at its Hardeson Road substation in Everett, the PUD’s first project includes two large-scale lithium ion batteries, one built by LG Chem and a second by Mitsubishi and GS Yuasa.

In a second project completed in 2017, the PUD deployed four strings of advanced vanadium flow batteries in a total of 20 shipping containers at its Everett substation, built by UniEnergy Technologies of Mukilteo, Washington.

These projects are made possible in part by a $7.3 million investment from the Washington State Clean Energy Fund. The Washington State Department of Commerce awarded more than $14 million in grants for demonstration projects that will help utilities better integrate intermittent renewable electricity, increase the efficiency of their systems and improve grid reliability.

The PUD energy storage program is the first one based on the innovative Modular Energy Storage Architecture (MESA). The MESA Standards Alliance is an industry group whose mission is to accelerate the growth of the energy storage industry through the development of an open, non-proprietary set of specifications and standards for energy storage systems. MESA utilizes a standard, scalable architecture that has the flexibility to add interoperable components – batteries, inverters and software – to meet specific needs and uses.

**Energy Storage Benefits:**

- Better integration of renewable energy, such as wind and solar
- Potential to minimize exposure to market volatility
- Improved grid reliability, flexibility and performance
- Ability to mitigate voltage and current issues
Energy Storage Partners

- **1Energy Systems**, Principal Partner and architect of MESA software controls
- **Alstom Grid**, supplier of the PUD’s EMS, SCADA & DMS platforms
- **LG Chem**, supplier of lithium ion battery
- **Mitsubishi & GS Yuasa**, suppliers of lithium ion battery
- **UniEnergy Technologies**, supplier of vanadium flow battery
- **Parker Hannifin**, provider of the MESA-compliant power conversion system
- **University of Washington**, research expertise in power systems and computer science
- **Pacific Northwest National Laboratory**, research expertise in power systems

Frequently Asked Questions

**What is MESA?**
MESA – or Modular Energy Storage Architecture – offers standard information and communication interfaces to connect batteries, inverters and software components into modular energy storage systems. The architecture was initially developed by 1Energy in coordination with the PUD and other partners and is now managed by an independent consortium of utilities and industry vendors.

**What problem does this address for the energy industry?**
Wind, solar and other renewable energy sources are intermittent and often may not be available during peak energy demand times. Effective energy storage is an invaluable resource that could help make clean energy available wherever and whenever it’s needed. The MESA project aims to provide more choice for utilities and give battery, inverter and software providers more ways to reach customers. Ultimately, it aims to transform the marketplace, making energy storage more economically and operationally viable.

**Why is the PUD choosing to lead this effort?**
The utility is committed to meeting load growth through conservation and a diverse mix of renewable energy sources. Given the intermittent nature of many renewable energy sources, they are often difficult to effectively integrate into the utility’s power portfolio. Energy storage provides a solution for the PUD as it moves toward greater use of renewable energy sources.

**How much power will it be able to store?**
The MESA project at the Hardeson substation calls for 2 megawatts of storage capacity – enough to serve about 1,500 PUD customers. The second battery project at the PUD’s Everett substation has 2.2 megawatts of capacity, slightly more than the first project.

**Are there other projects like this in the Pacific Northwest?**
There have been regional test projects conducted by other utilities and other energy organizations. However, this project is much different in that it offers greater flexibility in regards to the components that can be used, the scalability and standardization. A central goal of the MESA project is to transform the market to make energy storage more economically and operationally viable.