

Energy Storage Overview

November 2023

Energy storage allows for electricity to be saved and used at a later time, when and where it's most needed.

This creates efficiencies and capabilities for the electric grid – including using more energy generated from renewable resources.

Whether it's through supporting the reliability of existing plants, providing additional capacity, contributing to grid services or supporting variable, renewable energy resources, energy storage will play a key role.

There are two main types of energy storage – short-duration and long-duration. Long-duration energy storage has been used for over 100 years. The most common form, pumped hydro, has been part of TVA's system since the 1960s.

Lithium-ion batteries are the most common technology right now for short-duration energy storage due to their ease of construction and flexibility. The lithium-ion batteries used in energy storage are like the ones found in cellphones, laptops and electric vehicles. For energy storage, they're just bigger batteries with more complex systems and safety protocols.

LITHIUM-ION APPLICATIONS



Safety Protocols

TVA is prepared in the unlikely event of a battery malfunction. TVA will implement various safety procedures designed to enhance battery operations while ensuring region-wide awareness and safety. All TVA battery energy storage systems will include the following safety measures:



Safe Distances and Barriers



Advanced Battery Management System



First Responders Training

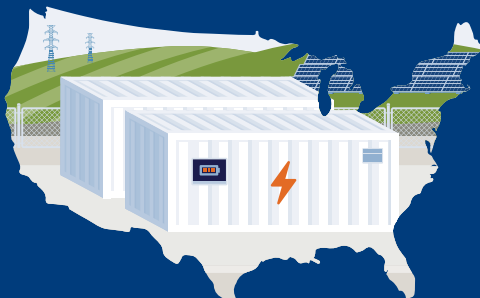


Fire Protection System

LITHIUM-ION BATTERIES

Lithium-ion batteries are currently the most common form of short-duration energy storage.

- Act as the most flexible assets on the grid
- Add value to renewable energy resources
- Are modular in design allowing for quicker construction
- Provide voltage support
- Allow for peak load shaving
- Supply resiliency in the form of backup energy



The Future of Battery Energy Storage and TVA

To learn more about energy storage and our path to a low-carbon future, visit: tva.com/energystorage