



Vonore, TN
Battery Energy Storage System

February 8, 2023

Vonore, TN

Battery Energy Storage System

TVA is installing its first owned and operated, grid-scale, battery energy storage system (BESS) near an industrial complex in Vonore, Tennessee, about 35 miles southwest of Knoxville.

Why is TVA interested in a BESS

- To shape the future of the energy marketplace and power the long-term economic health of our seven-state region.
- To research and build the energy grid of the future, learning and understanding the value and role battery storage can play to power the Tennessee Valley.
- To ensure the steady flow of reliable and clean energy as we build out the nation's premier energy system.
- To innovate and adopt new technologies that will provide our communities and businesses clean, low-cost, reliable electricity while helping them meet their sustainability goals.
- Battery storage projects are part of the 2019 TVA Integrated Resource Plan, a comprehensive study that shapes how TVA will provide low-cost, reliable and clean energy for the next 20 years. The IRP calls for adding up to 5 gigawatts of energy storage capacity through 2038.



Vonore, TN Battery Energy Storage System

Key Notes

- When the facility is operational in 2023, the BESS will supplement the high-quality power provided to local residents and industrial customers served by Loudon Utilities Board.
- The BESS will store energy when demand and power prices are low for use when electrical demand is higher.
- This energy storage system will provide peak load power without the need to build additional transmission lines for the foreseeable future.
- It will use lithium-ion batteries, the same technology used in most electric vehicles, to store 40 megawatt-hours of energy. That is enough electricity to power over 10,600 homes for three hours.

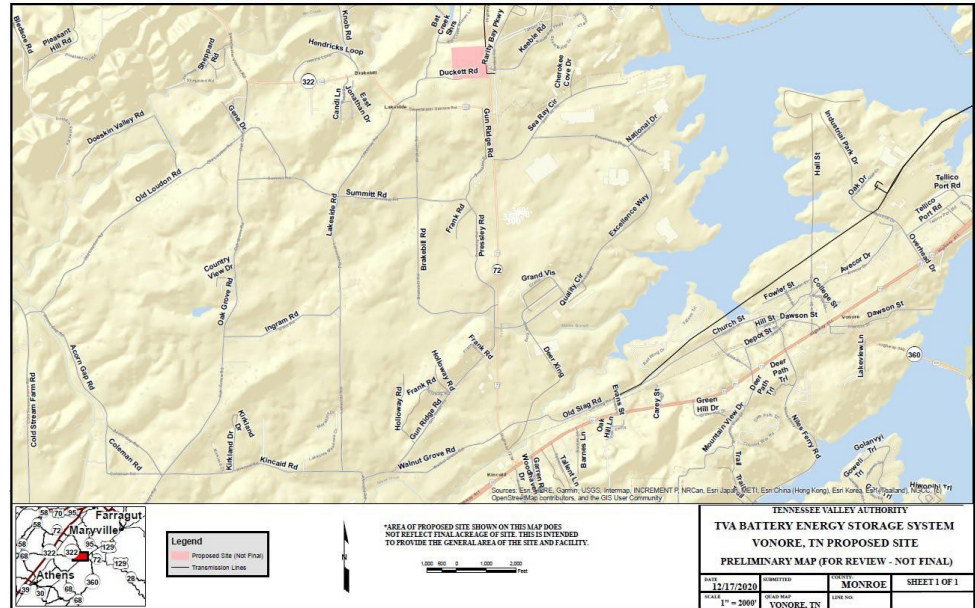


Vonore, TN

Battery Energy Storage System

Site Selection

- TVA looked at numerous locations across the valley with unique energy needs.
- The location would need to benefit from TVA's power quality while avoiding costs of new-build infrastructure.
- The Tellico West Industrial Park in Vonore, Tennessee, satisfies all of the criteria.
- Key factors that influenced the proposed site selection within the Vonore, TN area included, but were not limited to, the following:
 - Available property in the Vonore area in relatively close proximity to the Tellico West Industrial Park and with adequate space for this battery storage facility
 - Close proximity to existing TVA transmission infrastructure
 - Efficient access to enter the site from State Highway 72
 - Favorable terrain in terms of necessary grading for the site
 - Minimal concerns with karst topography
 - Located in area of minimal flood hazard
 - Minimal environmental impacts based on available data (NEPA review has been completed and approved)



Vonore, TN

Battery Energy Storage System

Site Details

- The proposed site will be located along State Highway 72 on the west side approximately 2.7 miles north of the intersection of U.S. Highway 411 and State Highway 72 in Vonore, TN.
- TVA purchased approximately 13.5 acres and the fenced in area is 3.6 acres.



Site Layout

- Existing 69-kV transmission line looped into new substation which will have a 69-kV breaker, 69-13-kV transformer and a 13-kV breaker.
- The BESS will connect to the new substation at the 13-kV breaker.
- The BESS will consist of 12 containers, 24 inverters and 12 pad mounted transformers.

Vonore, TN

Battery Energy Storage System

**Questions that have been sent to TVA regarding design
and safety aspects of the BESS installation**

Vonore, TN

Battery Energy Storage System

Previously Asked Questions:

Will the project make excessive noise for people living close to the facility?

It is very likely you will hear traffic noise from vehicles traveling Route 72 than from the Vonore BESS. At its worst, the anticipated level of noise at the substation fence line will be approximately 75dB – equivalent to a vacuum cleaner or average radio volume – and may happen in the infrequent instance when all outdoor equipment (heating, ventilation, air conditioning; inverters; transformers) are operating at the same time. This scenario could happen possibly a couple of times during any 24-hour period. This sound level will quickly diminish with distance from the site boundary.

Are special precautions being taken because lithium batteries can cause fires that are difficult to put out?

The system has been designed to utilize a chemistry product that is certified to UL-9540 standards. Demonstration to this standard requires that the manufacturer prove that the fire mitigation system can function to limit propagation of any fire that may occur in a module or series of modules so it does not impact the rest of the container. The simple function of the system is to use a dry-agent chemical that suppresses any fire that may be present at the first detected sign of fire (heat/smoke), with a local and targeted dispersal of that dry-agent. This standard has been developed over time after lessons learned from other events and is an industry leading practice.

Is there any traffic flow problems and if so, how have they been addressed?

Traffic flow problems because of the Vonore BESS are not anticipated – the facility will not require permanent employees after initial testing and commissioning. During construction, vehicles will enter and exit the site to deliver equipment only for limited times between November 2022 and April 2023.

Vonore, TN

Battery Energy Storage System

Previously Asked Questions:

How will batteries be disposed of after their useful life is over?

The Vonore BESS batteries can be recycled at the end of their useful life.

Any concerns of air pollution? Especially if a fire happens?

No air pollution is expected because of the operation of the Vonore BESS. If a fire should occur, as stated previously the facility is designed for containment.

How was fire suppression/mitigation designed into the system?

The FSS approach for the container involves mitigation for the most consequential events, including prevention of Thermal Runaway and Explosive Gas Buildup. The container and battery hardware includes an integrated clean agent system, which has been tested and approved to UL-9540 A standards (Standard for Energy Storage Systems and Equipment), that has demonstrated through lab testing success in mitigating thermal runaway in the event of cell failure. This prevents the spread of fire from any single module to another. Separately, the container also includes a gas detection system that will activate forced air venting of the container to prevent the buildup of explosive gases that may result from any material failure of cells. In addition to these mitigation strategies, the BMS controllers for the battery monitor its system health for temperature, voltage, and other potential faults, while the container protection monitors for ground faults and ambient temperature concerns. Alarms on any of these controllers will pre-emptively open all contactors and shut down the system. All these items work together to help prevent consequential events from occurring.

Has an emergency response plan been developed?

An emergency response plan is being developed, but not complete at this time.

Vonore, TN

Battery Energy Storage System

Additional questions or comments

