

*...exceptional service in the national interest.*

## Energy Storage Test Pad

### Services

The ESTP provides High Altitude independent 3rd party testing and validation of 1MW and less AC Electrical Energy Storage (EES) Systems. The ESTP enhances Sandia's existing capability to test DC storage components.

#### Data monitoring:

- All breakers are equipment with sub cycle wave capture meters.
- Ability to capture voltage, current, KVA, KW, KVAR, PF, frequency, harmonics and transients.
- Ethernet connectivity to monitor parameters and display using National Instruments' Lab-View software.

#### Data analysis and reporting:

- Data will allow the evaluation of the system including but not limited to:
  - System efficiency including balance of plant.
  - Ramp rate
  - System reliability
  - Performance to specifications
  - System operating temperature
  - Power electronic and balance of plant operation
- Analysis of system performance relative to standards and applications.
- Development of new testing procedures.
- Support development of new energy storage standards.
- Issue reports of findings.

#### Target Customers:

- Electrical Energy Storage system manufactures.
- Utilities including Independent system operators (ISO), Independent power producers (IPP), and region transmission operators (RTO).
- End Users including Commercial, government agencies, Industrial, and renewable Project developers.
- Research and development including independent and government research & development labs, and Universities.

The ESTP is operated by Sandia National Laboratory as part of DOE's Office of Electricity's Energy Storage Program.  
For more information please visit our website at: [www.sandia.gov/ess](http://www.sandia.gov/ess)



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# ENERGY STORAGE and TRANSMISSION ANALYSIS



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## Sandia National Laboratory's Electrical Energy Storage Test Pad (ESTP)

### Electrical Energy Storage Test Pad

The Energy Storage Test Pad (ESTP) is part of Sandia National Laboratory's Distributed Energy Technologies Laboratory (DETL). DETL conducts research and development to integrate emerging energy technologies into the nation's electrical grid to accommodate the increasing demands for clean, secure, and reliable energy. Sandia's research spans renewable generation, power electronics, energy storage and load management. With the ESTP, Sandia can test up to 1 MW grid tied Electrical Energy Storage (EES) systems.



### Test Pad Overview

#### System Capacity/Capability:

- 1.5 MVA, 12470 V to 480 VAC 3-phase transformer capable to test up to 1MW energy storage systems
- 2500 amp switchboard with motor operated main breaker.
- Five feeder breakers capable of a 1600 amp single point of EES connection or Multiple feed connections through a 1200 amp branch panel
- 1 MW/1 MVAR loadbank.
- Sub-cycle metering feeder breakers for transient analysis.

#### Testing Capability:

- Ability to test for both power and energy applications including: energy time shift, capacity, load following, area regulation, voltage support, T&D deferral, demand charge management, power quality and reliability.
- Duration of testing can range from one day to multiple months.
- Scalable from 5 KW to 1 MW, 480 VAC, 3 phase.



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