The Southwest Research Institute® (SwRI®) Energy Storage Technology Center® (ESTC) is the collaborative effort of a broad range of technology experts from diverse scientific fields. The group supports industry and government clients in the research, development, and evaluation of energy storage systems (ESS). SwRI has the in-depth expertise, broad experience, and extensive facilities and equipment required to address technology challenges in the development of energy storage systems, including:

- Battery systems for electric and hybrid electric vehicles
- Battery systems for grid storage
- Flywheels
- Hydraulic accumulators
- Stationary systems such as flow batteries tied to the electric power grid
- Thermal storage systems
- Ultra capacitors

**Services**

Services offered include:

- Abuse testing
- Battery management system development and testing
- Chemistry-related services
- Large system development for grid-scale storage
- Listing and labeling
- Manufacturing system development
- Materials development
- Qualification testing
- Test protocol development
- System integration

**Test and Evaluation**

The ESTC offers a wide range of test and evaluation capabilities and equipment for electrochemical systems (batteries), including:

- High power bi-directional DC power supplies
- Calorimeter chamber
- Fire test facilities capable of complete vehicle tests
- Measurement of toxic emissions
- Short-circuit test equipment for high-energy systems
- Hydraulic press chamber for abuse testing to SAE, ISO, UN, and other standards

(continued on back)
• Pack-level thermal testing
• Temperature-controlled aging
• Thermal imaging systems
• Physical environmental testing
  ◦ Simulated earthquake vibration
  ◦ Ground or air transportation vibration
  ◦ Installation and handling shock
  ◦ Temperature, humidity, wind, and rain
  ◦ High-altitude transportation and operation
  ◦ Airborne contamination
  ◦ Acoustic noise measurement
  ◦ Corrosive atmosphere
  ◦ UV exposure and solar loading

Facilities
ESTC facilities are used to evaluate:
• Cells
• Packs
• Grid storage battery systems
• In-vehicle packs
• In-vehicle battery and powertrain
• ESS component-in-the-loop
• Battery with electric motor and power electronics
• Fire exposure (short and long duration)

Additional Capabilities
In addition to development of energy storage devices, the ESTC offers assistance in many types of system integration, including:
• Power grid to storage communication protocols
• Cyber security of communication networks
• Control systems and strategies
• Storage system sizing using modeling and simulation

We welcome your inquiries.
For more information, please contact:

Ian Smith
Manager–R&D
210.522.2041
ian.smith@swri.org

Powertrain Engineering Division
estc.swri.org