

Discovery Across Texas

Identifying Wind and Energy Solutions Today to Ensure Grid Reliability, Efficiencies for Tomorrow



Launched in 2010, *Discovery Across Texas* is a smart grid demonstration project funded jointly by the Center for the Commercialization of Electric Technologies (CCET) and the Department of Energy. Its purpose is to identify technology solutions that will better integrate Texas' vast wind energy resources into the state's electric transmission, distribution and metering system. The project will also find ways to improve grid reliability, investigate ways to marry smart home energy use with wind resources, and educate consumers about the future of Texas' energy resources.



To accomplish these goals, *Discovery Across Texas* consists of three separate, yet synergistic components:

- Use of **Synchrophasor Technology** for wind integration and event monitoring in the ERCOT Electric Grid
- Planning an extension of the **Smart Meter Texas Portal** to support more efficient emergency load control and new ancillary services based on aggregated residential load and distributed battery systems
- Development of a “**Smart Grid Community**” that will serve as a model for electric distribution system behavior

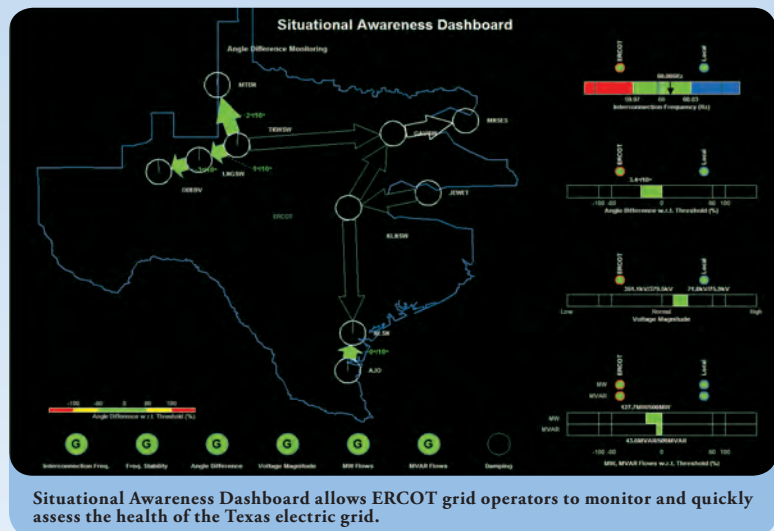
Synchrophasors – Today’s Measurements for Tomorrow’s Smart Grid

While the many benefits of wind power are well known, today’s reality is that wind farms stress the electric grid due to the unpredictability of power. In order for wind power to become an efficient energy source in the Texas electricity market, its effect on the reliability of the grid must be managed. *Discovery Across Texas* is looking to mitigate that risk by identifying reliability options through the use of Synchrophasor Technology.

Synchrophasors are precise real-time measurements of electrical quantities from across a power system. These grid measurements can be used for control, measurement and analysis of the power system.

By monitoring the ERCOT grid and its large-scale wind resources with Synchrophasor technology, *Discovery Across Texas* is gathering real-time, dynamic information

on wind resources and their impact on the transmission grid. With that information, ERCOT will be able to detect and identify undesirable conditions on the grid, thereby enabling operators to make adjustments to maintain grid reliability. They will also be able to expand the level of wind generation from available wind capacity.



Smart Meter Texas Portal – Contributing to a Successful AMS Rollout

The largest electricity utility companies in Texas have launched the most aggressive AMS deployment in the United States. As part of that initiative, they've created a portal for customers to better understand their usage patterns and potentially decrease their electricity consumption and costs. *Discovery Across Texas* is extending the portal's capabilities to provide valuable insight into:

- Large-scale residential load control techniques
- The viability of expanding the ancillary service market in ERCOT
- Peak shaving effects resulting from residential energy efficiency initiatives
- Consumer perceptions and opinions about smart meters and alternative pricing strategies

Smart Grid Community of the Future – Right in Our Own Backyard

The third component of *Discovery Across Texas* is to demonstrate the efficiencies that can be realized in our homes and communities through alternative energy sources. Just north of Houston, the Discovery at Spring Trails Community will soon showcase a variety of smart grid technologies that integrate wind from the grid with solar, storage and PEV charging. This community will give governments, consumers and the electric industry the data necessary to reshape residential load and support advanced demand response programs.

Smart Grid Technologies Now Appearing at Discovery at Spring Trails

- Distributed renewable energy generation
- Community energy storage
- Whole-house battery storage
- Smart appliances
- Two-way metering capabilities
- Community PEV charging
- Home PEV charging vehicle charging
- Rooftop solar photovoltaic
- Home Energy Management (HEM) systems

CCET – Redefining the Next Generation of the Electric Grid Through Technology

The CCET facilitates electric industry, technology company and university collaboration for the purpose of enhancing the safety, reliability, security and efficiency of the Texas electric transmission and distribution system through research, development and commercialization of emerging technologies. *Discovery Across Texas* is a partnership between CCET and the Department of Energy.

