UT Energy Week: “How Smart Grids Enable Consumers”
Feb. 18, 2015
Who We Are

» **Active Power** is a global leader in flywheel energy and power technology for mission critical applications

» Products built on elegant and proven flywheel and power electronics technology

» Combined benefits of products’ power density, reliability, and total cost of ownership are unmatched in the market

» Chosen by marquee customers and partners around the world
Active Power...By the Numbers

» Founded 1992; IPO 2000
» HQ in Austin, TX, with operations centers in UK, Germany, and China
» 200+ employees
» 4,000+ flywheels in systems shipped worldwide

» 200+ infrastructure modules deployed worldwide
» 50+ country deployments
» 200+ million hours of field runtime
» 1,000+ megawatts of critical power deployed
» 116 active issued patents and pending applications worldwide

Global Partners

Global Customers
Flywheel and Power Electronics
Support Five Core Solutions

Flywheel & Power Electronics

- Mission Critical
  - CleanSource UPS/DC

- Smart Grid/Microgrid
  - CleanSource PD

- Modular Systems
  - CleanSource PowerHouse

- Software
  - CleanSource View

- Service
  - Assess/Implement/Support
Where Do We Fit In?

- **Generation**
  - Wider Operating Range
  - Dispatchable Solar/Wind
  - Dispatchable Quick Start

- **Storage**
  - Voltage Support
  - Regulation
  - Fast Ramping
  - Frequency Response
  - Over Generation Mitigation Load Shift

- **Demand Response**
  - Peak Load Reduction
CleanSource PD stores energy and supplies power to grid on demand, smoothing transitions among sources and responding to frequency issues.

When called upon, CleanSource PD:
1. Flywheel immediately supplies power to grid
2. Transitions to battery for extended response
3. Disconnects and recharges flywheel and batteries when grid returns to nominal
CleanSource Power Driver (PD)
Value Proposition

CleanSource PD allows for the microgrid to seamlessly transfer between modes.

- PD topology has voltage and current controllers working in parallel in order to achieve transfers between grid connected and off-grid modes without a glitch.

- PD helps microgrid to minimize loss of control, thus it is easier to control

- It enhances TCO and ROI of microgrid by avoiding utilization of components with higher cost such as batteries (ES) and generators (Source)
How does AP benefit customers?

» We enable the integration of renewables into the smart and micro grids

» We improve the power quality of electrical systems

» We provide stabilization to mitigate unpredictable components of smart and micro grids

» We make renewables and energy storage technologies more affordable

» We enhance the reliability of electrical systems