Notrees Energy Storage Project

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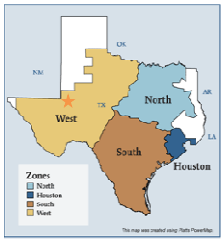
Project Objectives

- Use energy storage to increase the value and practical application of wind generation
- Integrate storage with intermittent renewable energy production
- Improve use of power-producing assets by storing energy during non-peak generation periods
- Demonstrate benefits of using fast response energy storage to provide ancillary services for grid management
- Verify that energy storage solutions can operate within the ERCOT market protocols
- Demonstrate ramp control and related operational benefits
- Prove storage is commercially viable at utility scale

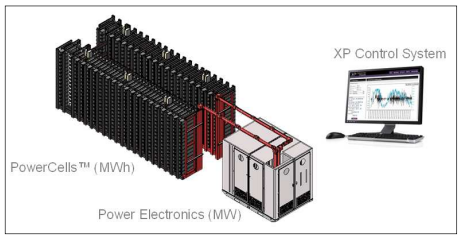
Project site

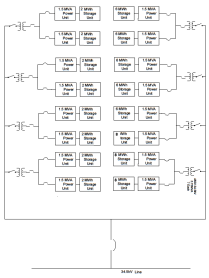


- Notrees wind farm, owned and operated by Duke Energy Renewables
- Located in west Texas – Ector and Winkler Counties
- 152.6MW total wind generation capacity
- Energy Storage System (ESS) will be located at the substation and tied on the distribution side

Energy Storage System

- Technology: Advanced lead-acid battery
- OEM Partner – Xtreme Power (XP)
- 36 MW / 24 MWh output
- Modules housed in ~ 6,000 sq. ft. building





- Twenty-four (24) Dynamic Power Modules (DPM™), each rated 1.5 MVA continuous
- Twelve (12) DPM™ cooling pump skids
- Twenty-four (24) DPM™ air/water heat exchangers
- Twenty-four (24) PowerCell™ storage systems including 1.0 MWh storage, racks, and buses
- Two (2) spare PowerCell™ charging and storage systems, etc.

Project Activities to Date

- Site construction began December 2011
- XP DPM™ modules being manufactured and installed
- Metrics & Benefits Plan developed

Upcoming Activities

- Acceptance testing of XP DPR modules ongoing
- Completion of site construction by November 2012
- Commercial operation by December 2012
- First year "Technology Performance Report" by Dec 2012
- System performance testing & analysis, 2013-14

Battery Acceptance Test Plan

- Real power (kW) from the DPR
- Reactive power (kVar) from the DPR
- Apparent power (KVA) from the DPR
- Power factor
- Total dc voltage – Between storage PowerCells and electronics
- PowerCell column pack dc voltage – Between storage PowerCells and electronics
- Max PowerCell column pack dc voltage – Between storage PowerCells and electronics

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