SmartGridCity™: Xcel Energy plugs into the smart grid

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SmartGridCity™ — Boulder, CO

- Collaborative project with diverse partners and vendors
- Builds a more modern, "digital" utility network and energy grid
- Multi-year, multi-phased project
- Complexity and scope brings unprecedented challenges
SmartGridCity™ -Technology Pilots

- Creates a robust, dynamic communications network
  - *Real-time, high-speed, two-way communication throughout the distribution grid*

- Conversion of substations to “smart” substations
  - *Remote monitoring, near real-time data and optimized performance*

- Consumer technology trials
  - *Smart meters*
  - *Web tools and in-home energy management devices*

- Integration of infrastructure to prepare for distributed generation technologies
  - *Examples include plug-in hybrid electric vehicles with vehicle-to-grid technology, battery storage systems, and renewable sources*
Smart Grid Consortium Partners

- **Accenture**: project manage the integration and management of data flow, including automating processes, transmission and distribution of electricity.
  - *diagnostic software*
  - *intelligent distribution assets and outage management systems*
  - *building a lab-like environment for testing power outages, reliability and potential impacts to the smart grid.*
Smart Grid Consortium Partners (continued)

- **CURRENT Group**: providing CURRENT Smart Grid™ solution that combines advanced sensing technology, two-way high-speed communications, 24/7 monitoring and enterprise analysis software, and related services to provide location-specific, real-time data.
  - Provides consumers information and control over their energy usage and enables the widespread deployment of renewable energy sources.
Smart Grid Consortium Partners (continued)

- **GridPoint Inc.**: their SmartGrid Platform™ applies information technology to the electric grid to provide an intelligent network of distributed energy resources to help control load, store energy and produce power.
  - *Allows the team to explore advanced demand management, supply management, solar PV integration, PHEV smart charging, online energy management, instant backup power, performance monitoring and customer support.*
OSIsoft: PI System software provides the infrastructure for collection and management of time series data required to monitor and implement the SmartGridCity™ concept.

Schweitzer Engineering Laboratories (SEL): provides sensing, control, communications, analytics, and automation solutions. Also provides solutions for Xcel Energy's Merriam Park "smart substation" project in Minneapolis, MN.
Smart Grid Consortium Partners (continued)

- **SmartSynch, Inc.**: Provides smart metering, energy management, demand response and carbon monitoring solutions to commercial and industrial customers in the utility's SmartGridCity™ initiative.
  - *SmartSynch meters deployed on the University of Colorado campus in Boulder, municipal buildings, select commercial and industrial buildings throughout the city.*
Smart Grid Consortium Partners (continued)

- **Ventyx**: provides work management solutions for deploying smart grid technologies; management for work and service requests triggered by the smart grid; planning and analytics for price and load forecasts; and decision support for connecting customer actions to trading and investment decisions in real time.
Smart Grid Consortium Partners (continued)

- Internal partners:
  - Field operations
  - Substation maintenance
  - Capacity planning
  - Standards
  - Regulatory/Tax departments
  - Legal department
  - Marketing department
  - Communications department
  - Government relations (including Public Utility Commission)
Project Management Structure

- **Five Delivery Teams**
  - **Customer**: in-home devices, meters, premise load balancing, marketing, billing, call centers
  - **Substations**: substation automation, feeder automation, inter-substation routing and distributed automation
  - **Distribution Grid Control**: outage management, demand response, distribution planning, engineering and asset management
  - **Field Operations**: fiber installation and meter installation
  - **Distributed Energy Resources**: virtual power plants (e.g. PHEV), signal creation, trading, risk management and forecasting
Project Management Structure

- Two Support Teams
  - Project/Financial Management
    - *Program Coordination*
    - *Financial Reporting, including inquiries from PUC*
  - Infrastructure Integration/Testing Management
    - *Business Architecture*
    - *Technical Architecture*
    - *Quality Assurance*
    - *Operations*
    - *Security Alignment*
Tools Used

- **Status meetings**
  - *Bi-weekly meetings with all external partners and project managers*
  - *Bi-weekly meeting with all internal project managers*
  - *Weekly status meetings for all teams*
  - *Weekly updates to project executives*
  - *Monthly meetings with Advisory Board members*

- **SharePoint Website**
  - *Issues and Risks*
  - *Contact lists*
  - *Ability to share, collaborate with all partners*
Tools Used *(continued)*

- Requirements workshops
- Change management board
- Internal Advisory Group
  - *Key leaders involved*
  - *Allows for review of deliverables as they become available*
- Testing
  - *User acceptance testing*
Resources

- www.xcelenergy.com/smartgridcity