

**Sioux Valley Southwestern Electric Cooperative, Inc.*****SVE SmartGrid Program*****Abstract**

The Sioux Valley Energy (SVE) Smart Grid Program project involves installation of an advanced metering system and a pilot program across the service territory to assess the effectiveness of time-based rate programs and enabling technologies. The project is aimed at reducing peak electricity demand, overall energy use, and operations and maintenance costs, while increasing distribution system efficiency and reliability. The project implements two-way communications to: (1) allow customers to view their energy consumption at their convenience through a Web portal and other customer systems, (2) allow SVE to manage, measure, and verify targeted demand reductions during peak periods, (3) allow SVE to evaluate the breadth of outages and restore those outages more quickly, often without the necessity of the customer calling to inform SVE of the outage, (4) perform near-real-time engineering analysis of the electric distribution system to allow for the most prudent use of capital dollars for system improvements, and (5) facilitate the installation of customer-owned distributed generation, typically renewable energy, without any additional metering costs to the customer.

**Smart Grid Features**

**Communications infrastructure** includes a power line communications network system that provides the backbone for energy management systems and allows for monitoring and control of distribution automation equipment in both urban and rural environments. SVE monitors feeder loads, in near real time, by aggregating smart meter data transmitted over the power line communications network. This reduces the amount of time and cost needed for distribution monitoring and allows SVE to better optimize distribution planning and operations.

**Advanced metering infrastructure (AMI)** provides smart meters to all of SVE's 26,500 residential and 2,500 commercial customers.

These meters provide the capability for a variety of current and future customer electricity price and service options and reduce SVE's costs of electricity delivery. Operational cost savings result from lower meter reading and customer services costs. New AMI features such as outage and restoration notification, and a remote service switch, enable SVE to respond to outages and customer requests more efficiently.

**At-A-Glance**

**Recipient:** Sioux Valley Southwestern Electric Cooperative, Inc.

**State:** Minnesota and South Dakota

**NERC Region:** Midwest Reliability Organization

**Total Budget:** \$8,032,736

**Federal Share:** \$4,016,368

**Project Type:** Advanced Metering Infrastructure and Customer Systems

**Equipment**

- 29,000 Smart Meters
- AMI Communications Systems
  - Meter Communications Network
  - Backhaul Communications
- Meter Data Management System
- Home Area Networks
- 200 In-Home Displays
- 200 Programmable Communicating Thermostats
- Customer Web Portals

**Time-Based Rate Programs**

- Critical Peak Pricing

**Key Targeted Benefits**

- Reduced Electricity Costs for Customers
- Reduced Operating and Maintenance Costs
- Increased Electric Service Reliability and Power Quality
- Reduced Costs from Equipment Failures, Distribution Line Losses, and Theft
- Deferred Investment in Generation Capacity Expansion
- Reduced Greenhouse Gas Emissions

**Sioux Valley Southwestern Electric Cooperative, Inc. (continued)**

**Advanced electricity service options** offered through the project include programmable communicating thermostats and in-home displays that communicate with the smart meters via home area networks. Web portals enable customers to monitor their energy use and are available to all customers receiving smart meters. The Web portal and the other customer devices facilitate two-way information exchange and enable customers to better manage their electricity use and costs.

**Time-based rate programs** include a critical peak pricing pilot to encourage consumers to shift their consumption from on- to off-peak periods and then to measure and validate the magnitude and effectiveness of the demand response. SVE plans for 400 customers to participate in this pilot involving in-home displays and programmable communicating thermostats for notification and control. Analysis of the pilot results includes assessments of energy and load impacts and customer acceptance. This information is critical for the design of future pricing programs.

**Timeline**

Key Milestones	Target Dates
AMI asset deployment begins	Q3 2010
Pilot pricing programs begin	Q2 2011
AMI asset deployment ends	Q3 2012

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