

# NorthWestern Energy Smart Grid Demonstration Project

## Progress Report to the State of Montana

### Energy and Telecommunications Interim Committee

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## Background Information

### 1. NorthWestern Energy's Commitment and Project Locations

- Budget = \$4.2 million.
- 50/50 cost sharing with DOE funds (ARRA/Stimulus money).
- Scope: A Distribution Project in two locations.
- City of Helena (urban area):
  - 3 – Substations (out of 7).
  - 8 – Distribution Circuits.
  - Approximately 200 homes and 2 state government facilities.
- Philipsburg (rural area):
  - 1 – Substation.
  - 1 – Distribution Circuit (240 miles, 1200 Customers).

### 2. NorthWestern's Role & Objectives

- Contributing member/participant in larger Regional experiment managed by Battelle Pacific Northwest National Laboratory (Battelle).
- Test & demonstrate Smart Grid technologies in Montana service territory.
- Evaluate costs, benefits and impacts on system reliability.
- Inform NorthWestern about possible future deployment.
- Utility "side" of the project:
  - Volt/VAR Optimization [VVO] – energy savings.
  - Distribution Automation – improve reliability.
- Customer "side" of the project:
  - Provide customers with new & innovative ways to control usage.
  - Time of Use Pricing – energy savings.
  - Demand Response & Load Control – energy savings.

### 3. Smart Grid Project Timeline

	2010	2011	2012	2013	2014
Phase 1 - Design	6 months				
Phase 2 - Build Out		24 months			
Phase 3 - Data Collection				24 months	
Phase 4 - Cost Benefit Analysis & Reporting					6 months

Phase 2 - Build Out	2011				2012	
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter
Utility Side - Energy Efficiency (Volt/VAR)	Software Installation			Test/Train		
			Helena - Field			
			Philipsburg - Field Equip			
Utility Side - Reliability (DA or FLISR)		Software		Test/Train		
				Helena - Field Equip		
				Pburg - Field Equip		
Customer Side - Energy Efficiency	Lockheed Martin / Tendril / Itron			Test/Train		
			Home Area Networks			

### Project Status & Recent Activities

- ✓ Attended system conformance testing orientation meeting with Battelle.
- ✓ Conducted ChoiceConnect Fixed Network training to familiarize NorthWestern field personnel with operation of the fixed network meter reading system.
- ✓ Completed recruitment of targeted 200 residential customer participants in Helena:
  - ✓ Performed all equipment installations.
  - ✓ Conducted customer education on use of system.
- ✓ Completed installation and testing of fixed meter reading network in Helena.
- ✓ Completed testing of MDM system, internal/external data pathways, production of billing determinants, routing of customer inquiries, other internal business processes.
- ✓ Upgraded operating system of IntelliTeam Volt/VAR application in Philipsburg.
- ✓ Started GIS mapping of Philipsburg feeder.
- ✓ Completed the software work needed for a working application program interface for hourly energy pricing. This interface ties the NorthWestern Smart Grid core software with contractor Tendril's system that operates the home area networks in participants' homes.
- ✓ Initiated data collection programming and feeding of data to a file transfer web site.
- ✓ Continued Transactive Control node programming.
- ✓ Completed Cyber Security Plan outline document.
- ✓ Completed factory acceptance test of Yukon Feeder Automation software.
- ✓ Completed Metcalf Building lighting project design.
- ✓ Continued external audit of all project activities and updated all subcontracts with Davis Bacon language.
- ✓ Outlined data collection method for voltage and bank measurements.
- ✓ Completed Beckwith capacitor controller communication troubleshooting.
- ✓ Issued Mechanical Technologies Inc. installation contract for work on the State of Montana buildings involved in the project.
- ✓ Completed filming of a Smart Grid educational video in cooperation with Montana State University.

## **Planned Activities**

- Volt/VAR Optimization [VVO] application in Helena application will be fully operational by year end and in Phillipsburg by September 2012.
- Distribution Automation [DA] application is also making good progress. In Helena – both applications should be running by Q3 2102.
- Begin regular monthly communication with 200 HAN participants.
- Continue regional Transactive Control signal development.
- Start State of Montana smart grid integration installation.
- Continue to prepare and provide required monthly reports:
  - American Recovery and Reinvestment Act of 2009 Monthly Contract Cost-to-Date Estimate.
  - Monthly Report.
  - Request for Reimbursement.
- Continue development of detailed Transactive Control design and Data Collection.
- Continue engineering and design work. This includes:
  - Design and layout of all communication systems in Phillipsburg substation.
- Continue to work with our major vendors. This includes:
  - Weekly teleconferences and continued testing of S & C Electric IntelliTeam VV software.
  - Weekly teleconferences and continued testing of Tendril Vantage Portal and software.
  - Meetings with Cooper Power Systems for distribution automation software; factory acceptance test was completed.

## **Milestones and Issues**

- The project is on schedule and under budget.
- The system that enables time-of-use pricing for participating customers will undergo final testing in August and become operational for participating customers beginning with the first regular billing cycle in September.
- Final conformance testing of NorthWestern's control node software with Battelle contractor Quality Logic is complete (September 2012). This is the final development step prior to live operation of the regional Transactive Control System.
- No major issues or concerns at this time.