Idaho Falls Power & the Pacific Northwest Smart Grid Demonstration Project



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i P Idaho Falls Power

Idaho Falls Power



Largest municipality in the state of Idaho

- 27,000 electric metered customers
- 17 square mile service territory
- 12 power distribution substations
- 5 Hydro electric generating facilities



Acknowledgment & Disclaimer

• Acknowledgment:

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Project Stakeholders

- Battelle Memorial Institute,
 Pacific Northwest Division
- Bonneville Power
 Administration
- 11 utilities (and UW) and their vendors
- 5 technology infrastructure partners



Pacific Northwest Demonstration Project Synopsis

What:

- \$178M, ARRA-funded, 5-year demonstration
- 70,000 metered customers in 5 states

<u>Why:</u>

- Develop communications and control infrastructure using incentive signals to engage responsive assets
- Quantify costs and benefits
- Contribute to standards development
- Facilitate integration of wind and other renewables

Only project of its kind integrating resources across multiple utilities to achieve regional benefits.





Idaho Falls Power: The past 10 years



- Develop and implement a Geographic Information System (GIS) including development of a electrical geometric network
- Upgrade the Utility SCADA System
- Build a city wide fiber optic network for city and utility purposes
- Implement an Outage Management system including an Interactive Voice Response system (and integrate with the GIS system)
- Upgrade the city's electric metering system

Idaho Falls Power Smart Grid Projects



- Conservation Voltage Reduction (CVR)
- Automated Power Factor Control
- Fault Detection, Isolation and Restoration
- Personal Energy Management (PEM) In home displays, water heaters, thermostats & Web portal
- Plug In Hybrid Electric Vehicles (PHEV's), battery storage and distributed generation
- AMI system implementation
- AMI, SCADA & Outage management system integration
- Cyber Security
- Outreach and Education



EnergyAxis Component View





Distribution Automation Network



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			i vorage n	caucae			
		4/24/20	14 7:38:16 AM				
Control Mode	es	Run Tir	mes Deman	d Run	File Age Tir	ne (secs):	35
CVR Mode	Manual	Last D	ata File Update:	4/24/20	014 7:38:22.14	2 AM	
Time Delay(s	ec) 60	Last G	ood Data Read:	4/24/20	014 7:38:41.29	8 AM	
EOL Setpoint	125.00	CVR La	ast Ran:	4/24/20	014 7:38:25.36	51 AM	
EOL PV	117.58	In Manu	ial Mode: Remote C	ontrol: RAIS	SE Command i	s recommand	ed
Substation LTC Control			End C	End Of Line Voltage Control			
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In-home Display "Test Drive"



- Helps you incorporate energy management into your daily routine
- Enables you to see how much power you are consuming in real-time, instead of waiting for the monthly bill
- Set it to alert you if you reach a consumption threshold
- IFP may send energy-related messages to the display
- *"Test Drive" open to 1000 volunteers*



Thermostat "Test Drive"



- Customizable to respond to factors such as temperature and electricity costs
- Embedded communications enable IFP to adjust temperature for short periods when demand is high; you can override if desired
- Displays current cost of power, state of control and total energy consumption
- IFP may send energy-related messages to the display
- *"Test Drive" open to 250 customers in selected neighborhoods*



Load Control "Test Drive"



- Helps IFP balance electricity supply and demand by removing non-essential loads during times of critical peak demand
- Control devices allow IFP to shut off power to water heaters for short periods of time; you can override if desired
- Device lets you see when water heater is, or has been, subject to load control event
- *"Test Drive" open to 250 customers in selected neighborhoods*



PHEV/ Battery Storage/Solar





Project Successes



- Implemented a two way communicating AMI system
 - With both a RF LAN & WAN
- Created Home area networks utilizing Zigbee protocol
- Deployed demand response programs over an AMI network
- Integrated the AMI system with SCADA for Distribution Automation purposes
- Enrolled over 1000 customer volunteers
- Significantly improved IFP system cyber security
- Improved Customer Outreach and Education processes

Project Challenges/Lessons Learned



- Some technologies relatively new, not time tested
- Industry interoperability is early in lifecycle
 - Vendors, systems & equipment
- Underestimated the complexity of integration work
- Timely support was difficult due to the amount of projects (ARRA) that were in progress
- Uncertainty about some Vendors
- Did not anticipate the amount of Outreach and Education that ended up being required



Questions ?

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