Pacific Northwest Center of Excellence for Clean Energy

Education Taskforce Meeting
NorthWestern Energy, 1944 Monad Road, Billings, MT
April 19, 2012, 8:30 a.m. – 2 p.m.

Ryan Fedie, Chair, Bonneville Power Administration
Tom Barr, Edmonds Community College
Lawrence Beaty, Idaho State University/ESTEC
Susan Bilo, Montana State University/Extension, Home & Alternative Energy Education Coordinator
Terrence Browne, Avista Utilities
Ryan Davis, Regional Education Training Center
Alan Hardcastle, WSU – Extension Energy Program
Mel Oyler, Cascadia Community College
Roger Parrish, Spectrum Consulting
Jay Pickett, Centralia City Light
Alison Pugh, Edmonds Community College
June Pusich-Lester, Northwestern Energy, engineer
R. Scott Rasmussen, Idaho State University/ESTEC
Kevin Schneider, Pacific Northwest National Laboratory
Debbie Singer, Northwestern Energy
Dennis Skarr, WDVA – Veterans Conservation Corp
Lisa Skriner, Montana State University
Collin Sorensen, WestCAMP/Manufacturing Extensions
Dave Sorensen, WestCAMP
Garret Stark, RETC
Ron Wheadon, Cascadia Community College
PNCECE: Barbara Hins-Turner and Monica Brummer

Call to Order, Ryan Fedie, Taskforce Chair, Bonneville Power Administration
Welcome, introductions and quick announcements. Minutes dated December 8, 2011, were adopted as written. Today's agenda was adopted; Ryan moved and Ron seconded approving minutes.

Welcome, NorthWestern Energy, *Debbie Singer, Key Account & Economic Development Specialist*

- Debbie described NorthWestern Energy and its customer base: 1,060 employees; 665,000 customers in MT, SD, NB; 80% of customers are in Montana – 2/3 of state. Gas and electric. Own some generation at Colstrip 4. Distribution equipment replacement is proactive; company is hiring a lot of engineers; getting close to being done with major equipment GIS – mapping.

NorthWestern Energy – Smart Grid Program, *June Pusich-Lester, Smart Grid Engineer*

- With company 1.5 years on demand side efficiency plus
- Smart Grid Demonstration Project, Butte, MT:7 – 10 years/$3.75 million – most money is in poles and infrastructure plus building blocks (communications)
- Key to smart grid is communications
- They are required by state law to meet demand so they need to use energy smarter to match usage. Supplies solar, coal, wind. Cost follows load. More demand = higher cost. May need to change that per demand loads. Customers pay a flat rate, which is not real and needs to change. Higher usage is air conditioning. Not used for heat because of other sources.
- We have to re-train engineers, construction, software folks to rethink as smart grid world grows. Smart grid focuses on the technical infrastructure.
- Participating in NW smart grid pilot project with PNNL (11 Partners and utilities) to inquire and evaluate (5 year project) to acquire data from customers' needs, costs etc. before rolling out to entire grid
  - 5 year, $4.2 million project 50% cost share with DOE

- Two cities: Helena and Philipsburg (rural – 50 miles outside of Butte)
- Helena has wireless coverage – increasing area cost $50,000 – installation is ongoing
- Is it reliable? – is the biggest issue/question to be answered.
- Will consumers accept and use the technology?
- 200 customers in Helena, MT to educate about smart grid and gain feedback on how when they use it. Does it cost too much? Do they use it?
- Currently 185 customers use smart technologies. It's hard to get them convinced; like pulling teeth. Customer acceptance is low.
- Smart meters read monthly and will replace those with meters that relay information more quickly.
- $1,300 for equipment in each home. How do utilities pay for it? Customers cannot be forced to pay for equipment.
- Time of use energy prices. Will cost effect customer's use of energy?
- Starting year 3 soon; then move into 2 years of testing
- Utilities side: optimization; test distribution automation
- Customer side: time of use pricing - savings 15% distribution system; 85% from customer side of meter. Shave 1 – 3 % of circuit load
- Home area network components – in-home display unit, computer link and phone app will show pricing. Home display unit will glow a different color with different prices. June has not changed behavior with home display unit. Battelle, Lockheed Martin created display units that units will go live in August

Jay Pickett – real time /flex time in-balance market thing…where will you see the change?
June: we don't know yet – not seeing any short term benefits yet; $1 - $2 a year savings
Tom Barr – power saving; can you be an aggressive power saver and set the programming?
June – can set it up per customer – she uses her programs for automation control. Turning off lights and adjusting house temp. Can measure energy use per appliance**.** Energy audit programs are available for those who request them

What's next?

- Competition for how much consumers saved will be implemented.
- ITRON metering system – collects 15-minute electric interval data
- In-house is a zippy wireless that talks to a network portal, which sends data to the utility
- Hired a third party in Helena – auditors and installers
- Scott and Lawrence were asking installment questions (2 hours to install; $1500 total?)
- Time of use prices needs to be approved by commission (TOU tariff); bill will never be increased, we give customers the savings.
- Automated data gathering and bill sending
- Also surveying customers and sending them project updates
- Peak prices off peak .03; mid .05; on peak .09 – supply charge per KW hour – signals are sent in three blocks
- Smart grid demonstration lab in Butte.
- Automated online enrollment with informative videos & chat lines
- State of Montana – Metcalf building (lighting control, based on price – when pricing is high, some room lighting will be dimmed or turned off) and Walt Sullivan building (HVAC control – air conditioning). The utility warns customers via email before dimming lights. Summer HVAC system will be challenging

- Control center at Battelle will send info to NW which will be sent to customers – sending out regional price taking back load capacity. Can occur each minute – will draw out to five or 15 minutes. There have been a bunch of technical issues concerning security. No customer specified data is transmitted; customers are labeled as A, B, C…

We have learned: consumers do want to know how much they are using. They want to set it and forget it. Consumers want control, options and choices but choose to set and forget. How stable will this be?

Montana State University, *Susan Bilo, MSU Extension Home & Alternative Energy Education*

- *Anchoring the Smart Grid project in Montana*
- New partner in the smart grid project dedicated to training; MT Weatherization (Wx) Training Center, Bozeman – www.weatherization.org
- There's now a push for energy which overlaps with Wx

- Typical course topics – energy auditing principals… 120 hours of energy auditor required
- Wx skill set training station lab and HVA diagnostics lab – enable a hands-on experience
- Wx is building science with a clear purpose – savings to investment ratio
- Home Energy Usage – heating and cooling 45%; water heater 11%; clothes washer/dryer 10%, Lighting 7%...
- **Useful links:** Wxtvonline.org; www.eXtention.org, www.homes-across-america.org, www.e3A.com, www.e3a4u.org
- More than 6 million homes have been weatherized
- Stackable credentials – degree associated in Wx – includes class on communications skills – 33 credits
- Deliverable for the PNCECE smart grid project is a 5-7 minute video for regional consumers; what is the smart grid and implications for consumers called Five Basics of Smart Grid – July 31st deadline

PNCECE Smart Grid Project Mid-Point Review, *Barbara Hins-Turner, PNCECE*
Barbara reviewed the past few months of travel which focused on representing industry across five states – We began with those states where we have the strongest connections (ID and MT second year). Avista is producing a large training and hire numbers. Kairie Pierce, will be working on expanding Washington's Demystifying Apprenticeship program across the region.

Alison Pugh – PI of NSF grant – program improvement grant; Edmonds, Cascadia, WSU and PNCECE are working on skill profiles on demand side occupations. The team is developing a matrix of critical work functions.

- Industry/labor/educators will meet and work together at the Educators Institute: working with skill profiles/standards. We are recruiting folks from community and technical colleges and K-12 faculty; recruitment and retention in under-represented groups; sharing best practices for hybrid and online offerings. Meeting in May to get folks excited about attending the summit. Stipends available (10) travel costs and curriculum development – curriculum needs to be available nationally

Manufacturing model – creating jobs. Identify small manufacturers that are making a product that will fit into the smart grid market; to encourage manufacturers to produce new products similar to what they are currently making to fit into smart grid technology. Veterans—identify training gaps that can be closed though targeted education and training. This begin with an analysis of skills, needed for training and how to have veterans trained within a short time, like 6 weeks or months vs. 2 or more years.

Dave Sorensen has graciously agreed to chair the Smart Grid Manufacturing Taskforce

Pre-apprenticeship trainees is the group going into jobs – project target 234; placed to date is 113 – (48.3% of goal). She puts students into spotlights to keep them in the focus of what we're about.

Career Lattice findings: jobs are distinct; jobs are changing; occupations vary among employees
Smart grid will require more IT, data management & analysis and communication skills

- Retirements, population dynamics will require workforce to have new skills; data management is really hard; we're going to have a huge interest from our industry partners for skill sets to collect, analyze and communicate data that is gathered through smart grid.
- Takes time to develop expertise and we have to be proactive
- It's not just about demand-supply sides. New skills and functions connect across the board.
- Demand side: there are many different ways to start a utility career. Common entrance port is through customer service
- Year 2 research with few exceptions, there isn't a lot of smart grid implementation happening. What's the impact of smart grid? What are the forecasts of needs? Interviews are being conducted to find out what needs are.

Utility Customer Service Representative (CSR) – many opportunities to get into industry; standards for CSR are lacking and vary by organization; CSR is an important area to focus on for skill standards

- The process takes two full days. 9 or 10 subject matter experts – front line employees
- Not possible without great cooperation from our employer partners. Everyone benefits. Students get job offers. Employers are happy and continue to support colleges….

- It will be hard to influence people – pass along to personnel dept. How do we build credibility first? It's going to include all industries – competing for the workforce pool.
- Rate components of critical work functions; skill standards can be a tool to use during hiring process. A lot of organizations are using skill standards in job openings, trainings, job descriptions
- We'll see all kinds of models depending on organizations. Tacoma Power – CSR is also smart grid rep; she's overloaded with smart grid questions. Customers and CSR aren't as prepared as they should be because of the new technology. How can we prepare them for the questions and data coming their way? We need to reach out and ask for those insights. We've hit the button to what's important to our employer partners.

Substation and Distribution Automation: ***Module 1: Introduction and Evolution of Electric Distribution Systems –*** *Kevin Schneider, Pacific Northwest National Laboratory*

Kevin presented the course PNNL developed in collaboration with Washington State University and the University of Washington. The curriculum consists of 16 different courses developed for 6 undergraduate classes and 12 graduate classes. WSU/UW were awarded a grant through the U.S. Department of Energy (American Recovery and Reinvestment Act (Recovery Act) funds to create the graduate level learning modules. These learning modules will be leveraged and replicated with a focus on the evolution of electric distribution systems in the Pacific Northwest for the PNCECE smart grid project.

Forty one-hour classes are divided into 10 four-hour modules focusing on power distribution, voltage control devices; substation design and automation; volt/VAR optimization, energy storage and electric vehicles; development of modern distribution systems, demand response

- includes history, how we got where we are, distribution system design characteristics…begins with technical aspects/progression of history **–** *people don't realize that the system is 180 years old.*
- Copies of slides/modules are available and will be posted on PNCECE's website.

Curriculum Development Sub-Committee Update, *Jay Pickett, Centralia City Light*

- Jay reviewed who attended yesterday's meeting; an amazing amount of information was presented; Avista was instrumental in supplying modules; action items.
- Next challenges: where to put the learning modules will be on the agenda for the next meeting – and how to catalog and disseminate information; we want to get to a point where employers see "PNCECE" on a resume and will recognize the individual for advanced standing in the hiring process. Need to set deadlines. Looking at finding an FTP site.
- Bob Topping presented safety and job hazard analysis information.

Upcoming Meetings

- *NW Smart Grid Summit: A Peer-to-Peer Workshop, PGE/Portland, May 10.* Barbara is on a panel and encouraged folks to attend.
- *Education Taskforce Meeting* – June 20, Washington State Labor Council, AFL-CIO Office, Olympia, WA
- Summit, Signature Crab Feed and Scholarship Auction, June 21
- Pre-summit Educators Institute on June 20
- Post-summit Smart Grid Manufacturing Roundtable on June 22
- *Dept. of Commerce Annual Conference, May 5 – 9 in Orlando.* MEP.org for more information. Steve, Dave, Collin will attend. National Institute for Standards and Technology. Heavily involved with smart grid.

Good of the Order

- Energy Efficiency Video Project, *Barbara Hins-Turner*

1:35 p.m. **Meeting Adjourned**