

Memo To: NW Energy Efficiency Taskforce Executive Committee
From: Jim West, Chair - RTF Policy Advisory Committee
Subject: NEET Action 1 Update Report
Date: October 1, 2012

Creation of a Regional Technical Forum (RTF) advisory committee was a result of one of 10 action items from the NEET Process in 2009. Specifically, the action was to “Prepare an independent evaluation of the RTF to determine how it can best meet the region’s needs in data collection, analysis, evaluation and dissemination of findings.”

2010 saw the creation of an Ad Hoc RTF Review Committee, and in 2011 this Review Committee recommended the establishment of a Regional Technical Forum Policy Advisory Committee. The RTF Policy Advisory Committee (PAC) was chartered by the Northwest Power and Conservation Council in April 2011, and it has been operating since July 2011.

The first 15 months of RTF PAC activity have seen agreement on a funding structure for the remainder of the 2010-2014 planning period, approval of the RTF’s scope of activity, approval of the 2012 work plan and budget, and approval of the RTF Charter and Bylaws.

In general, the first year of PAC activity can be described as affirming an overall operational framework for the RTF, while the second year of activity has begun to focus on how best to ensure the RTF's efficiency, objectivity, accountability, and transparency.

Below is a summary of the recommendations submitted by the RTF PAC and adopted by the Council since the RTF PAC began functioning.

SUMMARY OF RECOMMENDATIONS AND FINDINGS:

1) Scope of RTF Activities

- a) The RTF should focus on efficiency measure savings, protocols for estimating savings, coordination of research to improve savings estimates, and reporting on region-wide savings.
- b) The RTF should engage in review of evaluation findings only to inform its determinations.
- c) Review of others’ program impact evaluation designs will occur only on request by the program administrator(s).
- d) The RTF’s role in program impact evaluation, primary data collection, and review of others’ estimates should be limited to coordination, minimizing duplication of efforts, and dissemination.

2. RTF 2012 Operating Plan and 3-Year Business Plan
 - a) The RTF PAC agrees with the broad categories of work in the 2012 work plan and the 3-year business plan, including:
 - i) Standardization of Technical Analysis & Existing Measure Review; New Measure Development & Review of Unsolicited Proposals.
 - ii) Tool Development; Research Projects & Data Development; Regional Coordination.
 - iii) RTF Member Support & Administration; RTF Management.
 - b) The RTF PAC recommends increased contract staff support, or addition of a RTF-funded Council staff position, to reduce Council staff in-kind commitment.
 - c) The RTF PAC agrees with the existing process and criteria for developing and reviewing the work plan and recommends its continuation.

3. RTF Funding Level and Allocation
 - a) The RTF PAC recommends a funding level of \$1.5 million per year for the years 2012 through 2014.
 - b) The RTF PAC recommends use of the NEEA funding allocation method and percentages for the years 2012-2014, with a review of any changes to NEEA's allocations for possible adoption.

- 4) Guidelines for the Development and Maintenance of RTF Savings Estimation Methods
 - a) RTF PAC supports guidelines to improve the clarity, transparency and operational effectiveness of the RTF.
 - b) Implementation of the guidelines should not result in automatic deactivation of existing deemed measures due to arbitrary time limits.
 - c) Guidelines should be implemented with the understanding that they will be adjusted as necessary over time.

Guidelines should not become an obstruction to acquisition of energy savings by creating a bottleneck in the process.

- 5) RTF Bylaws: RTF PAC recommends approval of the RTF Bylaws as voted on by the RTF on December 13, 2011.

- 6) RTF Charter: RTF PAC recommends that clarifying language be inserted into the Charter voted on by the RTF on December 13, 2011. With inclusion of clarifying language, RTF PAC recommends approval of the Charter.

GENERAL OBSERVATIONS:

As the PAC began its work in Summer 2011, both RTF PAC members and Council staff expected the approval of a funding allocation model and the amount of funder commitments to take some time to work through. As it turned out, these items were dealt with in a relatively short time frame, resulting in approval of items 1 through 4 above in Fall 2011.

On the other hand, a significant amount of time and discussion was devoted to approval of the RTF Charter and Bylaws, with much attention being paid to RTF voting requirements. The RTF PAC found the language confusing and recommended that the language be clarified to be more explicit in terms of the minimum number of votes required for approval. The RTF Charter and Bylaws were approved by the Council in June 2012.

During its recent discussions, the RTF PAC considered making recommendations in the Charter and Bylaws to address certain operational aspects of the RTF, such as the lead time for providing review material in advance of meetings. Instead, it was decided that ongoing monitoring would allow the PAC to determine any issues that need to be addressed in terms of RTF operation. The RTF PAC anticipates that it will provide the Council with updates as needed. In addition, the RTF PAC agreed that it would review the RTF Conflict of Interest policy as its next item of business.

RTF PAC members, as individuals, are in agreement on the need for efficiency, objectivity, accountability, and transparency of RTF operations. However, there is not unanimous agreement among the PAC members on the most effective ways to ensure this. With this in mind, RTF PAC will proactively monitor ongoing operation of the RTF and will advise the Council as needed. In coming months the RTF PAC plans to develop appropriate methods and tools for monitoring operation of the RTF to ensure that these mutual needs are effectively met.



Memorandum

October 5, 2012

TO: NEET Executive Committee

FROM: Susan Hermenet (NEEA)

SUBJECT: Outstanding Data Gaps (NEET WG#1/Action 2)

NEET Workgroup #1 (“Measuring What Matters”) identified regional research and data needs and gaps. In the past year, there has been substantial effort by regional organizations and utilities in the area of market research and evaluation. Some key accomplishments include: completion of the Residential Regional Building Stock Assessment, kickoff of the Commercial Building Stock Assessment, Regional Technical Forum guidelines for standardization of energy savings estimates, measure life and measure costs and many utility-led research efforts.

In 2011, NEEA provided an updated of the three identified gaps and progress toward those. This serves as an update to that memo.

Absence of End-Use Load Shape Data for All Sectors

Importance/Use to the Region: Currently, power planning in the Northwest relies on load shapes from the 1980’s - End-Use Load Consumer Assessment Program (ELCAP). Not only have these load shapes changed since then but there is no data for many devices, such as mobile phone rechargers, that simply did not exist at the time of the last study. Of the three gaps, the absence of end-use load shape data is the most crucial to power planning.

Progress: The Regional Technical Forum (RTF) has undertaken a project to develop a business case and work plan to develop, archive, maintain and update end-use efficiency load data. KEMA, Inc. was hired for this project and has produced a draft report, *Building the Business Case – Implementing a Comprehensive Pacific Northwest Electric End-Use Data Development Project* (September 25, 2012), that is currently available on the RTF website: <http://www.nwcouncil.org/energy/rtf/subcommittees/enduseload/> .

The Kema report presents three data development options, one of which is a Comprehensive End-Use Metering option, which most closely represents an ELCAP. The estimated cost of this option is \$28.5million over a five year period. This is approximately 25% of the cost of 1980’s ELCAP (in inflation adjusted dollars), and represents 1.1% of five years of the region’s Energy Efficiency costs. As confirmed in the Kema report, utilities use this information for more than energy efficiency purposes. This information also benefits; resource planning, grid operations and reliability, wind integration and demand response, load forecasting, rates and pricing, customer service and smart grid investments. Energy Efficiency may be the place to raise funds as a utility wide solution.

In addition, NEEA/BPA/EPRI are conducting a Residential Building Stock Assessment Metering Study (aka Residential Building Test Bed), which is a proof-of-concept project for “non-intrusive”

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metering. The cost to collect detailed sub-metering data that results in usable data for analysis is \$10,000/home.

Given the aforementioned costs associated with data collection, one of BPA's R&D group focus areas is lowering the cost of data acquisition. They are currently pursuing at least two projects in this area.

Finally, there are no plans to conduct sub-metering of commercial buildings as part of the Commercial Building Stock Assessment in 2013.

Future Plans/Obstacles: Although progress has been made by the RTF, NEEA and BPA, there remains no forum/mechanism to fund or manage the data collection or analysis needed to create library of the region's load shapes. In order to fully fill this gap, the region needs an organized effort to take this endeavor forward.

The absence of end-use load shape data is a recognized issue at the national level as well. EPRI is currently outreaching and assessing interest with utilities nationally. If the PNW were to lead the nation in moving forward with filling this gap, and that led to funding from other parts of the country, there may be economies of scale that would benefit the PNW.

Lack of Sales Data (white goods, consumer electronics, etc.)

Importance/Use to Region: Regional and service territory-level sales data aids both program design and understanding of program impact. Sales data at this granular level is limited in availability and, in general, expensive. The Northwest Research Group has identified such sales data as a desirable product with value to energy efficiency planning, implementation and evaluation.

Progress: NEEA continues to provide aggregate sales data to funders for currently and previously funded initiatives. For products outside of NEEA programming, little if any region-specific sales data is available. Several utilities have begun collecting sales data for their own purposes.

Future Plans/Obstacles: It is becoming more apparent that multiple entities working with the same retailers/distributors can be difficult for market actors, therefore NEEA and utilities are exploring coordinating acquisition of data via the development and implementation of a retail strategy.

Deficit of Market Characterization of the Industrial and Agricultural Sectors

Importance/Use to Region: Future programming in the industrial and agricultural sectors requires a clear picture of trends, market actors and potential for energy savings.

Progress: NEEA is planning a regional market characterization for the Industrial sector in 2013.

Future Plans: Northwest energy efficiency organizations appear to be filling this gap with both regional and local research projects. The Northwest Research Group membership continues to discuss remaining gaps as well as opportunities for cooperation and collaboration.



2012 NEET Update

Emerging Technologies (Action 3)

October 5, 2012

NEET Action

Create a plan for NEEA, BPA and other regional entities to coordinate Emerging Technology (ET) activities and keep the “pipeline” full to meet future energy efficiency needs.

Accomplishments

Summary. After three years of ramping up, the Northwest now has a strong emerging technology program led by BPA and NEEA. In 2012, NEEA and BPA invested roughly \$6.5 million in over 50 emerging technologies representing roughly 3000 aMW of 20-year achievable energy savings potential. These emerging technologies represent all sectors (residential, commercial, industrial and agriculture) and address needs in all four states. About half of these projects are designed to help discover and characterize these new opportunities with the other half intended to help assess and validate the technical performance of identified emerging technologies, products and services. Much smaller in number but a significant portion of the budget are pilot projects in preparation for full-scale, region-wide programs.

A few examples of the technologies being readied include:

- Residential Heat Pump Water Heaters
- Advanced Roof-top heating and cooling units
- LED street and area lighting with advanced networked controls
- Efficient industrial refrigeration system operator training
- Next-generation efficient center-pivot irrigation systems

Collaboration. In 2012 BPA and NEEA collaboration has moved beyond avoiding duplication and coordination to a level that has resulted in synergistic increases in productivity and lower delivery costs for the region. This level of collaboration has accelerated movement of new technologies into programs, improved definition of regional specifications for new technologies, and demonstrated performance and cost reduction necessary to move technologies toward codes and standards. Specific areas of collaboration include:

- Budget / Planning – For over a year now BPA and NEEA have conducted joint planning and budgeting; identifying areas where we both have shared goals and then assessing the best role for each organization based on existing abilities/resources and specific needs for each organization. This results in optimal use of each organization’s resources to advance emerging technologies on behalf of the region.
- Implementation – BPA and NEEA ET staff are working in collaboration to implement projects as a single team with shared goals. This results in faster, lower cost implementation by leveraging the diversity of skills across the two teams. The team meets bi-weekly to discuss the portfolio of projects and more frequently in smaller groups on specific projects.
- Western Regional / National Collaboration – There are a growing number of regional and national collaboration efforts around emerging technologies. These represent opportunities to leverage extra-regional resources in support of our own regional goals. By combining resources,

NEEA and BPA have been able to effectively engage and collaborate with these efforts. Examples include the Consortium for Energy Efficiency's Emerging Technology Forum (CEE ET Forum), EPRI's EE demo and early deployment projects, the Western Cooling Energy Center, the West Cost Utility Lighting Team and California's Emerging Technology Coordinating Council. These collaborations are now beginning to yield supplemental or complimentary demonstrations with data that can be combined with the Northwest efforts to accelerate our assessment efforts and reduce costs to Northwest ratepayers.

- **Discovery** – Given the wide range of opportunities and possible new technologies, the process of new technology discovery requires many “eyes” and “ears” looking for new ideas. By combining resources, BPA and NEEA have been able to maximize our visibility of new technologies. Much of this work also involves collaboration with other organizations. Together BPA and NEEA host Technical Advisory Groups of experts with specific domain knowledge that identify and prioritize emerging technologies. This September, BPA, NEEA and EPRI worked together to host a Technology Roadmap summit that brought 200 experts from 100 organizations across the country to identify the research agenda that will fuel the development of new efficiency products needed for future energy efficiency programs and better understand current research happening across the country. This event will significantly strengthen the PNW EE technology roadmap (update launch March 2013) and guide BPA's research and development program.
- **Information transfer** – BPA and NEEA both utilize Conduit and the e3tnw.org emerging technology website as mechanisms for distributing information on emerging technologies to the many different audiences interested in this area. Support for these vehicles is shared between the two organizations minimizing costs to the region's ratepayers.

Challenges

Balancing short-term pressures with long term needs

Product innovation, measurement and verification of savings, and scaled market testing of new technologies all take many years to accomplish. For example, the now ubiquitous compact fluorescent lamp was first introduced to the market in the early 1990's and twenty years later still only fills about 25-30% of available lighting sockets. The lack of investment in emerging technologies over the last 15 years has created an urgent need to focus on technologies that can be ramped into programs in the very near-term. While we have identified technologies representing almost 3,000 aMW of achievable potential, only a portion will deliver results in the near term. We have to be careful that we do not just create another “empty” pipeline problem by over-investing in these near term opportunities without balancing investments in technologies or opportunities that will take longer to mature. This short-term pressure is likely to grow in light of current avoided costs and flat load growth in the short-term. We will need a portfolio approach that balances the near-term needs against the longer-term opportunities that continually feed the energy efficiency pipeline and maintain a robust supply of energy from the region's least cost resource.

Opportunity discovery is harder than ever and collaboration is essential.

As we have largely captured the “low-hanging fruit” from the emerging technologies of the 1980s and early 1990s, new emerging efficiency opportunities are getting more complex and diverse; (e.g. consumer electronics). This means that the discovery process requires more people looking at many more things in order to find the few that will actually survive the screening and assessment process. With the Technical Advisory Groups and road-mapping efforts, we have a good start on identifying new opportunities, but there will need to be continued efforts to ensure that discovery of new opportunities continues at a robust level. Furthermore, assessing these many opportunities will require significant manpower to manage all the complex relationships and diverse activities. By far

the best way to accomplish this is through the power of collaboration that offers benefits of reduced costs for Northwest ratepayers, accelerated identification of new opportunities and ultimately more energy efficiency in the pipeline. But collaboration is a time and staff-intensive effort. Additional human resources are likely to be needed if we are to keep the energy efficiency pipeline full in the future at the lowest possible cost to Northwest ratepayers.

Memorandum

October 1, 2012

TO: NEET Executive Committee

FROM: Elaine Blatt

SUBJECT: Update on NEET Action 4 – Energy efficiency forum and strategic planning for high impact energy efficiency initiatives

Two action items were identified at the conclusion of the work of NEET Work Group 3:

1. Infrastructure for Collaboration
2. Regional Plan for Coordination on High Impact Initiatives

This memorandum provides an update on progress in these two areas.

Infrastructure for Collaboration

In response to the conclusions of Work Group 3, NEEA implemented the following 2 initiatives to increase regional information sharing, coordination and collaboration to maximize regional energy efficiency accomplishments:

- *Conduit* – regional online community targeted at the energy efficiency community.
- *Efficiency Connections Northwest* – annual regional energy efficiency conference.

Conduit Status

As reported one year ago, NEEA, in collaboration with BPA, and under the guidance of a regional steering committee, launched Conduit in May 2011. Since we reported to the Executive Committee last year, Conduit membership and engagement numbers have grown steadily:

	October 2011	September 2012
Membership	939	1609
Content shared (pieces)	1070	2567
Comments posted	890	2234

Future efforts will focus primarily on:

- Improving member engagement with the site via additions of key content (e.g., initiation of Conduit blogger program).
- Promotions designed to socialize users to site features and increase engagement.
- Continued outreach to existing and new members.
- Limited new feature development (Conduit basic features are in place as of the end of 2012)

Efficiency Connection Northwest Status

NEEA, in collaboration with a regional program committee, continues to organize an annual energy efficiency conference focused on utility energy efficiency programs. The first two conferences,

[Northwest Energy Efficiency Alliance](#)

held in the Puget Sound region, were successful in achieving their goal of fostering regional dialogue and exchange of information. The third Efficiency Connections NW will be held in October in Spokane, fulfilling planners' commitments to regional equity.

Regional Plan for Coordination on High Impact Initiatives

As reported last year, NEEA's Regional Portfolio Advisory Committee (RPAC) was asked to take a leadership role in fostering coordination in the region. RPAC subsequently asked NEEA to facilitate that process. Building on previous RPAC work, NEEA initiated the Regional Coordination Potential assessment. Five recommended coordination areas were recently forwarded to RPAC:

- Training
- Commercial financing
- Commercial small business strategies
- Residential programs
- Manufactured housing

Some additional work will be conducted to flesh out these areas, including addressing the issue of appropriate lead organizations for a coordination effort. After this additional work is complete, the RPAC may recommend one or more of these areas for implementation in the region.

Other Areas of Coordination

Progress is occurring in other areas of coordination throughout the region:

- Puget Sound utilities continue to exchange information and coordinate on an informal basis.
- Portland-area and Eugene-area utilities recently organized groups to explore coordinated marketing activities.

NEEA-facilitated efforts include:

- Facilitating a regional planning process for commercial lighting, which is looking at regional training and tool development
- Leveraging regional advantage in the NW Ductless Heat Pump Project to implement regional marketing campaigns together with manufacturer and utility partners to promote adoption of ductless heat pump technology.
- Working collectively with utility partners to identify energy efficient heat pump water heaters for northwest climates, and providing training and support to trade ally and retail partners to increase product adoption and awareness.
- Facilitating the development of a regional retail strategy by convening utility staff and other stakeholders in February 2012. A recommendation has been made to establish a regional retail coordination group. If regional concurrence on the formation of the group is achieved through NEEA's Regional Portfolio Advisory Committee, the group will begin formal work on coordinated retail program strategy and deployment in 2012/2013.
- Coordination on industrial Strategic Energy Management (SEM) issues, managed through the Northwest Industrial SEM Collaborative, which involves NEEA, BPA, and ETO, along with a host of other stakeholders in the Northwest and British Columbia.

Memorandum

October 1, 2012

TO: NEET Executive Committee

FROM: Elaine Blatt

SUBJECT: Update on NEET Action 5 -- Marketing

NEET Work Group #4 investigated opportunities for coordinated marketing efforts to increase public awareness of energy efficiency and recommended the creation of the Regional Marketing Coordinating Council (RMCC) to further evaluate existing research, conduct additional research as required, and use the research to develop a regional messaging platform and toolkit. The following progress measure was established for the RMCC:

Has the Regional Marketing Coordinating Council convened to complete a work plan and to identify/establish market channels, messages, and tools?

Update

About one year ago, NEEA, which has facilitated the work of the RMCC, reported to the NEET Executive Committee that the above measure had been met, and that not only had the RMCC completed a work plan, but work was already underway to develop a messaging and marketing toolkit for the region. Work has continued, specifically:

- Primary messaging research was completed in October 2011. Additional social media research was completed in January 2012.
- A messaging hierarchy based on the outcome of the research was completed in December 2011 and tested as part of the social media research.
- Creative collateral (ads, web banners, TV and radio scripts, etc.) was developed and made available to the region in July 2012. See Appendix A for examples of this material.
- An accompanying Style Guide was developed that describes the messaging research and how it works and provides instruction on how to use toolkit elements.
- The toolkit is being disseminated throughout the region, and a number of utilities are already using the toolkit elements, notably Clark PUD, Eugene Water and Energy Board, Douglas Electric Coop, and Cowlitz PUD. See Appendix B for examples from Clark PUD and Douglas Electric. Clark has adapted the materials by inserting its own customers into the templates. Douglas used the material “off the shelf.”
- Results of the messaging research are being used to inform development of other messaging material in the region; most notably, BPA has used the results of its messaging research to help inform development of Energy Independence and Security Act (EISA) messaging for its utility customers.

Early utility response to the toolkit materials has been positive. In addition to the early adopters, cited above, we know that the Style Guide has been downloaded nearly 2000 times, and that 50 individuals have accessed the toolkit elements on NEEA’s website. About 50 DVDs containing the Style Guide and toolkit elements have been distributed to utilities across the region. The

magazine, Ruralite, has a copy of the toolkit and has offered to help its utility advertisers adapt the toolkit ads.

Utilities may access the Style Guide and toolkit materials via NEEA's website at <http://neea.org/resource-center/marketing-toolkits>. A videotaped webinar will be available shortly that provides further information about the toolkit, and which can be accessed at the convenience of utility staff.

Next Steps

In addition to continuing to disseminate the first phase toolkit elements across the region, work has been initiated on two follow on efforts.

Additional toolkit development

Work has begun on the next phase of toolkit development. This phase will add the following elements:

Integrated PR model – generates a database of local, first-person portraits from across the region, and creates a regional mosaic of themes, trends and tips that link individual consumer experiences to broaden momentum. The integrated PR model also will include templates and tools that utilities can use to refresh and generate additional content over time. It also will include an outreach guide to extend the energy efficiency story across a diverse set of media.

Online Educational Platform – envisioned as a shared resource that residents will be able to access through their utility website and online resources. It also will be accessed directly using “goodplace” as a prefix to each utility’s URL (e.g. goodplace.utilitysitename.com) so that it always carries the utility identity and would be designed to lead visitors to their utility’s website.

These additional elements will be available later this year.

Evaluation

Preliminary work is beginning that will allow for evaluation of the toolkit. Evaluation will include: 1) measuring uptake of materials by the region’s utilities; and 2) efforts to evaluate the impact of the toolkit on utility customers and the impact of the toolkit on utility programs.

Ongoing work of the RMCC

The RMCC continues to meet and oversee all aspects of the messaging and toolkit project. Over the past year, membership of the RMCC has expanded to 32 members representing 11 utilities, NEEA, BPA, Energy Trust of Oregon, and PNGC Power. In addition, discussion is underway to engage members of the RMCC with other regional groups working on related issues (e.g., the regional retail coordination group highlighted in the update on Work Group #3) to facilitate further regional collaboration.

Appendix A – Toolkit Examples

It's a Good Place TO BE

I saved \$275 by getting rid of energy waste.

CLICK TO LEARN MORE

I gave him comfort by getting rid of energy waste.

- David, 28

It's a Good Place TO BE

Be part of the solution. Learn more at GoodPlace.UtilityWebsite.com

COMPANY LOGO PUBLIC UTILITIES

We took super simple steps to defeat energy waste.

It's a Good Place TO BE

"I TOOK STEPS TO STOP ENERGY WASTE AND IT FEELS GREAT."

- Rachel, 28

COMPANY LOGO

It's a Good Place TO BE

Cutting energy waste keeps us warm at night.

- John & Katherine

To us, heating stuff just feels right. And heating energy just makes us cozy. With a couple of simple steps we cut energy waste and improved the comfort of our upstairs bedrooms. It's nice to be part of the solution.

Don't let waste break up on you. Learn more at GoodPlace.UtilityWebsite.com



Appendix B – Toolkit Adaptation: Clark PUD

"I REALLY APPRECIATE THE RESOURCES WE'VE GOT IN THE NORTHWEST AND I DON'T WANT TO WASTE THEM."
- Bree, Vancouver

It's a Good Place TO BE

I take a lot of pride in updates we've made to our 1947 home to reduce energy waste - from rewiring, to replacing light bulbs and appliances to updating duct work and replacing the furnace. It's always a work in progress but this house is a good place to be.

Be part of the solution.
Learn more at clarkpublicutilities.com




"I REMIND MY MOM TO TURN OFF THE LIGHTS!"

It's a Good Place TO BE

I take a lot of pride in updates we've made to our 1947 home to reduce energy waste. It's always a work in progress but this house is a good place to be.

Be part of the solution.
Learn more at clarkpublicutilities.com




Say hello to your first Home Energy Report.

Learn about your home's energy use, see how you compare to your neighbors, and learn ways to reduce energy waste and lower your bill.

OP@WER



It's a Good Place TO BE

"We're always seeking simple low-cost steps to avoid wasting energy."

-Andreas, La Center

Clark Public Utilities



Don't let waste sneak up on you.
Learn more at clarkpublicutilities.com

Appendix B (continued) – Bus ad from Clark PUD campaign



Appendix B (continued) – examples from Douglas Electric Cooperative

I saved \$275 by getting rid of energy waste.
- Ashley, 28

It's a Good Place TO BE

Wasting anything just bugs me. So when I found out that energy waste was still hiding out in my home, I needed to do something about it. With just a few simple steps my bills are lower each month and my home is more efficient.

DOUGLAS
ELECTRIC COOPERATIVE

Don't let waste sneak up on you.
Learn more at www.douglaselectric.com

Cutting energy waste keeps us warm at night.
- John & Katherine

It's a Good Place TO BE

To us wasting stuff just feels icky. And wasting energy is costly. With a couple of simple steps, we cut energy waste and improved the energy efficiency in our home. It's nice to be part of the solution.

DOUGLAS
ELECTRIC COOPERATIVE

Don't let waste sneak up on you.
Learn more at www.douglaselectric.com



Pacific Northwest Center of Excellence for Clean Energy
"A Centralia College Partnership"
 September 2012

Background

The Pacific Northwest Center of Excellence for Clean Energy (PNCECE), headquartered at Centralia College in Washington State is a nationally recognized model providing strategic coordination for the energy industry's skilled workforce in the Pacific Northwest. Washington's Centers of Excellence are community colleges designated by the State Board for Community and Technical Colleges as statewide leaders in specialized workforce education and training for industries that help the state's economy grow. PNCECE's partnership includes: consumer-owned and investor-owned utilities; a federal power-marketing administration (the Bonneville Power Administration); organized labor; a national laboratory (Pacific Northwest National Laboratory); and numerous community colleges and universities located in the Pacific Northwest region represented by Washington, Oregon, Idaho, Montana and Utah.

Through a \$5 million grant, leveraged to \$12 million awarded in 2010 by the U.S. Department of Energy, the Washington State model is being replicated to serve the five partner states in the Pacific Northwest and establish energy training satellites to identify Smart Grid and energy efficiency training needs across select supply and demand-side energy occupations. The grant application was endorsed by four Governors, 11 U.S. Legislators representing Washington, Oregon and Idaho, and the Northwest Energy Efficiency Taskforce (NEET) Executive Board members representing the Pacific Northwest states. NEET's 2009 Energy Workforce report charged the Center of Excellence at Centralia College with leading a coordinated, strategic approach to clean energy workforce development for the region in which the Center would work with regional partners to: **1) define energy efficiency jobs, 2) establish skill standards and identify job classifications for use regionally, and 3) create a regional clearinghouse for energy efficiency job openings.**

U. S Department of Energy Grant timeline, August 1, 2010 through July 31, 2013

Major Accomplishments aligned with NEET Workgroup 5: Building the Energy Efficiency Workforce of the Future

1) Define energy efficiency jobs:

Career Lattice

WSU Extension Energy Program developed occupational skill profiles that form the foundation for an energy Career Lattice. The Career Lattice is intended to provide a roadmap for colleges that are designing programs in the energy field, for employers in the energy field to create training for incumbent workers, and for individual job seekers who are making plans to enter a career in energy. Idaho Power donated a Smart Grid city graphic that enhances the visualization of the interactive version. The Career Lattice can be found at <http://cleanenergyexcellence.org/occupations/>

Energy Efficiency Occupations Video

A new video Energy Efficiency Occupations: Careers that Make a Difference was produced and recently released. The video that was co-funded by the Dept of Energy Workforce Training Grant and the WA State Center of Excellence funding focuses on energy efficiency occupations that are presented through interviews and site visits with BPA, Avista, PSE and others. <http://cleanenergyexcellence.org/career-videos/>

2) Establish skill standards and identify job classifications for use regionally

Customer Service Representative Skill Standards

Deployment of smart technologies by utilities across the region gave rise to the discussion around how Customer Service Representatives (CSRs) now require a level of technical expertise not previously needed in the profession. WSU Extension Energy program was contracted to convene a focus group of CSRs, which resulted in the development of core

documents in the development of Utility Customer Service Representative Skill Standards.

<http://cleanenergyexcellence.org/skill-panel/energy-industry/>

3) Create a regional clearinghouse for energy efficiency job openings

Web Portal

The PNCECE website and training portal was developed and has been populated with clean energy research, skill standards, and career information, including career videos, a job board and an interactive Career Lattice to attract job seekers, educators/trainers, apprentices, and pre-apprentices. www.cleanenergyexcellence.org

Job Creation and New Hires

The new hire target over the three year timeframe of the project was **234** workers placed into employment. As of June 30, 2012, **185** trainees (79.0%) have found employment with 37 different organizations in occupations such as ground crew, substation operator apprentice, plant operator trainee, meter tech and hydro utility worker most of which are new IBEW members at an average starting wage of \$15-24 per hour.

Educational Collaboration

University Collaboration

PNCECE has created a network of state universities to support training and sharing of information about smart grid technologies across the region. An anchor university has been identified in each state that has experience with their local industry workforce needs, is able to share “best practices” at a regional level and has expertise relative to the Smart Grid. University collaborative includes:

WA- Washington State University Extension Energy Program, OR- Portland State University, ID-Idaho State University Energy Systems Technology Center, MT- Montana State University, UT- Utah Valley University

Energy Educators Institute

The institute, sponsored by the Edmonds Community College National Science Foundation Grant, “Meeting the Challenge of Energy Management in a Carbon-Constrained World,” supports the efforts of Edmonds and Cascadia community colleges, Pacific Northwest Center of Excellence for Clean Energy (PNCECE), and WSU’s Extension Energy Program to work with industry representatives to identify specific skill sets that will enhance energy curricula for degrees and certificates in energy management. The institute was attended by more than 50 college faculty and industry trainers as a pre-conference event at the 7th Annual Energy & Construction Best Practices Summit - which provided a rich opportunity for educators to learn and connect with more than 200 energy professionals. The forum included an overview of the goals and current efforts to identify specific teachable skills derived from industry needs.

Training Targets

The initial training target for the project was to reach **1,215** individuals during the three year timeline. Training completed August 1, 2010 through July 31, 2012 reached **4,171** individuals. This includes pre-apprenticeship, apprenticeship and incumbent worker courses, and High School students participating in hands-on learning sessions.

Boards and Committees:

Center of Excellence Advisory Board

Chaired by Pat McCarty, Generation Manager/Tacoma Power

Smart Grid Grant Governance Board

Chaired by Troy Nutter, Manager, Operational Training/Puget Sound Energy

Education Taskforce

Chaired by Ryan Fedie, Engineering Service Manager/Energy Efficiency/
Bonneville Power Administration

Curriculum Development Subcommittee

Co-chairs: Jay Pickett, Industry Lead, General Manager/Pend Oreille County PUD

Bob Topping, Education Lead, Director of Strategic Initiatives, RETC

Smart Grid Manufacturing Taskforce

Chaired by David Sorensen, Executive Director/WestCAMP, Inc

SMART GRID AND DEMAND RESPONSE

Update for the Northwest Energy Efficiency Taskforce

September 13, 2012

NEET ACTION #9:

Increase regional collaboration on programs that address smart grid, load management, distribution efficiency and conservation voltage regulation

A) SMART GRID

Accomplishments

The region is poised to go live with the largest smart grid demonstration project in the nation. The five-year project includes eleven utility participants -- now in its third year -- will leave behind \$105 million in installed assets at the utility level. These smart meters, energy management systems, demand response controllers and appliances, sensors, and other technologies will help enhance reliability and wind integration, and give consumers more information and choices. This is collaboration among all the participants, testing 90,000 assets, across 68 asset system types.

The project grew out of a BPA and PNNL combined effort to advance the goals of the Olympic Peninsula Smart Grid project, which tested price responsiveness for residential and commercial loads at a relatively small scale. The project was awarded in 2009 by the Department of Energy, providing ARRA funds for half of the \$178M total in funding, and Battelle Memorial Institute (who operates PNNL) is the prime contractor. This project combines the local goals of those eleven utilities in testing their installed assets, along with a common “transactive control signal” that will test how we can connect the assets and optimize the power system via a simulated price signal. The signal is set to go live in October 2012.

The project was designed to be extensive in its reach:

- Geographically diverse, from the Puget Sound to Jackson Hole, Wyoming, with both rural and urban footprints.
- Test the widest array of smart grid devices – including smart meters, voltage optimization, demand response, automated distribution, microgrids, large scale electric batteries, distributed generation, small renewable (PV and wind), and electric vehicles.
- Utility diverse, including large and small, with three IOU’s and eight COU’s.
- Include leading industrial partners on a collaborative, cost share basis – for example, IBM, Alstom Grid, and 3Tier.

The project has a strong public communications component, leveraging outstanding public affairs staff at utilities. While there are central themes and objectives, the project

has found success in each utility carefully managing those themes for their local customers. The efforts and focus at Flathead Electric, for example, might be a bit different than those at Portland General Electric.

There are four main goals of the project:

- Develop a two way (transactive control) communications system
- Validate standards for cyber security and interoperability
- Develop methods to help integrate renewables
- Create the cost-benefit analysis to validate the value of Smart Grid technologies

It is this last major goal in which BPA is most involved. We hope to validate these new smart grid technologies and inform business cases so utilities can make wise decisions and optimize Smart Grid related investments. This “regional business case” is a major focus for BPA, and working with Navigant Consulting, we have developed a cost/benefit analysis and computational model and are moving forward with development of a data-driven business case.

There are 6 major benefit areas (e.g. reliability, energy efficiency, etc) that are mapped to the technology and systems that are deployed in the project. Early results for two technologies -- synchrophasor measurement units and voltage optimization -- are promising, and the next major focus area will be demand response. With the “go live” immediately pending, we are anticipating a flow of data and project analysis that will further enhance this business model, which we plan to share with utilities in the region.

Challenges

The Pacific Northwest Smart Grid Demonstration will test a transactive control concept as a means to optimize resources on the grid. For longer term adoption of the system, the region will need to consider:

- How to operate such a system without a market in the PNW?
- How to determine prices and provide pricing transparency with a complex set of inputs to an incentive signal?
- How to manage and provide governance over a signal across balancing authorities and the region?
- What the cost/benefit is of technology investment is, and who will pay for it?
- How to implement distributed systems that are cyber-secure and meet NERC and FERC reliability requirements?
- How such a system would assist in managing the integration of renewables such as wind?

Additionally, BPA recognizes that a significant amount of data (two years of data across 11 utilities) will need to be summarized from the Demonstration, in order to support

creation of a business case.

Next Steps

As the PNW Smart Grid Demonstration goes live, BPA will coordinate with Battelle to gather results from the over 90+ use cases of the project. BPA will populate a regional base case with these results (and from other demonstrations, pilots, and studies around the country). This business case will help inform the region about the cost effectiveness of smart grid technologies and systems.

Additionally, the region will begin to evaluate the transactive control system - as results of the two-year test period become known - and its applicability after 2015 when the Demonstration is slated to conclude. Criteria for evaluation are expected to include operational feasibility, cost/benefit, governance, and regional market and regulatory structure and best alternatives.

BPA will continue to execute an outreach plan focused on Smart Grid and Demand Response (see below) that involves communicating with utilities and utility groups, wind producers, regulatory bodies, public interest groups, planning entities, educational institutions and other Northwest stakeholders

B) DEMAND RESPONSE (LOAD MANAGEMENT)

Accomplishments

BPA and our utility partners are finishing up four years of testing, pilots, modeling, and analysis. During this time, BPA has collaborated on pilots with 16 different Northwest utilities. The testing has included more than 10 asset types at over 2000 end-consumer locations, with up to 35MW of load moving at a given time. We've tested many different technologies and demand response uses including:

- Commercial and public building load control
- Residential and commercial space heating energy storage
- Water heating energy storage and load control
- Industrial process load control and energy storage
- Large farm water management system load control and storage
- Small-scale battery energy storage
- Load increase using aquifer recharge opportunities

Highlights:

- Through our energy storage pilot, we have successfully connected a wind signal to demand response assets

- We have developed a simple utility DR/energy storage business case tool that has been reviewed with nine utilities, and gives a means to project ROI and payback on DR investments
- We tested a dispatch platform to communicate DR requests to a large industrial load
- Working with our utility partner, we've successfully dispatched an irrigation pump load in the irrigation district during light load hours, which helped them recharge an aquifer, and provided a proof of concept technology for helping with over generation scenarios.
- We have executed an **outreach plan focused on increasing regional demand response knowledge**. Activities have included:
 - BPA hosted Demand Response utility cross-sharing sessions, held bi-annually. The most recent session (May 2012) was well-attended, and included presentations by Mason County PUD #3, The City of Port Angeles, Lower Valley Energy, Emerald PUD, and Central Electric Cooperative.
 - Held meetings about Demand Response with groups including:
 - Northwest Power and Conservation Council (NWPPCC)
 - Idaho Consumer-owned Utilities Association (ICUA)
 - Public Power Council (PPC)
 - Northwest Requirements Utilities (NRU)
 - Northwest Public Power Association (NWPPA)
 - Have actively participated in the NWPPCC sponsored DR sharing forum, known as the PNDRP. We presented most recently at the last session in February 2012
 - Engaged educational institutions via speaking engagements or pilot participation including Montana State University, the University of Washington, and Portland State University.

What we have learned:

- DR is cost-effective, available in predictable and reliable quantities and time periods and available from many end uses
- DR appears to cost less than other alternatives such as pump storage and electric batteries, when addressing BPA needs, and this needs to be verified at a commercial scale.
- DR has flexibility to address multiple regional needs
 - DR can help address utility peaks and distribution system constraints, wholesale system peaks, balancing reserves, over-generation and non-wires opportunities
 - Potentially provides additional revenue stream for utilities

Challenges

Demand response has had slow adoption in the Pacific Northwest, particularly in public power. These reasons include:

- Less acute capacity shortages = less need for new resources
- Lower power and demand rates = longer payback period when compared to current costs
- Fewer high-visibility outages = less need for immediate solutions
- Public utilities rely on BPA for capacity = no reason to self-supply capacity
- Limited application of time-of-use rates = less opportunity to benefit from peak/non-peak price differential
- Less extreme summer, winter, and daily peaks = less need for demand management

However, as it becomes apparent that there may be a shortage in traditional capacity resources (i.e. hydro) in the years ahead and as the economic incentives change for many utilities, we are seeing numerous Northwest utilities pursuing/considering the use of Demand Response.

Next Steps

BPA is now starting a round of **Technology Innovation energy storage/demand response** tests involving:

- New technology with electric water heaters
- Heat pump water heaters
- Data centers
- Electric batteries

We are testing how to optimize energy efficiency with energy storage and demand response and we are seeking to determine if energy storage can help address capacity constraints and help provide overall management of the grid.

The tests represent a shift in the typical power system paradigm; rather than follow load with generation, we are seeking to manage load to optimize generation.

To provide learning opportunities for BPA and the region, BPA is evaluating the potential of moving from proof-of-concept pilots to commercial demonstration. Objectives for these potential commercial demonstration projects include:

- Evaluate a portfolio of DR projects to address both utility and BPA needs
- Achieve a scale that is operationally meaningful (i.e., goes beyond “noise in the system”)

- Include a blend of uses to address multiple utility and BPA needs
- Enable regional DR experience and learning
 - Learn/evaluate prioritization, business processes, reporting and cost benefit
 - Ensure dispatchability by participating utilities, BPA Power and BPA Transmission
 - Evaluate infrastructure and operations impacts
 - Test geographic-focused DR solutions and DR integration with non-wires initiatives
- Assess multiple acquisition methods
 - Blend of commercial aggregators, utility as aggregator and possibly trade ally options
- Communicate with stakeholders throughout
 - Customer utilities, wind producers, utility groups, other regions, NPPC/PNWDRP, regional IOUs, etc.

2012 NEET Update

Distribution System Efficiency

October 1, 2012

NEET Action

Enable the acquisition of Voltage Optimization (VO) distribution system efficiency through the development of simplified measurement and verification protocols and increased awareness.

Accomplishments

In January 2009, BPA formed a Distribution System Efficiency (DSEI) technical workgroup in support of the NEET workgroup. The technical workgroup established minimum system performance criteria needed for RTF approval of protocols. Following RTF approval of Simplified VO M&V Protocols in May 2010, BPA has offered VO measures combining system improvements and voltage reduction under the Energy Smart Utility Efficiency (ESUE) program. Since 2010, ESUE assessments have been completed at 14 utilities.

In 2009, BPA hosted six DSEI workshops. In 2011 BPA and NWPPA partnered to conduct four technical VO training sessions, and ESUE was presented at NWPPA's annual Engineers and Operators Conference.

Challenges

Voltage Optimization (VO) offers low-cost (\$22.70/MWh) energy efficiency to the region. While the regional cost of VO energy efficiency is lower than other measures, utilities haven't widely adopted VO because of a mismatch between costs and benefits. Utilities must finance and implement the project while end users receive the majority of the benefit.

BPA is not on pace to meet the 6th Power Plan's five-year distribution system efficiency target of 20 aMW because the VO projects are financially unattractive to most utilities. During the five-year period, BPA expects to acquire 3-5 aMW energy savings from distribution system efficiency.

Of the 14 utilities with completed ESUE studies, only two are implementing the suggested improvements. The main barriers are cost and engineering resource requirements.

Cost Barrier

The average cost to implement VO per substation is \$293,000. Unfortunately, most expenses can not be avoided. Setting minimum performance thresholds ensured the relationship between voltage drop and energy saved is consistent between multiple distribution systems. The DSEI technical workgroup established minimum system performance thresholds based on input from utility engineers and industry standards.

Utilities decide not to implement VO because they do not feel that they will be able to recover the costs of the required system improvements. Utilities' financial analysis of distribution system energy efficiency projects is different than the regional analysis because utilities incur all the cost and only consider the benefit from energy saved on their distribution system. Of the energy saved by VO, 14% is from distribution system loss reduction and 86% is saved behind the customer's meter.



Engineering Resource Barrier

VO requires significant utility labor for design and construction work. VO support is added to the Engineering Department's normal workload. The Engineering Department requirements to implement a VO project include:

1. Update GIS maps and power flow models.
2. Data collection and data integration (cause delays in project development).
 - a. Feeder-level meter installation
 - b. Integrating feeder-level data in SCADA.
3. Design recommended system improvements. Utilities make design decisions on:
 - a. Reconductoring
 - b. Regulators
 - c. Tap changes
 - d. Capacitors
 - e. Balancing phases
4. Scheduling and implementing system improvements.

Summary of Decision Factors

Utilities implement VO because of:

1. Utilities facing **Tier II rate pressure**.
2. **Synergies** with previously planned substation and feeder upgrades.

Utilities don't implement VO because:

1. The majority (86%) of energy is saved behind the customer meter (**lost revenue**).
2. **Lack of Tier II rate pressure**
3. **High project cost**. Utilities lack capital budget for required system improvement.
4. **Loss revenue concerns**.
5. Distribution efficiency incentives compete with other efficiency programs for utilities' **fixed conservation budgets**.
6. Efficiency is seen as "competing" with **safety and reliability**.
7. Utility has limited **engineering labor**

What is BPA doing?

- **Assess opportunities**. In FY2012 and FY2013, 5-7 technical assessments annually at Washington I-937 utilities, utilities with Tier II rate pressure, and utilities planning distribution system improvements.
- **Increase awareness** for distribution system efficiency within utilities' conservation and engineering departments through case studies, regional technical training and smaller re-conductoring or transformer energy efficiency projects. The purpose of increased awareness is early notification of distribution system improvement projects.
- **Influence 7th Power Plan distribution system efficiency targets** by providing BPA's assessment and market adoption information.
- **Collaborate with the Regional Technical Forum's (RTF's) review of CVR protocols**. As utilities consider "smart grid" approaches to VO that do not fit the Simplified VO Protocols, the region needs guidelines for measurement and verification.