

Identifying the Elements of Transformation



2015 PNUCC ANNUAL REPORT



PNUCC has played a pivotal role in the region's electric utility industry for nearly 70 years.

As a voluntary, non-profit organization, PNUCC is a forum for bringing the power of good ideas to bear on a range of issues that affect electricity providers and large industrial users in the Northwest. Through PNUCC members have the opportunity to listen and learn from each other and help shape evolving regional policies.



Chairman's Message

"Identifying the Elements of Transformation" is an apt theme for this year's recap of PNUCC's activities. Transformation is happening in how we assure the adequate and low-cost electricity supply that our end-users depend on in their daily endeavors. We are also seeing a transition of industry leadership as the reins are being turned over at both the regional level and at PNUCC.

First, I want to salute Dick Adams, who retired this past year after guiding PNUCC for 35 years. His work in transforming this organization into an influential body has been nothing short of remarkable. I know I'm not alone in expressing my gratitude for his intellectual curiosity and regional leadership.

Thankfully, PNUCC is fortunate to have a seamless transition in leadership with Shauna McReynolds as our new executive director. She has a wealth of knowledge and experience ensuring that our organization's voice is heard, and that our membership is informed and engaged. We're excited to see Shauna's personal touch on our work going forward.

On the issues for the electric power industry, the future presents a lot of questions about how utilities will meet their customers' needs while maintaining acceptable value and satisfactory reliability. PNUCC continues to provide valuable insight and education to make certain that solutions for addressing the region's power supply challenges are grounded in physical and economic reality while protecting the environment for future generations.

We've seen a major transition in how the region embraces energy efficiency. More and more, it is the end user who is making the choice to use energy wisely... as it should be. The market has succeeded in fostering dramatic improvements in technology and consumer education and that should be reflected in policymaking going forward.

As I personally move on to the next chapter in my life I will hand over the chairman's gavel in January to very capable hands. I wish you all the best.

Cheers!

John Prescott

Chairman of the Board



Executive Director's Message

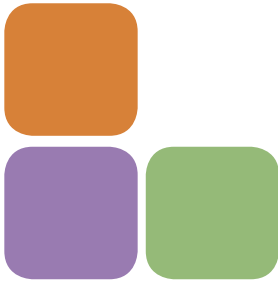
PNUCC's mission of "bringing the power of good ideas together" is as fitting today as it was when it was first adopted. We serve our members by addressing real-world issues with fresh, credible perspectives focused on ensuring a plentiful power supply for Northwest consumers. We are a catalyst for study, education and information grounded in practical application. In 2015, we proved the success of this formula once again. And I must say I am honored to have the opportunity to carry on the tradition.

PNUCC had an incredibly fruitful year spurred by the enthusiasm of the Board, technical committee members and the guests we've invited to the PNUCC forum. We've kept abreast of new technologies, emerging markets, rate redesign and impending carbon mandates. Members are pressing forward; reworking their integrated resource plans and examining their relationships with their customers. All while system operators are carefully navigating these shifting market realities and integrating renewable resources and distributed technologies to keep the power flowing.

Looking ahead, PNUCC will continue to focus on the most relevant issues as we consider opportunities to broaden membership, embracing the transformation and strengthening our voice. Our industry partners bring an important point of view, and frankly, a great deal of political savvy.

As his chairmanship comes to a close, we owe a big thank you to Chairman John Prescott. This year's Board review of PNUCC's strategic direction provided strong validation and unique insights for the future of the organization. The value of this endeavor is magnified by John's dedicated leadership and thoughtful guidance, serving us well in the years to come.

Sincerely,
Shauna McReynolds
Executive Director



Understanding the Elements

Our region has all the elements required to transition toward a new energy landscape. We enjoy bountiful, clean hydropower, a reliable natural gas infrastructure, robust conservation programs, and an ever-growing portfolio of renewable generation and new technologies. Most of all, we have a healthy spirit of collaboration. PNUCC's members share and explore real-world challenges, and devise innovative solutions.

This past year we've made great strides in addressing critical business issues, crystallizing our understanding of the implications of new state and federal mandates, and distilling our thoughts on future load growth and options for meeting peak demand.

PNUCC's long-term planning expertise produced valuable insight into distributed solar and the future development of the region's natural gas infrastructure. The PNUCC forum gave us entrée to what is happening in the emerging California Energy Imbalance Market. We also brought in experts to help educate us about the shifting political landscape, technological advancements, scientific innovations, and developing markets and opportunities. And we've gained new understanding from utility and industry leaders who were willing to share what they've learned with us.

Solar Energy Momentum

The growing interest in solar generation in the region represents a potentially significant transition for utilities, particularly in the way the industry values business with customers who are partially producing their own energy. As this solar application grows in popularity, planners are interested in the benefits it brings to the system.

The PNUCC System Planning Committee continued their productive track record this year by quantifying and testing the value of distributed solar generation to the power grid. Their report, *The Value of Northwest Distributed Solar*, took a microscope to customer-owned solar power, discussing its various value components, including energy, capacity and integration. The authors noted that distributed solar is becoming more affordable for customers, especially where aggressive solar incentives are made available, and that its value to utilities varies significantly depending on geographic location. The eastern part of the region has greater solar exposure compared to most of the communities west of the Cascades.

Creating a Sustainable Formula

A spirit of engagement and cooperation facilitated productive exchanges with Northwest Power and Conservation Council members as they sat down with the PNUCC Board during the year to report on their progress in compiling the draft Seventh Northwest Power Plan.

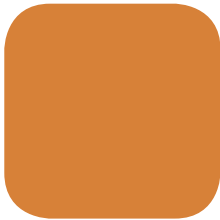
PNUCC members' engagement in the countless Council advisory groups and gatherings this last year is leading the Council to lay out several options for meeting system demand for the next 20 years.

We agree that old strategies need reformulating. With flattening loads, environmental mandates and the planned closure of coal generators, the Seventh Plan should map out strategies that are consistent with where we see utilities headed in their individual integrated resource plans. Maximizing energy efficiency savings and seizing opportunities to utilize demand response programs to meet needs during peak periods are at the heart of the formula. PNUCC is pressing the Council to be realistic in what is achievable. And the Seventh Plan analysis demonstrates that new generation from natural gas power plants is a vital element for some companies to satisfy future needs.

Demand Response—An Empirical Review

Does the region have all the pieces to put together enough demand response to meet future capacity needs? PNUCC's System Planning Committee tallied up demand response throughout the region, which currently totals about 850 MW of summer and 400 MW of winter demand response. Much of the current demand response is from irrigation customers. In the Seventh Power Plan, the Council is decidedly bullish about growing demand response as a lower-cost option to building new generation.

Where the views diverge on demand response isn't in establishing effective programs—it's on the cost and availability. PNUCC members have been educating the Council that demand response, while successful in reducing peak demand, is one of the more challenging resources in their portfolios. For example, industrial customers producing high-tech goods would require large payments to interrupt production—if they would consider it at all. Even residential and commercial customers will become accustomed to compensation for changing their energy usage. Going forward, expect a healthy amount of discussion at PNUCC about the challenges.



PNUCC members receive regular reports on the Northwest Power and Conservation Council meetings to provide us with useful data on important regional topics.

CH4: A Critical Compound

In keeping with PNUCC's mission to test and study assumptions about each of the elements contributing to our region's energy universe, our Power & Natural Gas Planning Taskforce completed a report, *The Northwest Gas Landscape—Looking Forward*. As a joint effort of PNUCC and the Northwest Gas Association, taskforce members examined the region's natural gas supply and demand trends. Their report educated members on what new infrastructure options might be available, the potential for new gas users in the Northwest, and how different types of gas transportation options might impact gas supply planning for utilities.

Bottom line—new large gas users may be in the driver's seat when it comes to deciding future infrastructure builds, leaving existing users, including utilities, to adapt to new infrastructure and gas supply strategies.

Battery Storage Lab

PNUCC continued to provide a learning laboratory for testing new, utility-scale technologies in 2015. Less than two years ago, the Board was introduced to the concept of a battery storage system at the utility when Snohomish PUD shared their project—that at the time was in its conceptual stage. Today, the PUD's first of two battery storage systems is online. With regular updates PNUCC members are learning first-hand how this technology is designed to improve reliability and help integrate renewable energy sources. Back at their utilities, members are armed with information on how this battery system provides standard interfaces between equipment components to bring more choices for utilities, reduce projects' complexity and promise to lower costs.

Monitoring EPA's Clean Power Plan

In September, the Environmental Protection Agency announced its final rule of the Clean Power Plan under section 111d of the Clean Air Act. The 1,500-plus page rule establishes different target emission rates for each state based on regional variations in generation mix. An initial read revealed that Idaho, Oregon and Washington's targets should be manageable and that Montana has a more challenging standard to achieve.

To better gauge the impacts of the Clean Power Plan on the ability of Northwest utilities to meet their customers' needs, PNUCC's technical experts queried key EPA staff on how to best interpret the rule. In addition, the Board met with Montana, Oregon and Washington staffers tasked with creating their state plans. They shared their thoughts for developing a compliance plan, and identified some anticipated areas of concern.

PNUCC's experts are summing up our findings in a briefing paper to help inform members as they engage with the states to develop plans for compliance in 2016. The paper provides an overview of our current understanding of the Clean Power Plan and what it will mean for each state going forward.

**PNUCC
continues
to provide
a learning
laboratory.**

A Supply and Demand Litmus Test

Every year, PNUCC's experts put on their proverbial lab coats to pour over data and variables in order to formulate the region's load and demand picture. The *Northwest Regional Forecast* provides a real-world litmus test for the theories and wish lists of policymakers and energy stakeholders. By its nature, a forecast is a hypothesis of what may occur. This work is based on data acquired from utilities' independent research and findings reflected in their own integrated resource plans.

PNUCC's *2015 Forecast* continued to show flattening load growth for the region, coupled with increasing intermittent power supplies. Within the planning horizon out to 2025, the Boardman Coal Plant is expected to close. The result: a projection that confirms the need for additional resources to meet peak needs during the winter and, to a growing degree, the summer.


Synthesizing Rate Design

The success of utility conservation programs and the anticipated growth in customer-side generation, mostly solar panels, are changing customer needs from their local utility and have prompted many utilities to reexamine their relationship with their customers. Earlier this year, two PNUCC members shared how they were able to shift their rates and improve cost recovery.

EWEB reported that their utility has achieved a more than 90 percent renewable resource portfolio, while maintaining their long-term commitment to conservation. This was accomplished in the face of flat and declining sales for more than 10 years. Low-income, high-consumption customers have seen the most benefit from the changes, with very little pushback.

We heard a similar result in the recap of Grays Harbor PUD's experience. PNUCC members took notes on how Grays Harbor PUD stood out with its high, fixed charge and very low, first-tier, kilowatt-hour rate for residential customers. Their unique situation includes thousands of seasonal customers that had to be factored into their equation. We learned that with strategic adjustments the PUD was able to ensure the costs of services were sufficiently recovered, while encouraging conservation and maintaining a healthy relationship with their customers.

These utilities succeeded because they brought their customers along with them on the transition, explaining what was occurring and the impact it would have on their individual bills.



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California—A Change Catalyst

One of PNUCC's most talked-about topics of the year was the changing California power industry and what it could mean for the Pacific Northwest. Regular updates on California's energy legislative agenda, governor's initiatives and activities with the public utilities agencies filled our Board agendas.

Experts were brought in to discuss the state's evolving energy picture. They addressed carbon restrictions, the potential impact of electric vehicles, rooftop solar ratemaking challenges, and the Energy Imbalance Market (EIM).

PNUCC members learned how California is looking to achieve carbon targets of 80 percent below 1990 carbon emissions levels by 2050. According to the Northern California Power Agency, the state is taking an all-of-the-above approach to meeting the goal, which calls for more renewables for the electric sector, and the electrification of other sectors, such as automobiles. Experts estimate that California would need around seven million electric vehicles to hit its targets.

The elements of change in the Golden State will be an entire field of study for PNUCC and the Northwest in 2016.

The EIM Chain Reaction

Keeping members informed of evolving conditions in the marketplace is an important PNUCC function. The past year, the Board hosted a group tasked with creating an effective governance structure for the California ISO Energy Imbalance Market.

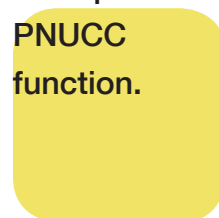
They offered the view that an EIM makes effective use of resources around the West, and its automated dispatch resolves imbalance, avoids congestion and ultimately enhances system reliability. In addition, there are no costs to participating in or exiting this market.

PNUCC will continue to be a place to share what is known about the expanding EIM and to discuss how this market could shape our connection with California.

Compounding Treaty Chemistry

Much of 2015 has been a waiting game while the Administration studied the US Entity's draft Recommendation regarding the future of the Columbia River Treaty. In late summer signals from D.C. indicated that the Administration is getting closer to taking steps toward discussions with the Canadian government regarding the Treaty. PNUCC has been supporting efforts to encourage the US State Department to move forward and to provide them information about the costs and benefits of potential changes in the Treaty, changes that would correct the imbalance between Canada and the United States in the sharing of downstream power generation benefits.

Keeping members informed of evolving conditions in the marketplace is an important PNUCC function.





Our Mission

Bringing the power of good ideas together to assist PNUCC members in fulfilling their company missions in this ever-changing electric industry.

PNUCC’s mission is accomplished by providing the:

- Searchlight for changes that will have a significant impact on how our industry does business in the future
- Catalyst for examining issues that impact a significant portion of its membership
- Forum for dialogue on policy issues of regional importance
- Hub for technical analysis and data on vital Northwest power industry issues
- Nexus for educating the region on the realities of the current and future challenges of the electric power industry

Our Staff

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Also, a sincere thank you to **Dick Adams** for his 35 years of leadership, dedicated service and collaborative spirit that defines PNUCC today. Retired May 2015.

2015 Budget

Staff Expenses	\$498,600
Overhead Expenses ¹	171,000
Outside Services (Contractors)	
Consultants—General	5,000
System Planning	10,000
Communication Initiative	20,000
BPA-Customer Collaborative ²	18,000
Council Meeting Report ³	21,000
TOTAL	\$743,600

¹ Reflects net costs. Includes income from NW RiverPartners.

² Reflects net costs. Includes income from Collaborative members.

³ Reflects net costs. Includes cost-sharing with NWPCC.



2015 Board of Directors

John Prescott	PNGC Power	<i>Chairman</i>
Lisa Grow	Idaho Power	<i>1st Vice-Chair/Treasurer</i>
Jack Speer	Alcoa Inc.	<i>2nd Vice-Chair</i>
Shauna McReynolds	PNUCC	<i>Secretary</i>
Franco Albi	Portland General Electric	
Chad Bartram	Benton PUD	
Scott Bolton	Pacific Power	
Kelcey Brown	PacifiCorp	
John Bushnell	NorthWestern Energy	
Tom DeBoer	Puget Sound Energy	
Steve Eldrige	Umatilla Electric Cooperative	
Roger Gray	Eugene Water & Electric Board	
John Hines	NorthWestern Energy	
Mark Johnson	Flathead Electric Cooperative	
Michael Jones	Seattle City Light	
Larry La Bolle	Avista Corp.	
Tim Nies	Franklin PUD	
Maria Pope	Portland General Electric	
Chris Robinson	Tacoma Power	
Jason Thackston	Avista Utilities	
Tony Webb	Grant County PUD	
Josh Wilund	Alcoa Inc.	

Committee Leaders

Communications Committee Chair

Jeff Beaman, Central Electric Cooperative

Power and Natural Gas Planning Task Force

Phillip Popoff, Puget Sound Energy

System Planning Committee Chair

Phillip Popoff, Puget Sound Energy

2015 PNUCC Members

Alcoa Inc.	Grays Harbor PUD
Ashland Municipal Electric Utility	Idaho Falls Power
Avista Utilities	Idaho Power
Benton PUD	Lane Electric Cooperative
Benton Rural Electric Association	Lewis County PUD
Blachly-Lane Electric Cooperative	Lincoln Electric Cooperative
Central Electric Cooperative	Northern Lights Inc.
Chelan County PUD	NorthWestern Energy
City of Cheney Light Department	Okanogan Co. Electric Cooperative
City of Sumas	Pacific Power
Clark Public Utilities	Pend Oreille County PUD
Clatskanie PUD	PNGC Power
Clearwater Power Co.	Portland General Electric
Consumers Power Inc.	Puget Sound Energy
Coos-Curry Electric Cooperative	Raft River Rural Electric Cooperative
Cowlitz County PUD	Seattle City Light
Douglas Electric Cooperative	Snohomish County PUD
Emerald People's Utility District	Tacoma Power
Eugene Water & Electric Board	Tillamook PUD
Fall River Rural Electric Cooperative	Umatilla Electric Cooperative
Flathead Electric Cooperative	Vera Water & Power
Forest Grove Light & Power	Wells Rural Electric Company
Franklin PUD	West Oregon Electric Cooperative
Grant County PUD	Whatcom County PUD



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