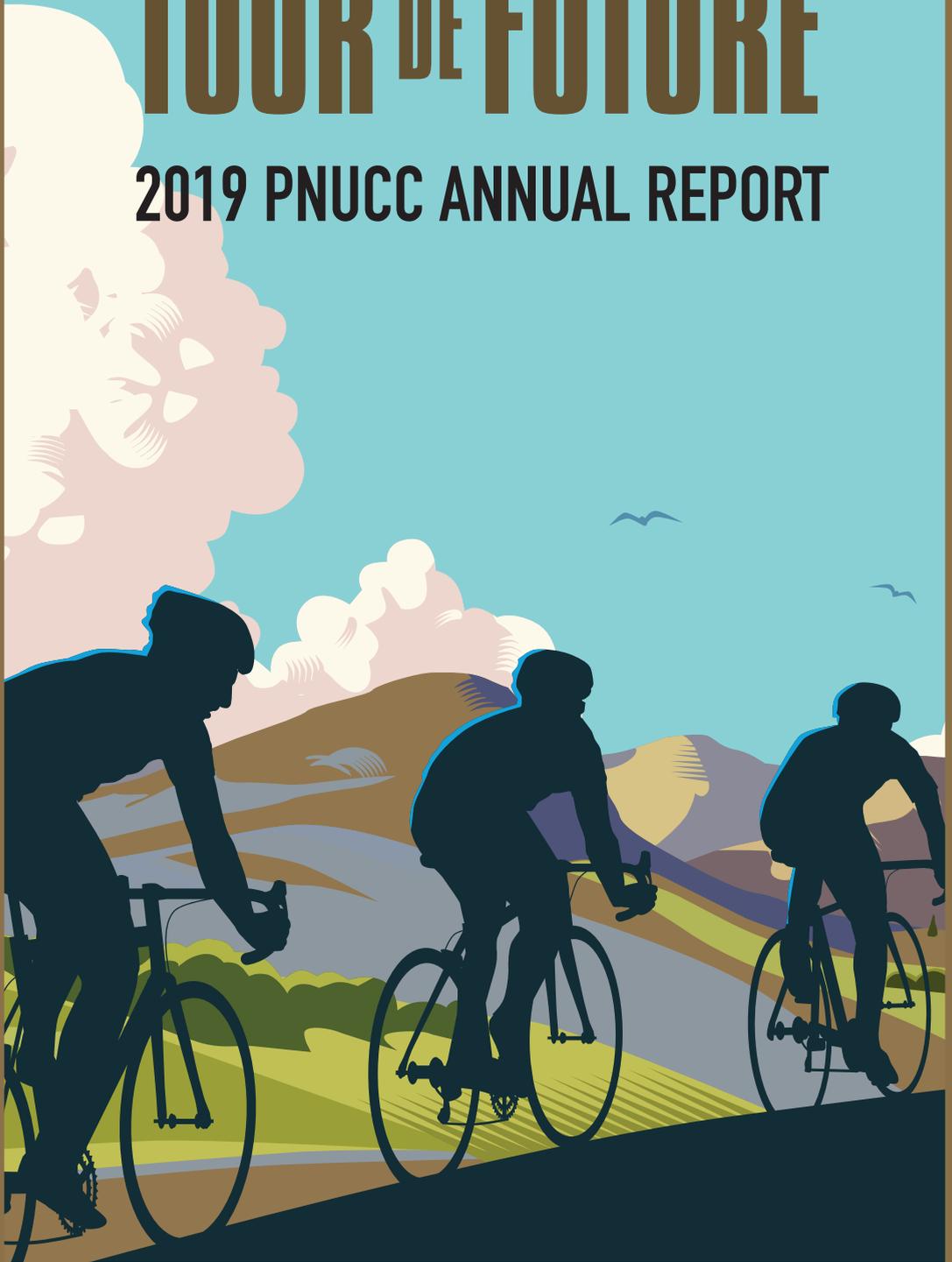


TOUR DE FUTURE

2019 PNUCC ANNUAL REPORT



CHAIR'S MESSAGE

If this year's annual report were to be found in a time capsule 50 years from now, what would be the race recap of PNUCC and the Pacific Northwest's utility providers in 2019? On the surface, it would seem familiar to previous years, and reflect on the continued accomplishment of our common core mission to deliver safe, affordable and reliable electricity to our communities.

At PNUCC we talk a lot about this mission and how our members work diligently to meet their customers' needs. And yet today, fulfilling our mission is just expected. Our complex business has become basic. Simply providing safe, affordable and reliable electricity is now the time trial for the bigger race. Success lies in understanding that our customers, our stakeholders and our world are demanding more.

Our customer and operational landscape is changing rapidly in ways both large and small. We are seeing the Northwest power sector as interconnected and engaged like never before. From the growth of the Western Energy Imbalance Market, to the merging of transmission planning organizations, to deeper conversations about the fundamental adequacy of our regional energy supplies, PNUCC members are actively identifying and solving the issues of our day. Often in groundbreaking, collaborative ways.

We see the rapid shifts in customer expectations. Added public policies and constraints are being placed on our energy system due to more and more localized climate change related policymaking. Each individual demand can have wide-ranging impacts. And again, we are adapting and collaborating to solve for these changes.

Our members are engaged in customer-centric energy solutions that showcase emerging technologies, new business models and creative leadership that one might associate more with Silicon Valley tech companies than with electric utilities. But that innovation is happening here and within our PNUCC community.

Our members are leading energy transformation while reducing their impacts on the environment. Whether finding new ways to lower impacts on wildlife or lowering emissions, in 2019 the Northwest energy system is getting cleaner and will undoubtedly be far more so 50 years from now.

At PNUCC, we see these changes and we examine them. We talk to each other about best practices and we bring in experts to further educate us. PNUCC members are constantly learning and improving. Fifty years from now many will look back at our work together in 2019 and see that we embraced the change and uncertainty of our time. And we did it together, through our relationships and our spirit of collaboration.

Never underestimate the power of a community to solve challenges. PNUCC stands as that strong community. Thank you all for your participation, your wisdom, and engagement in this community.

Scott D. Bolton

PNUCC Chair

EXECUTIVE DIRECTOR'S MESSAGE

For almost 75 years, PNUCC has been the peloton, a place where we work collaboratively to *Bring the Power of Good Ideas Together*. Our diverse mix of public and investor-owned utilities, industry partners and experts keep a close watch on the region's electric power industry.

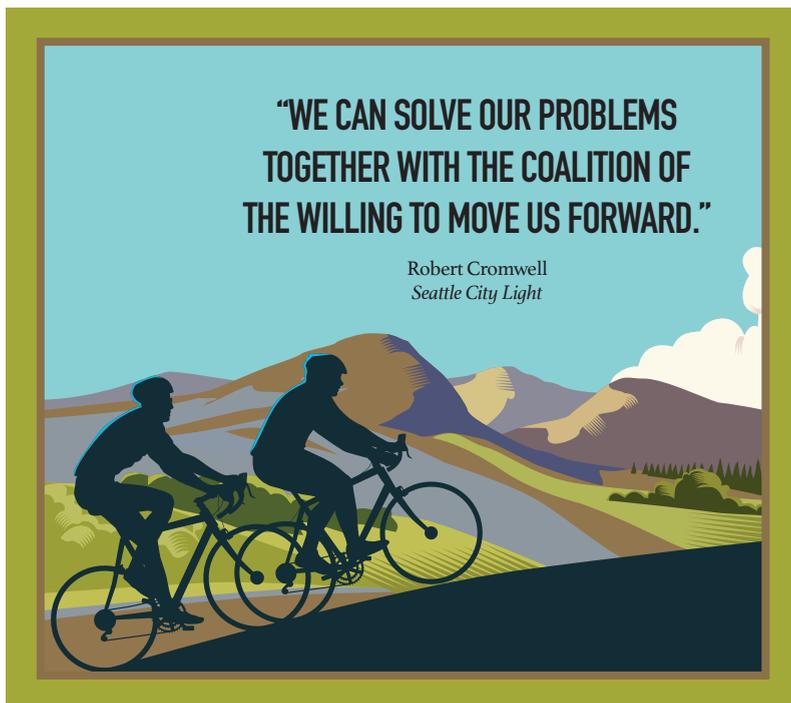
This year's *Tour de Future* finds PNUCC members picking up the pace on this challenging and complex course. The value of regional collaboration is especially elevated now with the spirit of team heartily demonstrated stage after stage in 2019. Sure, there will continue to be tough, steep stages where we struggle to make the climb, but we've proven time and again it can be done.

It is with deep appreciation that I thank the PNUCC Board of Directors, members, technical committee participants and staff for their innovation and tenacity to push through whatever they are confronted with.

In this annual report, we explore a few of the trends, actions and issues that occupied our time and energy on this past year's course.

Shauna McReynolds

Executive Director



BREAKING AWAY FROM CARBON

Pacific Northwest utilities continue their race to break away from carbon emissions, some even surpassing current carbon reduction goals. High levels of renewable generation and the expected steady pace of coal plant retirements in the next several years provide the backdrop for the decarbonization race. Anchored by new policy and legislative activity, members are working to understand where the next opportunity might be and how PNUCC can add to existing efforts.

Fueling the conversation was the idea of electrification. With this in mind, we examined moving from gasoline to electric powered vehicles and home-heating systems now powered by natural gas. To help guide the discussions PNUCC and the Northwest Gas Association teamed up and, working through the System Planning Committee and Power and Natural Gas Planning Taskforce, produced *A Discussion on Electrifying Light Duty Vehicles and Natural Gas Heating in the Northwest*. This report provides data for utility use in examining load and carbon impacts of a shift in the transportation sector to electric vehicles. It also provides data for utility use in evaluating the impacts of electrification of natural gas home heating.

Utilities are also leaning into the curves and setting the pace with projects like Idaho Power's recently launched *Clean Today, Cleaner Tomorrow* initiative. By embracing the value of the region's carbon free resources ahead of any policy mandate, they are showcasing what is already being done to mitigate the impact of carbon, and setting themselves and the region up to be serious contenders in the decarbonization of the industry.

TAKING ON THE HEADWIND

Riding into the wind, members have shifted gears and are re-calibrating as they look for resources to meet future energy needs. Throughout the year, experts joined PNUCC to share the latest on batteries, pumped storage, hydrogen-fuel technologies and newer, reinvigorated hydro as they prepare for the next stage of the race.

The 2019 *PNUCC Northwest Regional Forecast*, the sum of utility loads and resources from their integrated resource plans, is a constant predictor of how the race will unfold. Guided by experts from the PNUCC System Planning Committee, the *Forecast* shows the deficit of available generation to meet peak demand will continue to grow, particularly during the summer months as coal-fired power plants go off-line by 2025.

In March PNUCC members were reminded just how close the power supply is to the edge. Prolonged cold with multiple complicating factors resulted in a high price event. PNUCC explored the chain of events to better understand the unforeseen hazards that dotted the region and actions taken to keep the power supply flowing.

In anticipation of what lies ahead, over 30 PNUCC load forecasting experts rallied to strategize at this year's PNUCC Load Forecasting Workshop. They discussed assessing forecast accuracy, electrification, climate change modeling and more. This opportunity to learn from each other and delve into the intricacies of forecasting, given possible twists and turns along the way, ensures members are prepared to best position their companies to meet challenges coming at them head on.

RESOURCE ADEQUACY WEARS THE YELLOW JERSEY

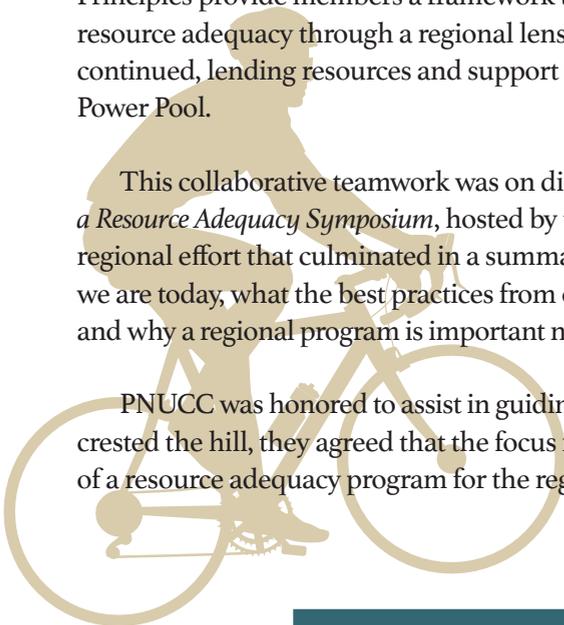
The announcement of even more retirements of coal-fired and gas-fired power plants across the greater West found regional and individual utility planners busy diving into the resource adequacy issue throughout the year. With a clear understanding of what's at stake, it is no surprise that reliability and resource adequacy were leading the pack and garnering the most attention at PNUCC.



PNUCC engaged on the issue, creating an on-going dialogue. This broader discussion led to the adoption of the PNUCC Resource Adequacy Principles. These Principles provide members a framework to shape the discussion as they look at resource adequacy through a regional lens. PNUCC's engagement in resource adequacy continued, lending resources and support to the regional initiative led by the Northwest Power Pool.

This collaborative teamwork was on display at *Dynamics of Today's Energy System—a Resource Adequacy Symposium*, hosted by the Northwest Power Pool. It represented a regional effort that culminated in a summary of the analysis of data that explains where we are today, what the best practices from other programs might look like for the region and why a regional program is important now.

PNUCC was honored to assist in guiding the analysis and discussion. As the team crested the hill, they agreed that the focus in 2020 should be on developing the elements of a resource adequacy program for the region.



THE POWER OF THE PELOTON

PNUCC members are on a course that is constantly moving with challenges that are not always apparent at the start. This is especially true now, with the power industry in the midst of profound changes as customer preferences, energy policies, and the region's economy and energy supply unfold. Just like the Tour de France, there are utilities who breakaway to explore new innovative ideas while others refresh old familiar ones.

One of the hallmarks of PNUCC's monthly forums is the opportunity for members to share their journey. Sometimes it's a tough climb over multiple years, while other times a sprint is required to comply with a new policy or respond to customer needs. Take for example two large substations that were energized in 2019. These high-stake efforts are underscored by two completely different, yet innovative, approaches that achieve the same result—a new substation to serve customer load.

Northern Wasco County PUD's Quenett Creek Substation was built to serve a rapidly growing industrial area in The Dalles, Oregon. They were able to move ahead quickly under an innovative design/build concept through a public/private partnership to meet their customer's needs.

In contrast, the Denny Substation built by Seattle City Light, represents multiple decades of planning, with high levels of public engagement that provided an opportunity to adapt and change course along the way. This innovative design, in the core of the center of Seattle, will serve the public and provide power.

Also in recent years, the Northwest has seen a number of intense and destructive wildfires. Lessons learned in California following devastation of entire communities in 2018, and their link to utility transmission lines, was a wake-up call for PNUCC members. With safety as their priority, members shared their approach for implementing best practices in utility operations to reduce the potential for wildfires due to utility operations. Once again, the value of engaging stakeholders took the lead as they shared the value of partnering with first responders, local governments and federal wildland agencies to develop their Wildfire Mitigation Plan.

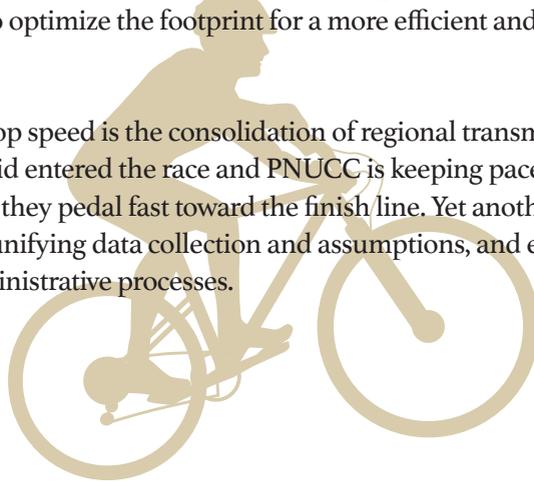
NAVIGATING THE REGIONAL TERRAIN

PNUCC members shared their experiences and expertise on a number of initiatives gaining momentum in the region, many of which are expected to be well underway by 2022. And like the peloton, the combined power of the willing is pulling the team toward the finish line.



The success of the Western Energy Imbalance Market (EIM) and the expansion of the participants prompted the next question—What is the next incremental piece to add that maximizes the value of diversity in the region? The answer—A voluntary Extended Day Ahead Market (EDAM). And if developed, the EDAM would be layered on top of the EIM to optimize the footprint for a more efficient and cost-effective day-ahead solution.

Also, reaching top speed is the consolidation of regional transmission planning efforts. NorthernGrid entered the race and PNUCC is keeping pace with the members behind the effort as they pedal fast toward the finish line. Yet another opportunity to capture savings by unifying data collection and assumptions, and eliminating redundancy in administrative processes.



THE NEXT STAGE STRATEGY

There's so much going on in the utility space, and PNUCC is the place where it all comes together. We team up for a common purpose in a collaborative environment that brings members together, where all thoughts are respected and tough issues are discussed. And the value of the conversation is enriched even further with each new member that joins the team. This year PNUCC welcomed Mason PUD No. 3 and Energy Northwest into the field.

The popular Board and member executive forum in July included a robust discussion on a number of top-of-mind issues facing utilities. Public affairs experts from utilities across the region joined them as they rode through key pieces of legislation and other policy actions that impact the Northwest and inform their decisions. And a rundown on current data and trends captured how economic jitters happen when a good economy experiences troubling signs, such as a lingering trade war.

As we race into 2020, we will remain focused on the analysis and details used to inform the Council's 2021 Power Plan. The System Planning Committee and Power and Natural Gas Taskforce will continue to explore and dive deeper into important issues facing Northwest utilities. And following the course that was set nearly 75 years ago, PNUCC will continue its mission of *bringing the power of good ideas together*.

2019 BOARD OF DIRECTORS

SCOTT BOLTON, CHAIR

PacifiCorp

TOM DEBOER, 1ST VICE-CHAIR

Snohomish PUD

JASON THACKSTON, TREASURER

Avista

SHAUNA MCREYNOLDS, SECRETARY

PNUCC

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Franco Albi	<i>Portland General Electric</i>
Chad Bartram	<i>Benton PUD</i>
Kelcey Brown	<i>PacifiCorp</i>
John Bushnell	<i>NorthWestern Energy</i>
Scott Coe	<i>Emerald PUD</i>
Suzanne Cooper*	<i>Bonneville Power Administration</i>
Sarah Edmonds	<i>Portland General Electric</i>
Roger Gray	<i>PNGC Power</i>
John Hines	<i>NorthWestern Energy</i>
Mark Johnson	<i>Flathead Electric Co-Op</i>
Scott Kinney	<i>Avista</i>
Frank Lawson	<i>Eugene Water & Electric Board</i>
Kevin Nordt	<i>Grant PUD</i>
Tess Park	<i>Idaho Power</i>
Bear Prairie	<i>Idaho Falls Power</i>
Chris Robinson	<i>Tacoma Power</i>
Adam Richins	<i>Idaho Power</i>
Todd Simmons	<i>Tillamook PUD</i>
Debra Smith	<i>Seattle City Light</i>
Shauna Tran	<i>Puget Sound Energy</i>
Dave Ward	<i>Grays Harbor PUD</i>
Paul Wetherbee	<i>Puget Sound Energy</i>

*Special thanks to Phillip Popoff, outgoing chair,
System Planning Committee and Power and
Natural Gas Planning Taskforce*

**non-voting member*

2019 MEMBERS

Ashland Municipal Electric Utility
 Avista
 Benton PUD
 Benton Rural Electric Assn
 Blachly-Lane Electric Co-Op
 Central Electric Co-Op
 Central Lincoln PUD
 Chelan County PUD
 City of Cheney Light Dept.
 Clark Public Utilities
 Clatskanie PUD
 Clearwater Power Co.
 Consumers Power Inc.
 Coos-Curry Electric Co-Op
 Cowlitz County PUD
 Douglas Electric Co-Op
 Emerald PUD
 Energy Northwest
 Eugene Water & Electric Board
 Fall River Rural Electric Co-Op
 Flathead Electric Co-Op
 Forest Grove Light & Power
 Franklin PUD
 Grant County PUD
 Grays Harbor PUD
 Idaho Falls Power

Idaho Power
 Lane Electric Co-Op
 Lewis County PUD
 Lincoln Electric Co-Op
 Mason County PUD #3
 Northern Lights Inc.
 Northern Wasco PUD
 NorthWestern Energy
 Okanogan Co. Electric Co-Op
 Orcas Power & Light
 PacifiCorp
 Pend Oreille County PUD
 PNGC Power
 Portland General Electric
 Puget Sound Energy
 Raft River Rural Electric Co-Op
 Seattle City Light
 Snohomish County PUD
 Tacoma Power
 Tillamook PUD
 Umatilla Electric Co-Op
 Vera Water & Power
 Wells Rural Electric Co.
 West Oregon Electric Co-Op
 Whatcom County PUD

2019 PNUCC BUDGET

Staff Expenses	\$ 527,000
Overhead Expenses	\$ 166,000
Outside Expenses	\$ 37,000
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Total Budget	\$ 730,000

ABOUT PNUCC

PNUCC has played a pivotal role in the region's electric utility industry for nearly 75 years. As a voluntary, non-profit organization, PNUCC is the Northwest's only forum where investor- and consumer-owned utilities, and other industry partners, make a difference on a range of issues that affect electricity providers and their customers. The diversity of the PNUCC membership provides a unique opportunity to identify common interests, share perspectives, learn from each other, and have frank, valuable discussions to ensure members understand where their interests overlap and why they diverge when they do.

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:

- a **searchlight for changes** that will have a significant impact on how our industry does business in the future
- a **catalyst for examining issues** that impact a significant portion of the membership
- a **forum for dialogue** on policy issues of regional importance
- a **hub to coordinate technical analysis and data** on Northwest power industry issues
- a **resource for sharing information** on issues of regional importance

PNUCC STAFF

Shauna McReynolds, *Executive Director*

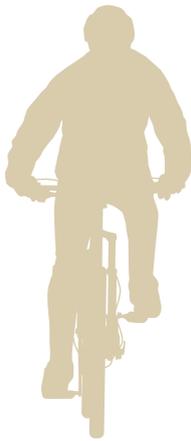
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