Portland General Electric Company
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PortlandGeneral.com

April 13, 2018

Email
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Filing Center
Public Utility Commission of Oregon
201 High Street, SE Ste. 100
Salem, OR 97301

RE: UM 1690 – Portland General Electric Green Tariff Filing

Attention Filing Center:

Portland General Electric hereby submits its application to re-open Docket Number UM 1690, and accompanying testimony describing PGE's proposed green tariff program. Enclosed for filing in the above referenced matter please find the following:

- **Petition to Amend Order No. 16-251 and Reopen Docket**
- **PGE/100 – Direct Testimony of Maria Pope, Ted Wheeler, Mark Gamba, Steve Callaway, Chuck Bennett, Shane Bemis, and Denny Doyle**
  - **PGE/101 – Letter of support from Adobe**
  - **PGE/102 – Letter of support from U.S. Bank**
- **PGE/200 – Direct Testimony of Brett Sims and Jay Tinker**
  - **PGE/201 – Draft green energy schedule**
  - **PGE/202 – 3Degrees Report**

If you have any questions, please contact Jacob Goodspeed at (503) 464-7806. Please direct all formal correspondence and requests to the following email address: pge.opuc.filings@pgn.com.

Sincerely,

Jay Tinker
Director, Regulatory Policy and Affairs

BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UM 1690

In the Matter of PUBLIC UTILITY COMMISSION OF OREGON, Voluntary Renewable Energy Tariffs for Non-Residential Customers.	**PORTLAND GENERAL ELECTRIC COMPANY'S PETITION TO AMEND ORDER AND REOPEN DOCKET**

Pursuant to ORS 756.568 and Order No. 16-251, Portland General Electric Company ("PGE") moves the Commission to amend Order No. 16-251 and reopen Docket UM 1690. In support of this Petition, PGE states:

1. On July 5, 2016, the Commission issued Order No. 16-251, which adopted Staff's recommendation to close Docket UM 1690 due to PGE and PacifiCorp advising the Commission that neither utility would be filing a draft voluntary renewable energy tariff (VRET).[1]

2. At that time, PGE encouraged "that the Commission not foreclose a later filing should conditions and customer interest change."[2]

3. The Commission's order acknowledged that the utilities "are permitted by law to petition to amend or rescind an Order closing this proceeding to allow the docket to resume at some future date under appropriate circumstances."[3]

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[1] *See*, In the Matter of Voluntary Renewable Energy Tariffs for Non-Residential Customers, OPUC Docket No. UM 1690, Order No. 16-251, Appendix A at 4 (Jul. 5, 2016).

[2] *See*, PGE's Response to Commission Order No. 15-405, OPUC Docket No. UM 1690 (Apr. 14, 2016).

[3] Order No. 16-251, Appendix at 5.

4. PGE asserts that circumstances have changed. The Company has worked with its customers and stakeholders to develop a voluntary green tariff that the Company believes satisfies the conditions and requirements the Commission set forth for VRETs in Order No. 15-405.[4]

5. PGE's draft green tariff is attached as Exhibit 201 to the Testimony of Brett Sims and Jay Tinker (PGE/200), filed simultaneously with this Petition.

6. PGE requests that the Commission amend Order No. 16-251, which Docket UM 1690, and reopen the docket to permit review of the Company's green tariff.

7. Alternatively, PGE requests that the Commission open a new docket to consider the Company's testimony and draft green tariff.

For the reasons stated above, PGE requests that the Commission grant its petition to amend Order No. 16-251 and reopen Docket UM 1690, or alternatively to open a new docket to consider PGE's testimony and draft green tariff.

DATED this 13th day of April, 2018.

PORTLAND GENERAL
ELECTRIC COMPANY

By Cece L. Coleman for Douglas Tingey

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[4] [4] *See*, In the Matter of Voluntary Renewable Energy Tariffs for Non-Residential Customers, OPUC Docket No. UM 1690, Order No. 15-405 at 1-2 (Dec. 15, 2015).

UM 1690 / PGE / 100
Pope – Wheeler – Gamba – Callaway – Bennett – Bemis – Doyle

BEFORE THE PUBLIC UTILITY COMMISSION

OF THE STATE OF OREGON

UM 1690

PORTLAND GENERAL ELECTRIC COMPANY

Direct Testimony and Exhibits of

Maria Pope
Ted Wheeler
Mark Gamba
Steve Callaway
Chuck Bennett
Shane Bemis
Denny Doyle

April 13, 2018

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I. Introduction

Q. Please state your names and current positions.

A. My name is Maria Pope. I am the President and Chief Executive Officer of Portland General Electric Company (PGE).

My name is Ted Wheeler. I am the mayor of Portland, Oregon (Portland).

My name is Mark Gamba. I am the mayor of Milwaukie, Oregon (Milwaukie).

My name is Steve Callaway. I am the mayor of Hillsboro, Oregon (Hillsboro).

My name is Chuck Bennett. I am the mayor of Salem, Oregon (Salem).

My name is Shane Bemis. I am the mayor of Gresham, Oregon (Gresham).

My name is Denny Doyle. I am the mayor of Beaverton, Oregon (Beaverton).

Q. Ms. Pope, what is the purpose of your testimony?

A. My testimony will describe PGE's actions and commitments – including the filing of this green tariff – to advance a clean energy future and decarbonize the electric grid.

Climate change has a very real, immediate impact, here in Oregon and around the globe. It's essential that greenhouse gases are systematically driven out of the energy economy. The Intergovernmental Panel on Climate Change[1], which includes the world's foremost collection of climate scientists, estimates that limiting global temperature rise to two degrees Celsius above pre-industrial levels will help avert the most destructive impacts of climate change. This global goal was the central aim of the 2015 Paris Climate

[1] http://www.ipcc.ch/news_and_events/docs/factsheets/FS_what_ipcc.pdf
http://www.ipcc.ch/

Agreement[2]. It is a challenging goal that will require the global community to work together to dramatically reduce greenhouse gas emissions.

In the spring of 2017, PGE joined over 2,500 businesses and universities, along with state and local governments, to say #WeAreStillIn by promising to continue to do our part to meet the United States' commitments in the Paris Agreement. In addition to driving down greenhouse gas emissions in our resource portfolio, our commitment includes evolving the smart grid platform to help our customers and Oregon reach our shared emission reduction and sustainability goals. To do this, we will build on our history of promoting and integrating renewable energy, energy efficiency and demand response, emerging clean technologies such as energy storage and energy flexibility; weaving together technology and information through a modern and resilient energy grid.

We are proud to partner with our state, municipalities, and customers to advance a clean energy future.

Q. Please describe the Green Tariff that PGE is filing, and why PGE has chosen to file for approval of this program.

A. PGE has prepared – in close collaboration with many of our commercial and municipal customers – and filed a Green Tariff that is designed to provide customers increased choice in the procurement of renewable energy. Customers would stay on their current PGE service, and would have the ability to procure renewable energy through PGE as a way to move to 100% renewable consumption immediately, as PGE works to advance Oregon's clean energy future. The supplemental nature of this option – the ability for subscribers to

[2] https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-d&chapter=27&lang=_en&clang=_en

remain on PGE's generation service while opting for renewables – will insulate non-subscribing customers from risk. A full discussion of the tariff structure and PGE's strategy to provide choice while insulating non-participating customer from risk is discussed in PGE/200, Sims – Tinker.

Q. What action has PGE taken to reduce greenhouse gas emissions?

A. In 2016, PGE collaborated with environmental groups and customer advocates to pass one of the most progressive clean energy laws in the nation. The resulting landmark law – the Oregon Clean Electricity and Coal Transition Plan – sets a target of 50 percent renewable energy by 2040 and also transitions Oregon off of coal-fired electricity by 2035. As a result, Oregon's electricity sector will substantially reduce greenhouse gas emissions; PGE will be 70 percent carbon-free by 2040.

In the near term, we are continuing to pursue renewable resources to meet our customers' needs and decarbonize our portfolio. With the additional 100 MWa of renewables approved by the Public Utility Commission of Oregon (OPUC) in December 2017, we are committed to serving approximately 50 percent of our customers' energy needs with clean and renewable energy by the end of 2020. We are also deliberately pursuing new renewable product offerings for our customers who want to decarbonize faster. The green tariff that PGE has filed is vital to helping our customers achieve this shared goal.

Q. You mentioned customer optionality as a stated goal of the Green Tariff. What other strategies have guided PGE in crafting this renewable energy product offering?

A. Successfully transitioning to a clean energy future will depend on thoughtful planning, community partnerships, actively empowering customers, and embracing new technologies.

Broadly speaking, the success of this vision will rely on three interrelated and overarching strategies:

- Decarbonization through investing in clean and reliable energy.
- Modernization through a smarter, more resilient grid.
- Empowering our customers in their energy technology choices.

The filed green tariff is designed to meet and advance all three of these strategies.

Q. In July of 2016, the OPUC set forth nine conditions to be considered if PGE were to file a tariff allowing for a voluntary green program.[3] Does PGE's filed green tariff meet these conditions?

A. Yes. PGE – in collaboration with our customers and stakeholders – has crafted a renewable energy program we believe addresses the main concerns expressed in the nine conditions that arose from Order 16-251. The specific adherence to the conditions is outlined by Witnesses Sims and Tinker in PGE/200.

Q. Many states currently allow their regulated utilities to offer voluntary renewable energy products. Did PGE model the filed Green Tariff offering on any current offering?

A. No. While we investigated other green tariff models across the country, PGE did not adopt the model of any specific state or utility offering. PGE has, however, worked extensively to identify and incorporate the best practices listed in the Corporate Renewable Energy Buyers' Principles facilitated by the World Resources Institute (WRI). These practices call for increased access to cost-competitive options, greater choice in procurement options, access

[3] Order No. 16-251

to products that are bundled and provide "additionality" to the renewables market, and the opportunity to work with local utilities and regulators to procure renewable energy.[4]

Additionally, PGE worked with 3Degrees consulting, which provided an overview of regulated utilities nationwide that offer similar bundled renewable products. 3Degrees' report is attached as PGE/202.

Q. Why has PGE chosen to file for the approval of a Green Tariff?

A. For more than 125 years, PGE has been powering our customers' lives, delivering energy that is safe, reliable, and affordable. We have made significant policy advancements with the passage of SB 1547. However, today, that is not enough. Customers expect more. They also want their energy to be clean and secure. Our history of serving customers, commitment to equitable access and opportunity, and dedication to the communities where we live and work puts us in a unique position to help lead this transformation, while also preserving the affordability and reliability of a service that is essential to the health and vitality of our society.

[4] http://buyersprinciples.org/

II. City of Portland Climate Action Plan

Q. Mayor Wheeler, what is the purpose of your testimony?

A. My testimony is intended to outline the climate and decarbonization goals of the City of Portland, as well as the progress that Portland has made on our action plan to reduce carbon emissions.

Climate change is the greatest environmental challenge of the 21st century. It poses a serious threat not just to Oregon's natural treasures – forests, mountain snows, and rivers – but also to our jobs and our health.

We've already reduced carbon emissions by 14 percent since 1990, while our population has increased 30 percent and we have 20 percent more jobs. We have established a strong foundation for continuing to reduce emissions that also benefits our economic, social, and cultural lives. Climate change cannot be solved by the government in isolation. Businesses, residents, institutions, and non-profit organizations all have essential roles to play.

Q. Has the City of Portland put forward a plan for moving toward a clean energy future?

A. Yes. In 1993, Portland was the first U.S. city to create a local action plan for cutting carbon. Portland's Climate Action Plan (CAP) is a strategy to put Portland and Multnomah County on a path to achieve 40 percent reduction in carbon emissions by 2030 and 80 percent reduction by 2050 (compared to 1990 levels). The plan builds upon a legacy of forward-thinking climate protection initiatives by the City of Portland and Multnomah County that have resulted in significant total and per person reductions in local carbon emissions.

The 2015 Climate Action Plan builds on the accomplishments to date with ambitious new policies, fresh research on consumption choices and engagement with community

leaders serving low-income households and communities of color to advance equity through Portland's climate action efforts.

Q. Please provide a high-level summary showing the steps that Portland will take to achieve CAP goals.

A. The Portland and Multnomah County 2015 Climate Action Plan charts a path to reduce local carbon emissions through:

- Shifting to low-carbon patterns of urban development, transportation, buildings, and consumption.
- Benchmarking commercial energy performance
- Greening Oregon's electricity supply

Q. Please detail Portland's efforts to date to green Oregon's Electricity supply.

A. Along with many stakeholders, including the affected utilities, Portland actively supported the passage of Senate Bill 1547, a 2016 law requiring that Oregon's large utilities supply 50 percent of all electricity from new renewable resources by 2040. This is a major extension and expansion beyond the previous requirement of 25 percent renewable electricity by 2025. The law also requires that the utilities phase out power from coal-fired plants entirely by 2035. To protect against cost burdens, the law also caps cost increases resulting from compliance at 4 percent in any year.

Q. Has Portland engaged with PGE to green the electricity supply used by the city?

A. Yes. In addition to supporting SB 1547, Portland has engaged with PGE and in OPUC proceedings on community solar, solar incentive program design, voluntary renewable energy tariffs, resource value of solar, and renewable portfolio standard (RPS) legislation.

Portland has and will continue to advocate for a statewide community solar program that ensures low-income households are able to participate.

Q. Could PGE's green tariff filing help the City of Portland achieve the decarbonization goals outlined in Portland's Climate Action Plan?

A. Yes. Although Portland has not committed to receiving bundled energy through a PGE green tariff, Portland is broadly supportive of programs – such as a utility-offered green tariff – that could provide incremental renewable resources and decarbonization of the region's energy mix.

III. City of Milwaukie Vision and Action Plan

Q. Mayor Gamba, what is the purpose of your testimony?

A. Our testimony is intended to describe the City of Milwaukie's vision for 2040, including ecosystems, energy, environment, and resilience.

Along with the rest of the Portland Region, the City of Milwaukie is growing. By 2040, Milwaukie's population is expected to increase by 12 percent – an additional 2,500 new residents. While growth can be a positive, it also means change. The challenge – and opportunity – is to create strategies to accommodate change while preserving community assets like Milwaukie's small town character, rivers, creeks, parks, schools, thriving local businesses and public spaces. The City of Milwaukie is committed to managing growth in a planned and cost-effective way to retain and enhance those Milwaukie attributes that community members value.

In 2016, the City of Milwaukie launched a community-wide engagement process to develop a Vision and Action Plan. The intent of this Vision and Action Plan is twofold: to describe what Milwaukie residents, business owners and employees want the community to be like in the year 2040, and to help guide investments in the years to come. Working within the framework of sustainable community planning, the Vision and Action Plan uses a "quadruple bottom line" approach to identify strategies and priorities that manage growth in a considerate, equitable and cost-effective way. The quadruple bottom line refers to maximizing results for every dollar spent for people, planet, place, and prosperity. The focus is on City services in collaboration with partner services such as North Milwaukie Parks and Recreation District and North Clackamas School District. The results of the process also will

help inform the update of the Comprehensive Plan, the City's primary long-range physical planning document.

To guide the process, a citizen-based Vision Advisory Committee (VAC) was formed and made up of volunteer community members. Over 30 applications were submitted for 15 positions. Committee representation was diverse in terms of age, interests and background, and neighborhood representation. Supported with community feedback, the VAC was instrumental in helping shape the topics and themes in the vision and developing action items, metrics and partners.

Q. Please articulate the City of Milwaukie's vision for 2040.

A. In 2040, Milwaukie is a flourishing city that is entirely equitable, delightfully livable, and completely sustainable. It is a safe and welcoming community whose residents enjoy secure and meaningful work, a comprehensive educational system, and affordable housing. A complete network of sidewalks, bike lanes, and paths along with well-maintained streets and a robust transit system connect our neighborhood centers. Art and creativity are woven into the fabric of the city.

Milwaukie's neighborhoods are the centers of daily life, with each containing amenities and community-minded local businesses that meet residents' needs. Our industrial areas are magnets for innovation, and models for environmentally-sensitive manufacturing and high wage jobs. Our residents can easily access the training and education needed to win those jobs.

Milwaukie nurtures a verdant canopy of beneficial trees, promotes sustainable development, and is a net-zero energy city. The Willamette River, Johnson Creek, and Kellogg Creek are free flowing, and accessible. Their ecosystems are protected by a robust

stormwater treatment system and enhanced by appropriate riparian vegetation. Milwaukie is a resilient community, adaptive to the realities of a changing climate, and prepared for emergencies, such as the Cascadia Event.

Milwaukie's government is transparent and accessible, and is committed to promoting tolerance and inclusion and eliminating disparities. It strongly encourages engagement and participation by all and nurtures a deep sense of community through celebrations and collective action. Residents have the resources necessary to access the help they need. In this great city, we strive to reach our full potential in the areas of education, environmental stewardship, commerce, culture, and recreation; and are proud to call it home.

Milwaukie's full Vision for 2040 is attached as Exhibit 102.

Q. As it relates to Milwaukie's comprehensive vision for 2040, what environmental goals has Milwaukie set?

A. Milwaukie's "Planet" goals are those that have to do with ecosystems, energy, environment, and resilience. Milwaukie's vision contains the following three goals:

- The entire city nurtures a connected canopy of trees planted and stewarded by its residents. Smart and focused development honors and prioritizes life-sustaining natural resources.
- Milwaukie has free flowing, accessible, pristine waterways that are protected by a robust stormwater treatment system. The Willamette waterfront is easily accessed by the public and offers a wide variety of activities and events that can be enjoyed by all.

- Milwaukie is a model city that produces more energy through renewable sources than it uses. It is a prepared and resilient community, adaptive to the realities of a changing climate.

Q. Please provide detail regarding Milwaukie's "planet" goals that are currently underway or have been completed.

A. Milwaukie has the following "planet" actions currently underway:

- Develop a strong tree ordinance that incentivizes tree protection, has equitable tree replacement standards, and provides adequate flexibility for property owners.
- Ensure that the City's infrastructure and facilities can reasonably withstand natural or man-made disasters and that the City can continue to provide services during an emergency event.
- Promote household and neighborhood-level emergency preparedness by expanding the role and capacity of Community Emergency Response Teams.
- Develop a Climate Action and Energy Plan that aims to reduce the impacts of the Milwaukie community on climate change and by 2040 make Milwaukie a net-zero energy community that produces more electricity than it consumes.

Q. Could PGE's green tariff filing help the City of Milwaukie to achieve the "planet" goals around reducing the impact of the Milwaukie community on climate change?

A. Yes. Although Milwaukie has not committed to receiving bundled energy through PGE's green tariff, we are currently participating at the Platinum level in PGE's Clean Wind Program and supportive of programs – such as a utility-offered green tariff – that could

provide incremental renewable resources and decarbonization of the region's energy mix, and an opportunity for Milwaukie to go above and beyond our current REC purchases.

IV. City of Hillsboro Environmental Sustainability Plan

Q. Mayor Callaway, what is the purpose of your testimony?

A. My testimony is intended to describe the City of Hillsboro's environmental sustainability goals, as outlined in the 2015 Environmental Sustainability Plan.

Hillsboro's Environmental Sustainability Plan (ESP) is the product of a five-year community engagement and stakeholder planning effort. Environmental sustainability formally emerged as a community priority during the ten-year update of the Hillsboro 2020 Vision and Action Plan in 2010. Through that outreach process, the public expressed strong support for expanding sustainability efforts beyond City Hall and into the broader community. In response, the City of Hillsboro launched and facilitated a public-private Sustainability Task Force (HSTF) in 2012. The HSTF, in turn, assumed responsibility for developing a formal plan and structuring and implementing community priorities related to energy, resource conservation, materials management, and environmental education.

In 2013, Hillsboro initiated research and outreach to build the foundation for Hillsboro's next twenty-year community plan, Hillsboro 2035. Through that process, additional environmental priorities were identified and transferred to the HSTF for review and development. While the Hillsboro Vision (Community Plan) sets a broad roadmap for building a more sustainable community (including social, economic, and broader livability issues), the ESP is specifically focused on stewardship of the environmental goals therein.

Today, the ESP is both a stand-alone plan and an integral part of the Hillsboro 2035 Community Plan, where "sustainability" is identified as one of the community's primary

vision goal areas along with "Health, Wellness, and Safety," "Education and Community Involvement," "Economy and Infrastructure," and "Livability and Recreation."

Q. Please articulate the goals outlined in the City of Hillsboro's ESP.

A. The ESP contains three primary goal areas and numerous – both existing and potential – specific actions to be carried out over the next five years. It is designed to be flexible and easily updated as new opportunities arise, additional implementation partners step forward, and technological advances provide new approaches for achieving plan goals.

The broad goals are to protect natural assets, minimize greenhouse gas emissions, and recover, recycle and renew resources.

Hillsboro's full Vision for 2040 is attached as Exhibit 102.

Q. What are the three primary goal areas in the ESP?

A. Hillsboro has set the following three primary energy goals:

- Reduce greenhouse gas emissions
- Reduce use of non-renewable energy resources
- Expand use of renewable energy resources to meet demand

Q. What potential projects and policies is Hillsboro considering over the next five years?

A. Hillsboro has identified the following actions that may be sought over the next five years:

- Update Hillsboro Energy Map
- Promote energy conservation programs on City website and other means
- Promote PGE's Energy Tracker for residential and small businesses
- Provide education: demonstrate how to use retail sites to recycle light bulbs; energy efficiency demos at library, Lowe's, Home Depot, etc.

- Conduct focused campaign with Clean Energy Works Oregon (CEWO)
- Distribute energy efficiency information and resource links through City Building Department during inspections
- Promote the U.S. Department of Energy Better Buildings/Better Plants Challenge
- Develop business education program that focuses on small/medium business and peer to peer outreach
- Identify and document industry classifications and energy use data patterns
- Continue green power purchases
- Convert biogas from wastewater treatment to natural gas for fleet and other energy use
- Participate in U.S. Department of Energy Rooftop Solar Challenge
- Develop or support community solar program
- Diversify housing options
- Enhance or support workforce training
- Develop mobility hub pilot program
- Enhance city bike facilities
- Promote and enhance employer commute incentive programs
- Develop policies to facilitate transit-oriented development

Q. Could PGE's green tariff filing help the City of Hillsboro to achieve the energy goals listed in the ESP?

A. Yes. Although Hillsboro has not committed to receiving bundled energy through PGE's filed green tariff, Hillsboro is broadly supportive of programs – such as a utility-offered green tariff – that could provide incremental renewable resources and decarbonization of the region's energy mix.

V. Salem Strategic Plan

Q. Has Salem articulated an environmental action plan?

A. Yes. Salem's Strategic Plan – released Fall 2017 – details Salem's strategic vision in the following seven areas:

- Vision for Growth and Development
- Affordable Housing, Social Services, and Homelessness
- Economic Development and Downtown
- Critical Infrastructure
- Sustainable Service Delivery
- Public Transportation
- Environmental Action

Q. Please articulate the opportunities and challenges – with regard to the Environmental Action Priority – in Salem's Strategic Plan.

A. Local governments may impact the environment through direct services to residents and through its operations of a variety of facilities that comply with state and federal laws in providing safe drinking water, preventing flooding, and treating stormwater and wastewater. State regulations also provide a framework through which the built environment is developed. Local governments, in turn, regulate local development. In communities across Oregon, local governments are also developing policies and longer-range planning for energy use, climate action, and resilience.

Salem, as a municipal corporation in its day-to-day operations and as a regulatory body for our local community, has undertaken numerous efforts and developed partnerships to address climate-related issues of energy use and efficiency, preparing for and reducing

flooding, community sustainability, preserving and enhancing the urban tree canopy, planning for all types of natural hazards and seismic retrofitting of facilities.

When asked as part of the statistically valid survey in December 2016, the majority of residents (77%) were satisfied with Salem's protection of the natural environment. However, participants at engagement activities supporting the Strategic Plan were concerned that the City does not have enough measures in place to ensure environmental protection into the future. Specifically, participants asked Salem to report progress on the 2010 grant-funded Salem Community Energy Strategy and incorporate environmental impacts into policy decisions.

Q. What is Salem's desired outcome, regarding environmental action?

A. An ongoing, comprehensive, and robust program, partnerships and commitment to support reduction of greenhouse gas emissions in our community and energy conservation in City facilities and operations.

Q. Could PGE's green tariff filing help the City of Salem to achieve environmental action goals?

A. Yes. Although Salem has not committed to receiving bundled energy through PGE's filed green tariff, Salem is broadly supportive of programs – such as a utility-offered green tariff – that could provide incremental renewable resources and decarbonization of the region's energy mix.

VI. Gresham Climate Goals

Q. Has Gresham taken actions toward a clean energy future?

A. Yes. Gresham has implemented an energy management program to aggressively reduce the consumption of city facilities and reach the City Council's reduction goals. The wastewater treatment plant (WWTP), which was once the highest-consuming city facility, now produces 100 percent of its electricity need from onsite renewable power. All of Gresham's 8,000+ streetlights have been converted to LED fixtures, dramatically reducing greenhouse gas emissions, energy consumption, and lifecycle costs. Gresham has also sited two 18-foot tall solar trees in front of the city building and installed solar panels in the parking lot – saving $600,000 in energy costs over 30 years.

Q. Why has Gresham decided to take the above-mentioned actions to transition to a clean energy future?

A. Shortly after taking office in 2007, I signed the Mayor's Climate Protection Act and went to work looking for places where environmental responsibility could make economic sense. In 2011, the City Council formally approved Gresham's Internal Operations and Facilities Sustainability Plan, further guiding Gresham's sustainability goals and opportunities. We are innovating with technology to save money for our residents while doing the right thing for the environment.

Q. Could PGE's green tariff filing help the City of Gresham to transition to a clean energy future?

A. Yes. Although Gresham has not committed to receiving bundled energy through PGE's filed green tariff, I am broadly and conceptually supportive of programs – such as a utility-offered

green tariff – that could provide incremental renewable resources and decarbonization of the region's energy mix.

VII. Beaverton Climate Action Plan

Q. Please state your names and current positions.

A. My name is Denny Doyle. I am the Mayor of Beaverton, Oregon (Beaverton). My qualifications appear at the end of this testimony

Q. Mayor Doyle, what is the purpose of your testimony?

A. My testimony is intended to describe the City of Beaverton's Climate Action Plan.

Our climate is changing. The uncharacteristic weather we have been experiencing over the past few years and the wildfire is just some of the many changes we have seen and will continue to see in the coming years. At the core of this challenge is creating a path to a future where the residents of Beaverton can not only stay safe, but can also thrive in the opportunities that vast change create.

We know that the Pacific Northwest will be one of the most habitable areas of the United States into the future with total annual precipitation staying the same while agriculture production will increase. That, combined with an already greener electrical grid, means that Beaverton will be a better place to live for many generations than most of the country. We have the power to envision and create a city that evolves to meet the future physical conditions. Together, we can create a clean, renewable future, but only if we act now.

That is why Beaverton has created our first community focused climate strategy – Beaverton's Climate Action Plan. We are doing our part to take action, but we can't meet our goals without everyone creating our future together.

Q. Please articulate what is included in Beaverton's Climate Action Plan.

A. The overarching goal of Beaverton's Climate Action Plan is twofold:

1. Reduce community-wide greenhouse gas emissions to mitigate the impacts of climate change, and;

2. Evolve our systems to adapt to the arriving physical conditions of a changing climate.

The Beaverton Climate Action Plan outlines both mitigation and adaptation measures to ensure the City remains a safe, resilient, and economically viable community now and for many generations to come.

Q. What mitigation actions are Beaverton planning to take to reduce greenhouse gas emissions?

A. Beaverton has identified the following mitigation actions related to energy that will work to reduce greenhouse gas emissions:

- Expand programs and partnerships to increase participation and implementation of cost-effective energy efficiency and water conservation actions in the residential, commercial, and industrial sectors for existing buildings and new construction.
- Support local utilities and building code changes as needed to accelerate transition to electric vehicles.
- Support distributed community solar energy development through protection of net metering. Consider expanding to include virtual net metering.
- Encourage smaller housing to reduce energy consumption, environmental impacts of construction, and consumption of goods/materials.

- Consider code requirements consistent with the parameters specified in the 2016 Oregon Energy Reach Code; Incorporate low carbon footprint concept from Architecture 2030, the Energy Trust of Oregon, or LEED.
- Encourage state building code changes to incorporate energy performance targeted at net-zero energy consumption by 2030.
- Develop and implement home energy score policy and program that requires all homes listed for sale in Beaverton include a home energy performance audit and report.
- Promote policies in Oregon that implement carbon pricing.
- Provide "real time" energy use information to inform behavior.

Q. Could PGE's green tariff filing help the City of Beaverton to achieve the goals outlined in the Beaverton Community Action Plan?

A. Yes. Although Beaverton has not committed to receiving bundled energy through PGE's green tariff, Beaverton is broadly supportive of programs – such as a utility-offered green tariff – that could provide incremental renewable resources and decarbonization of the region's energy mix.

Adobe

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April 5, 2018

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P.O. Box 1088
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RE: UM 1690 – Customer's Comments on Portland General Electric Company's Voluntary Green Tariff for Non-Residential Customers

At Adobe, we believe that we have an obligation — to our employees, our communities, our investors, our customers and the environment — to operate our business sustainably. This has been a core value at Adobe from its inception and the commitment is embedded in our guiding principles.

We developed our renewable energy goals and commitment to RE100 in 2015, with the objective to run our operations and digital delivery of product with 100% renewable energy. We intend to achieve this goal with no purchase of unbundled renewable energy credits (RECs) or carbon offsets but, rather, by direct purchase of clean power on the grids where we work and live. In 2017 we signed a direct, open access power purchase agreement (PPA) to power our Bangalore site with 100% renewable energy. In 2018 we signed a virtual PPA in collaboration with Facebook and Enel Energy in Nebraska equal to our California load at the end of 2016. Our Hillsboro, Oregon data center is a critical next-step in achieving our RE100 objective.

We welcome the opportunity to work with PGE in support of their green tariff proposal. The potential for powering our digital delivery of product to our customers from our Oregon data center with 100% renewable energy -- bundled with its environmental attributes -- is precisely what we hope to achieve. The ultimate goal should be to decarbonize the grid so everyone in the community can benefit from renewable energy. We believe this green tariff is an important step in that direction.

Partnering with PGE not only brings their energy expertise of 130 years, but also sends a strong, positive message to our local employees and the community at large that we are moving forward together responsibly.

We support PGE's efforts on this green tariff initiative and ask the Oregon Public Utility Commission to approve PGE's efforts and create a pathway to a future all Oregonians desire.

Sincerely,

Vince Digneo
Sustainability Strategist
Adobe

usbank.com

Public Utility Commission of Oregon Attn: Filing Center
201 High Street, S.E.
P.O. Box 1088
Salem, OR 97308-1088

RE: UM 1690 – Customer's Comments on Portland General Electric Company's Voluntary Green Tariff for Non-Residential Customers

At U.S. Bank, we're passionate about helping customers and the communities where we live and work. We care deeply about ***promoting sustainable business practices while supporting economic growth.***

U.S. Bank embraces our responsibility to be a good steward of our natural resources. We have implemented a 'continuous improvement' approach by protecting and conserving our natural resources through methods such as:

- Developing business practices that protect and conserve our natural resources.
- Embracing opportunities for new products, services and partnerships that improve how environmentally sustainable we are.
- Adopting new technologies, such as renewable resources, that continue to reduce our carbon footprint.

Many of these approaches can create long-term value for our stakeholders through increased revenues, reduced costs and reduced risks. But just as importantly, these tactics can help improve the world we all share.

U.S. Bank leads and participates in numerous initiatives to become more environmentally responsible. This includes setting goals to measure our progress.

We have committed to reducing our operational greenhouse gas emissions by 40% by 2029 and 60% by 2044, using a 2014 baseline.

U.S. Bank is a leader in developing Community Solar Garden programs in four states in order to make it easier to access and adopt solar, which creates job opportunities and spurs economic development in these markets.

We support PGE's efforts on this green tariff initiative and ask the Oregon Public Utility Commission to approve PGE's efforts to create a program that would allow U.S. Bank the option to participate in another local community green energy opportunity.

Gregory Thorne

Gregory Thorne
Vice President
Sustainability & Energy Manager

UM 1690 / PGE / 200
Sims – Tinker

BEFORE THE PUBLIC UTILITY COMMISSION

OF THE STATE OF OREGON

UM 1690

PORTLAND GENERAL ELECTRIC COMPANY

Direct Testimony and Exhibits of

Brett Sims
Jay Tinker

April 13, 2018

Table of Contents

I. Introduction and Summary

Q. Please state your names and current positions.

A. My name is Brett Sims, I am the Director of Commercial Strategy, Integration, and Planning for Portland General Electric Company (PGE).

My name is Jay Tinker, I am the Director of Regulatory Policy and Affairs at PGE.

Our qualifications are listed in Section IV of this testimony.

Q. What is the purpose of your testimony?

A. The purpose of this direct testimony is to provide support for PGE's green tariff program, filed under Docket No. UM 1690. Our testimony is further designed to:

- Provide context and background regarding the green tariff process to date in Oregon.
- Introduce and provide the structure of PGE's proposed green tariff, a draft of which is included as Exhibit PGE/201.
- Discuss the nine conditions listed in Order No. 16-251 that utilities should meet if designing a voluntary renewable energy product.

Q. What is PGE seeking from the Commission in this docket?

A. PGE is seeking approval from the Public Utility Commission of Oregon (OPUC or Commission) to offer the green tariff structure proposed – inclusive of program characteristics, limits, and pricing mechanisms. This tariff will serve as the channel to offer a voluntary renewable energy product to customers who wish to enroll, and in future periods PGE will file individual agreements with customers as compliance filings to the approved green tariff.

Q. With regard to the tariff that PGE is filing today, has PGE reached specific agreements with customers, or on a specific project?

A. No. The tariff that PGE is filing today outlines the proposed characteristics of the green tariff program and the rules by which PGE will enroll customers in a voluntary renewable energy program, if approved. Specific agreements and pricing information, between PGE and participating customers, will be filed upon completion (assuming tariff approval), and will comply with the rules and program parameters outlined in the tariff filed today.

Q. Please provide context regarding Docket No. UM 1690, and why PGE chose to file for green tariff approval through this docket.

A. PGE has designed and filed this proposed green tariff to comply with the nine conditions, as applicable, listed in Order No. 16-251 of Docket UM 1690. UM 1690 was opened in April of 2014, following the passage of House Bill 4126 (HB 4126), which directed the Commission to examine whether a utility-offered voluntary renewable energy tariff was in the public interest. The docket was divided into phases: a Phase I study of potential impacts of allowing electric companies to offer voluntary renewable products to nonresidential customers according to the five statutory factors of HB 4126, and a Phase II, which would answer the threshold question of "whether, and under what conditions, it is reasonable and in the public interest to allow electric companies to provide voluntary renewable energy tariffs to nonresidential customers." UM 1690 involved a robust and transparent process, with over 25 stakeholders providing suggestions, feedback, advice, and recommended best practices regarding the form and structure of a voluntary renewable energy product in Oregon, including whether it is in the public interest to allow a utility-offered green tariff.

On August 25, 2015 the Commission issued Order No. 15-258, which closed Phase I of the docket. In December of 2015, the Commission proceeded on a 2-1 vote to move to Phase II of the docket, and set forth the nine conditions with which a voluntary renewable energy program should comply. Following further comment and an opportunity for the utilities to file draft voluntary renewable energy tariffs, the Commission issued Order No. 16-251, in which the Commission ruled to allow utilities to offer voluntary renewable energy tariffs provided they meet the nine conditions delineated in the Order.

Q. You mentioned that the docket was opened when the legislature passed HB 4126 and that law contains five statutory factors to guide the investigation. Please list those five factors.

A. The five factors included in HB 4126 – and used in UM 1690 to organize the Phase I study – are as follows:

- Whether allowing electric companies to provide [voluntary renewable energy programs] to non-residential customers promotes the further development of significant renewable energy resources.
- The effect of allowing electric companies to offer [voluntary renewable energy programs] on the development of a competitive retail market.
- Any direct or indirect impact, including any potential cost-shifting, on other customers of any electric company offering a [voluntary renewable energy program].
- Whether the [voluntary renewable energy program] provided by electric companies to non-residential customer rely on electricity supplied through a competitive procurement process.

- Any other reasonable consideration related to allowing electric companies to offer [voluntary renewable energy programs] to their non-residential customers.

Q. These five statutory factors were interpreted by the PUC to inform (in Order No. 15-405) the nine conditions ultimately set forth in the Commission's Order. Please list the nine conditions.

A. The nine conditions listed in Orders No. 15-405 and 16-251 are as follows:

1. Renewable portfolio standard (RPS) definitions that must apply to voluntary renewable energy products are for resource type, location, and bundled renewable energy certificates (RECs).
2. Voluntary renewable energy options should only include bundled REC products. Any RECs associated with serving participants must be retired by or on behalf of participants, unless the participants consent to RECs being retired by the utility or developer.
3. The year that a voluntary renewable energy program eligible resource became operational should be no earlier than 2015.
4. The voluntary renewable energy program size is limited to 300 aMW for PGE.
5. Voluntary renewable energy product design should be sufficiently differentiated from existing direct access programs.
6. Voluntary renewable energy product offering terms and conditions (including the timing and frequency of offerings), as well as transition costs, must mirror those for direct access. PGE may propose terms and conditions that differ from current direct access provisions but must propose changes to their direct access programs to match those changes.

7. The regulated utility may own a voluntary renewable energy resource, but may not include any voluntary renewable energy resource in its general rate base. It may recover a return on and return of its investment in the voluntary renewable energy resource from the subscriber; however, the utility must share some of the return on with the other utility customers for ratepayer-funded assets used to assist the voluntary renewable offering.
8. All direct and indirect costs and risks are borne by the participating voluntary renewable energy customers, shareholders of the utility or third-party developers and suppliers with provisions allowing independent review and verification by Commission Staff of all utility costs. Costs include but are not limited to ancillary services and stranded costs of the existing cost of service rate based system.
9. All voluntary renewable offerings must be made publicly available and subject to review by the Commission to ensure they are fair, just, and reasonable.

Q. Following the establishment of conditions that would inform green tariff structure, did utilities file proposed voluntary renewable programs?

A. No. PGE informed the Commission on April 14, 2016 that due to existing market conditions and the requirement to meet all nine conditions put forth by the Commission, PGE would not be proposing a voluntary renewable product at that time. PGE requested that the Commission not foreclose a later filing should conditions and customer interest change. The Commission subsequently closed the docket through Order No. 16-251.

Q. Has PGE's filed green tariff met the nine conditions?

A. Yes. A detailed analysis of how PGE's proposed tariff meets each condition is included in Section III of this testimony.

Q. According to Order No. 16-251, what were to be the next steps in the docket if it had not been closed?

A. As stated on page 25 of Appendix A to Order No. 16-251, Staff recommends "close Phase 2 and open Phase 3 by authorizing electric companies to file schedules with the Commission for consideration of approval of rates, terms, and conditions of services offered under the voluntary renewable tariff, subject to the conditions adopted in Phase 2." The Commission accepted Staff's recommendation.

PGE's filing described in this testimony outlines the rates, terms, and conditions of such a service, in accordance with the planned move to a Phase 3 as described in Order No. 16-251.

II. Structure of Green Tariff

Q. Please provide the structure of PGE's proposed green tariff.

A. PGE is proposing a green tariff designed to meet four key goals: 1) promote the development of new renewable generation to drive additionality, 2) provide a product that is consistent with the preferences we are hearing from our customers, 3) encourage partnerships, and 4) avoid cost-shifting to nonsubscribing customers. These goals are met with the following design characteristics:

Promote use of new renewables:

The proposed green tariff will drive decarbonization of the economy by acquiring bundled renewable energy and RECs for customers through power purchase agreements (PPAs) with specified, incremental renewable resources as defined in Condition 1 of Order No. 16-251 (resource brought online no earlier than 2015). Although the Commission mandated that 2015 should be the threshold for "new," PGE will strive to serve customers through incremental renewable resources – accelerating decarbonization and transformation of the regional power supply mix.

We are also promoting the use of new renewables by structuring the product to be flexible enough to meet individual customer needs, consistent with overall program parameters and design elements. We plan to supply the green product in this filing through PPA(s) with expected contract terms between 10 and 20 years, while providing subscription options to retail customers who choose to enroll in the program. Currently, PGE plans to offer 5, 10, 15, or 20 year enrollment options.

Encourage partnerships through competitive procurement of bundled RECs:

In compliance with Conditions 2, 3, 5, 7, and 8 of Order No. 15-405, PGE is proposing to structure the initial green tariff offering through PPA(s) with a third-party. We have heard from our customers that they want renewable programs to be flexible, to support additionality – adding new renewables to the grid that would not have come online otherwise – and to offer alternatives regarding resource type and location. In order to meet our customer's renewable energy goals as quickly as possible, and to comply with the conditions set forth in UM 1690, our proposal includes a commitment to supply the program with PPA(s) for this initial green tariff filing.

In addition, PGE plans to secure PPA(s) to support the green tariff by leveraging competitive procurement processes. This approach will help ensure our ability to consider a variety of proposals and select resources that provide the best combination of cost and risk.

Avoid Cost Shifting

In compliance with Conditions 7 and 8, PGE has designed a green tariff specifically to avoid any cost shifting to non-participating customers. Subscriber customers will remain on their current, applicable cost of service schedule (including all relevant riders, supplemental schedules, and regulatory adjustments), participating in the green tariff through an additional supplemental rider. The green tariff subscribers will continue to contribute to all system costs, eliminating the risk of stranded rate base assets.

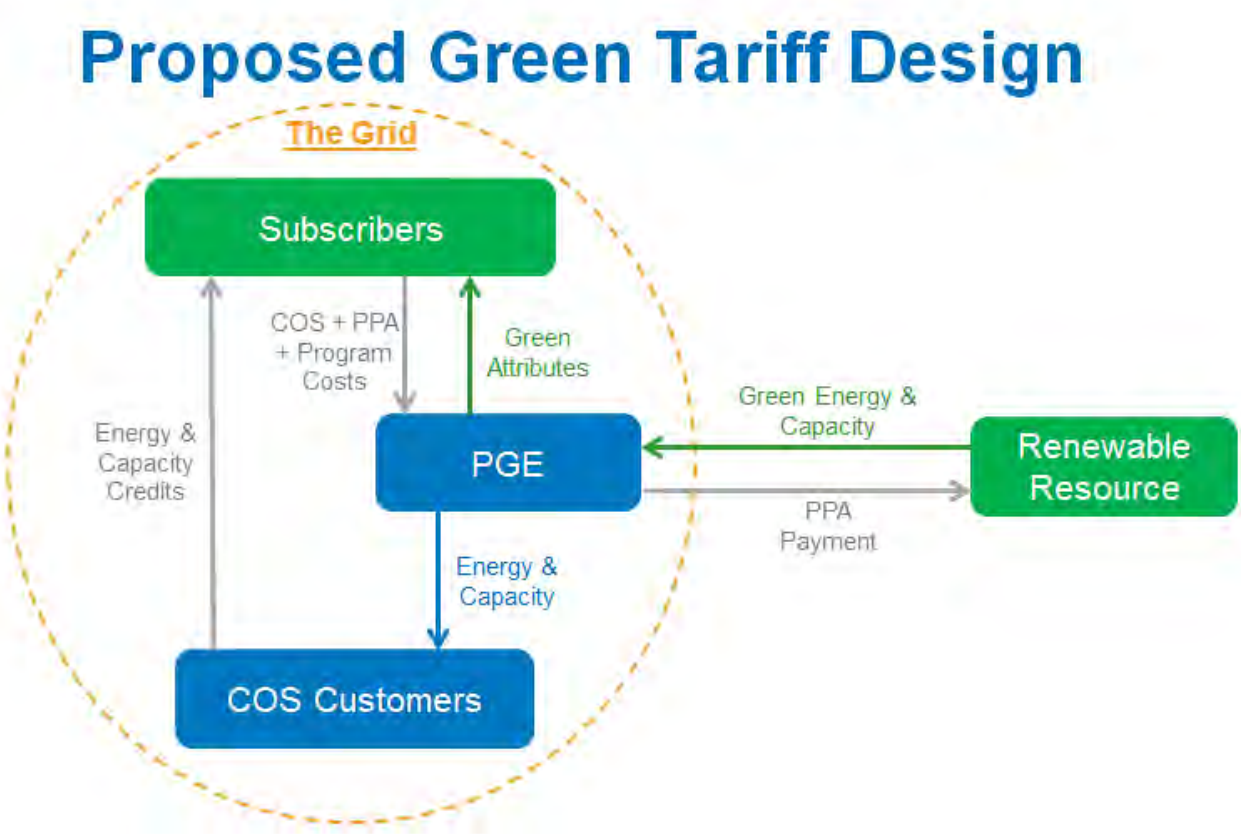
Green tariff subscribers will bear the full cost of the program and the underlying renewables resources. Risks associated with subscriber contract obligations, resource production variances, and/or asset availability will be borne by participating customers, PGE, and PPA suppliers.

Q. The initial offering of the proposed green tariff will be served through a PPA. Has PGE considered owning a resource in the future?

A. Depending on customer interest and other market factors, PGE may consider future ownership of a green tariff resource, as allowed by the Commission in Order No. 15-405. If PGE proposes to own a green tariff resource in the future, it will be in compliance with the nine conditions.

Q. Please provide a graphical representation of the proposed tariff to help parties envision its structure?

A. PGE's proposed tariff will be structured as follows:



PGE will enter into a PPA(s) with a renewable resource, with any premium above the energy and capacity value of the resource to be paid by subscribers to the green tariff

program. The green energy and capacity acquired from the renewable resource will be delivered to PGE's grid. The RECs will be retired on behalf of subscribers, while all customers will benefit from the energy and capacity additions to the grid.

Under the proposed green tariff construct, subscriber customers would receive a credit for the incremental value of energy and capacity provided by renewable resources secured for the program. Both the system load-resource balance requirements (sufficiency or deficiency) and value of incremental capacity and energy would be determined at the time of program fulfillment. When PGE is resource sufficient, we propose that subscribers be credited only for the value of energy in accordance with IRP methodology (AURORA market price forecast). If PGE is resource deficient at the time of program subscription/resource fulfillment, we propose that participating customers be credited the value of capacity according to the then approved Schedule 201, in addition to the value of energy based on the AURORA market price forecast.

The subscribers will remain on PGE's cost of service system, and will continue to pay all applicable rates, riders, supplemental schedules, and regulatory adjustments as they do currently. Any program costs associated with the green tariff will be borne by subscribers and/or PGE shareholders.

Q. Can PGE provide an example of how this might look to subscribers?

A. Yes. An example is shown in Figure 2 below. The example and numbers provided are for illustrative purposes only. Actual prices and credit values will be based on the underlying renewable project(s) and associated PPA(s), number of program participants, subscriber agreement terms and conditions, PGE load-resource balance and the value of capacity and energy at the time of fulfillment.

+ $45/MWh – PPA cost borne by subscribers

+ $3/MWh – Administration and integration cost paid by subscribers

- ($33/MWh – Energy Credit through AUT)

- ($5/MWh – Capacity Credit (if applicable) through AUT)

= $10/MWh – incremental cost to subscribers

Figure 2 – proposed pricing and crediting mechanism

The $45/MWh illustrative PPA cost is paid by subscribers, with all customers (including participants) providing credits to compensate for the energy and capacity added to the cost-of-service portfolio, in accordance with system need and the value of the incremental capacity and energy. Any administration and integration costs will be paid directly by the subscribers. The energy and capacity credits will not be based on the PPA price, but will represent market value for energy and the approved Schedule 201 value for capacity. The net cost to subscribers represents the de facto value of the incremental renewable resource.

Q. Will the RECs (or any green attribute) associated with the green tariff resource be used to benefit all customers?

A. No. Only the energy and capacity from the renewable project will flow to all customers, and all cost-of-service customers will credit only the value of energy and capacity to subscribers. The RECs associated with the green tariff facility will not be used for general RPS compliance purposes, unless that use is specifically requested by the subscriber (per Order No. 16-251). RECs obtained on behalf of program subscribers will be solely for the use/benefit of subscribers to the program.

Q. You state that customers will provide a credit to subscribers based on the energy and capacity additions made to PGE's grid. Could you provide additional detail regarding that proposed mechanism?

A. Yes. PGE proposes that the crediting process occur through the Annual Update Tariff (AUT), as currently applies to PGE's power supply contracts and wholesale market purchases for fuel and electricity. Cost-of-service customers (including subscribers) will pay a per-kWh charge for energy and capacity value associated with the green tariff PPA(s) which is then credited to subscriber customers. Both the charges and credits will then be calculated through the AUT, similar to how PPA costs are allocated currently. The values of the per-kWh charge will be determined at the time at which the green tariff resources and subscriptions are fulfilled, and will represent an energy value calculated using the AURORA model in accordance with the methodologies from PGE's Integrated Resource Plan (IRP), updated with current assumptions. If the utility is in a period of resource deficiency – as defined in PGE's most recently acknowledged IRP – subscribers will also receive a capacity credit based on the resource capacity contribution as determined in accordance with IRP methodology and valued in the then current Schedule 201. No capacity credit will be applied during periods where PGE's system is resource sufficient.

Other than crediting subscribers for the energy and capacity added to the grid, non-subscribing customers will not be subject to any costs associated with the green tariff, and will be insulated from risks associated with the green tariff project(s).

Q. Does PGE anticipate that the value of the credit will change over time?

A. PGE's proposed program would lock in the credit values paid to subscribers at the time that the PPA is executed.

The values of credits will differ based on the future timing of subscriber enrollment, resource acquisition, and other factors, including PGE's portfolio and sufficiency/deficiency at the time.

The proposed credit value will be submitted to OPUC Staff in the form of a compliance filing.

Q. Is PGE currently requesting that the OPUC approve the values associated with the PPA and the credits?

A. No. At this time, PGE is seeking approval only of the rules and structural parameters of the tariff. PGE is seeking approval for the "formulaic method" described above for determining green tariff prices and credit values. Specific values will be brought to the Commission in the form of a compliance filing when subscriber agreements are completed, using then current inputs and market assumptions.

Q. Will PGE require the subscribers to the green tariff to pay transition adjustments, as direct access customers do?

A. No. The green tariff is a supplemental product, meaning that it serves only as an addition to the subscriber's current cost of service rate schedule. Subscribers to the green tariff will continue to pay their share of the costs of PGE's system, eliminating the risk of stranded assets borne by a reduced number of cost-of-service customers. We understand and share the Commission's concern about transition adjustments and the need to avoid stranded costs for any proposal that allows customers to leave cost-of-service pricing/tariffs for a green product. That is not the case here.

The transition adjustments in direct access represent the proportional share of the fixed costs of PGE's power supply portfolio associated with the customer(s) that leave PGE's cost

of service rates to receive energy service from an alternative supplier. These adjustments can be either positive or negative and are designed to neutralize the cost or benefit impact to remaining cost-of-service customers caused by direct access customers leaving PGE's system for energy supply. Since the green tariff subscribers remain energy customers on their applicable cost-of-service rate schedule, they are not subject to transition adjustments. The subscribers instead continue to contribute to fixed power supply costs through their cost of service schedule.

Q. In accordance with condition 6 of Order No. 15-405, will PGE be proposing a crediting mechanism by which cost of service customers pay a credit to exiting direct access customers?

A. No, this structure exists already. When a direct access customer exits PGE's system, the customer temporarily pays their cost of service costs that are functionalized to generation, minus the value of market energy. The remainder is known as the transition adjustment. Deducting the forward market price of energy represents a crediting mechanism that the direct access customer receives for the energy that PGE no longer uses to serve the direct access customer.

Following the five year transition adjustment period, the direct access customer pays no generation costs to PGE, instead paying generation costs to their selected supplier.

Q. If a current direct access customer was interested in receiving supplemental renewable energy through this green tariff, would the customer be permitted to do so?

A. No. As this green tariff product was specifically designed to comply with the nine conditions and thus has a unique framework – that it is supplemental in nature, sufficiently differentiated from direct access, and is designed to avoid stranded costs on the rate based

system – subscribers will be required to be receiving base service from a PGE schedule that includes generation service.

A customer who is already on direct access has the ability to purchase supplemental renewable energy through their Electricity Service Supplier (ESS).

Q. Would a subscriber to the green tariff be able to elect direct access service during the term of their contract?

A. No. PGE has specifically designed this program to be supplemental to PGE's base retail service, and to eliminate risk of cost-shifting to nonsubscribing customers. The crediting mechanism is based on a customer that is receiving PGE generation, and has locked in credits based upon the time the PPA was executed. If that customer elected to obtain base service from an electricity service supplier while simultaneously receiving service through the green tariff, PGE's portfolio position would change, and the credit values may no longer be accurate and insulated from cost shift. If a customer elects to join the direct access program, the customer will be removed from the green tariff.

Q. You mentioned that non-subscribers will be insulated from risk, and that non-subscribers will not be asked to pay anything other than energy and capacity (as applicable) credits in this program. Please provide more detail regarding how PGE proposes to manage risk.

A. Yes. The green tariff is structured so that program risk is shared between PGE, the generator, and program subscribers. PGE anticipates adding a risk premium to the program cost, which is intended to balance the inherent uncertainties that result from a program that incorporates specific generation resources, differing contract lengths and individual subscriber

performance obligations. To the extent that risk is realized, the risk premiums paid will be used to absorb the risk-realized costs.

If realized risks exceed the collected risk premium, such additional risks will be borne by PGE, not by non-subscribing customers.

Q. Will risk premiums paid by subscribers change based on the contract length that subscribers sign up for?

A. Yes. Although subject to negotiation between PGE, PPA suppliers, and subscribers, PGE anticipates that the risk premium will reduce as the subscribers' preferred term length more closely matches the PPA length, and the risk premium may increase if the subscribers' preferred term is significantly different than the PPA length. This premium difference is intended to balance against the risk of subscriber turnover.

Q. How does PGE plan to treat unsubscribed energy in this program?

A. PGE intends to match the subscriber demand to the PPA. PGE intends to only enter into a PPA when the resource is adequately subscribed by participating customers. Based on differing subscriber appetites and needs, we realize that subscriber term lengths will be different and that there is the potential of "churn" as subscribers exit and enter the program. PGE will use the risk premium to minimize this risk. Should demand exceed availability, PGE plans to provide "pre-enrollment" opportunities by which customers can sign up for the "next" green tariff project, but will also be reserving their spot in line in case a subscription slot in a current program becomes available.

In the event that a portion of the project is unsubscribed, PGE shareholders will bear the difference between the PPA price and the energy/capacity credits.

Q. How does PGE plan to allocate the costs of administering this program?

A. The potential costs of administering the program (staff, software, etc.) will be billed directly to the subscribing customer(s). PGE – through the risk premium – will insulate non-subscribing customers from bearing costs associated with program administration.

Q. PGE mentions that "adequate" subscription levels will need to be reached before a PGE will seek to enter into a PPA. Please define adequate in this context.

A. Generally speaking, PGE will aim to hit a 90% subscription level before a PPA is sought. However, regardless of subscription level, non-subscribing customers will not be subject to risk in the event that a facility is not fully subscribed.

III. Compliance with the nine conditions

Q. Has PGE designed the filed green tariff with the intention of satisfying the obligations of the nine conditions?

A. Yes. PGE designed the green tariff to meet the nine conditions. Due to the specific nature of the green tariff that PGE has filed, we anticipate that some of the provisions from 2015 may not fully apply to PGE's proposed program. We clearly note below where that is the case.

Q. Please explain how PGE's proposed green tariff meets condition 1 – RPS definitions for resource type, location, and bundled RECs must apply to voluntary renewable products.

A. PGE's filed green tariff uses the following definitions for resource type, location, and "bundled RECs," consistent with how these terms are defined in Oregon State Law:

> **Location:** The facility that generates the qualifying electricity for which the bundled renewable energy certificate is issued is located in the United States and within the geographic boundary of the Western Electricity Coordinating Council (WECC).[1]
>
> **Resource Type:** Electricity generated utilizing the following types of energy may be used to comply with the RPS – wind energy, solar photovoltaic and solar thermal energy, wave, tidal, and ocean thermal energy, geothermal energy.[2] As the green tariff program is limited to projects built after 2015 – and is intended to be incremental in nature – the rules regarding age of resource in ORS 469A.025 are met. All other specifications listed in ORS 469A.025 are used for the purposes of green tariff resource type.

[1] ORS 469A.135
[2] ORS 469A.025

Bundled RECs: means a renewable energy certificate for qualifying electricity that is acquired by an electric utility or electricity service supplier by a trade, purchase, or other transfer of electricity that includes the renewable energy certificate that was issued for the electricity, or by an electric utility by generation of the electricity for which the renewable energy certificate was issued.[3]

Q. Please explain how PGE's proposed green tariff meets condition 2 – voluntary renewable options should only include bundled REC products. Any RECs associated with serving participants must be retired by or on behalf of participants, unless the participants consent to RECs being retired by the utility or the developer.

A. PGE's proposed green tariff was designed to bring a bundled product – energy, capacity, and a green attribute – to the grid. PGE will not provide "REC only" options to customers in this tariff, and any subscribing customer must enter into a contract for energy, capacity, and the green attribute.

As noted in PGE/201, RECs will be retired by or on behalf of program subscribers.

Q. Please explain how PGE's proposed green tariff meets condition 3 – The year in which a voluntary resource became operational should be no earlier than 2015.

A. PGE has included in the filed tariff that a resource brought online prior to January 1, 2015 is not eligible for inclusion in a green tariff product. PGE anticipates that projects used for the green tariff will be incremental and will represent true additionality of renewable resources, consistent with the preference we are hearing from our customers.

Q. Please explain how PGE's proposed green tariff meets condition 4 – the voluntary program size is limited to 300 aMW for PGE.

[3] ORS 469A.005

A. The size of PGE's initial green tariff offering will depend on customer demand. We anticipate that the initial offering will be well below the 300 aMW cap listed in the conditions.

Q. Please explain how PGE's proposed green tariff meets condition 5 – voluntary product design should be sufficiently differentiated from existing direct access programs.

A. PGE's voluntary green tariff program is designed to be significantly different – and complementary to – the direct access program that exists in Oregon. Our goal is to provide customers increased choice regarding their energy supply. A breakdown of differences is shown in Table 1 below.

Program Element	Green Tariff	Direct Access
Customer leaves PGE generation system?	No, subscriber stays on PGE cost of service schedule and continues to pay all applicable rates and riders	Yes. Customer is able to select either short-term or long-term generation system exit.
Transition Adjustments Apply	No. Subscriber stays on PGE cost of service schedule, so no transition adjustments necessary.	Yes. As the customer transitions off of PGE's generation service, the customer contributes to 5 years of fixed generation costs.
Customer receives credit for avoided energy procurement by the utility.	Yes. Through the AUT.	Yes. Forward market energy is subtracted from cost of service costs functionalized to generation.
Provides customer choice?	Yes, through selected customer resource type and RFP for third-party supply.	Yes, through choice of alternate generation supplier for base electric service.
Program is limited to new renewables only?	Yes.	No.
Program Cap	Yes. Currently proposed to be less than 300 aMW	Yes. Currently 300 aMW.

Q. Please explain how PGE's proposed green tariff meets condition 6 – voluntary program terms and conditions (including the timing and frequency of VRET offerings), as well as transition costs, must mirror those for direct access. PGE may propose voluntary program terms that differ from current direct access provisions but must propose changes to direct access programs to match those changes.

A. PGE's proposed green tariff is available as a premium service to customers who would like the option of opting for renewable energy. The existing direct access program is already designed to allow for voluntary renewable energy from an electricity service supplier at a premium. No changes to the direct access program are necessary based on PGE's Green Tariff filing.

Q. Please explain how PGE's proposed green tariff meets condition 7 – the regulated utility may own a voluntary resource, but may not include any voluntary resource in general rate base. It may recover a return on and return of its investment in the voluntary resource from the voluntary customer; however, the utility must share some of the return on with other utility customers for ratepayer-funded assets used to assist the voluntary program offering.

A. In this filing, PGE does not propose to own the renewable facility in this program. Rather, PGE will seek a PPA on behalf of subscribers, and will leverage competitive processes to secure renewable resources.

PGE is not proposing to own the facility, and has priced no "return on" into the program formula. To the extent that PGE incurs administration costs for the marketing, offering, or operation of this program, those costs will be allocated directly to subscribers.

Q. Please explain how PGE's proposed green tariff meets condition 8 – All direct and indirect costs and risks are borne by the subscribing customers, shareholders of the utility, or third-party developers and suppliers with provisions allowing independent review and verification by the Commission Staff of all utility costs. Costs include but are not limited to ancillary services and stranded costs of the existing cost of service rate based system.

A. PGE has addressed condition 8 by working with our customers to create a tariff design that enables our customers to remain on cost of service (eliminating the risk of stranded assets in the existing rate based system) and by directly allocating ancillary program costs – such as administration and integration (also known as shaping and firming) – directly to the subscribing customers.

Q. Please explain how PGE's proposed green tariff meets condition 9 – all voluntary renewable offerings must be made publicly available and subject to review by the Commission to ensure that they are fair, just, and reasonable.

A. Should the Green Tariff proposal be approved, PGE will bring completed customer agreements before OPUC Staff in the form of a compliance filing. Staff will be able to verify that the offering, terms, conditions, and prices are in accordance with the approved green tariff. If Staff finds the compliance filing deficient, they are able to direct PGE to rework the agreement to ensure full compliance with the approved green tariff.

If other parties would find it helpful, PGE is open to providing this information publicly following the execution of the agreement, subject to subscriber consent, developer consent, and a protective order.

IV. Customer Demand and Green Tariff Availability

Q. In 2014 when UM 1690 was initiated, were voluntary green energy products prevalent throughout the United States?

A. No. At the time that HB 4126 was passed and Docket UM 1690 was opened, Oregon was among the first states to examine utility-offered green tariffs.

Q. Have utility-offered green tariffs become more common between 2014 and 2018?

A. Yes. Many states currently allow for utility-offered green tariffs, including California, Washington, Nevada, Utah, New Mexico, and Wyoming. The comprehensive map is shown in Figure 3 below:

Figure 3 – courtesy of 3Degrees

Q. Oregon allows retail choice to non-residential customers through direct access. Why is a green tariff necessary in addition to direct access?

A. PGE acknowledges that certain renewable options are available to customers through Oregon's direct access program. However, direct access is not always the preferred choice for customers, nor do all customers want to be forced to leave the utility's generation system in order to procure renewable energy. Allowing customers to have increased choice for renewables will put Oregon in the company of states such as Michigan, Maryland, and California, which all have both retail choice and approved utility green tariffs.

Q. How does PGE know that customers actually want PGE to provide this new renewable product?

A. PGE has designed this program with significant input from our customers. We held multiple listening sessions, public workshops, and one-on-one meetings to ensure a product that responds to our customers' needs. During these sessions, customers expressed an interest in advancing the development of renewable energy resources in Oregon and in having a greater portion of their electric usage attributed to renewable resources. We retained consulting services from 3Degrees (whose report is attached as PGE/202) and worked closely with World Resources Institute (the group that has developed best practice principles for the design of green tariffs).

PGE/100 in this docket includes the testimony from mayors of Oregon's six largest cities, advocating for optionality regarding renewables. PGE has also attached customer letters – advocating for additionality – as PGE/101 and PGE/102.

V. Qualifications

Q. Mr. Sims, please state your educational background and experience.

A. I received a Bachelor of Arts degree in Business with a focus in Economics from Linfield College in 1990, and a Master of Business Administration degree from George Fox University in 2001. Prior to my current position, I was the Director of Origination, Structuring, and Resource Strategy at PGE. I have also held other managerial positions at banking, technology and energy companies prior to working at PGE.

Q. Mr. Tinker, please state your educational background and experience.

A. I received a Bachelor of Science degree in Finance and Economics from Portland State University in 1993 and a Master of Science degree in Economics from Portland State University in 1995. In 1999, I obtained the Chartered Financial Analyst (CFA) designation. I have worked in the Rates and Regulatory Affairs department at PGE since 1996.

Portland General Electric Company
P.U.C. Oregon No. X-XX **Original Sheet No. XX-X**

SCHEDULE XX
LARGE NONRESIDENTIAL
GREEN ENERGY RIDER DRAFT

PURPOSE

This tariff is an optional supplemental service that supports the development of local new renewable resources as defined in Oregon Laws 2014, Chapter 100. Under this Schedule, a Nonresidential Customer may purchase a subscription share of a new renewable facility matched to the preference of the subscribing customer (up to the customer's yearly consumption).

DEFINITIONS

"Local" means that the facility that generates the qualifying electricity for which the bundled renewable energy certificate is issued is located in the United States and within the geographic boundary of the Western Electricity Coordinating Council (WECC). This definition is consistent with Oregon Revised Statute (ORS) 469A.135. PGE may seek specific resource locations at the subscribing customer's request.

"Bundled Renewable Energy Certificates" means a renewable energy certificate for qualifying electricity that is acquired by an electric utility or electricity service supplier by a trade, purchase, or other transfer of electricity, or by an electric utility by generation of the electricity for which the renewable energy certificate was issued. This definition is consistent with ORS 469A.005.

"Energy Value" or "Forward Energy Value" means the energy value calculated using the AURORA model and the same methodologies described in the Integrated Resource Plan (IRP), updated with current assumptions.

"Capacity Value" or "Capacity Expense" means the value of capacity, per PGE's approved Schedule 201 QF Avoided Cost at the time which the PPA is executed.

AVAILABLE

In all territory served by the Company.

Portland General Electric Company
P.U.C. Oregon No. X-XX **Original Sheet No. XX-X**

SCHEDULE XX (Continued)

APPLICABLE

This schedule is available – subject to capacity made available within the program – for enrollment following its initial approval, to all Nonresidential Customers whose aggregate demand across all retail schedules exceeds 30kW. In the event that a customer has multiple accounts – some of which may fall under 30kW of demand – the customer will be allowed to aggregate all Nonresidential accounts.

GENERAL PROVISIONS

I. Customers enrolling in this schedule commit to a designated annual quantity of renewable energy pursuant to a renewable energy service agreement between the subscribing customer and the Company for this schedule.

II. In procuring the bundled renewable energy on behalf of the subscribing customer, the Company will ensure that renewable energy resources utilized under this schedule are or have been placed in service on or after January 1, 2015.

III. The Company shall procure bundled renewable energy on the customer's behalf from a new renewable facility. In the event of yearly under-generation from the renewable energy resource, the Company will purchase renewable energy certificates on the Customer's behalf to ensure that the Customer's subscribed amount is covered under this tariff. In the event that the renewable energy supplier is no longer able to supply bundled renewable energy to the Customer, the Company, at the election of the Customer, shall make reasonable efforts to enter into a new purchased power agreement with another renewable energy supplier as soon as practicable with the cost of the renewable energy to the Customer revised accordingly.

IV. This schedule is for supplemental retail service, and will be served solely as a supplement to retail base rates by the Company. Subscribing customers who leave retail base service, or who are not currently on retail base service are ineligible for this program.

V. The Company will retire the RECs associated with the energy procured for the participating Customer, or at the Customer's request, transfer the RECs to the Customer.

SCHEDULE XX (Continued)

PRICING STRUCTURE

1. While enrolled in the Green Tariff, the customer shall continue to take service under – and pay the components of – their applicable base rate schedule.
2. The Green Tariff rate will pass to participating customers the costs of acquiring the renewable resource, integrating it onto the Company's system, and operating this supplemental program. The subscribing customer will be credited with the Energy Value and Capacity Value (as applicable). These charges and credits will be determined and billed as follows:

    - PPA cost or Revenue Requirement for each MWh under contract;
    - An administrative charge to account for program costs, integration, shaping, firming, and other relevant program expenses;
    - A risk adjustment;
    - Credit for Energy Value and Capacity Value, as defined in the "Definitions" section above.
3. Non-subscribing customers will not be subject to PPA costs, administrative costs, integration costs, or any cost associated with this program, except the crediting of Energy Value and Capacity Value, as applicable.

CREDITS

The date of resource deficiency for the Company will be established as of the date that PGE enters into a PPA to procure the renewable resource on the subscribing customer's behalf.

Bill credits for renewable energy shall be based on a $/MWh rate. During a time of capacity resource deficiency for the Company, the credit will be equal to the energy value plus avoided capacity expense over the term in which the renewable energy supplier delivers renewable energy to the Company. During a time of capacity resource sufficiency for the Company, the credit will represent only the energy value.

The bill credit amount shall be determined at the sole discretion of the Company (subject to regulatory review through compliance filing) consistent with applicable Oregon and federal law and regulation, including 18 C.F.R. § 292, using the Company's avoided cost model to determine the Capacity Value. The credit values for energy and/or capacity will be determined at the time of PPA execution, fixed over the term in which the renewable energy supplier delivers to the Company.

The Company shall allow for regulatory review of the rate and credit mechanism agreed upon by The Company and the Customer through a compliance filing to the OPUC.

SCHEDULE XX (Concluded)

CONTRACT PERIOD

The customer may elect to subscribe to the Green Tariff for terms of 5, 10, 15, or 20 years. Customer shall enter into a contract for service under this Rider for a term and with terms and conditions consistent with the term and terms and conditions of the contract with the renewable energy supplier, or as agreed upon between Company and Customer (and subject to regulatory review). If the Customer requests an amendment to or termination of the service agreement, or defaults on the service agreement before the expiration of the term of the agreement, the Customer shall pay to the Company an early termination charge equal to the bill amount due under the termination and damages as agreed to in the contract between the Company and the subscribing customer. Such termination charge may be adjusted if and to the extent a successor customer requests service under this Tariff and fully assumes the obligation for the purchase of renewable energy prior to the effective date of the contract amendment or termination: provided, however, the Company will not utilize or change utilization of its assets and positions to minimize Customer's costs due to such early termination.

3Degrees
319 SW Washington St., Suite 1020
Portland, OR 97204

MEMORANDUM

To: Portland General Electric

From: 3Degrees Group, Inc.

Subject: Green Tariff Benchmarking Memo

Date: March 22, 2018

EXECUTIVE SUMMARY

Portland General Electric (PGE) seeks to partner with municipalities and businesses to create smart and renewable energy solutions to meet their respective energy goals. This memo summarizes research conducted to assist PGE in understanding the regulatory landscape for green tariffs in the Pacific Northwest, and nationally, as well as guidelines for designing a Green Future℠ Tariff that is appealing to customers and meets regulatory requirements.

Green tariffs can be designed in a variety of different ways and, as such, no two green tariffs are alike. We have identified nine strategic design components to consider when structuring a green tariff. Each component can be implemented in either of two ways, which we have characterized in the table below. The mechanism chosen for each component carries a series of pros and cons for both the utility and the customer, which ultimately affect the costs, risks, and appeal of a green tariff program.

Table 1: Green Tariff Program Design Components

	COMPONENTS	MECHANISMS	
structure	1. COMPATIBILITY	Tariff	Rider
	2. STRUCTURE	Sleeved PPA	Subscription product
	3. ELIGIBILITY & LIMITS	Limited by rate class, size, load	Minimal eligibility limits
project	4. VOLUME	Fixed capacity	Load percentage
	5. ADDITIONALITY	New build project	Existing resource
	6. OWNERSHIP	Utility-owned project	3rd party PPA
financial	7. CONTRACT TERM	Fixed	Flexible
	8. COST/CREDIT STRUCTURE	Market-based credit	Non-market based credit
	9. RATE BASE INTERSECTION	Minimal Rate Base Leveraging	Leverages rate base processes

FINAL

Key Benchmarking Results

There are 15 green tariffs currently available to customers across the country, not including three proposed green tariffs that are under consideration by regulators. Section one provides a national map of green tariffs currently available. Two of the tariffs currently available are offered by utilities in Michigan (Consumers and DTE Energy), which may be the most relevant to PGE's effort as they also operate in a partially de-regulated state.

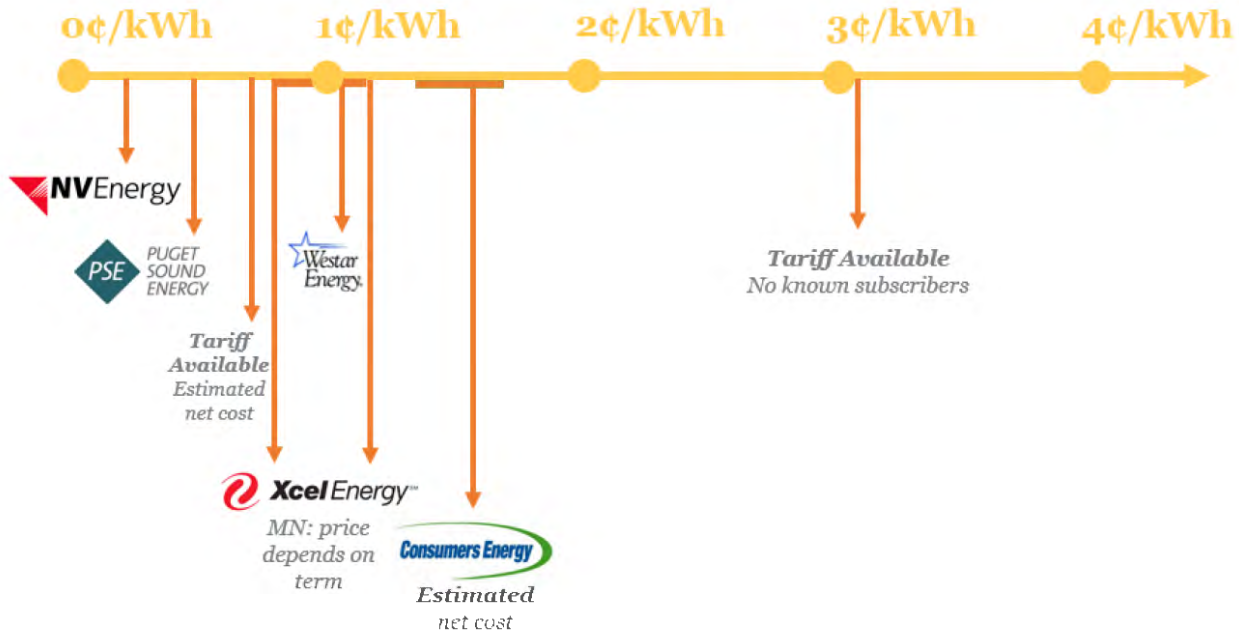
Key Customer Requirement Insights

Sleeved PPA programs aside, we note that most subscription-based utility green tariffs sell out within hours to months of launch. They tend to be quite diverse in their offerings' characteristics and costs, and do not tend to be very high cost. As such, we conclude both that there is a tremendous demand for utility-provided renewable energy, and that the utility offering need not attempt to respond to all possible customer requirements, but should rather have a clear value proposition and purpose for the structure proposed, and to be transparent and open about its benefits and costs.

Key Economic Indicator

The figure below illustrates how select green tariff offerings compare on a net cost basis.

Figure 1: First Year Net Cost Comparison of Select Green Tariffs



INTRODUCTION

In 2014, House Bill 4126 (HB4126) directed the Oregon Public Utilities Commission (OPUC) to study the impact of allowing utilities offering green tariffs—Voluntary Renewable Energy Tariffs (VRET)—to nonresidential customers. HB4126 also included a requirement that "All costs and benefits associated with a voluntary renewable energy tariff shall be borne by the nonresidential customer receiving service under the voluntary renewable energy tariff."

The key threshold question that the OPUC was directed to answer by HB4126 was: "whether, and under what conditions, it is reasonable and in the public interest to allow electric companies to provide VRETs to nonresidential customers." Consequently, there was an 18-month stakeholder engagement process exploring this question, which ultimately resulted in an OPUC Staff report that recommended utilities be allowed to offer a VRET so long as certain conditions were met. The OPUC Staff set forth nine conditions to meet "the statutory and regulatory concerns regarding additionality, no cost shift, and minimal impact on competitive retail market."

The OPUC Commissioners decided in a two-to-one vote to defer an answer to the threshold question. In addition, the Commissioners replaced three of the nine conditions recommended by the OPUC Staff. Their substitutions were driven mainly by two Commissioners disagreeing with the Staff's conclusion that utilities should not own assets to serve a VRET (e.g. the Commissioners believed that they should be able to do so). The Commissioners also asked PGE and PacifiCorp to propose draft VRETs for consideration.

PGE therefore drafted a proposal, but customer feedback on PGE's proposal was not encouraging, in large part due to the projected cost. Meeting all nine of the criteria set out by the Commissioners was challenging and ultimately impacted PGE's ability to offer a compelling draft tariff. Ultimately, PGE decided not to file a tariff and PacifiCorp did likewise. Both utilities declined to do so noting that they could not meet both customers' demands and the requirements laid out by the OPUC.

Ultimately, the VRET docket (UM 1690) was closed without any changes implemented. However, the closure of the VRET docket does not change the requirements it laid out for a VRET design. Consequently, any new proposed tariff will need to either address these requirements or alternatively make a sufficient case for their waiver.

This memorandum summarizes research conducted to assist PGE in understanding the regulatory landscape for green tariffs in the Pacific Northwest, and nationally. Further, it provides a benchmark for the quantitative and qualitative aspects green tariffs in order to assist

PGE in designing a green tariff that complies with Oregon law and meets customers' needs and preferences.

We begin by providing a summary of the benchmarking research conducted on green tariff design. Section two discusses customer requirements and preferences. Section three presents the results of an economic analysis of cost premiums from currently available programs. Section four offers several case studies with detailed information and statistics.

FINAL

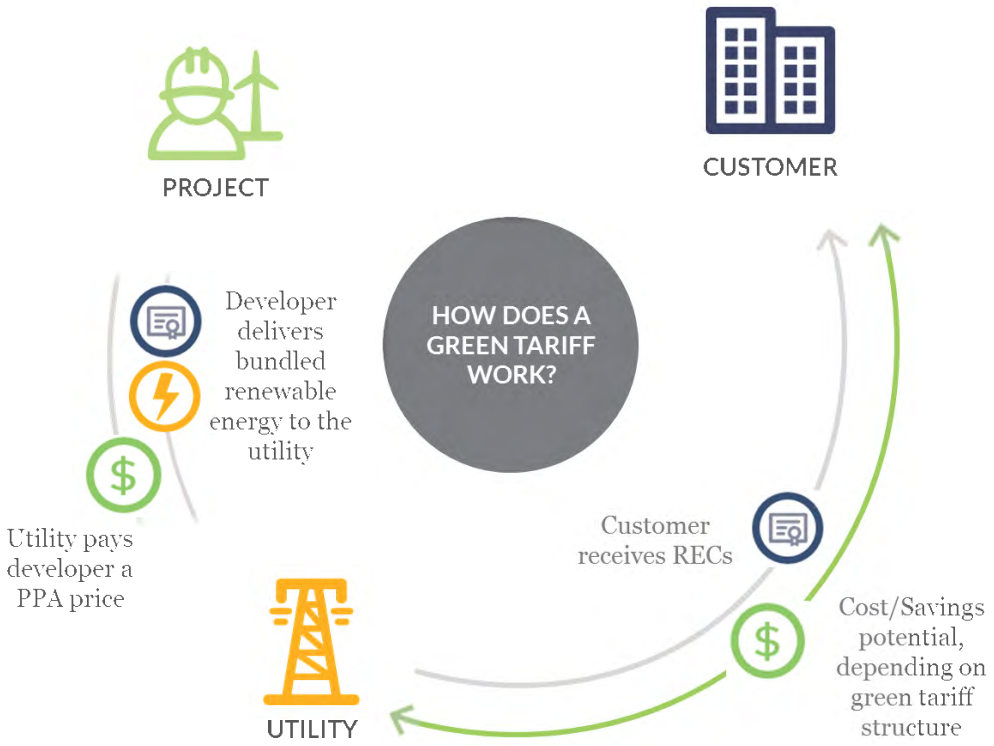
01 | NATIONAL TRENDS IN GREEN TARIFF DESIGN

Green tariffs have emerged as an option for customers in markets where there is no retail electricity choice allowing direct access to renewable energy. A green tariff replaces or alters the standard electricity rate structure under which customers are charged in order to directly procure renewable energy from a new asset.

A. The Basics

Several characteristics distinguish a green tariff from other utility-offered green programs. Firstly, a green tariff is not an unbundled REC-only offering. It is a rate structure that allows customers to purchase renewable energy (bundled energy + RECs) directly through their current utility service provider. Secondly, they are designed primarily for business customers with load in states that lack access to a liquid wholesale electricity market or for which a VPPA is not a viable option. Finally, the net cost reflects the actual cost of generating and delivering the renewable energy, which avoids the shifting of associated costs and risks to non-participating customers.

Figure 2: Typical Green Tariff Energy, REC, and Financial Flows



**Utility dispatches power to the customer, just as they always have*

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Table 2: Green Tariff Benefits for Utilities and Customers

Utility Benefits	Customer Benefits
Closer connection with customers who have renewable commitments	Access to utility-scale renewable projects with lower costs compared to smaller-scale
Increasing geographic and generation source diversity within the state or service territory	Fixed price structures can help hedge customer fossil fuel cost exposure
System-wide benefits and positive externalities such as reduced grid congestion, job creation, local air quality improvements, etc.	Powerful, simple, visible sustainability action with great story and tangible results
Demonstrably equitable price/rate setting that contributes to PUC approvals	When appropriately structured, carries less risk exposure compared to other long-term renewable energy supply mechanisms

B. Approved Green Tariffs

There are limited green tariffs available nationally, but the list of approved tariffs continues to grow in order to help business and municipal customers meet their renewable energy and climate goals. Each green tariff is unique, as regulatory approval requirements differ from state to state and customer demands vary. The key question, of course, tends to be the cost of the tariff for participants.

I. Programs in Regulated States

- **Black Hills Energy (WY):** Large Power Contract Service (designed for Microsoft)
- **Dominion Energy (VA)**:
  - Schedule RG tariff – no longer active; it was never used
  - Schedule RF tariff – received written support from Facebook
- **Duke Energy (NC)**: Green Source Rider – no longer active
- **Georgia Power (GA)**: C&I REDI Program
- **Madison Gas and Electric (WI)**: Renewable Energy Rider
- **NV Energy (NV)**: Nevada Green Rider
- **Omaha Public Power District (NE)**: Schedule No. 261M
- **PNM (NM)**: Green Energy Rider – created for Facebook
- **Puget Sound Energy (WA)**:
  - Green Direct
  - Schedule 451 (designed for Microsoft)
- **Rocky Mountain Power (UT)**: Schedule 32, Schedule 34

- **Xcel Energy (MN & CO)**:
  - MN Renewable*Connect program is active
  - CO Renewable*Connect tariff has been approved; Spring 2018 enrollment

II. Programs in Partially De-regulated States

- **Consumers Energy (MI)**: tariff provisionally approved; subscription period open
- **DTE Energy (MI):** Voluntary Renewable Energy Pilot Program approved
- **PG&E**, **SCE** & **SDG&E (CA)**: Green Tariff / Shared Renewables Program

Figure 3: Green Tariff Availability

Green Tariff Available
Green Tariff Proposed, but still under PUC consideration
Renewables facilitated by utility, but no green tariff offered
Retail Choice - customers can purchase renewables from non-utility suppler
No known direct utility-scale renewable energy supply options offered by utility

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C. Overview of Design Components

When a utility designs its own green tariff, it must make a number of choices and trade-offs to meet both their customers' demands as well as design a fair tariff that will be approved by regulators.

We have identified nine strategic design components to consider when structuring a green tariff, which we have grouped into three categories. Each component can be implemented in either of two ways, which we have characterized in the chart below. The mechanism chosen for each component carries a series of pros and cons for both the utility and customer, which ultimately affect the costs, risks, and desirability of the green tariff program.

Table 3: Green Tariff Program Design Components

	COMPONENTS	MECHANISMS	
structure	1. COMPATIBILITY	Tariff	Rider
	2. STRUCTURE	Sleeved PPA	Subscription product
	3. ELIGIBILITY & LIMITS	Limited by rate class, size, load	Minimal eligibility limits
project	4. VOLUME	Fixed capacity	Load percentage
	5. ADDITIONALITY	New build project	Existing resource
	6. OWNERSHIP	Utility-owned project	3rd party PPA
financial	7. CONTRACT TERM	Fixed	Flexible
	8. COST/CREDIT STRUCTURE	Market-based credit	Non-market based credit
	9. RATE BASE INTERSECTION	Minimal Rate Base Leveraging	Leverages rate base processes

The first three design components relate to the core structure of the green tariff. Compatibility determines whether a utility decides to keep the existing tariff in place and facilitate renewables through a rider, or whether the existing tariff is replaced with a new tariff only for renewables. Riders have been a popular mechanism because they make incremental cost or savings clear, which may facilitate cost-shifting discussions.

1. COMPATIBILITY: design to complement or replace current rate tariff?				
	Description	**Pros**	**Cons**	**Examples**
Tariff	*Tariffs replace the standard rate customers are charged on their bills with the cost of the renewable energy	*Bill is simpler for the customer, and better communicates the change in supply	*Complicated by graduated rates, partial subscriptions	**Xcel's (MN) Renewable*Connect:** tariff replaces existing tariff
Rider	*Riders are calculated separately from the customer standard rates *Represented as an additional line item on the customer bill	*Makes incremental cost or savings clear, unambiguous	*Implies renewables are different than, and perhaps not included in standard supply	**NV Energy's (NV) Nevada Green Rider:** rider works with existing customer tariff

The decision between a sleeved PPA and a subscription product tends to be a decision to support one or several large customers versus an inclusive tariff that is available to small, medium, and large customers with differing requirements. Subscription products provide more regulatory comfort because sleeved PPAs can be viewed as special contracts, which invite regulatory scrutiny.

2. **STRUCTURE:** design for single customer or broad appeal?				
	Description	**Pros**	**Cons**	**Examples**
Sleeved PPA	*Custom tripartite agreements specific to an individual project *Tariff customers commit to contract with utility under terms similar to project PPA	*Minimizes utility risk as PPA is sized to match customer requirements *Can be used for economic development w/terms not available to the larger rate base *Keeps all current rates and levies intact; no disaggregation of bill required	*Out of reach for vast majority of customers *Resource-intensive for utility and customer to negotiate and implement	**NV Energy's (NV) Nevada Green Rider:** Customers must take full project capacity
Subscription Product	*Aimed at a larger set of customers or customer classes	*Provides a new product option for many customers *Typically enables more flexibility in program design - more customer benefits can be offered with associated pricing	*More resource-intensive to implement than a single sleeve *Filings can sometimes be used as venue to address largely unrelated issues	**Puget Sound Energy's (WA) Green Direct**: Portfolio-based offer with multiple projects expected

3. **ELIGIBILITY & LIMITS:** design to maximize participation or minimize admin. burden?				
	Description	**Pros**	**Cons**	**Examples**
Rate Class, Project Size, or Load Limits	*Limited to customers on certain tariffs *New vs. existing customers *Caps participation at certain project size (e.g. 5 MW or 10%) *Limited to new loads or load over a specific threshold (e.g. >10M kWh/year)	*May be used as an economic development mechanism and only be available to new load – not existing load *Eligibility limits help utilities fit programs within existing operational constraints	*More participation restrictions decrease number of eligible or interested customers *Extraordinary limitations may be perceived as special tariff for single customer	**Dominion's (VA) Schedule RF**: only for customers with 30M+ kWh of new load are eligible
Minimal Eligibility or Size Limits	*Few, if any, limits to customer participation *Can limit to customers who want 100% renewable energy	*Encourages broad participation by appealing to all customer types and sizes *Programs with significant interest may achieve project cost reductions through economies of scale	*May increase program costs for all participants due to higher transaction and associated administration costs	**Xcel's (MN) Renewable*Connect:** sole limitation is cap at 10% of total available amount

The second set of design components relates to specific decisions about the asset itself. When determining how much renewable energy to procure, the utility must decide whether it prefers to simply divide a project into smaller slices and sell them to the customers, or whether it should offer a specific load coverage percentages. Once project size is selected, there are multiple different ways to manage demand: first-come first-served, caps on participation (10% of project size per account, prorated, etc.), or capacity related by customer class.

4. VOLUME: offer customers fixed capacity blocks or load coverage percentage?

	Description	Pros	Cons	Examples
Fixed Capacity	Fixed capacity subscriptions are unambiguous and easier for utility to manage	*Fixed capacity subscriptions easier for utility to manage *Quantity available is unambiguous and easy to communicate *Provides an intuitive connection between the project and customer	*Customers do not know if their needs will be met *Requires customers to true up remaining load served by brown power with unbundled RECs	**NV Energy's (NV) Nevada Green Rider:** Customer must take full project capacity
Load Percentage	Load-based subscriptions enable customers to meet 100% RE goals and/or changing load	*Ideal for 100% renewable energy commitments *Effective for customers with changing loads	*Requires utilities to address annual load – generation mismatches	**Consumers Energy's (MI) Renewable Energy Pilot Program -** Customers elect a subscription level between 20% and 100% of their load

5. ADDITIONALITY: source energy from a new or existing asset?

	Description	Pros	Cons	Examples
New Build	Utility offers generation from new asset that is being built as a direct result of green tariff program	*Meets additionality test and WRI's Buyers' Principals *Helps customer clearly articulate how it is achieving its RE goals	*Tend to be more expensive	Nearly all existing programs
Existing Resources	Utility offers generation from existing resource that may or may not currently serve its load	*Tend to be less expensive *You can use them to bridge gap until new asset comes online (MN)	*Additionality requirement not met	**Black Hills's (WY) Large Power Contract Service**: Microsoft used to supply from existing wind projects.

The "additionality" of the project is a key consideration for many business customers, as there is reputational risk associated with procuring renewable energy from existing resources. These customers want to go above and beyond the status quo and existing regulatory requirements to cause additional renewables to be built that otherwise would not have been added to the grid had it not been for their actions.

The decision by a utility to build and own versus contract through a PPA is often directed by regulators. If a utility is consistently the subject of scrutiny about trying to get assets included in the rate base, then the PPA could be a better decision. As for determining which project to procure, some utilities allow sleeved PPA customers to participate in project selection.

6. OWNERSHIP: utility-owned project or third-party PPA?				
	Description	**Pros**	**Cons**	**Examples**
Utility-Owned	Utility owns project	*Utilities with resources in their IRP at later date that are planned to be utility owned, then this can be treated as an accelerated of that.	*If not part of the IRP process, then can be perceived as if project is trying to get included in rate base	**Consumers Energy (MI):** Utility owns project and sells subscriptions
Third-Party PPA	Utility contracts directly with developer	*Project risk burden is clear and unambiguous	*May not yield lowest cost	**NV Energy's (NV) Nevada Green Rider:** Sleeved PPA between customer and developer

The third set of design components relates to the financial aspects of a green tariff, which, unsurprisingly, are often the most important for customers. Contract term and cost are critical decision factors for customers. In addition to contract tenor, a utility can decide whether or not to offer an early termination clause. Some utilities allow free early termination with reasonable notice (Georgia Power, 180 days), while most utilities impose steep fees (Xcel MN, $10/MWh multiplied by customer's last 12 months of usage).

7. CONTRACT TERM: offer flexible contract tenor options and early termination clauses?				
	Description	**Pros**	**Cons**	**Examples**
Fixed Contract Term	*Typically, fixed terms represent a long-term contractual commitment *Charges differ with term *Many tariffs offer several term options and include renewal provisions	*Long-term contracts reduce admin costs, commit customers to utility, and reduce risk of "unsubscribed" portions *Long-term contracts can improve tariff economics for customers	*Many customers cannot make long-term electricity purchase commitments, or prefer not to do so	**Puget Sound Energy's (WA) Green Direct** - 10, 15, or 20 year term option
Flexible Contract Term	*Month-to-month or annual terms, or negotiated long-term commitments *Exit provisions	*Enables more customers to consider participating *Renewals & replacement subscriptions can be priced higher, in line with value and risk	*Flexible terms can increase admin costs *Creates difficult-to-quantify risk of unsubscribed quantities	**Xcel's (MN) Renewable*Connect** – Three contract lengths: month-to-month, 5 years, 10 years

The cost and credit structure determines the overall net cost and factors heavily into the cost-shifting methodology. Cost is most than just the resource cost; it can also include any administrative fees, transmission, ancillary services, variable renewable energy integration, and charges to protect from cost shifting, among others. On the credit side, there are market-based and non-market rate, which often depend on location.

8. COST/CREDIT STRUCTURE: costs and credits vary widely			
Costs			
Resource, transmission, ancillary services, integration, charges, and fees			
Market Credit	**Bases of Non-Market Credits**		
	Unbundled Rates	**Bundled Rates**	**PURPA Avoided Costs**
Credits may include the hourly market value, marginal fuel cost, or other. They should also include a capacity value if there is any.	Use appropriate billing determinants to approximate value of the green resource; neutral to other rate payers	Must first unbundle rate structure to approximate the value of the green resource; neutral to other rate payers	Use published avoided cost method to determine value of the resource; can be levelized or not

All green tariffs are designed to avoid any shifting of costs or benefits to the rate base. In some cases, the economic benefits of green tariffs are planned to flow to the rate base. Some utilities expect green tariff resources to be less expensive than other resources that they have already procured for their portfolio.

9. RATE BASE INTERSECTION: how insulated should rate base be from costs & benefits?				
	Description	**Pros**	**Cons**	**Examples**
Minimal Rate Base Leveraging	Program structured in a way that does not allow for cost and risk mitigation by leveraging rate base processes.	No perception of renewable energy subsidization by non-participating customers	Does not leverage existing resource procurement processes, which may increase cost for customer Potential financial benefits are not shared with rate base	**Rocky Mountain Power's (UT) Schedule 32:** customer selects project; utility signs contracts with customer, facility
Leverages Rate Base Processes	Program leverages RPS or other rate-based processes and/or resources so as to minimize cost or manage risk while maintaining integrity of customer subscribed portions	May be perceived as renewable energy subsidization by non-participating customers	Enables more rapid tariff deployment and can be linked to obligation for later new-build Green Tariff project cost obligations could flow to rate base for unsubscribed portions; sharing risk	**Dominion's (VA) Schedule RF**: expected revenues would be applied to the fuel cost

02 | CUSTOMER REQUIREMENT INSIGHTS

A rapidly growing number of businesses have set renewable energy supply targets and/or carbon reduction goals. These commitments result from numerous influences, which act synergistically: the mounting evidence of climate change; the inadequate actions of governments to curtail emissions; company leadership teams at the most successful companies gaining a growing sense of responsibility or legacy; customer pressure (B2B/supply chain); advocacy pressure from investor-oriented and consumer-oriented camps (CERES, CDP, Greenpeace); and the availability of solution sets that make these goals attainable for reasonable cost.

In establishing these goals and the attendant action plans, most companies rely on common measurement rules and reporting guidelines. For greenhouse gas emission (GHG) calculations, the Greenhouse Gas Protocol's "*Corporate Accounting and Reporting Standard*" is the most commonly used ruleset. The GHGProtocol's 2015 "*Scope 2 Guidance*"[1] further governs and standardizes the calculation of emissions from electricity use.

Companies with renewable supply goals, however, seek to increase the quantities of renewable energy in their electricity supply mix, without an explicit reference to the change in GHG emissions that result. For example, a growing group of companies have established "RE100" goals,[2] committing themselves to 100% renewable energy.

Additionally, over 70 businesses and numerous national organizations, such as the Edison Electric Institute and National Association of Regulatory Utility Commissioners (NARUC), have signed onto the Corporate Renewable Energy Buyers' Principles.[3] These six principles are:

1. *Greater choice in our options to procure renewable energy*
2. *Cost competitiveness between traditional and renewable energy rates*
3. *Access to longer-term, fixed-price renewable energy*
4. *Access to projects that are new or help drive new projects in order to reduce energy emissions beyond business as usual*
5. *Increased access to third-party financing vehicles as well as standardized and simplified processes, contracts and financing for renewable energy projects*
6. *Opportunities to work with utilities and regulators to expand our choices for buying renewable energy*

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[1] *http://www.ghgprotocol.org/scope_2_guidance*
[2] *http://there100.org/companies*
[3] *http://buyersprinciples.org/wp-content/uploads/Corporate_RE_buyers_principles_2017_September-1.pdf*

Solutions developed by PGE will be viewed by customers, in part, by the ability of a green tariff to forward their own company's targets and goals at a reasonable cost, and to satisfy the commonly held Buyers Principles.

A. Customer Considerations Common to All Green Tariffs

Every customer is different and brings its own set of most-critical needs. It will not be possible for PGE to satisfy all of its customers' requirements with this tariff. With this in mind, the following features are points of interest for nearly all customers, though their relative level of importance will differ.

I. Additionality or Impact

Large customers want their actions to make a difference in the world. One reason many current REC buyers are stepping away from RECs, is that they cannot explain to their stakeholders, nor to themselves, the impact of their purchase. There is only an indistinct line between a REC purchase and a change in the world. Some customers today are seeking a direct, line-of-sight, simple-story explanation of their renewable energy supply, or their emission reduction strategy. A green tariff has the opportunity to provide that link. A tariff seeking to meet this need will consider the following.

- There should be a clear line-of-sight between their purchase and a renewable resource which is new to the grid. The customer should be able to explain how their commitment helped bring the new resource to fruition.
- Additionality or impact is not a binary off/on switch; it is a continuum or scale. In most cases, for example, opening the tariff to subscription (at least indicative/letter-of-interest) prior to its renewable resource coming online is sufficient to demonstrate additionality, even for customers who subscribe much later.
- In addition, the project does not need to be entirely uncontemplated by the utility. Resources which are included in an IRP as placeholders several years out for example, can be moved up in time and become a green tariff resource; or resources originally intended for the ratebase can be re-allocated to the tariff to reduce ratebase risk. Or, resources can do double-duty, supplying the tariff in part and other needs in part; or supplying the tariff for a number of years and then becoming an RPS resource.
- Additionality is unlikely to be a large consideration for small customers or those just starting to procure renewable energy; it is likely to be quite important to customers with large loads and other supply choices. Still, the offering's position on the sliding scale of impact, has a surprising amount of flexibility.

II. Cost Profile

In the context of a Green Tariff, customers are seeking to receive fair value for their commitment to the utility, and are willing to pay fair rates for services provided. This does not mean, however, that if the rates are fair, they will subscribe. Fair rates are a necessary but insufficient condition for customer excitement or willingness to pay.

For many of the largest customers, for example, the requirement or desire to buy renewable energy is tempered/limited by its cost. These customers may have many choices around the country in procuring renewables or otherwise meeting their goals. Therefore, they only pursue offerings that reach cost parity or better over the term of their commitment, compared to their otherwise electricity price. Meeting customers' cost requirements may be aided by considering the following insights.

- Renewable energy's economic benefits accrue over the long term. Large customers are willing to make long-term commitments to tariffs (10+ years) if they see a cost benefit compared to their standard rate, to doing so.
    - These customers will need to calculate long-term costs, including a comparison to the estimated long-term cost of staying with the standard offer. PGE can assist this effort and demonstrate transparency by providing convenient, helpful data to assist in these calculations – such as rate histories, a standard set of forward prices, etc.
    - Customers differ in how they calculate a tariff's costs. Some may compare to Direct Access, some may compare to the standard rate, some may compare to the standard rate + RECs. Customers have differing discount rates and load profiles. You cannot solve for every customer profile, but it will be helpful to identify a few key customers and work together to model pro forma costs so as to have a credible way of talking about the tariff's benefits that rests on actual customer cases (even if they are not public).
- Some customers will be unable to make long-term commitments. It is generally accepted practice among green tariffs that these customers will pay more for their participation than longer-term subscribers. This constitutes fair value for the service being provided.
- Some large customers are willing to sign on to tariffs which entail an added cost, even as projected over the long term. But to attract these customers, careful attention needs to be paid to identifying and communicating the non-economic benefits of participation.

III. Options

Offering flexible choices within a tariff serves two purposes: it makes the tariff attractive to customers with differing priorities; and it demonstrates a departure from a one-size-fits-all mentality which is sometimes ascribed to utilities. Which options the tariff should include should ideally come from customer input, but here are a few examples:

- **Term.** As noted elsewhere, customers have varying abilities and desires to commit to tariffs. Green tariffs vary from month-to-month to 20-year sleeves, and everything in between. Some tariffs also have rolling renewals with fixed escalation rates at renewal, which differ from customers who sign on for the first time, later. This is an arena where creativity is fruitful.

- **Market-Based Rates.** For an important but small minority of customers, the ability to step off the regulated energy rate and pay a market-based rate for their power instead, is a benefit. This change enables them to use the renewable project's economic benefit – if that benefit is based on market pricing – as a hedge to their local power costs. PGE could offer market-based pricing to a subset of tariff customers, and treat them differently. For example, market-based rate customers could be required to pay transition costs, or market-based rates could be triggered only after 5 years of participation and only for 10-year commitments, etc.

- **How to subscribe.** We have described here the choice between subscribing to a portion of the resource (e.g. 10 MW) or subscribing to a proportion of load (e.g. 50% or 100%). Though it creates some administrative complexities, you could offer your customers the choice.

- **RPS handling.** Most green tariffs assume that customers are seeking 100% voluntary green energy, so their subscription (e.g. 100% renewable) supplies RECs for 100% of load, and any RPS burden owed by the utility is supplied via the customer's standard rate or other provisions.[4] Considering Oregon's aggressive RPS, we believe one way to make the tariff cost effective would be to offer an RPS choice: 100% renewable customers can allow the appropriate quantity of their subscription to be surrendered for RPS purposes; or they can require transfer of 100% of their load's RECs with the RPS requirement charged separately.

- **REC handling.** Customers will want RECs retired under the program, but may differ in how they prefer the retirement be affected. Most utilities establish as a default, that they will retire RECs on the customer's behalf, and provide documentation

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[4] For example, in some cases, new RPS rules are adopted simultaneously with green tariffs and purposefully exempt 100% renewable loads from the RPS altogether.

accordingly. PGE can offer as an option (and some customer prefer) that RECs be transferred to a customer's account, instead.

IV. Local Community

One of the surprisingly strong motivations for companies in seeking to work with their utilities, is their desire to demonstrate an ongoing commitment to the local community in which it operates. This is not just about renewable resource location, but about the utility and its employees as community members alongside the corporate customer. There are a number of ways that this non-economic benefit of working with the utility can be highlighted or enhanced.

For example, much can be done to coordinate employee engagement with a local project, even if such engagement is limited to project construction or operation ceremonies (think, employees of subscribers coming together to sign wind turbine towers before they're erected). Other opportunities abound (think, a time-lapse buildup of a wind generation graph that covers the previous year provided to subscribers for their use prior to Earth Day; think, ads celebrating subscribers in hyper-local newspapers).

In short, some customers who choose to join with PGE over the long term, would appreciate being acknowledged and celebrated for that commitment. And, the more PGE can help engage the subscriber's stakeholders (employees, customers, residents, students) in understanding the customer's contribution to sustainability... the better.

In conclusion, Customers' needs are diverse, and one solution will never meet all customers' needs. A tariff can be made more attractive by offering options which allow customers to specify options which are important to them.

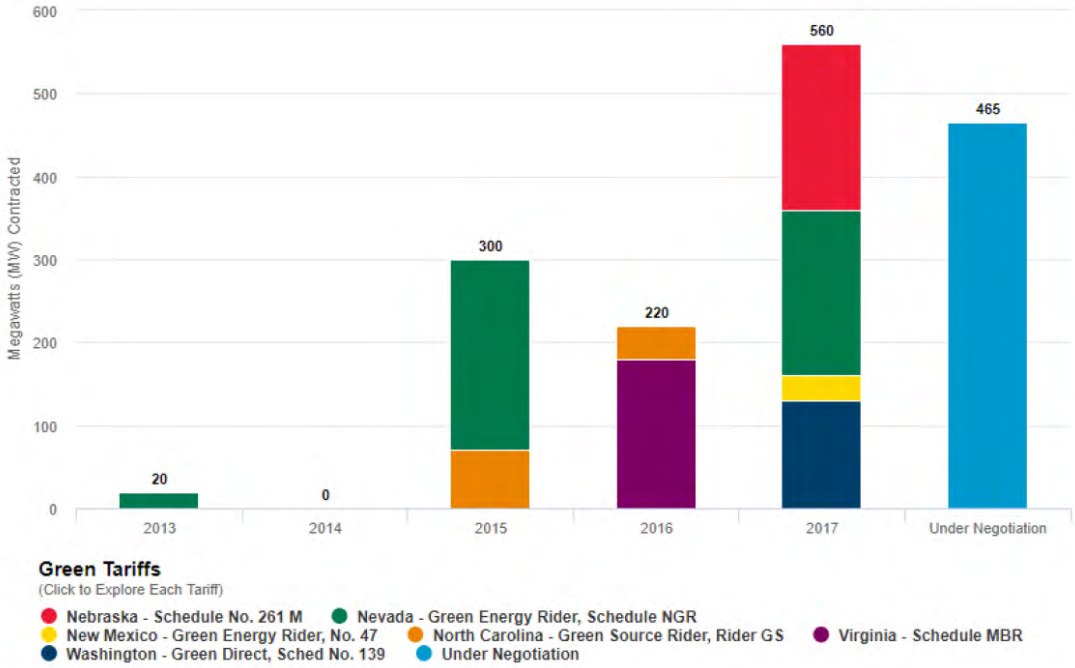
B. Characteristics of Successful Programs

If we set aside sleeve-type programs where a customer brings a potential resource to the utility, we note that most utility green tariffs sell out within hours to months of launch. The ones that do not tend to be very high cost. Those that do sell out are quite diverse in their offerings' characteristics and costs.

As such, we conclude both that there is a tremendous demand for utility-provided renewable energy, and that the utility offering need not attempt to respond to all possible customer requirements, but should rather have a clear value proposition and purpose for the structure proposed, and to be transparent and open about its benefits and costs. The resulting value proposition may not speak to all customers, but experience in other territories leads us to

conclude that it need not do so to be successful.

Figure 4: U.S. Green Tariff Deals – as of April 2017



Source: World Resources Institute

FINAL

03 | COMPARATIVE ECONOMIC ANALYSIS

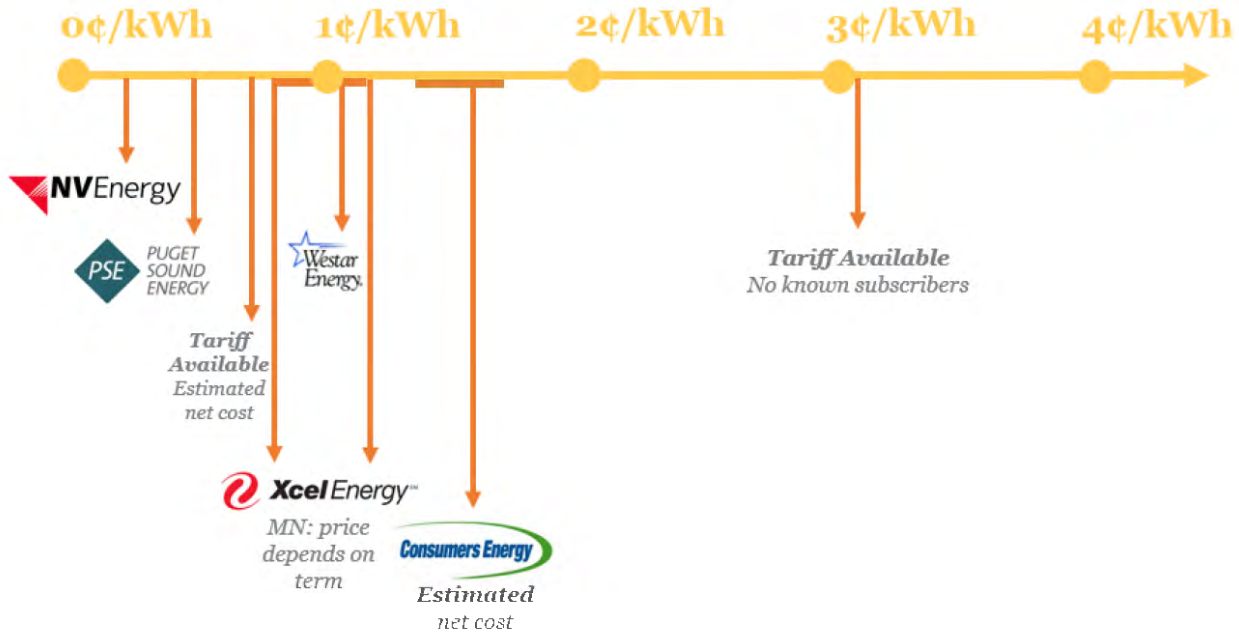
This section discusses how PGE's VRET 1.0 compares to other green tariffs and Direct Access in Oregon. We also address approaches to cost-shifting avoidance.

A. Estimated Costs of Select Green Tariff Offerings

- Many successful tariffs have clustered around a $0 – $0.015/kWh estimated net premium
- Programs with estimated premiums of over $0.02-0.03/kWh have not been successful attracting business customers
- Consumers Energy's and other programs' credits are related to hourly pricing, therefore ultimate net cost depends on load profile
- Current estimates change over time, as credits fluctuate

The figure below shows how existing green tariffs compare nationally.

Figure 5: First Year Net Cost Comparison of Select Green Tariffs



We compared the green tariff net costs with Direct Access options in Oregon based on indicative energy supply, transmission, and fee costs (including Transition Adjustments). On a levelized basis, Direct Access is estimated to cost $0.02/kWh less than current average rates. However, given the complexity and up-front costs associated with transitioning accounts to Direct Access, we only see this being a viable option for certain larger customers.

B. Approaches to Modeling Cost-Shifting Impacts

Utilities are typically required to shield non-participating customers from any impacts of a green tariff (i.e. cost-shifting) and, thus, offer green tariffs at a price that reflects the actual cost of generating and delivering the renewable energy.

Nationally, green tariff offerings tend to impose a one-time or recurring fee to cover administration charges which is designed to help ensure that non-participating customers will not be impacted. Utilities have proposed, and been successful with, other approaches to cost-shifting avoidance. Four such approaches are described below.

I. **Xcel Energy's "Neutrality adjustment"** in Minnesota is an example of an approved attempt to avoid cost shifting to non-participant customers. Below are the details, including the utility's calculation framework. The $0.004747/kWh charge includes line losses, curtailment costs, variable renewable energy integration cost, and stranded asset effects, among others. Some new load is exempt from the neutrality adjustment, as new load is not a "movement away" from the current mix. The neutrality charge is lower in years 6–10 for 10-year contract customers. Neutrality adjustment revenues will be credited to the Fuel Clause, thereby providing relief to non-participating customers from program-related costs.

Figure 6: Xcel Energy Minnesota's "Neutrality Adjustment" Calculation[5]

Northern States Power Company — Docket No. E002/M-15-____
Attachment F, Page 1 of 1

Potential Non-Participant Impact from Renewable*Connect (R*C)
Illustrative Example

	2017 - No R*C Program			2017 - With R*C Program			Impact			
	GWh	$ Cost	Rate/MWH	GWh	$ Cost	Rate/MWH	GWh	$ Cost	Rate/MWH	%
Resource View										
Renewable Connect (R*C) (Excludes Nuetrality Charge)	0	0	0	178	5,011	28.09	178	5,011	28.09	-
Legacy Renewable	7,561	317,838	42.04	7,561	317,838	42.04	0	0	0.00	
Standard	23,342	553,863	23.73	23,342	553,863	23.73	0	0	0.00	
Avoided Energy				(178)	(4,233)	23.73	(178)	(4,233)	23.73	
System Energy	30,903	871,702	28.208	30,724	867,468	28.23	0	0	0.03	0.1%
R*C and System Energy	30,903	871,702	28.21	30,903	872,479	28.23	0	778	0.03	0.1%

	2017 - No R*C Program			2017 With R*C Program			Impact			
	GWh	$ Cost	Rate/MWH	GWh	$ Cost	Rate/MWH	GWh	$ Cost	Rate/MWH	%
Customer View										
System Customers										
Legacy Renewable	7,517	316,003	42.04	7,561	317,838	42.04	44	1,835	42.04	
Standard	23,207	550,666	23.73	23,342	553,863	23.73	135	3,198	23.73	
Avoided Energy				(178)	(4,233)	23.73	(178)	(4,233)	23.73	
System Unadjusted	30,724	866,669	28.21	30,724	867,468	28.23	0	799	28.23	0.1%
Economic Impact Adjustment					(799)	(0.03)		(799)	(0.03)	-0.1%
System	30,724	866,669	28.21	30,724	866,669	28.21	0	0	0.00	0.0%
Renewable*Connect Customers										
Legacy Renewable	44	1,835	42.04				(44)	(1,835)	0.00	
Standard	135	3,198	23.73				(135)	(3,198)	0.00	
New Renewable				178	5,011	28.09	178	5,011	0.00	
R*C Unadjusted	178	5,033	28.21	178	5,011	28.09	0	(22)	(0.12)	-0.4%
Economic Impact Adjustment					799	4.48		799	4.48	15.9%
R*C Adjusted	178	5,033	28.21	178	5,810	32.57	0	778	4.36	15.5%
Total System	30,903	871,702	28.21	30,903	872,479	28.23	0	778	0.00	0.1%

Source: Minnesota Public Utilities Commission

II. **Puget Sound Energy's Fixed Charge complements existing charges**, which enables the customer to pay known renewable energy resource costs but also continue to pay all the other standard charges (e.g. energy charges, demand charges, riders, monthly fees, etc.). All charges and credits may be updated during each rate case. Details about PSE's cost and credit amounts are provided in the case study section. The figure below illustrates PSE's application of cost and credits on a sample customer bill.

[5] https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={7366305C-4985-4F6A-A9C5-06FC3B092F77}&documentTitle=20169-125048-02 *(Page 47)*

Figure 7: Puget Sound Energy Green Energy Credit Example

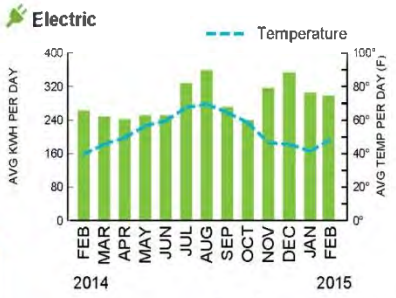
Electric Detail Information: 12345 POWER AVE S, Bellevue

Rate Schedule	Meter #	Start Date Read	End Date Read	Multiplier	Kilowatt Hours (kWh)	Electric Demand (kVA)	Reactive Power (kVAR)	Meter Read Type
Commercial 24	Z012345678	1/21 12456	2/20 12686	10	2,300	—	—	Actual Read

Your Electric Charge Details (30 days)	Rate x Unit		=	Charge
2,300 kWh used for service 1/22/2015 - 2/20/2015				
Basic Charge	$25.81	per month	$	25.81
Electric Energy Charge	0.095073	2,300 kWh		218.67
Other Electric Charges & Credits				
Electric Cons. Program Charge	0.004620	2,300 kWh		10.63
Power Cost Adjustment	-0.001375	2,300 kWh		-3.16
Merger Credit	-0.000315	2,300 kWh		-0.72
Federal Wind Power Credit	-0.002478	2,300 kWh		-5.70
Renewable Energy Credit	-0.000165	2,300 kWh		-0.38
Premium Green Energy Credit	-0.047010	2,300 kWh		-108.12
Premium Green Charge (139.101 Wind Blend)	0.048500	2,300 kWh		111.55
Subtotal				248.58
Taxes				
State Utility Tax ($10.23 included in above charges) Effect of Bellevue City Tax	3.873% 6.250%	$248.58		15.54
Current Electric Charges			**$**	**264.12**

Your Usage Information

Electric



	Last Year	This Year
Average daily kilowatts	64.67	**73.00**
Average daily cost	$6.92	**$8.31**
Days in billing cycle	30	**30**
Average temperature	39°F	**48°F**

Source: Puget Sound Energy

III. **NV Energy's Avoided Cost Credit** is an example in which the customer pays the full cost for every MWh and is credited back at the utility's avoided cost. This approach attempts to calculate the difference between the resource and the marginal cost resource in the resource stack. The structure of the Nevada Green Rider is unique in that it does not allow any financial benefit to flow through to green tariff participants. Any financial benefits would flow to the rate base as avoided cost changes over time.

IV. **Appalachian Power Company (APCo) proposed a "balancing charge"** in its December 27, 2017 application for Virginia SCC approval of its proposed Rider WWS. This is APCo's third attempt at a successful green tariff. APCo claims this charge is necessary to keep non-participating customers and the company indifferent to customer participation in the Rider WWS. The balancing charge portion of Rider WWS will be credited to the Fuel Factor deferral, the Dresden G-RAC deferral, and the generation component of base rates. Below is a simplified example provided by APCo to illustrate the cost and credit structure, and the calculation of the $0.00425/kWh premium.

Figure 8: APCo's Rider WWS Revenue Allocation and Rate Credit Example[6]

Residential Customer Example				
Proposed Rider WWS				
		$/kWh		$
WWS Renewable Premium	$	**0.00425**	$	**4.25**
WWS Balancing Charge	$	**0.06798**	$	**67.98**
Distribution kWh	$	0.01814	$	18.14
Total T-RAC	$	0.01871	$	18.71
RPS-RAC	$	-	$	-
DR RAC	$	0.00037	$	0.37
EE-RAC	$	0.00038	$	0.38
Service Charge Per Month	$	8.35	$	8.35
Bill @ 1000 kWh			$	118.18
Standard Residential Tariff				
		$/kWH		
Base G	$	0.04349	$	43.49
G-RAC	$	0.00280	$	2.80
Distribution kWh	$	0.01814	$	18.14
Total T-RAC	$	0.01871	$	18.71
EE-RAC	$	0.00038	$	0.38
RPS-RAC	$	-	$	-
DR RAC	$	0.00037	$	0.37
Fuel	$	0.02169	$	21.69
Service Charge Per Month		8.35	$	8.35
Bill @ 1000 kWh			$	113.93
WWS Premium to Standard Service			$	4.25
				3.7%

Source: Virginia State Corporation Commission

[6] http://www.scc.virginia.gov/docketsearch/DOCS/3%24v001!.PDF *(pages 33 - 38)*

04 | SELECT CASE STUDIES

A. Consumers Energy: Voluntary Large Customer Renewable Energy Pilot

Launched in 2017, the Consumers Energy LC-REP stands out for the flexibility it offers customers. Similar to Oregon, Michigan is a partially de-regulated state, where up to 10% of a utility's load can (and has) opted out. The tariff was created as part of an economic development effort, and also serves to increase satisfaction among existing customers and to help allay support for increasing the opt-out limit.

A few key elements of flexibility are:

- The ability to choose – on an annual basis – to pay market energy rates in lieu of Consumers' standard power supply rates when subscribed to the tariff at the 100% level;
- The ability to choose market energy rates by bringing new load to Consumers' territory and supplying your own renewable PPA ("Bring your own PPA");
- At a customer's option, Consumers will "true up" customer renewables to the subscribed load percentage if the project generates less than expected.

Some of this flexibility is enabled by Consumers' ability to use unsubscribed generation for RPS compliance. However, the initial asset made available was small – 42 MW wind – and the tariff's launch was successful (press release coming soon), so no RPS use is expected. A second, larger asset is in the planning stages.

The cost is known and flat at $45.00/MWh. The credit fluctuates with market prices and capacity value. 3Degrees estimates a first-year charge of about 1.4 – 1.7 cents/kWh.

Table 4: LC-REP Option A Program Summary

Structure Mechanism	LC-REP Option A	Additional Notes
1. Compatibility	Rider – with options	Priced as an add-on to current bill; can opt to additionally change standard bill power supply rate to an hourly MISO market rate
2. Structure	Subscription Product	Variety of participation options
3. Eligibility & Limits	Large customers	Available to customers with demand over 1 MW
4. Volume	Load percentage	Customers may subscribe 20% - 100% of load
5. Additionality	New build project	New wind asset; follow-on phase to existing project
6. Ownership	Utility owned	Consumers build/own/operate; in Michigan
7. Contract Term	Two options	3-year initial term, with renewals avail 20-year term, flat rate
8. Cost / Credit Structure	Market-based credit	Charge $0.045/kWh; 2% increase on renewal Credit MISO hourly nodal price plus MISO capacity
9 Rate Base Insulated	Leverages Rate Base Processes	Financials are independent of rate base. Unsubscribed generation may be used for RPS

Table 5: LC-REP Option B Program Summary

Structure Mechanism	LC-REP Option B	Additional Notes
1. Compatibility	Tariff	At 100% of load, can opt to change standard bill energy rate to an hourly MISO market rate
2. Structure	Market rate product	Option B is intended to improve hedge value of customers' own renewable PPAs
3. Eligibility & Limits	New, large loads	New customers or new load w/demand over 3MW
4. Volume	Load percentage	Most attractive at 100% of load
5. Additionality	Not required	Any customer renewable asset in MISO
6. Ownership	Customer owned	"Bring your own PPA"
7. Contract Term	Flexible	Annual contract
8. Cost / Credit Structure	N/A	Customer may contract w/Consumers to act as agent for customer PPA settlement
9. Rate Base Intersection	Leverages Rate Base Processes	-

B. NV Energy: Nevada Green Rider

Launched in 2013, NV Energy's NGR rider allows a customer to enter into a special contract with NV Energy for new or existing renewable energy asset. Apple and Switch have signed multiple projects under this rider and the City of Las Vegas has signed one. There are no known sign ups for smaller customers. Below are recent PPA rates

- Apple's Boulder Solar II: $39.90/MWh, 3% esc.
- Switch's Playa Solar I: $38.70/MWh, 3% esc.

The cost structure is at least partially negotiable, but includes the following components:

- Cost is the PPA price; credit is the annual long-term capped avoided cost
- No opportunity for cost savings; the premium's floor is zero

The estimated net cost has been calculated at:

- Apple: $4.12 / MWh
- Switch: $2.71 / MWh

Table 7: Nevada Green Rider Program Summary

Structure Mechanism	Nevada Green Rider	Additional Notes
1. Compatibility	Rider	Priced as an add-on to current bill
2. Structure	Sleeved PPA	-
3. Eligibility & Limits	Limited to certain customer classes	Northern NV: GS-2 meters or larger, demand 50 - 500 kW or monthly usage > 10,000 kWh Southern NV: LGS-1 meters and larger, monthly usage > 3,500 kWh
4. Volume	Fixed capacity	Customers offtake full project capacity
5. Additionality	New build project	The program will be supplied by new asset
6. Ownership	Either	The power can be owned or procured by NV Energy.
7. Contract Term	Flexible	Negotiated but not less than two years.
8. Cost / Credit Structure	Market-based credit	Customers pay existing rate schedule. Rider is any difference between PPA price and most recent adopted long-term avoided cost, levelized
9. Rate Base Intersection	Leverages rate base processes	Any financial benefits would flow to the rate base as avoided cost changes over time.

FINAL

C. Puget Sound Energy: Green Direct

Launched in April 2017, Puget Sound Energy's green tariff is generally viewed as a successful tariff. PSE contracted as the off-taker for a 130 MW wind project and will aggregate subscribers for its output.

PSE sold 75% within first month, 100% within first round: PSE launched a second subscription round / phase II. Known business customer sign-ups include Target, Starbucks, REI's HQ, a university, and Sound Transit.

Energy-related costs in existing tariff are replaced by the PPA contract price plus expenses. Other existing tariff billing determinants (e.g., demand charges) remain the same.

Cost in 2019, 2% escalator thereafter

- 20-year: $50.21 / MWh
- 15-year: $50.63 / MWh
- 10-year: $51.11 / MWh

Credit is $45.692 / MWh

The estimated net cost has been calculated at ~$5 / MWh

Table 8: Green Direct Program Summary

Structure Mechanism	Green Direct	Additional Notes
1. Compatibility	Rider	Priced as an add-on to current bill
2. Structure	Subscription Product	PSE will aggregate subscribers for output
3. Eligibility & Limits	Limited to large customers	Available to customers with annual load of 10M+ kWh, and government entities
4. Volume	Load Percentage	Customers must subscribe 100% of load at each subscribed service address
5. Additionality	New build project	The program will be supplied by new asset
6. Ownership	Utility PPA	PSE contracted as the off-taker for a 130 MW wind project
7. Contract Term	Flexible	10, 15, or 20-year contract requirement; early exit fee offered
8. Cost / Credit Structure	Market-based credit	Charge for wind energy will be $0.052/kWh, with an annual 2% esc. The credit for electricity not used would be $0.047/kWh
9. Rate Base Intersection	Minimal Leveraging of rate base processes	-

D. Xcel Energy (MN): Renewable*Connect Program

Launched in January 2017, Xcel Minnesota's Renewable*Connect program targets small and large customers. The program sold out 100% of capacity during open enrollment.

The cost and credits (the net tariff cost) replace the fuel cost credit on customers' bills. Stated kWh price for customers based on the resource cost, a capacity credit, a "neutrality adjustment," and an administrative charge. Renewable*Connect costs are set and change each year, but the fuel cost credit changes in unpredictable ways. Therefore, the annual net cost fluctuates. Xcel advertises potential for savings over the long-term.

The 2017 price premium was estimated according to average 2016 fuel cost credit for business customers:

- Month-to-month premium: $11.10 / MWh
- 5-year commitment premium: $7.90 / MWh
- 10-year commitment premium: $7.40 / MWh

Table 9: Renewable*Connect Program Summary

Structure Mechanism	Renewable*Connect	Additional Notes
1. Compatibility	Rider	Priced as an add-on to current bill
2. Structure	Subscription Product	Customer can purchase 100 kWh blocks or up to 100% of annual load
3. Eligibility & Limits	Few	New and existing load eligible. Customer share cannot exceed 10% of total available volume.
4. Volume	Load Percentage	Customers can elect up to 100% of their usage
5. Additionality	New build project	Xcel released an RFP in December 2016, seeking supply for this program
6. Ownership	PPA with Developer	Utility will not own project
7. Contract Term	Flexible	Month-to-month, 5 year or 10 year terms
8. Cost / Credit Structure	Non-Market Based	Credit for energy and capacity, with the energy credit able to change on an annual basis on the avoided cost (mostly gas plants)
9. Rate Base Intersection	Minimal leveraging of rate base processes	"Neutrality adjustment" ($0.0047/kWh) is an attempt to avoid cost shifting. Xcel will procure mix of solar and wind resources to match system on- and off-peak demand

CONCLUSION

This memo summarizes research conducted to assist PGE in understanding the regulatory landscape for green tariffs in the Pacific Northwest, and nationally. The objective of this memo is to provide a benchmark for the quantitative and qualitative aspects of green tariffs in order to assist PGE in designing a green tariff that complies with Oregon law and meets its customers' needs and preferences. The regulatory landscape for green tariffs in the Pacific Northwest is dissimilar from other regions across the country, but there are many relevant insights that can be gathered from green tariff programs implemented (or attempted) by other utilities.

Sleeved PPA programs aside, we note that most subscription-based utility green tariffs sell out within hours to months of launch. They tend to be quite diverse in their offerings' characteristics and do not tend to be very high cost. As such, we conclude both that there is a tremendous demand for utility-provided renewable energy, and that the utility offering need not attempt to respond to all possible customer requirements, but should rather have a clear value proposition and purpose for the structure proposed, and to be transparent and open about its benefits and costs.