THE MANY FLAVORS OF CONSUMER CHOICE

INNOVATION WEBINAR
March 21, 2024
3:00 - 4:00 p.m. ET

Moderator: Commissioner
Bonnie Suchman
Maryland Public Service Commission

Aaron August
Senior VP, Chief Customer and Transformation Officer,
Puget Sound Energy

Travis Kavulla
VP of Regulatory Affairs, NRG Energy

Allison Bates Wannop
Policy Director,
DER Task Force
Founded in 1889, the National Association of Regulatory Utility Commissioners (NARUC) is a non-profit organization dedicated to representing the state public service commissions who regulate the utilities that provide essential services such as energy, telecommunications, power, water, and transportation.

NARUC's members include all 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands.

Our mission is to serve the public interest by improving the quality and effectiveness of public utility regulation.
The NARUC Center for Partnerships & Innovation (CPI) builds relationships, develops resources, and delivers training to assist state commissions contending with complex current and emerging issues.

CPI is funded by cooperative agreements with the U.S. Department of Energy (DOE) and the U.S. Department of Commerce’s National Institute of Standards and Technology (NIST).

NARUC CPI conducts work across five key energy areas and many topics within each: generation; transmission; distribution; customers; and critical infrastructure preparedness, response, and resilience.

For more information, visit: https://www.naruc.org/cpi/cpi-home/
Upcoming Events

Virtual Events:
• DER I&C Virtual Workshops – March 26 & April 4
• Bulk Power System Training Series – April 2, 11, 16
• April Innovation Webinar on electric school buses – April 25

In-Person Events:
• Cybersecurity Training – April 16 – 18, New Orleans
• Nuclear site visit & workshop – April 24 – 26, Knoxville, TN
• Renewable energy site visit – May 1 – 2, Indianapolis, IN
• Mid-Atlantic regional energy equity workshop – May 6 – 8, Washington, DC
• Coal & carbon management site visit – June 26 – 28, Gillette, WY
The Many Flavors of Consumer Choice

Moderated by:
Commissioner Bonnie Suchman, Maryland Public Service Commission
The Many Flavors of Customer Choice

March 21, 2024

Travis Kavulla
Vice President, Regulatory Affairs
NRG Energy
Executive Summary

Retail Competition

- In ~1/3 of states, customers may directly select their own retail supplier of electricity and gas
- Community Choice / Municipal Aggregation now permitted in several states, including some that prohibit or limit residential customers’ shopping

Aggregated Customer-Sited Resources

- Aggregations of Demand Response (and more recently, all Distributed Energy Resources) able to participate as proxy supply resources in RTO auctions, monetizing their capacity and other values
- Retail utility programs that pay for performance or provide subsidies to DERs like smart thermostats and batteries

Utility Rates & Tariffs

- Advanced metering has meant a ‘smart grid’ with dumb rates – but that’s changing as more utilities introduce time-varying rates
- Novel tariffs allow customers with additional choices, including subscription-like, flat-bill, and BYO products—albeit still within a framework of a retail monopoly

Formal Retail Competition Still the Most Comprehensive Way to Achieve Customer Choice... But Not the Only Way
Retail Competition
Gas Competition in the United States
## Retail Choice versus Traditional Utility Supply

<table>
<thead>
<tr>
<th></th>
<th>Retail Choice</th>
<th>Utility Supply</th>
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<tbody>
<tr>
<td><strong>Competition</strong></td>
<td>Multiple retailers will compete to offer customer best service and price to win business</td>
<td>Utility has no (or very little) competition with customer’s business</td>
</tr>
<tr>
<td><strong>Risk Management</strong></td>
<td>Retailer covers most price risk</td>
<td>Utility will recoup unexpected past costs in the future</td>
</tr>
<tr>
<td><strong>Price Certainty</strong></td>
<td>Customers can choose a fixed price product (generally available up to 5 years long)</td>
<td>Utilities filed rates valid at any given time, but subject to various ‘tracker’ proceedings + general rate cases</td>
</tr>
<tr>
<td><strong>Innovation</strong></td>
<td>Less permissions generally required to introduce new product, though market fundamentals can constrain loss-leading products</td>
<td>Utility can sometimes employ ratepayer subsidies to innovate, but pace of change is slower</td>
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Aggregated Customer-Sited Resources
Demand Response Aggregation Under Order 719
• Extends Order 719 principles of market access for DR to DER
• No state opt-out
• Applies only in RTO footprints (so not West or Southeast)
• RTOs all over the map on implementation timeline
Number of Retail DER Aggregations Procured by Utilities in Each State

Smart Meters ... Still Dumb Rates (Mostly)

Adapted from: Cooper and Shuster, "Electric Company Smart Meter Deployments: Foundation for a Smart Grid," Institute for Electric Innovation, April 2021, p. 3.
Other Novel Approaches to Rate Design

**Subscription**
Purchasing a ‘load shape’ from utility, then being exposed at margin to wholesale pricing

**Flat Bill**
A truly flat bill regardless of customer usage in any given month, with no true up after the fact (unlike “budget billing”)

**Buy Through**
Bring your own energy and pass it through a utility tariff

- **Stabilizing Element (Hedge) for Both Customers and Utilities**

- **Georgia Power**
  - **Flat Bill**
  - means -
  - No Surprises
  - no matter the season
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travis.kavulla@nrg.com
The **DER Task Force** is a community of DER enthusiasts dedicated to unlocking the immense promise of distributed energy resources in the electric power system.

Click [here](#) to join our Slack workspace of 2,000+ DER professionals, and take part in virtual and in-person learning.

Email Allison: [allison@dertaskforce.com](mailto:allison@dertaskforce.com)

Follow Substack full of energy philosophy, a newsletter, and linking to our podcast, debating vanguard industry topics, like utility ownership of DERs.

Stay tuned for info on DERvos ‘24, our industry-spanning “unconference” which in 2023 featured Jigar Shah, Jesse Jenkins, Lynne Keisling, Rewiring America’s Leah Stokes, and a Vehicle-to-Grid-powered after party.
Coordinated DERs currently provide 30-60 GW of capacity.

Deploying 80-160 GW of VPPs by 2030 could save $10B - 22B/year.

DERs like Microgrids can provide site and community reliability and resilience, by maintaining community resources like grocery stores and schools.

Proven DER solutions can be NWAs, for example using a battery or load management to avoid a 4kV line conversion.
<table>
<thead>
<tr>
<th>What is a VPP?</th>
<th>What isn’t a VPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ DERs</td>
<td>✗ TOU Rates</td>
</tr>
<tr>
<td>EV Chargers, Batteries, Smart Water Heaters, Thermostats, Generators, Load Flexibility, Managed Charging</td>
<td>✗ Energy Efficiency</td>
</tr>
<tr>
<td>✓ Dispatched</td>
<td>✗ A Single DER</td>
</tr>
<tr>
<td>✓ Together</td>
<td></td>
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<tr>
<td>✓ To Serve the Grid</td>
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An **Aggregator** manages a multiple DERs to provide grid services, and can be a Third-Party, a Retailer Supplier, or the Utility

<table>
<thead>
<tr>
<th>Aggregator Relationship to Load Serving Entity</th>
<th>Restructured</th>
<th>Vertically Integrated RTO</th>
<th>Vertically Integrated Non-RTO</th>
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<tbody>
<tr>
<td>• Utility as Aggregator</td>
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<tr>
<td>• Utility-Aggregator Partnership</td>
<td></td>
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<tr>
<td>• Aggregator sells Utility resources through bilaterals</td>
<td></td>
<td>• Aggregator sells Utility resources through bilaterals</td>
<td></td>
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<tr>
<td>• Aggregator uses tariff (e.g., VDER)</td>
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<td></td>
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<tr>
<td>• Retailer as Aggregator</td>
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<tr>
<th>Aggregator Direct Participation Wholesale Market</th>
<th>Restructured</th>
<th>Vertically Integrated RTO</th>
<th>Vertically Integrated Non-RTO</th>
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<tbody>
<tr>
<td>• Energy</td>
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<td>• Energy</td>
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<tr>
<td>• Ancillary Services</td>
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<td>• Ancillary Services</td>
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<tr>
<td>• Capacity</td>
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<td>• Capacity</td>
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Retail Programs Can Pay 4-15x Wholesale

**MISO Capacity**
- Utility Programs = $30,000-75,000 MW-yr
- Wholesale = $1,850 MW-yr, ‘21-22

**Massachusetts Capacity**
- Connected Solutions = $275,000 MW-yr
- Wholesale = $31,000 MW-yr

A single DER can be enrolled in a Utility’s Retail Capacity program and an Aggregator’s Wholesale Market Energy or A/S Program “Complementary Participation”

Aggregators can also fill market gaps
- Serve ineligible customers
- Create Customized Products
- Develop Innovative Services
  - Ex: ancillary services for 100 kW customers
**BYOD Battery VPPs**

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<tbody>
<tr>
<td>Docket</td>
<td>Program Assessment Report</td>
<td>Vt PUC 19-3537-TF</td>
<td>Utah PSC 20-035-T07</td>
<td>NCUC E-2, Sub 927</td>
</tr>
<tr>
<td>Funding Source</td>
<td>Energy Efficiency Budget</td>
<td>Direct Power Supply Operating Expense</td>
<td></td>
<td>DSM/EE Mechanism</td>
</tr>
<tr>
<td>Incentive</td>
<td>Pay for performance $275 kW</td>
<td>Upfront Rebate $850/kW for 3hr $950/kW for 4hr +$100/kW near constraint</td>
<td>Upfront Rebate: $400/kW Performance: $15/kW/yr</td>
<td>Upfront Rebate: $360/kW Cohort A: TOU + CPP Cohort B: Performance $6.50/kW/month</td>
</tr>
<tr>
<td>Dispatch</td>
<td>Max 60x/summer</td>
<td>Max 8x/month</td>
<td>Daily</td>
<td>27x/yr</td>
</tr>
<tr>
<td>Problem Addressed</td>
<td>Peak Shaving Environmental Goals</td>
<td>Peak Shaving Customer Reliability</td>
<td>Daily Peaks Frequency Response</td>
<td>Peak Shaving</td>
</tr>
<tr>
<td>Enrolled MW</td>
<td>310 MW (as of 2020), relative to 100 MW goal</td>
<td>5 MW cap, lifted in 2023</td>
<td>100 MW</td>
<td>Pending</td>
</tr>
</tbody>
</table>
PSE’s Clean Energy Transformation
Fueling the growth of local communities for over 150 years

- We’re Washington’s largest and oldest utility, serving 1.5 million customers in 10 counties.

- We’re undergoing the most significant transformation in our history as we strive to meet some of the most ambitious clean energy laws in the nation.

- Our core purpose is the safe and reliable delivery of energy to our customers, under all conditions.

WA State Context
- Washington is not part of an RTO or ISO
- Pacific Northwest has been a region traditionally blessed with excess capacity from an abundance of hydro; absorbed by the rapid growth in intermittent resources (i.e. wind), capacity and reliability are higher on the minds of customers and PSE
- The clean energy transition is well underway (statutorily), with a growing focus of our attention on other forms of choice that address these emerging issues through programs like TVR, VPP and DR
Washington has enacted some of the most ambitious climate policies in the country

**Clean Energy Transformation Act**  
(SB 5116)  
Passed in 2019 and commits WA state to a carbon-neutral electric supply by 2030 and 100% clean electricity by 2045

**Climate Commitment Act**  
(SB 5126 - "Cap & Invest")  
Passed in 2021 and establishes a program aimed at capping and reducing GHGs from the largest emitting sources and industries, to work towards the state’s greenhouse gas limits set in state law

**Clean Fuel Standard**  
(HB 1091)  
Passed in 2021 to curb pollution from the transportation sector, which accounts for almost 45% of state GHG emissions

**Clean Buildings Act**  
(HB 1257)  
Passed in 2019 and adopts a new energy performance standard for existing commercial buildings over 50,000 sq. ft.
Our clean energy transformation timeline

**Net Metering, Retail Wheeling, and Transportation Services**
PSE provides interconnection services for qualifying customer-generators in accordance with State legislation.

**Green Power Rate Alternatives**
PSE became a leader with residential green power and “Green Direct” programs.

**Voluntary RNG**
PSE continues to investigate and pursue more regional RNG supply opportunities to support voluntary customer choice RNG programs.

**Energy Orchestration**
Enabling ‘energy orchestration’, with and for our customers, will shape PSE for decades to come.

**Time-of-Use Rates**
Time-of-use (TOU) Rates are adjusted based on when customers use energy.

**EV Tariff Schedule**
Transportation electrification continues to be an area of growing interest, primarily because of its potential to lower emissions and improve public health.

**Community Solar**
Community Solar is a way for PSE electric customers to share the benefits of 100% local solar power.
The path to a clean energy future is complex and not without challenges

- The **scale and pace** at which we need to acquire new, clean energy resources is **unprecedented**.

- The **demand** for electricity is expected to **increase significantly** due to policy changes.

- **Clean energy technologies** that can replace baseload generation provided by coal and natural gas are **not commercially available** yet.

- The **electric grid** will need to be **expanded and modernized** to support the transition to clean energy.

- The region faces a **critical reliability gap** for the first time in its history.

- We have to balance this accelerated transformation with the need for **affordability and equity**.
While keeping in mind the role of the natural gas delivery system in the clean energy transition

- We have nearly 900,000 natural gas customers and natural gas is currently the primary source of heating for PSE customers.
- Natural gas plays a vital role especially at times of peak demand.
- We must ensure that our decarbonization efforts are thoughtfully planned and carefully implemented.

On a cold winter’s day, the gas system provides more than 2X the energy provided by our electric system to our customers.
Customers will play a pivotal role in enabling the clean energy transition

### WHY

Energy engagement that drives system and customer **Flexibility, Visibility, Control, Automation** and **Growth**

### HOW

1. Emerging Partnerships
2. Clean Technology Exploration
3. Program Enablement & Optimization

*Informed by Customer Journeys*

### EVOLVE

Move from reactively event based, to proactively orchestrated, shaping & shifting demand curves through comprehensive load management and value stacking of products & programs

### WHAT

5 Primary parts, working as one

1. Energy Efficiency
2. Demand Response
3. Distributed/Renewable Gen
4. Storage
5. EV

### DRIVERS

- Technology
- Climate
- Policy
- Market Forces
- Equity
Customer-centricity has not been what the industry was founded upon, but it is what will define it for decades to come.
On this growing and innovative energy journey, PSE is striving to be our customers partner of choice

• **Unlocking** new ways to serve our customers that will literally make outages invisible and redefine how energy is used by them.

• **Harnessing** the potential of EVs to decarbonize the grid at the lowest cost to PSE and highest value to customers.

• **Enabling** our customers’ vision of what a utility should be and helping customers engage in energy.