

THE MANY FLAVORS OF CONSUMER CHOICE

INNOVATION WEBINAR

March 21, 2024

3:00 - 4:00 p.m. ET

NARUC CPI Innovation
Webinar



**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

About NARUC

- 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.

About CPI

- 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

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

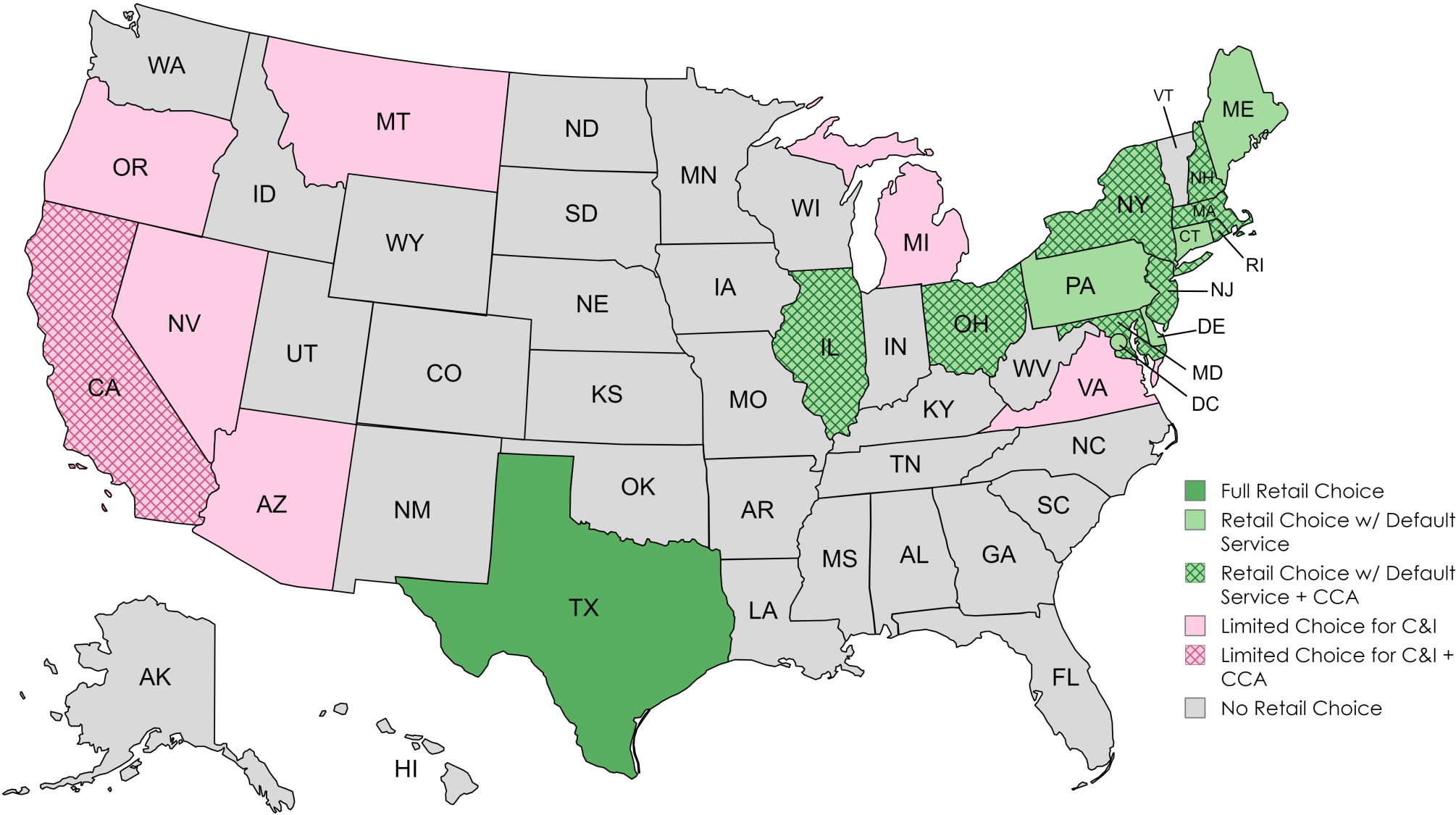
Formal Retail Competition Still the Most Comprehensive Way to Achieve Customer Choice... But Not the *Only* Way

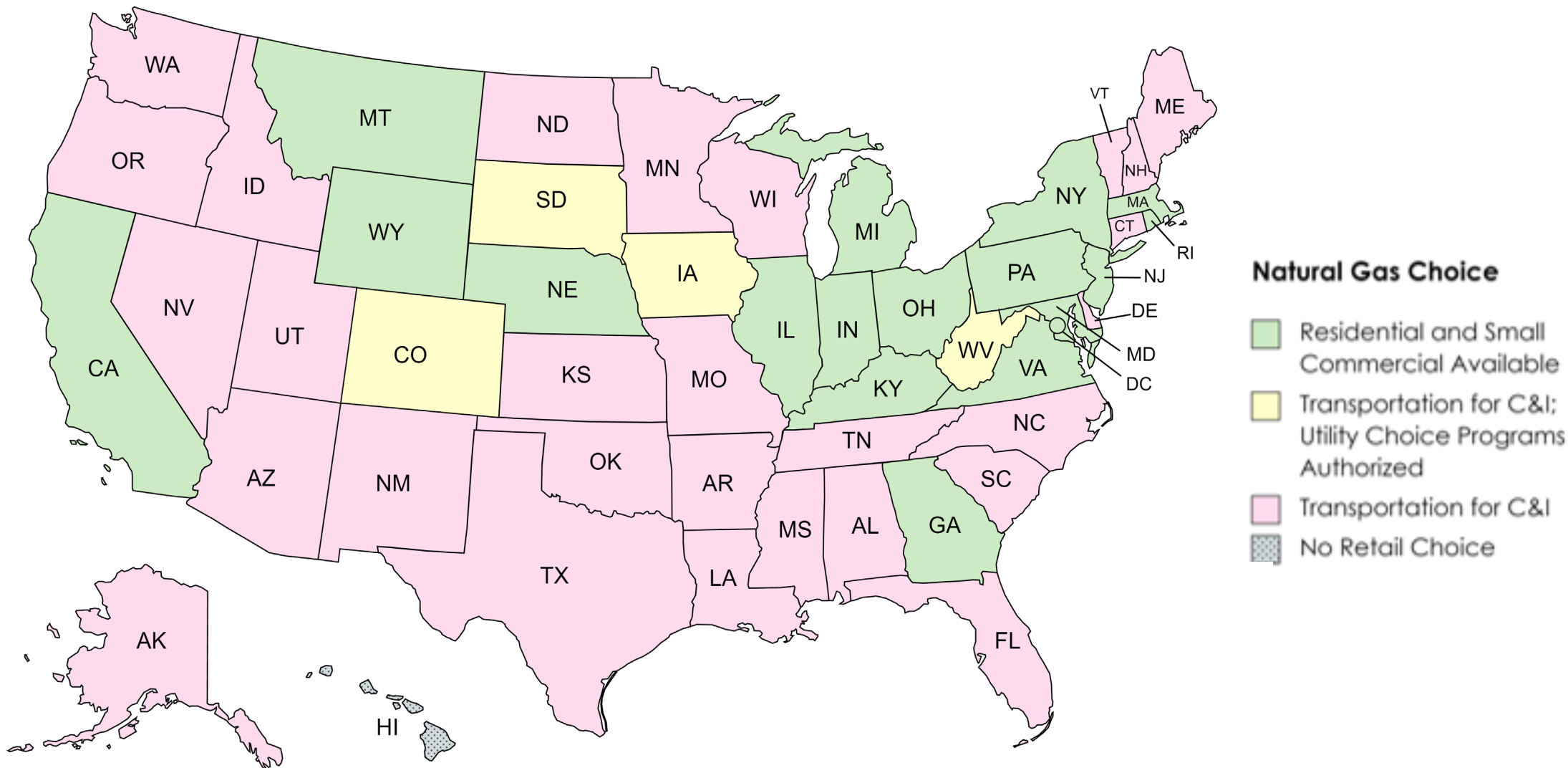


Retail Competition

Choosing Your Own Supplier

Retail Electric Competition in the United States





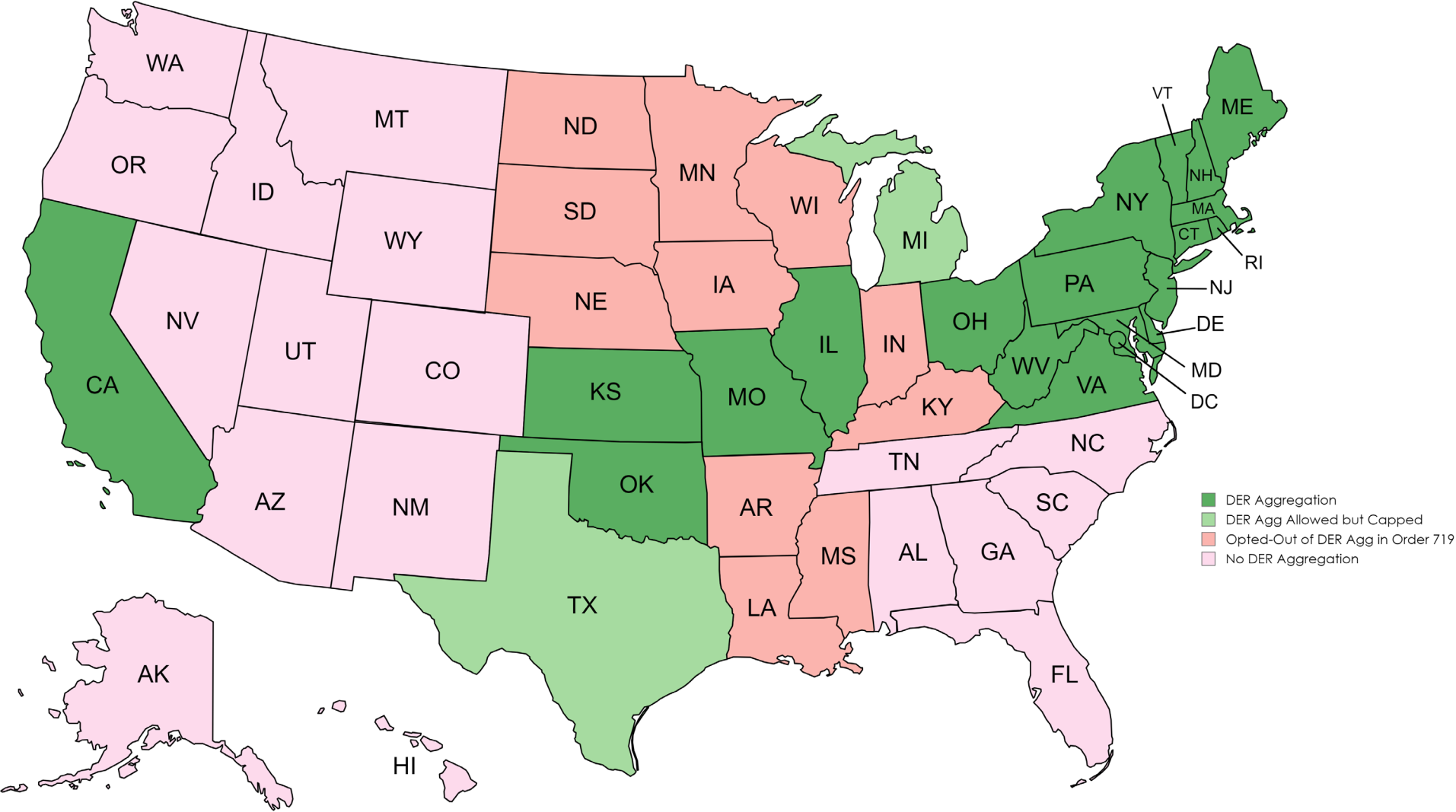


	Retail Choice	Utility Supply
Competition	Multiple retailers will compete to offer customer best service and price to win business	Utility has no (or very little) competition with customer’s business
Risk Management	Retailer covers most price risk	Utility will recoup unexpected past costs in the future
Price Certainty	Customers can choose a fixed price product (generally available up to 5 years long)	Utilities filed rates valid at any given time, but subject to various ‘tracker’ proceedings + general rate cases
Innovation	Less permissions generally required to introduce new product, though market fundamentals can constrain loss-leading products	Utility can sometimes employ ratepayer subsidies to innovate, but pace of change is slower



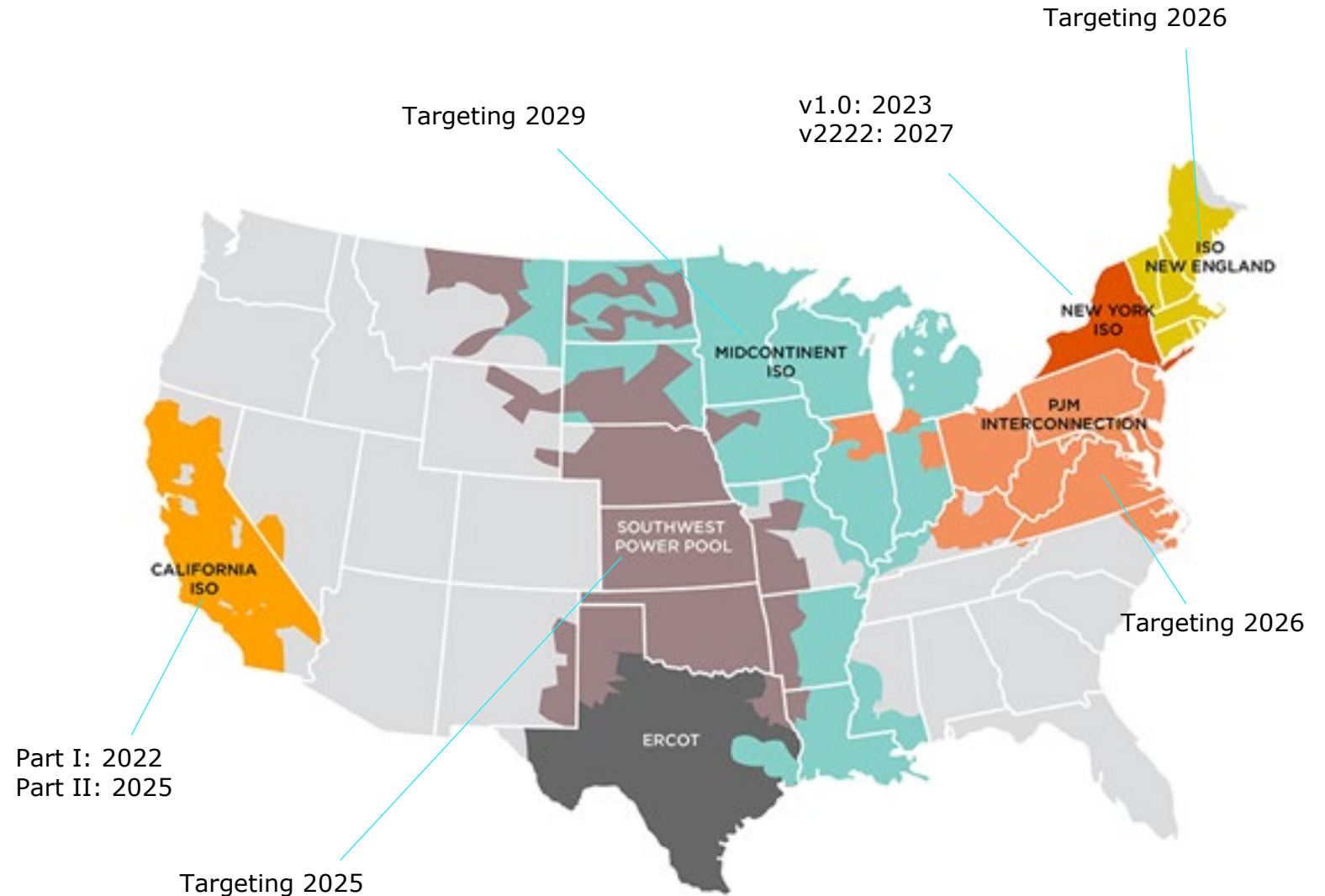
Aggregated Customer-Sited Resources

Demand Response Aggregation Under Order 719

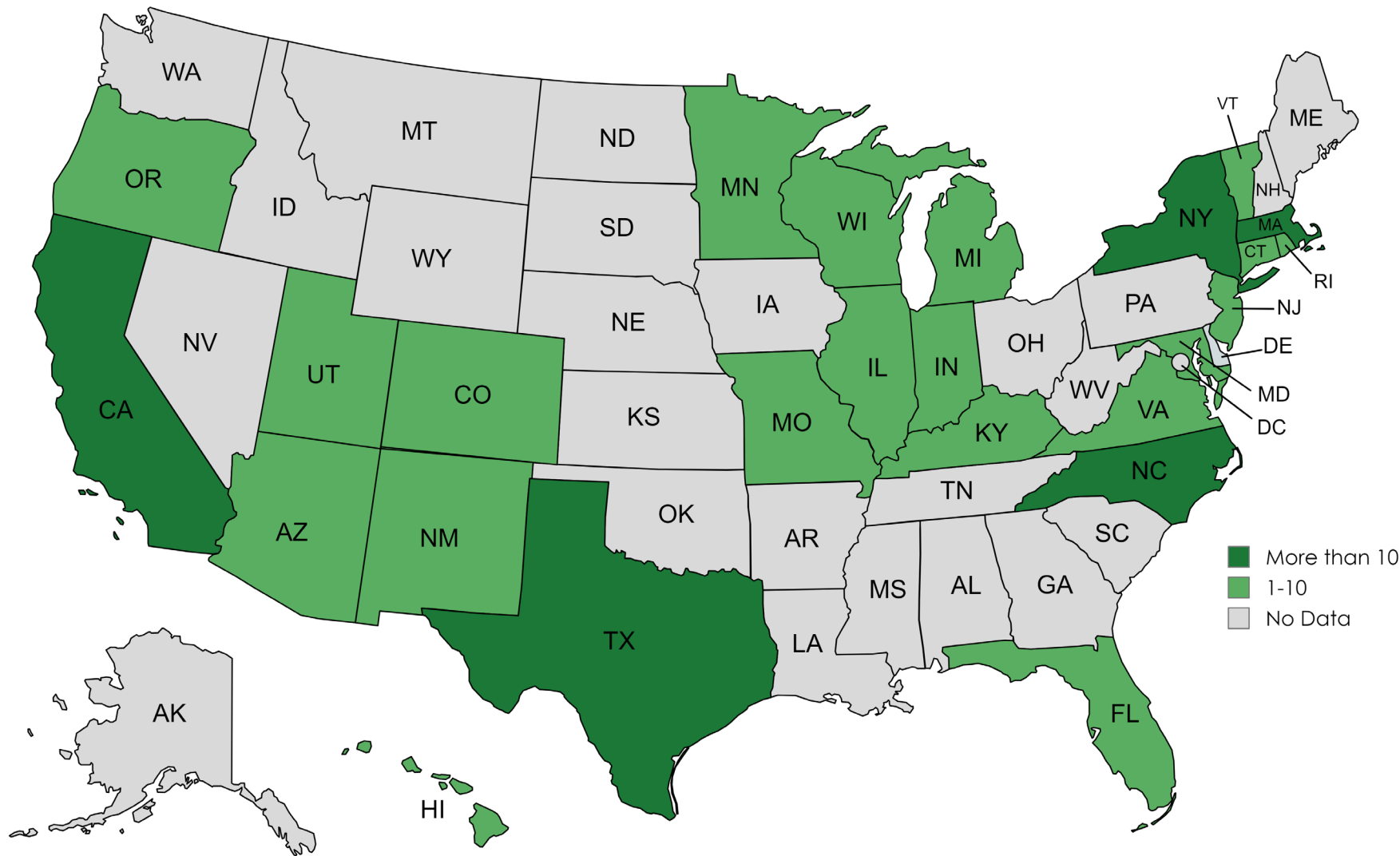


Distributed Energy Resource Aggregation under Order 2222

- 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

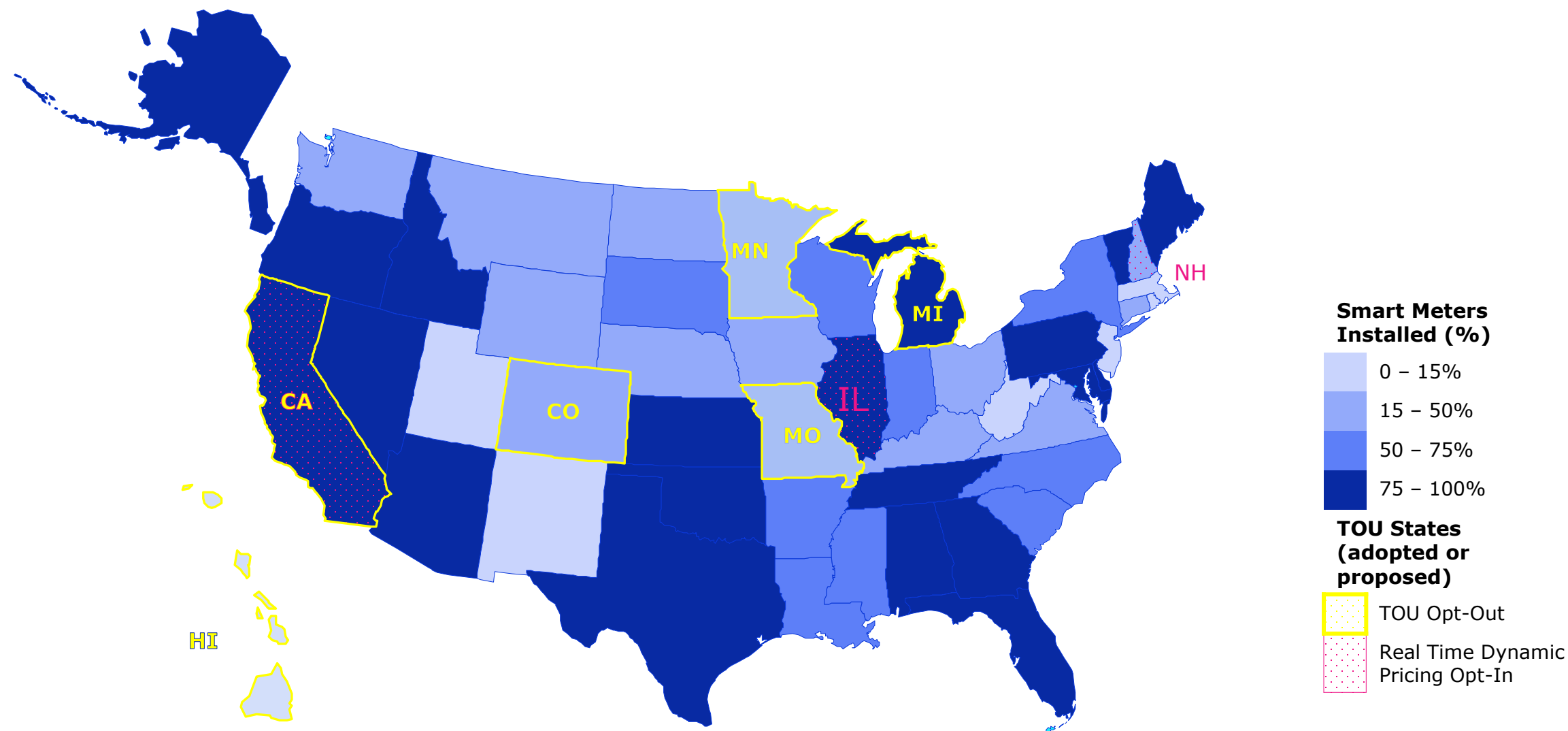


Adapted from Jennifer Downing et al, US Department of Energy, [Pathways to Commercial Liftoff: Virtual Power Plants](#) (September 2023), p.22.



Utility Rates & Tariffs

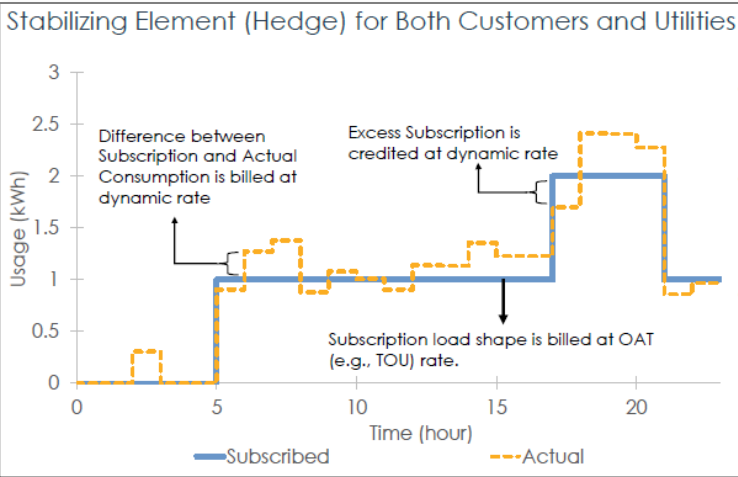
Smart Meters ... Still Dumb Rates (Mostly)



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

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")

Georgia Power

FlatBill
- means -
No Surprises

no matter the season

Buy Through

Bring your own energy and pass it through a utility tariff

RATE RIDER AG-X
GENERAL SERVICE
ALTERNATIVE GENERATION

AVAILABILITY

This rate rider schedule is available in all territories served by the Company at all points where facilities of adequate capacity and the required phase and suitable voltage are adjacent to the sites served.

APPLICATION

This rate rider schedule is available for Standard Offer Customers who have an Aggregated Peak Load of 5 MW or more and are served under Rate Schedules E-34, E-35, E32-L, E-32 TOU L, E-32 M, E-32 TOU M, E-32 S, or E-32 TOU S.

Customers must have interval metering, Advanced Metering Infrastructure, or an authorized alternative in place at all times of service under this schedule. If the Customer does not have such metering, the Company will install the metering equipment at no additional charge. However, the Customer will be responsible for providing and paying for any communication requirements associated with the meter, such as a phone line.

All provisions of the Customer's applicable rate schedule will apply in addition to the provisions of this Schedule AG-X.



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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



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

DERs



VPPs

Coordinated DERs currently provide
30-60 GW of capacity

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

[DOE VPP Report](#), pp. 3, 37



Reliability and Resilience

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



NWAs

Proven DER solutions can be NWAs,
for example using a battery or load
management to **avoid a 4kV line
conversion**

What is a VPP?



DERs

EV Chargers, Batteries, Smart Water Heaters,
Thermostats, Generators,
Load Flexibility, Managed Charging



Dispatched



Together



To Serve the Grid

What isn't a VPP



TOU Rates



Energy Efficiency



A Single DER

An **Aggregator** manages a multiple DERs to provide grid services, and can be a Third-Party, a Retailer Supplier, or the Utility

	Restructured	Vertically Integrated RTO	Vertically Integrated Non-RTO
Aggregator Relationship to Load Serving Entity	<ul style="list-style-type: none">• Utility as Aggregator• Utility-Aggregator Partnership• Aggregator sells Utility resources through bilaterals• Aggregator uses tariff (e.g., VDER)• Retailer as Aggregator	<ul style="list-style-type: none">• Utility as Aggregator• Utility-Aggregator Partnership• Aggregator sells Utility resources through bilaterals	<ul style="list-style-type: none">• Utility as Aggregator• Utility-Aggregator Partnership
Aggregator Direct Participation Wholesale Market	<ul style="list-style-type: none">• Energy• Ancillary Services• Capacity	<ul style="list-style-type: none">• Energy• Ancillary Services• Capacity	

Retail and Wholesale Programs are **Complements**



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

	Connected Solutions (MA: Restructured, RTO)	Green Mountain Power (VT: VI, RTO)	Rocky Mountain Power <u>Wattsmart</u> (UT: VI, non-RTO)	Duke <u>PowerPair</u> (NC: VI, non-RTO)
Docket/Info	Program Assessment Report	Vt PUC 19-3537-TF	Utah PSC 20-035-T07	NCUC E-2, Sub 927
Funding Source	Energy Efficiency Budget	Direct Power Supply Operating Expense		DSM/EE Mechanism
Incentive	Pay for performance \$275/kW	Upfront Rebate \$850/kW for 3hr \$950/kW for 4hr +\$100/kW near constraint	Upfront Rebate: \$400/kW Performance: \$15/kW/yr	Upfront Rebate: \$360/kW Cohort A: TOU + CPP Cohort B: Performance \$6.50/kW/month
Dispatch	Max 60x/summer	Max 8x/month	Daily	27x/yr
Problem Addressed	Peak Shaving Environmental Goals	Peak Shaving Customer Reliability	Daily Peaks Frequency Response	Peak Shaving
Enrolled MW	310 MW (as of 2020), relative to 100 MW goal	5 MW cap, lifted in 2023	100 MW	Pending

PSE's Clean Energy Transformation

March 2024





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

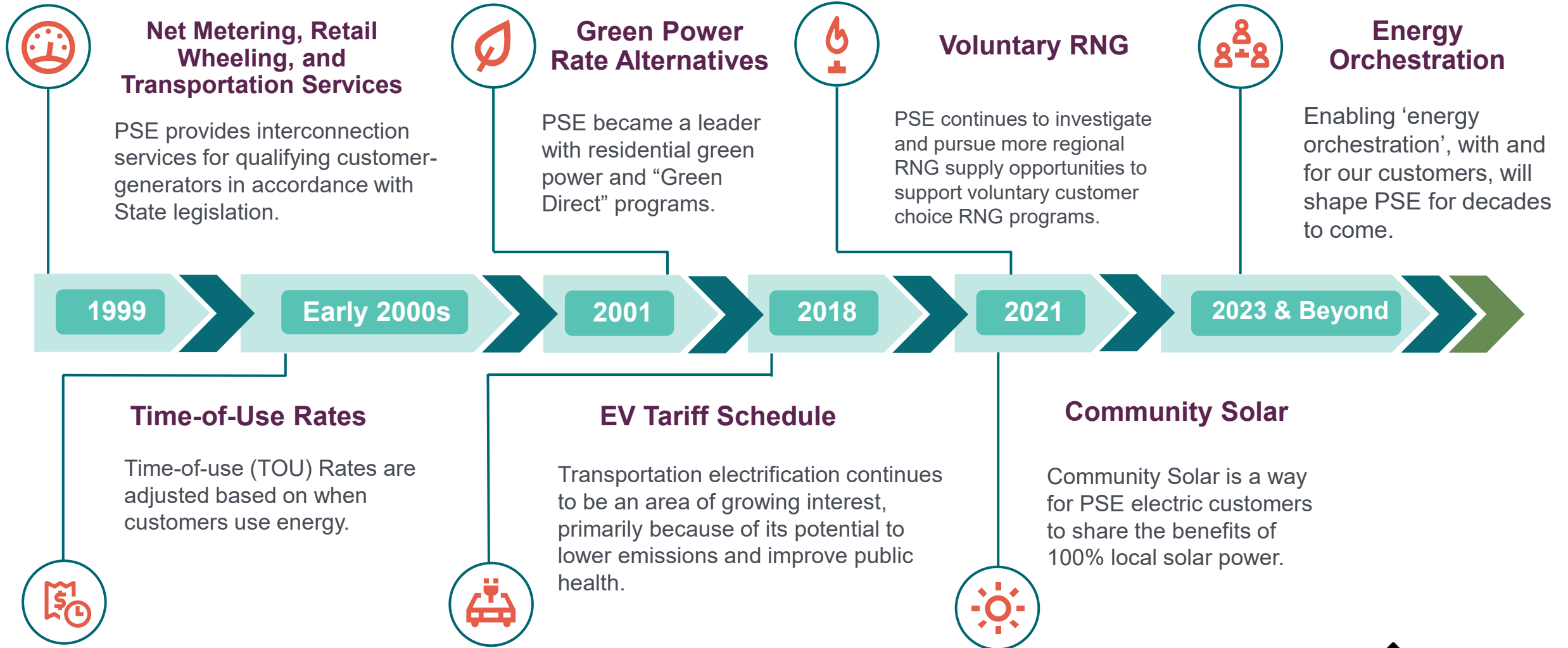
Clean Fuel Standard (HB 1091)

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





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

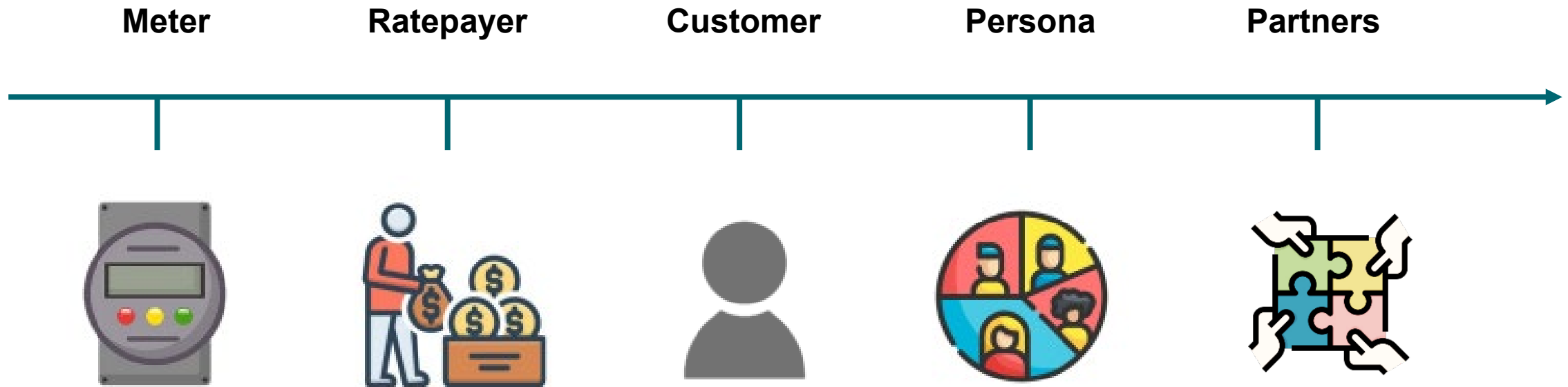
5 Primary parts, working as one

- 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.