RAP
REGULATORY
ASSISTANCE PROJECT

August 18, 2026

Copy That: How States Can Replicate Existing Virtual Power Plant Models

Moderator



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About RAP

Regulatory Assistance Project (RAP)® is an independent, global NGO advancing policy innovation and thought leadership within the energy community.

Learn more about our work at raponline.org

Agenda

Opening + Welcome – RAP
- Initial Insights

VPP level setting – RMI

State and utility programs
- Massachusetts – National Grid
- Colorado – Xcel Energy
- New York – Department of Public Service

Developer perspective – Sunrun

Moderated discussion

Future RAP work

Initial Insights

Replicate and Scale

VPPs can provide significant benefits at scale.

- Virtual power plants are aggregated and coordinated distributed energy resources, like smart thermostats and home batteries, that provide services in support of grid operations.
- Aggregation, coordination, and scale are key to delivering meaningful benefits.
- Compensation must be commensurate with benefits to enhance energy affordability and avoid market distortion.

Replicating successful programs supports timely implementation and scale by:

- Addressing utility operational questions;
- Lowering soft costs for developers to operate in a new program; and,
- Providing customer insights (e.g., compensation levels necessary to drive behavior).

Long-Term Vision

VPPs can provide multiple types of grid services.

- Most VPP programs target bulk power system peaks.
- States and utilities are exploring the different grid services VPPs can provide, most notably addressing distribution system constraints.
- All else equal, scaling benefits should take precedence over adding complexity.
- These value streams can be layered onto existing programs over time.

Establishing a long-term vision for VPPs

- A long-term vision ensures that nearer-term steps build towards the desired endpoint.
- Elements of a long-term vision should include:
    - Market mechanisms at the bulk power and distribution level.
    - Transparent and time- and location-differentiated retail pricing.



Expert Presentations

Today's speakers



Kevin Brehm
Manager, Electricity, RMI



Nick Watson
Director, Grid Optimization & Flexibility, National Grid (MA)



Zach Pollock
Director, Electric and Gas Planning, Xcel (CO)



John Rhodes
Chief Program Officer, Department of Public Service (NY)



Bronte Payne
Senior Manager, Sunrun

Virtual Power Plant Basics and Regional Examples

Kevin Brehm

RMI/ VP3

kbrehm@rmi.org



VPP Basics

1. What is a virtual power plant?
2. What technologies are involved in VPPs?
3. What are the types of VPPs?
4. How are VPPs supporting affordability?
5. How are VPPs supporting system reliability and customer resilience?

VPP Design Takeaway from VPP Flipbook

- VPP Design Elements
- Trends and emerging themes
- Policy and Design Takeaways

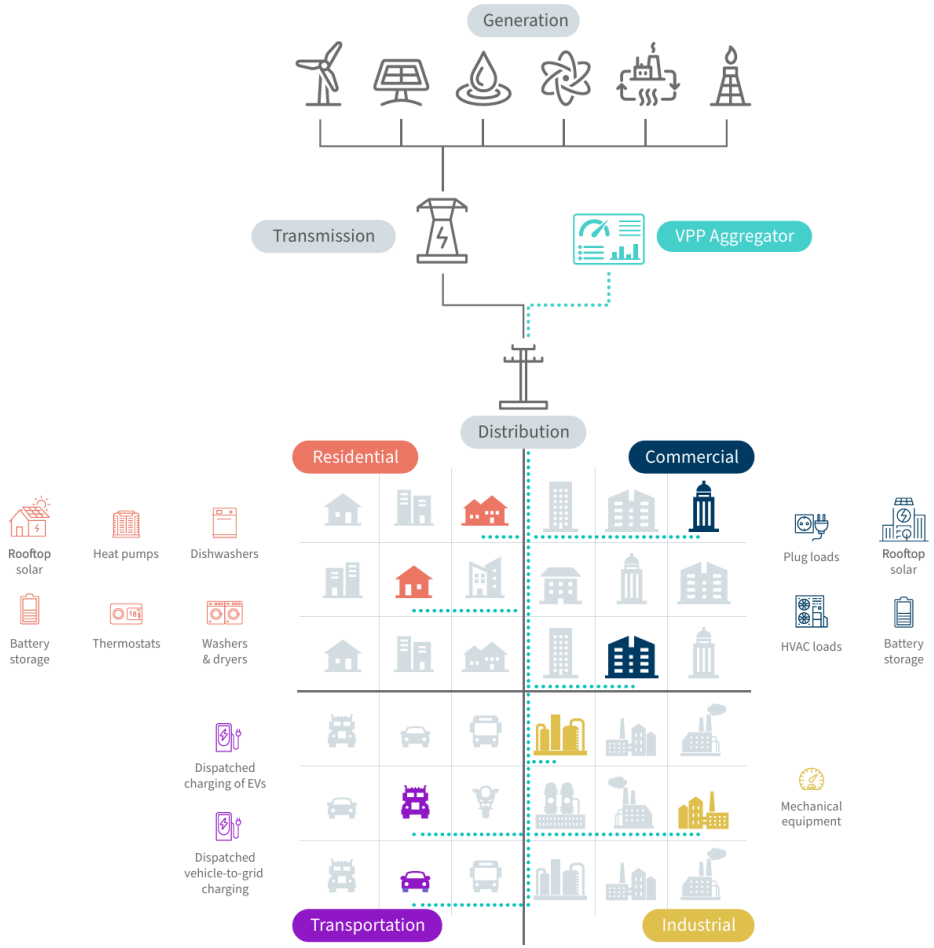
What is a Virtual Power Plant?

An aggregation of DERs and other load management technologies that can balance electrical loads to defer or avoid transmission or distribution upgrades and provide utility-scale, utility-grade grid services analogous to those provided by traditional generation resources

- NJ BPU Straw Proposal working definition in section 1 (derived from DOE Liftoff Report)

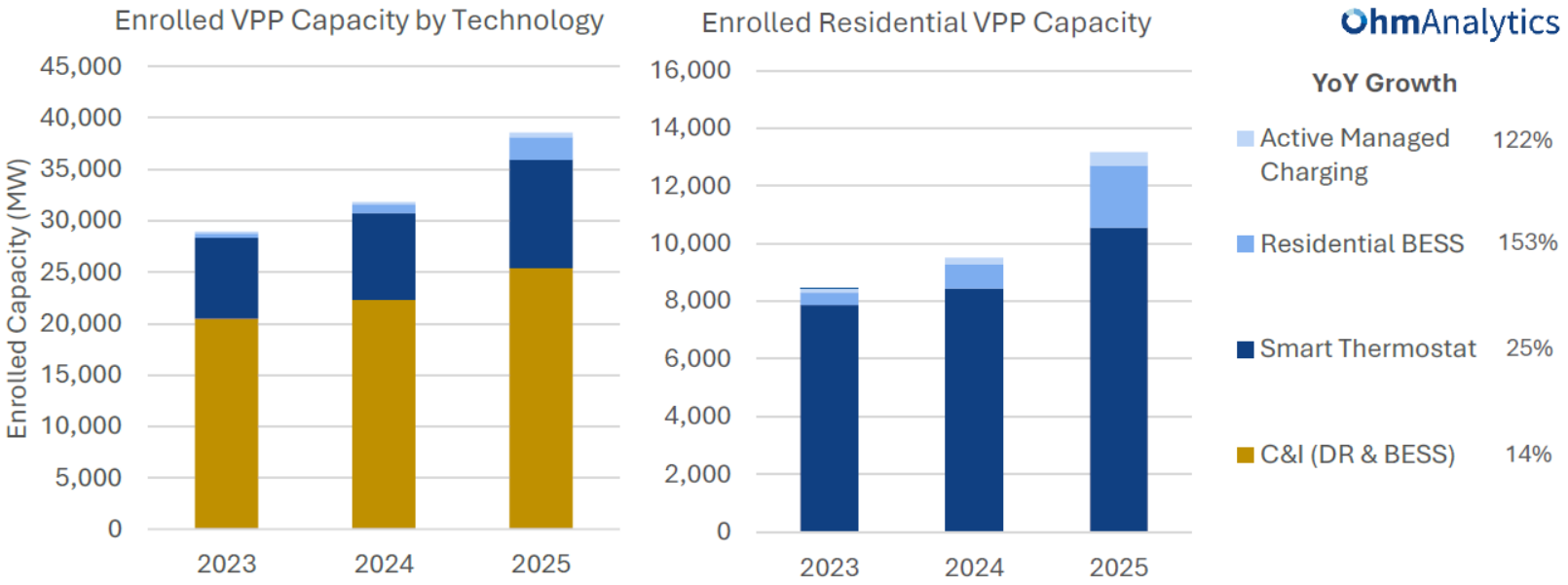
An aggregation of distributed energy resources (DERs) that can be dispatched to support the grid in exchange for compensation

- RMI Flipbook 2.0 (forthcoming, 2026)



What technologies are involved in VPPs?

Technologies involved in VPPs



Additional DERs Included in VPPs:

- Behavioral demand response
- Appliances
- Plug loads
- Bidirectional charging
- Other DERs

Source: Ohm Analytics 2025 VPP Market Report

What are the types of VPPs?

There's not broad consensus for how to talk about the types of VPPs. Here's the language we're currently using.

Utility VPP	Customer Program Utility VPP
	Aggregator-access Utility VPP
Market-Participant VPP	Market aggregations
	Competitive Retail
Bring Your Own Distributed Capacity* VPPs	BYODC Utility VPP
	BYODC Market-Participant VPP

Other Ways Industry is Talking about Types of VPPs:

CHARGED, Pathways to Greater Load Flexibility

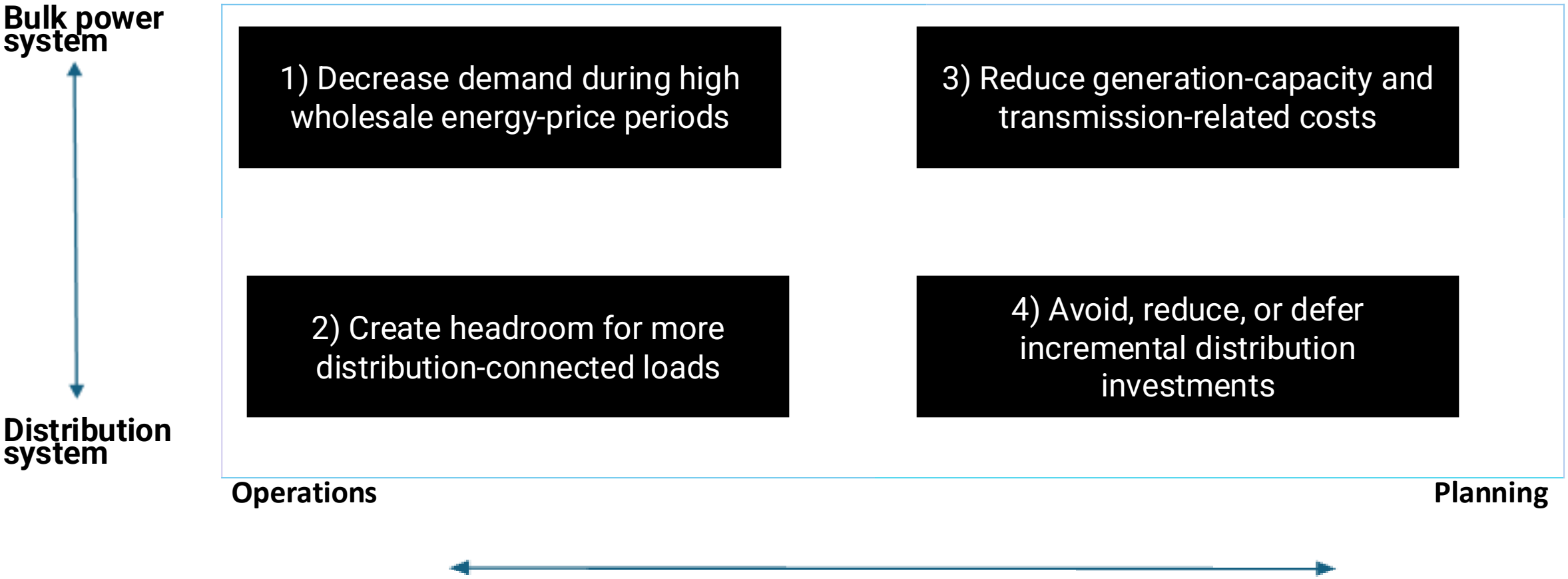
- Implicit flexibility
  - Via price signals
- Explicit flexibility
  - Contractual obligation

NJ BPU Strawman:

- Interim Program: 2 Delivery Pathways
  - EDC-Administered
  - Third-party aggregator
- Long-term open-access VPP

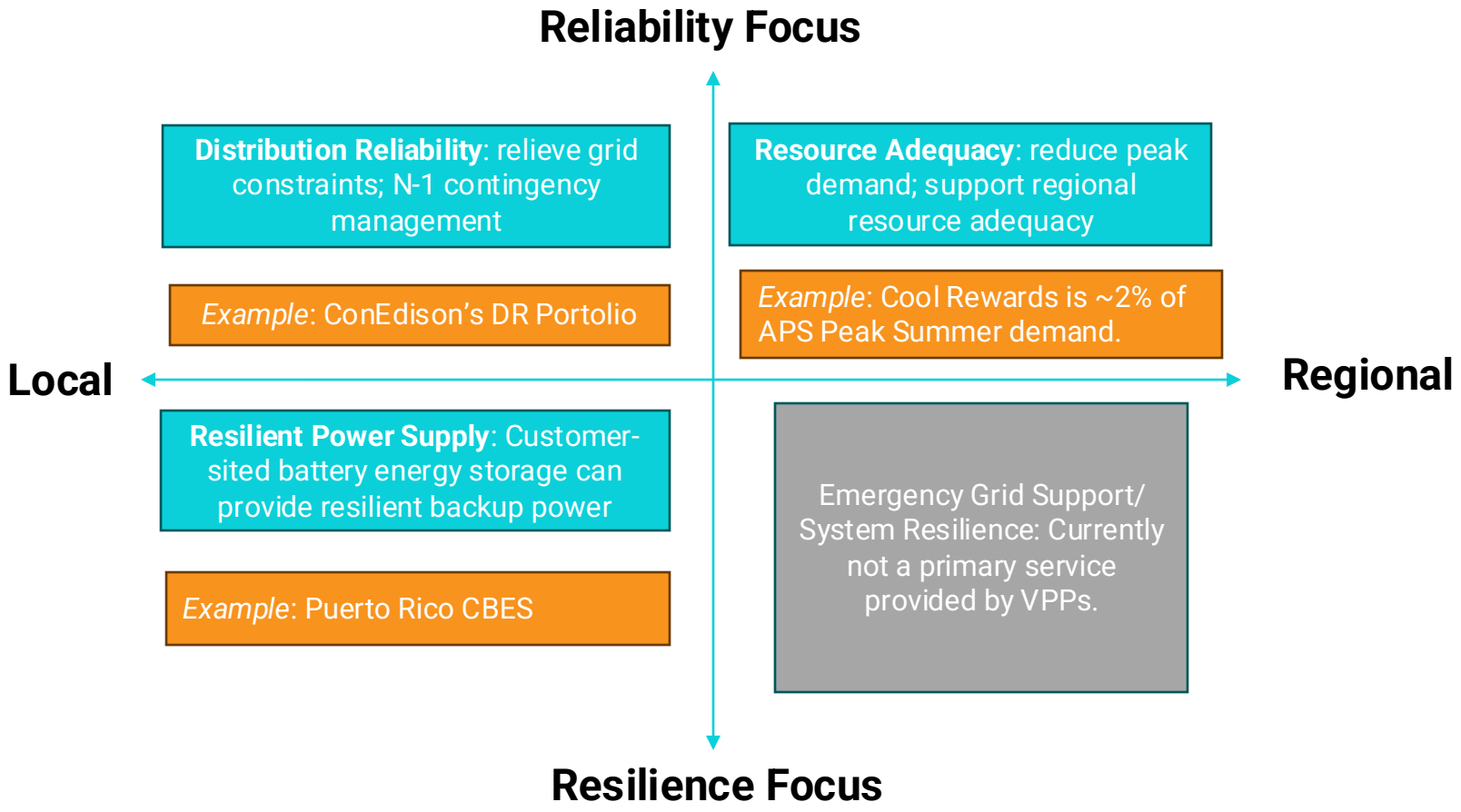
* BYODC was popularized by Ad Hoc Group and Alliance to Save Energy in Bridging the Load Grap: A Collaborative Pathway for Utilities, Hyperscalers, and Customers

How are VPPs supporting affordability?



Source: adapted from Tyler Fitch et al, *Power Shift,* RMI, https://rmi.org/insight/power-shift/.

How are VPPs supporting system reliability and customer resilience?

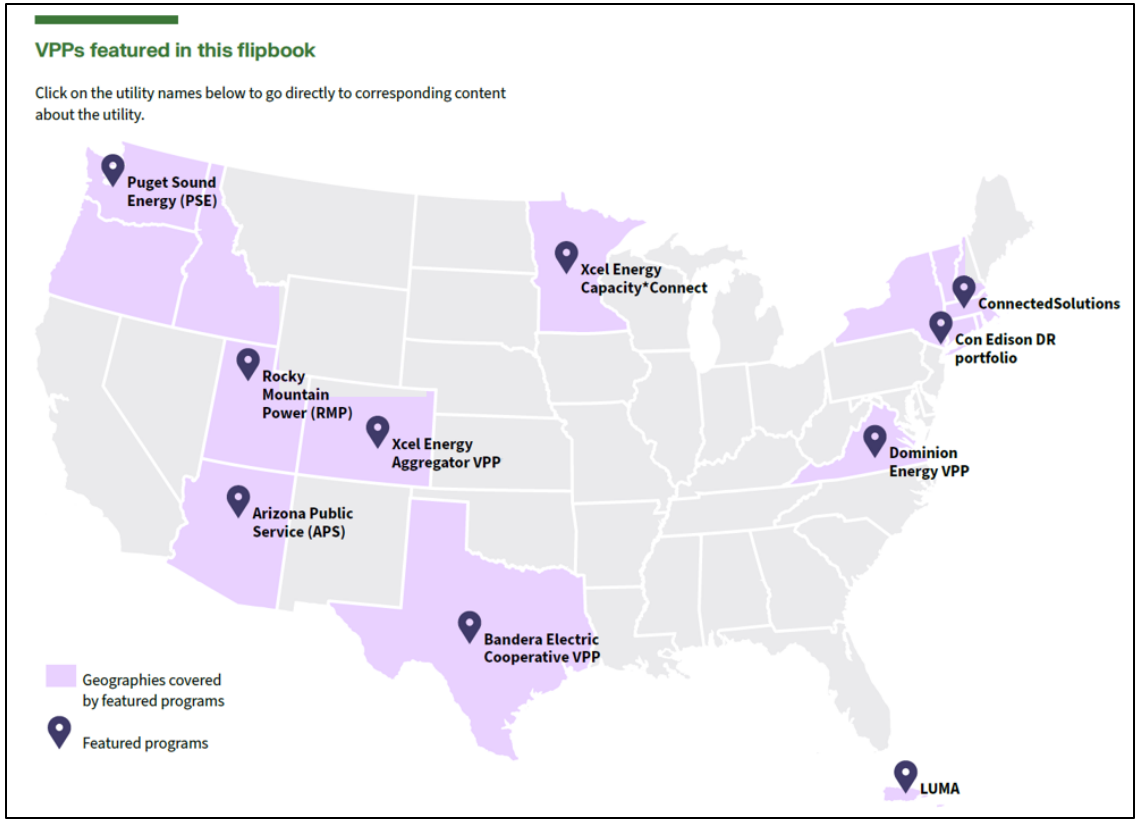


Reliability is the ability of the electric grid to consistently deliver power when and where it is needed, including having enough resources to meet demand and maintaining stable grid operations.

Resilience is the ability of the electric system to withstand, respond to, and recover from disruptions, especially major or unusual events that may cause outages.

VPP Design: Select takeaways from *VPP Flipbook: 2026 Update*





Each VPP is analyzed using standard design metrics

Category	Metric
Overview	VPP type
	Grid services provided
	Resource type
	Customers enrolled
	MW enrolled
Policy environment	State(s)/territory
	Utility type
	Wholesale market
	Enabling policy or plan

Category	Metric
Roles and responsibilities	Resource off-taker
	Program operator
	Participating OEMs and aggregators
	Device owner
Customer experience	Customer segment
	Customer enrollment
	Customer payment channel
	Compensation structure
	Compensation levels
	Customer participation requirements
Operations	DER control
	Metering, telemetry, and verification notes
	Dispatch timing

Trends and emerging themes from VPPs featured in the flipbook

New programmatic approaches to dispatch and compensation for locational distribution grid services	Increased use of performance-based compensation	Utility ownership of DER assets	Portfolio approach for DSM and VPP programs
Xcel CO AVPP *Connected Solutions+*	*Xcel CO AVPP* *Dominion VPP*	*Xcel Capacity*Connect (MN)*	*Dominion VPP* *Coned DR Portfolio* *Puget Sound Energy*

VPP policy and design takeaways from *VPP Flipbook* research

VPP Policy and Design Considerations

1) Increase access to VPP options

1a) Remove barriers to market-participant VPPs (e.g. 3rd party AMI data access)

1b) Establish utility VPPs

1c) Advance BYODC solutions

2) Maximize VPP value by stacking services

2a) Design VPPs to provide local & bulk system services

2b) Enable dual enrollment in wholesale market & utility VPPs

3) Ensure VPPs are leveraged to avoid system costs

3a) Integrate VPPs into planning

3b) Integrate VPPs into operations

4) Adopt a pragmatic and learning mindset

4a) Learn from leading practice

4b) Start with a workable policy/ program & improve it over time

Thank You!

kbrehm@rmi.org





nationalgrid

New England Electric

Grid Services Development

August 18th 2026

The ConnectedSolutions program has been at the vanguard of “grid flexibility” for years.

The Company has **~55k customers** enrolled in its demand response program; enrolled resources total **~100 MW**, equivalent to **2% of peak demand** for MECO. We also have a managed charging program for EVs in place.

Industry-Leading Innovation – in 2024, EnergyHub and National Grid demonstrated **orchestration of DR resources** – managing smart thermostats and BTM batteries to deliver a consistent level of DR response for a multi-hour event.

ENERGY STORAGE NORTH AMERICA

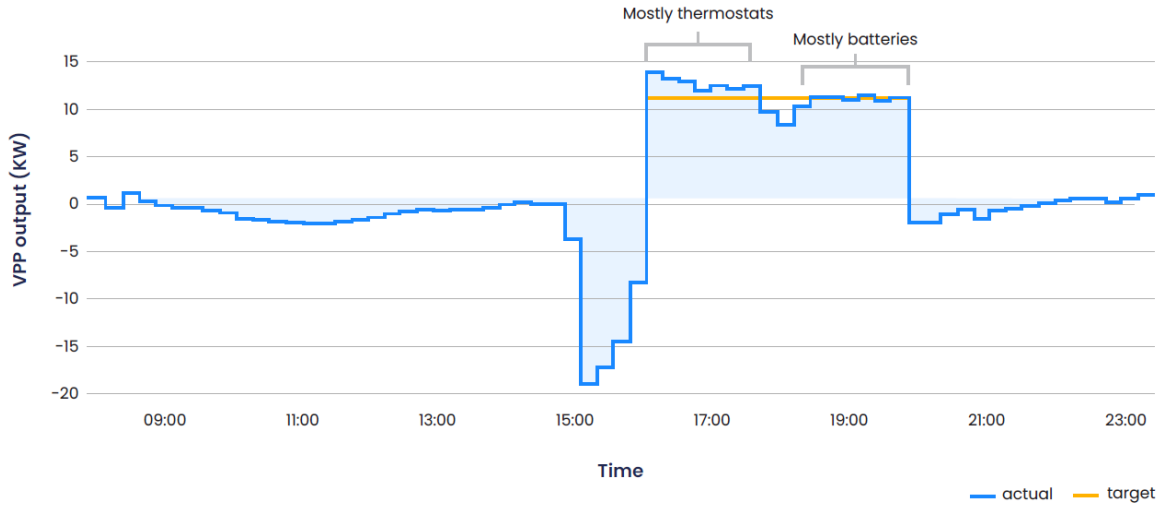
2019 BTM Innovation Award – for being an early mover incorporating BTM storage in DR program

Smart Electric Power Alliance

2025 Energy Equity Power Player of the Year – for open access, device-agnostic program

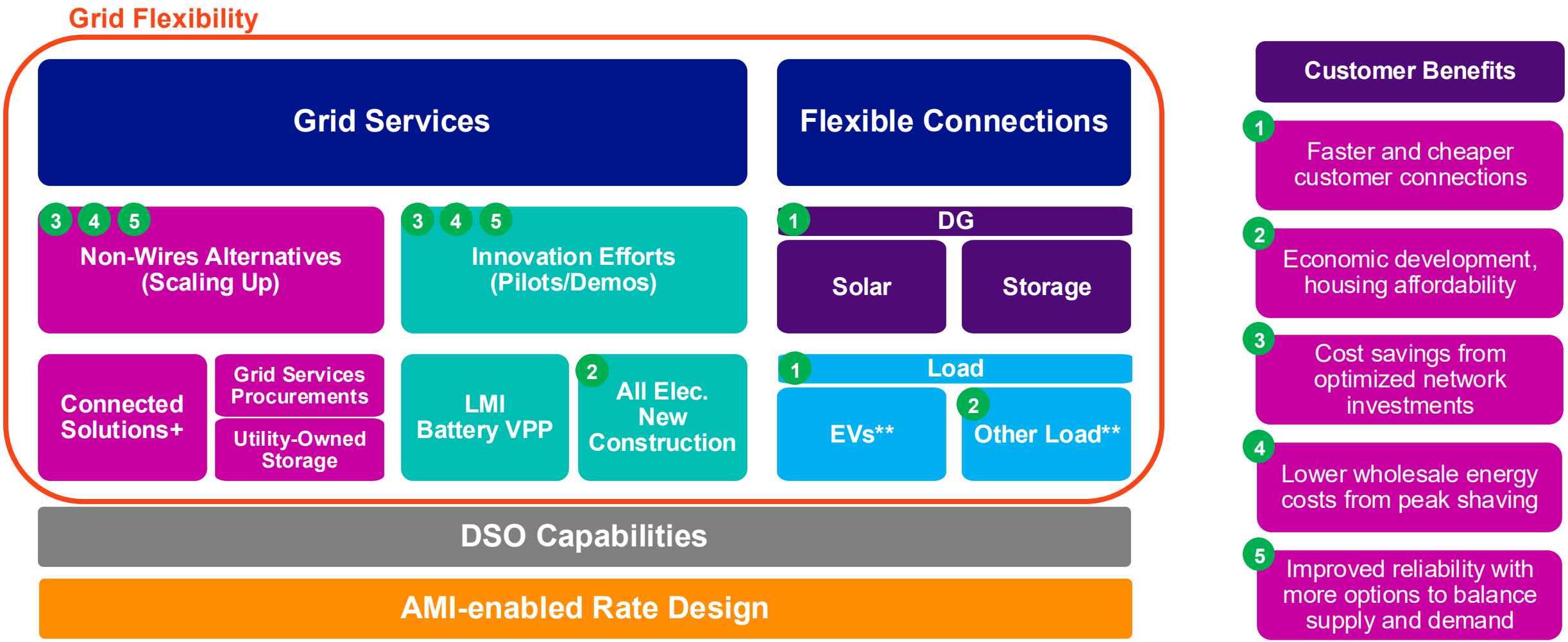
PUBLIC UTILITIES FORTNIGHTLY
Powered by SEPA

2025 Nikola Tesla Award in Artificial Intelligence – for Dynamic Load Shaping using AI



National Grid

Expanding beyond ConnectedSolutions, National Grid has a portfolio of developing grid flexibility solutions.



Customer Benefits

1. Faster and cheaper customer connections
2. Economic development, housing affordability
3. Cost savings from optimized network investments
4. Lower wholesale energy costs from peak shaving
5. Improved reliability with more options to balance supply and demand

***Load Flexible Connections Roadmap to be developed in FY27*

Massachusetts Non-Wires-Alternatives are facilitated by the Future Grid Plan

- All MA electric utilities were required to file an Electric Sector Modernization Plan (ESMP) to the MA DPU to **help meet the climate goals and net-zero greenhouse gas emissions targets by 2050**

ESMP: Deliver an electric network to support the State's Clean Energy and Climate Plan ($2.5bn plan)

ESMP pillars

1. Building the network for electrification and DER growth
2. Making it easier for all customers to participate in the clean energy transition
3. **Operationalizing flexibility and maximizing its value**

Flexibility use cases addressed by ESMP investments:

1. Bridge to wires NWAs (16+)
2. Deferral NWAs (3 candidates)

Supporting investments proposed in ESMP:

$50m Grid Services Compensation Fund to fund new NWAs / VPP customer offerings (2025-2029)

New customer VPP offerings proposed in ESMP:

Flexibility VPP market procurements for grid services (market-based)

2025-2029: Use this ESMP to **gain real-world learnings by testing** and operationalize VPPs as non-wires solutions for high-needs use cases up to a pre-determined fixed budget.
2030-2034: Leverage learnings from ESMP 1 on what works best to cost-effectively **scale flexibility** into the way we operate and plan our network where technically feasible.

Grid Services at National Grid in Massachusetts

National Grid has been testing two grid services approaches since July 2025 to address local network constraints via Non-Wires Alternatives (NWA). Over the first Massachusetts **ESMP** phase, National Grid will utilize the **Grid Services Compensation Fund (GSCF)** to establish and grow grid services based on real-world learnings.

Grid Services Offerings Launched Since July 2025

ConnectedSolutions+

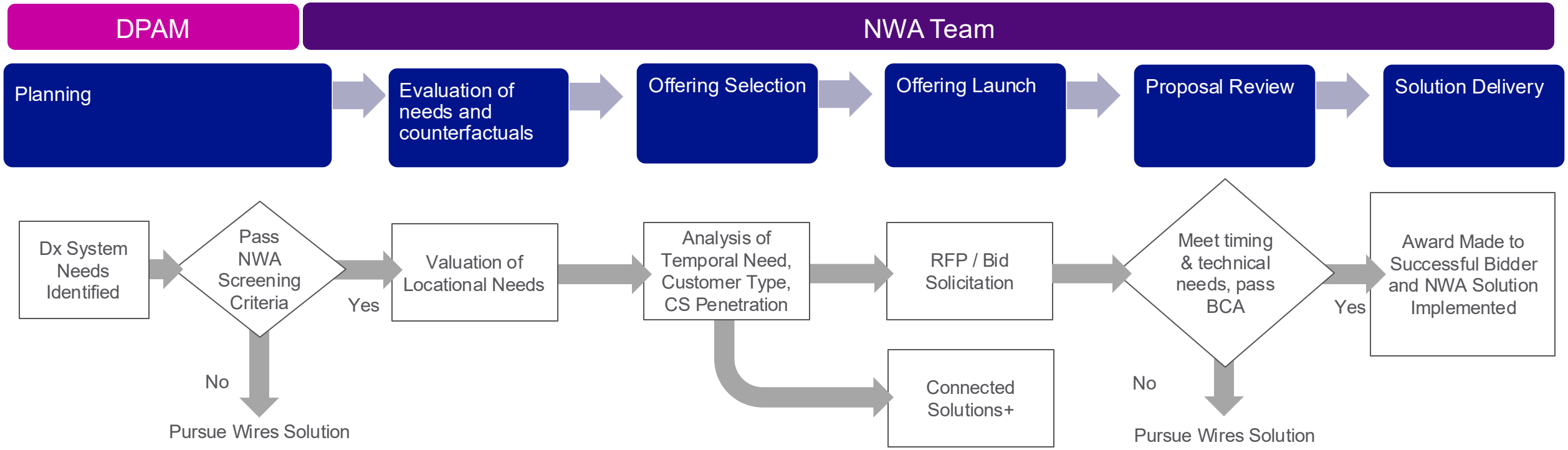
Incremental, localized incentives offering launched in **15 locations**

Non-Wires RFPs

Market based offering; contracting bids in 7 locations, **totaling ~3.7 MW**

Grid Services are being integrated with planning

We are building out the capabilities to identify potential NWA opportunities on the distribution network, value the needs appropriately and deploy offerings that can help us to manage the specific need.



Current Grid Services Offerings

In just one year of ESMP funding, National Grid has established 15 ConnectedSolutions+ locations and 7 Non-Wires Alternative (NWA) locations across MA.

ConnectedSolutions+

Estimated kWs of Dispatchable Capacity as of May 2026**			
Location	**Dispatchable kW**	**Location**	**Dispatchable kW**
Barre-Athol	53	Nantucket	763
Bridgewater	155	Palmer	87
East Longmeadow	62	Plainville	19
Foxborough	1373	Salem	235
Lynn	31	Ware	142
Malden	17	Whitman	298
Medford	24	Worcester	14
Millbury	214		
Total Dispatchable Capacity**			**~3.6 MW**

**Includes existing capacity from ConnectedSolutions in identified areas and incremental capacity from ConnectedSolutions+



Non-Wires RFPs

kWs of Awarded Capacity as of May 2026		
Location	**Dispatchable kW**	**Asset Type**
North Oxford	1,200	Resi BTM Battery Aggregation
Foxborough	1,930	FTM BESS
Millbury	140	Resi BTM Thermostat Aggregation
Mill St	20	Resi BTM Thermostat Aggregation
Plymouth	60	Resi BTM Thermostat Aggregation
Wellington	160	Resi BTM Thermostat Aggregation
Pine Banks (Melrose)	180	Resi BTM Thermostat Aggregation
Total Awarded Capacity		**~3.7 MW**

ConnectedSolutions+

National Grid designed and launched **ConnectedSolutions+ in 2025**, offering customers increased financial incentives to meet local grid needs. ConnectedSolutions+ is now live in **15 Massachusetts locations** in National Grid's service territory.

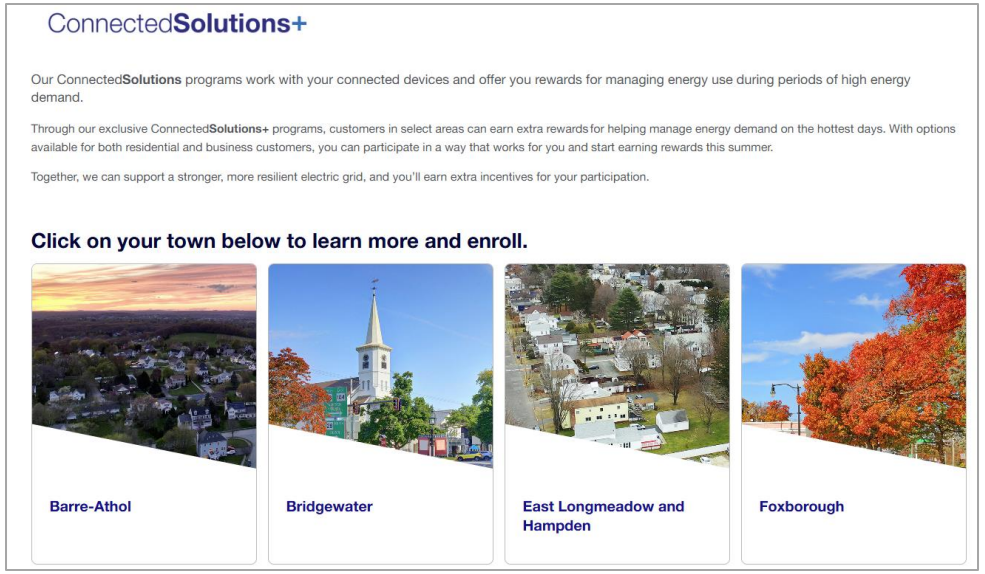
Program Design:

- **Location Specific Focus:** Building off system-wide ConnectedSolutions, **ConnectedSolutions+ aligns DER flexibility** where grid constraints are emerging
- **Unlocking More DER Value:** Locational dispatch enables National Grid to test **how local dispatch can reduce stress on the grid** at peak times
- **Increased Incentives for Customers:** Customers in ConnectedSolutions+ areas earn more for their incremental participation on top of base ConnectedSolutions

ConnectedSolutions+ 2025 Enrollment Metrics		
	Nantucket	N. Foxborough
Total dispatchable grid flexibility for local needs (kW)	690	1051
Est. Net New Grid Flexibility (kW) in 2025	146	45

Expansion of ConnectedSolutions+:

- In Summer 2026, National Grid scaled ConnectedSolutions+ to **15 total locations**
- National Grid implemented supplemental offerings to **further drive customer adoption:**
  - **Upfront Battery Rebate:** eligible customers **earn up to $7,500** for residential battery installation
  - **Direct Thermostat Install:** eligible customers' **co-pay is waived** when they receive a thermostat through MassSave Weatherization program



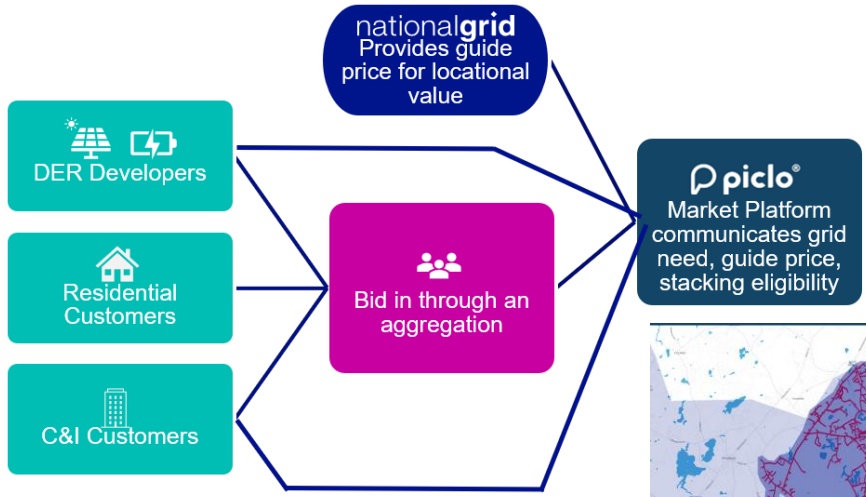
NWA RFPs

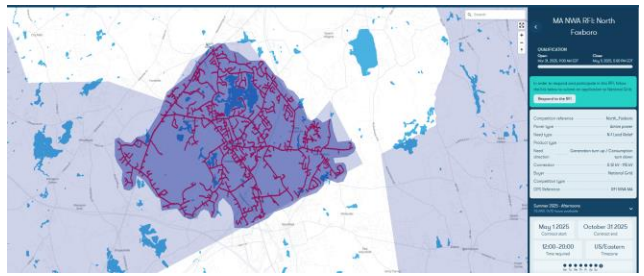
National Grid has released three RFPs via Piclo since the start of ESMP term to procure flexibility from FTM assets and BTM aggregations. The team continues to apply learnings and refines their RFP strategy based on participant feedback.

RFP Outcomes to Date:

- In their latest RFPs (2026), National Grid received proposals from **8 vendors** (12 of 23 locations included in RFP)
- National Grid **awarded 7 bids across 3 vendors** and is working through contracting ahead of 2027+ dispatch







Applying Lessons Learned:

- Developers indicate short term contracts (<5 years) are not financially viable, an **ongoing headwind for contracting new-build assets within ESMP term**
- National Grid aspires to do more **targeted outreach** to qualified vendors to leverage existing assets for grid services
- To improve efficiency of evaluating bids and contracting vendors, National Grid will implement a **rolling monthly evaluation** and has designs to create a more dynamic ecosystem

We're connecting customers more quickly and cheaply with Flexible Connections.

DG Customer Use Cases For Flex Interconnection

Standard Flex Interconnection

*"I'm happy to be curtailed at **times of grid need** in exchange for a **faster interconnection**"*

5 Customers Enrolled

10+ customers in studies

"Bridge to" Solution

*"I'll pay for the expensive upgrade, but **use flex to connect me now** while the upgrade is being built"*

Local Power Controller (LPC)

*"I have **new DG and new load that will offset my DG**, and will never export to the grid"*

3 Customers Enrolled

20+ customers in study queue

DG Customer Value Under Current Use Cases:



Cost Reduction



Faster Interconnection & Customer Optionality

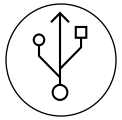


Value Stacking

Next Frontier for Flexible Connections:



Integrating with Market-based Procurements



Scaling with DERMS Capabilities

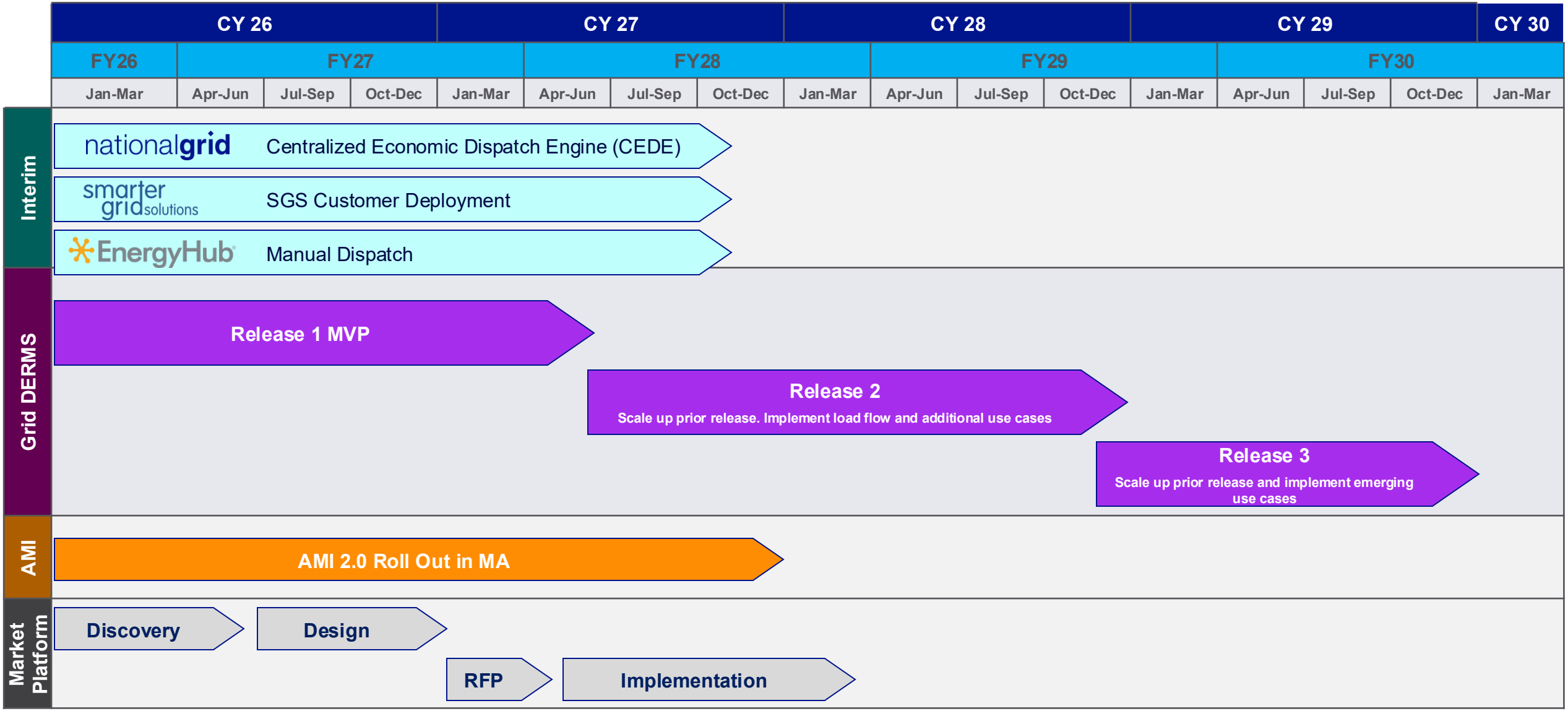


Developing Flexible Load Strategy



Implementing EV Flexible Connections

Over the next few years, we are investing in and delivering a significant amount of DSO-enabling technology



The Evolving Role of Flexibility

National Grid envisions a future in which third-party flexibility plays a larger role alongside traditional distribution infrastructure and utility-owned DERs, ensuring the most cost-effective mix of solutions is deployed to meet network needs.

However, we believe there are key structural changes that we will need to put in place to achieve scale:

1) Enabling longer-term price signals for investment in new assets to provide grid services

2) Enabling utility spend on flexibility to work alongside capital deployment, integrated into a utility's core activities
   - Optionality on spend
   - Earnings equalization
   - Incentivization to make shifts within utility practices

3) Improved bidirectional transparency between utility and potential participants

4) Coordination between ISO-NE, utilities, and MA DPU to promote a frictionless market environment

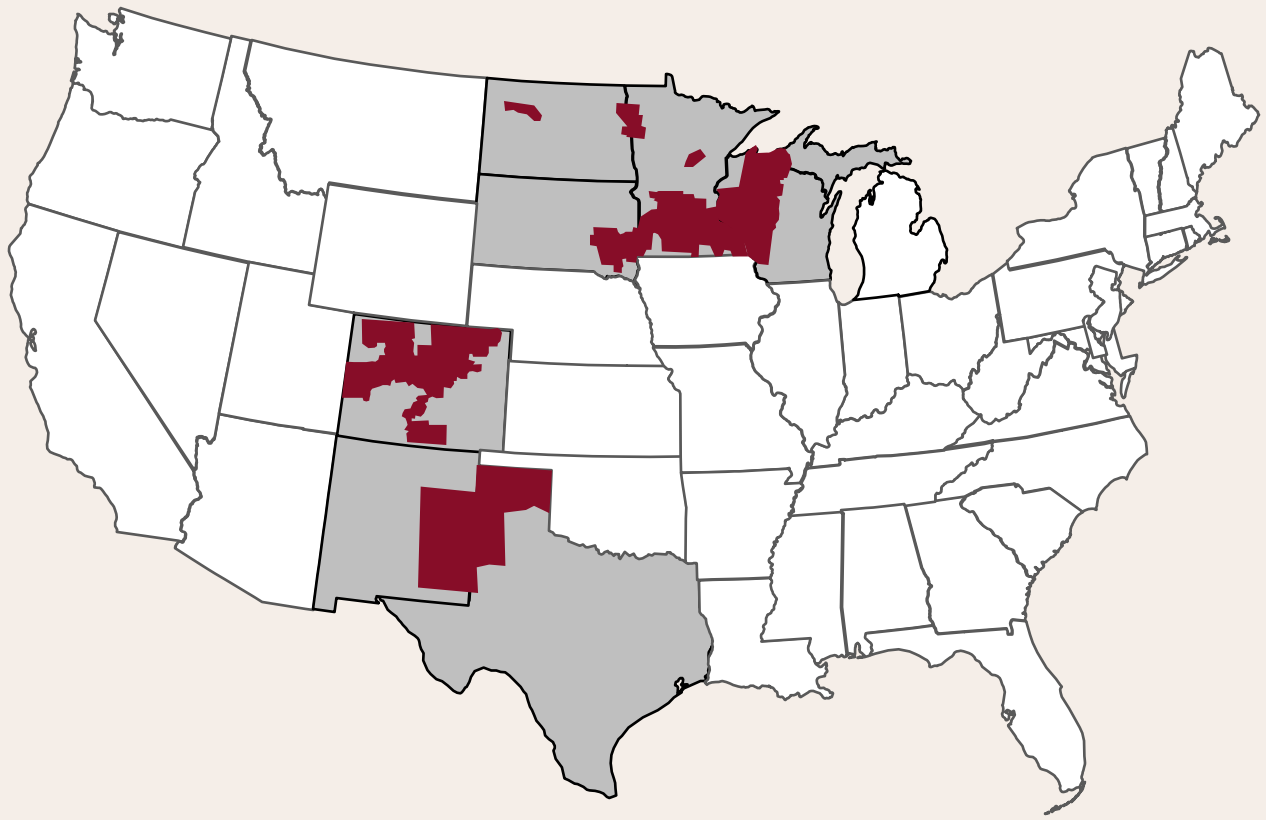
OVERVIEW OF GRID SERVING DER/VPP PROGRAMS

August 18th, 2026
Zach Pollock – Director, Integrated System Planning



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ABOUT XCEL ENERGY



Serving eight states

3.9 million electricity customers

2.2 million natural gas customers

2 GW interconnected DER

125,000 DER installations

Nationally recognized leader

- Wind energy
- Energy efficiency
- Carbon emissions reductions
- Innovative technology
- Storm restoration

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OUR GOAL TO BE A NET-ZERO ENERGY PROVIDER BY 2050

2030

80%
lower electric carbon emissions



ELECTRIFICATION-FIRST
customer options



NET-ZERO METHANE
gas service



2035

1.5M
EVs enabled by charging infrastructure



20%
of fleet converted to EVs



2050

ZERO-CARBON
electric emissions



NET-ZERO
gas service



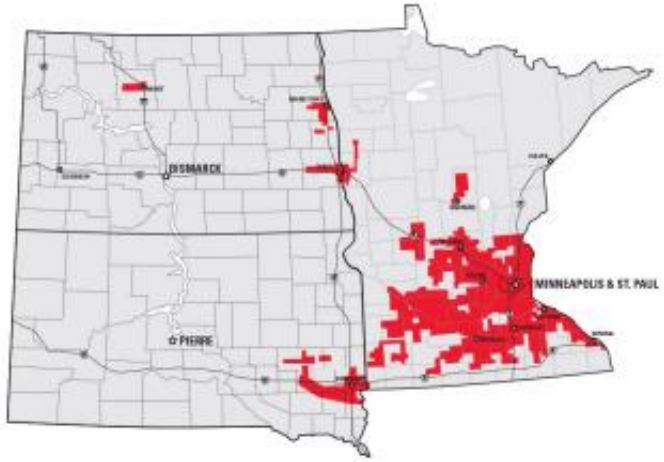
ZERO-CARBON
fuel within 1 mile



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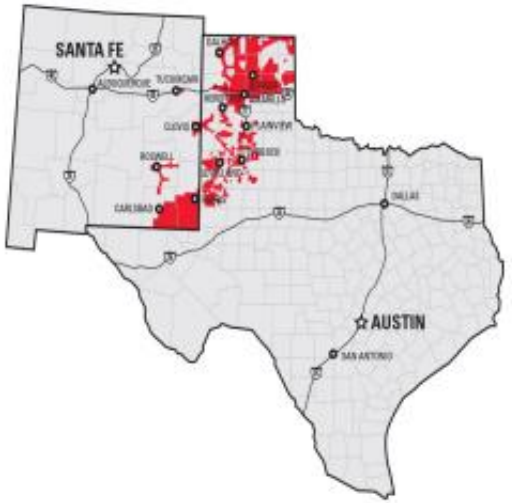
OPERATING COMPANY MARKET FOOTPRINT AND DER PENETRATION

Minnesota / Upper Midwest



- 1.5 million electric customers
- ~1 GW of DER – mostly Community Solar

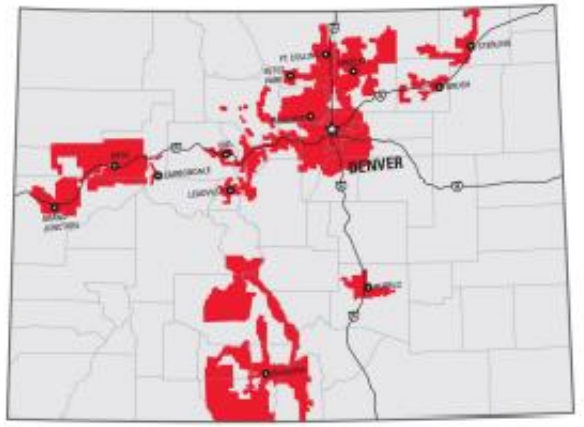
New Mexico and Texas



- 0.4 million electric customers
- Low DER penetration, increasing interest in private generation / microgrids

Colorado

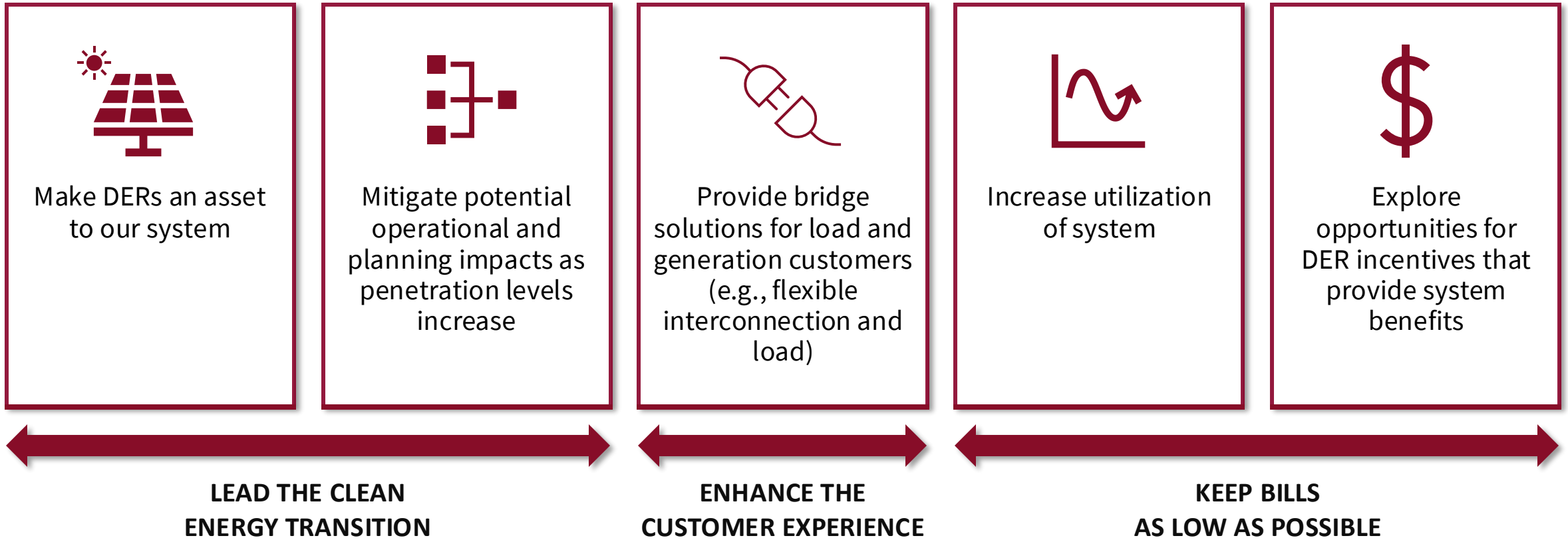
(Not a full market participant; EISM only)



- 1.6 million electric customers
- ~1 GW of DER – mostly rooftop solar

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ALIGNMENT OF DER STRATEGY TO OUR STRATEGIC OBJECTIVES



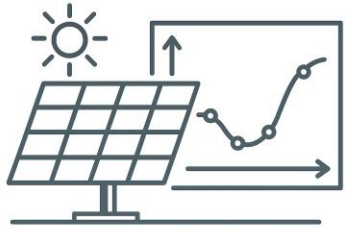
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THE OPPORTUNITY AND NEED FOR DERS TO PROVIDE SYSTEM VALUE



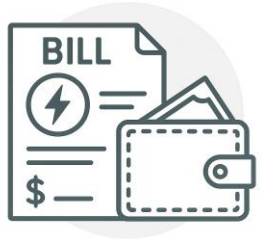
Increasing Overall System Complexity

- Challenges of planning and operating a very highly renewable grid.
- Changing customer consumption and demand at the grid edge.
- Limited visibility into the distribution system.



Declining System Value of Legacy DER Programs

- DER incentive programs were historically focused on system-wide energy (e.g. NEM) and renewable value (e.g. RECs).
- Declining impact of programs for a variety of reasons.
- Need to evolve programs to focus on value streams that match complexity.



Affordability and Capital Efficiency

- Growing complexity is requiring investment and change to serve our system and customers.
- Increasingly challenging to balance affordability with infrastructure needs.
- Capital must be disciplined by customer impact– building to the expectation of pending growth.

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OVERVIEW OF XCEL GRID SERVING DISTRIBUTED STORAGE/VPP PROGRAMS





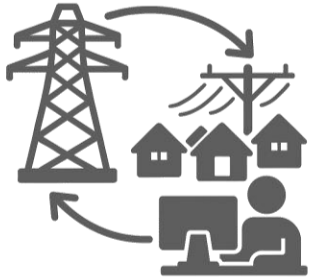




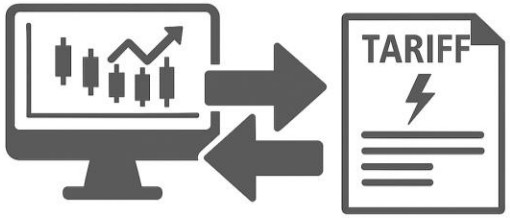
	Capacity*Connect (DCP – MN)	Dispatchable Distributed Generation (DDG – CO)	Aggregator Virtual Power Plant (AVPP – CO)	Renewable Battery Connect (CO)
Primary Use Case	Bulk-System Capacity and Energy; Distribution Benefits for areas where dispatch overlaps	Distribution Load Relief	Bulk System Capacity: Distribution Benefits for areas where peaks overlap	Bulk System Capacity
Asset Types	Front-of-the-Meter battery storage	Front-of-Meter renewable generation resource co-located with energy storage	Behind-the-Meter; Technology-neutral	Behind-the-Meter BESS paired with PV
Asset Ownership	Company-owned assets	Third-party	Third-party; Company	Third-party
Asset Size	Larger-scale (1-3 MW)	Larger-scale (750 kW minimum injection capacity)	Minimum of 100 kW per aggregation	Residential
Dispatch/Event Duration	4 Hours	4 Hours	4 Hours	3 Hours
Dispatch/Event Limitations	As required by MISO	As defined by schedules	80 Events Per Year	60 Events Per Year

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REMAINING QUESTIONS AND CHALLENGES



Operational coordination between the ISO/RTOs, bulk system, distribution system, aggregators and our customers.



Price equilibrium between wholesale market economics and retail tariffs. Do existing retail tariffs limit participation?



Customer acceptance

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NEW YORK STATE | Department of Public Service

VALUE OF DISTRIBUTED ENERGY RESOURCES IN NEW YORK

INTRODUCTION, IMPLEMENTATION, AND LEARNINGS

AUGUST 28, 2026

VDER - Introduction

NYS PSC launched VDER in 2015 as an approach to providing compensation for DERs.

- Performance-based
- Certain enough to work financially for developers
- Value-based

Value-based means giving credit for costs that the grid or the utility avoids, using estimates but also with confidence that they are actually avoided.

This is intended both to achieve "fair compensation" and also to incentivize for the most valuable deployment eg, locational.

The monetary value of the compensation is developed in a Value Stack structure, with 5 components:

- Energy value
- Capacity value
- Environmental value
- Demand Reduction value
- Location System Relied value

The local utility calculates the monetary value of the electricity produced and applies it as bill credits, which subscribers use to pay to the developer via subscription agreements.

NOTE: This is **not** a program to provide "missing money". This needs to stick to the avoided cost principle

VDER – The Components

Value Name	Description	Eligible DERs
Energy Value (LBMP)	LBMP is the day-ahead wholesale energy price as determined by NYISO. It changes hourly and is different according to geographic zone.	All technologies: PV, storage, CHP, digesters, wind, hydro, and fuel cells.
Capacity Value (ICAP)	ICAP is the value of how well a project reduces New York State's energy usage during the most energy-intensive days of the year. Developers can choose from three payout alternatives and most ICAP rates change monthly.*	All technologies receive ICAP. Dispatchable technologies (stand-alone storage, CHP, digesters, and fuel cells) will receive Alternative 3.
Environmental Value (E)	E is the value of how much environmental benefit a clean kilowatt-hour brings to the grid and society. The E value is locked in for 25 years.**	PV, wind, hydro, and storage charged exclusively from PV or wind energy. Stand-alone storage is not eligible at this time.
Demand Reduction Value (DRV)	DRV is determined by how much a project reduces the utility's future needs to make grid upgrades. DRV is locked in for 10 years.**	All technologies.
Locational System Relief Value (LSRV)	LSRV is available in utility-designated locations where DERs can provide additional benefits to the grid. Each location has a limited number of MW of LSRV capacity available. The LSRV is locked in for 10 years.**	All technologies. Project must be on a utility-specified substation.
Community Credit (CC)	CC is available on a limited basis to encourage the development of Community Distributed Generation (CDG) projects. CC is the successor to the Market Transition Credit (MTC) and is similar in structure. The CC is locked in for 25 years.** PV projects in utility territories that have fully expended their CC may be eligible for the Community Adder – an upfront incentive administered by NY-Sun.	Available for CDG projects including PV and digesters. Wind, hydro, and fuel cells receive CC at a derated value. Not available for stand-alone storage or CHP.

VDER – Deployment Success

Solar

- 8 GW of distributed solar in New York, mainly through VDER (July 26)
- Another 2.7 GW in development, lately also FOM BESS

Battery Energy Storage

- 270 of front-of-meter distributed storage installed (March 26)
- Another 760MW in contracted/awarded

VDER – Work to Implement

The key issues are the values and also interconnection of the projects (not strictly a VDER topic but inescapable in every discussion).

Developers are revenue-focused, understandable and essential to their willingness to invest, but not necessarily aligned with best value for customers.

Utilities on this topic tend to be reliability focused, on system effects of interconnecting DERs on their system, and on the cost effects – whether added or avoided.

Commission is focused on assuring best reliability and affordability for customers, and optimal achievement of the State's policy.

You can see that alignment won't "just happen"

VDER – Roles

The New York State Department of Public Service (DPS) oversees VDER implementation and policy development, including running policy and technical working groups

The New York State Energy Research and Development Authority (NYSERDA) provides implementation support, including training materials and a "Value Stack Calculator for developers

VDER – Learnings/Examples of Current Topics in New York

Is it helpful or unhelpful to have the same compensation values for solar and BESS, when the second is so much more dispatchable than the first?

The purpose of VDER is to provide smart deployment signals, geographically. Do the VDER compensation signals get developers to invest in locations that are most beneficial to the grid/system costs. And for dispatchable DERS – to operate at times/in modes that are most beneficial to the grid/system costs

How can we continue to strengthen the confidence that “avoided costs" are actually avoided, so that we pay only for outcomes truly achieved

Virtual Power Plant Best Practices



SUNRUN

America’s Largest Operator of Distributed Power Plants

Sunrun is America’s largest provider of home battery storage, solar, and home-to-grid power plants, now serving more than **1.2 million** customers.

From Q3 2024 to Q2 2026, Sunrun has scaled from…

135,000 → **266,000** storage systems installed

20,000 → **121,000+** participating DPP customers

60% → **74%** national storage attachment rate

2.1 GWh → **4.6 GWh** of networked storage capacity

By the end of 2028, Sunrun expects to bring online over 10 GWhrs of Networked Storage Capacity



Samuel with his Tesla Powerwalls
Sunrun customer in Puerto Rico & VPP Participant

VPP Program Pillars

01

Ratepayer Value Driven

Avoided cost structure to inform program compensation.

Values will change over time, particularly with locational value or new use cases.

02

Start Simple

Layer in complexity over time. “Learn by doing.” *(ConnectedSolutions+)*

Allow utility, installers, & participants to gain experience and comfort with the VPP.

03

Open Access

Participation pathways for individual customers, OEMs & third-party owners.

Provide consumers choice in equipment & providers.

DERMS provider can facilitate integrations.

04

Certainty Enables Growth

Clear program runway to spur market development.

Pilots, program caps, limited consumer options, and uncertain compensation limit ability to scale.

Best Practices: Structure

$/kW/season or year performance payment

- Set for all program participants
- Performance averaged across all events during a season/year

Event-Based Dispatch

- Target high-value hours to maximize ratepayer value
- Day-ahead event notification, with same-day for emergency events
- Up to 4-hour event duration

Measurement & Verification

- Use of integrated revenue-grade metering for the battery to measure direct performance.
- Data provided through integration with the DERMS provider

Compensation Lock-In Period

- 5-10 years from time of enrollment.
- Provides balance between certainty for participants versus updating ratepayer value & compensation over time.

Bonus Payments

- May offer upfront enrollment payments (*Virginia, Connecticut).*
- Additional compensation can be useful to increase participation from low-income households, outage-prone areas, or in high distribution value areas *(Connecticut, Massachusetts, New York)*



Best Practices: Customer Experience & Enrollment

Simplicity in the Enrollment Process

- Allow for **"Opt-Out Enrollment"** by aggregators, third-party owners, or OEMs where participants have provided authorization for the entity to do so.
  - Customers are notified, can opt-out of program at any time, and are compensated.
  - Significantly increases participation, particularly from existing customers in a market.
- OEM-led in-app enrollment for customer-owned systems.
- If VPP programs are replaced, allow for automatic transition to retain existing program capacity.
- Minimize friction points, paperwork, and administrative burden.

Consumer Protections

- Allow for event opt-outs without penalty, other than reduced performance compensation.
- Don't call events when major weather events may cause outages.
- Allow participants to choose battery discharge parameters.

Batteries are Distinct from Traditional Demand Response Resources

- Allow for exports/injection from batteries.
- Unlike thermostats, EV charging, or C&I demand response, customer comfort is not impacted by participation.
- Can measure performance directly rather than relying on AMI data and baselining.


Questions?
SUNRUN



Moderated Discussion

New RAP Load Flexibility Lead



Emma Rodvien
Director, US Regulatory Affairs, Kraken
Former Sr. Analyst with the Rhode Island PUC
Joining RAP on August 31st

RAP
REGULATORY
ASSISTANCE PROJECT

Thank You

Learn more about our work at raponline.org