



# **Order No. 2222 – What DER Aggregation Use Cases Will It Unlock?**

Jeff Dennis, General Counsel and Managing Director

Prusha Hasan, Policy Associate

Advanced Energy Economy

# About Advanced Energy Economy (AEE)

- AEE is a national association of businesses that are making the energy we use secure, clean, and affordable.
- AEE is the only industry association in the United States that represents the full range of advanced energy technologies and services, both grid-scale and distributed. Advanced energy includes energy efficiency, demand response, energy storage, wind, solar, hydro, nuclear, electric vehicles, and more.
- AEE also supports the work of the Advanced Energy Buyers Group (“AEBG”), a coalition of large buyers of advanced energy technologies to meet sustainability goals.
- AEE pursues policy transformation in the states and in wholesale power markets that expand market opportunities for advanced energy technologies and lay the foundation for a 100 percent clean advanced energy future.



# DERs Are an Important Part of PJM's Energy Future

- Cumulative distributed energy resource capacity in the United States is projected to grow to 387 gigawatts by 2025
- Order No. 2222 gives us the opportunity to make the most of the region's investment in DERs
- AEE report illuminates the near-term use cases that DER aggregators expect to pursue under Order No. 2222 and offers solutions to overcome barriers to participation

## FERC ORDER NO. 2222: WHAT DER AGGREGATION USE CASES WILL IT UNLOCK?

Order No. 2222 unleashes the power of distributed energy technologies — Here is how aggregators and developers plan to bring DERs to wholesale energy markets to create a more reliable and flexible grid

June 2021

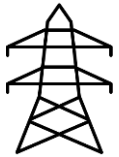


San Francisco | Washington D.C. | Boston  
aee.net | powersubs.aee.net | @aee.net



# Benefits of Aggregated DER Participation

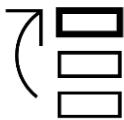
**Benefits for All:** If RTOs/ISOs, distribution utilities, DER aggregators, states, and other stakeholders work to remove barriers to participation, integration of DER use cases into wholesale markets will create benefits for all participants in the electricity sector:



**Wholesale market operators** gain the ability to utilize these assets to meet the needs of the larger grid



**Distribution utilities** gain local resilience on the distribution grid



**DER aggregators** are provided a new revenue stream, helping them make DERs and new services available to more customers



**Consumers** benefit from cost savings passed on by DER aggregators while also receiving a desired service



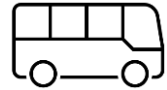
**States** can accelerate achievement of policy goals and empower their retail consumers

# General Recommendations to Guide RTO Compliance Efforts

- **Recommendation 1:** *RTOs/ISOs should create market rules that maximize the participation of DERs. The goal of stakeholder processes in RTOs/ISOs should be to create pathways that allow full participation of aggregated DERs in all wholesale markets*
- **Recommendation 2:** *RTOs/ISOs should ensure that a range of business models and technologies can participate*
- **Recommendation 3:** *Grid operators should seek to harmonize retail and wholesale use cases*
- **Recommendation 4:** *While implementation dates will depend on a number of factors, RTOs/ISOs should not unduly delay timely implementation of FERC's final rule.*



# What DER Aggregations Will Order 2222 Unlock?



Frequently Dispatched DERs, e.g., Electric Buses, Battery storage



Residential Demand Response, e.g., Smart Thermostats and Water Heaters



Residential Behind-the-Meter (BTM) Resources, e.g., Solar, Solar + Storage, Storage, and EV Charging



Front-of-the-Meter (FTM) Distribution-Connected Resources

***This is a non-exhaustive list intended to help illuminate considerations that must be taken into account to accommodate a range of DERs.***



# Order 2222 in Action: Frequently Dispatched DERs, e.g., Electric School Buses



A growing number of school districts are replacing fossil fuel school buses with electric models which are rarely used at night or during the summer



During these times, these resources can become a flexible resource that can provide many grid services



There are currently **480,000** school buses serving more than **25 million** students



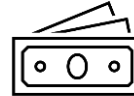
Other examples of frequently dispatched DERs include residential EVSE, energy storage, and workplace charging

# The Opportunity and Barriers: Frequently Dispatched DERs, e.g., Electric School Buses



## Potential Retail Services:

- Transportation/Electric Vehicle Charging
- Demand Response
- Peak Load Shaving
- Non-Wires Solutions Via Distribution Utility



## Potential Wholesale Services:

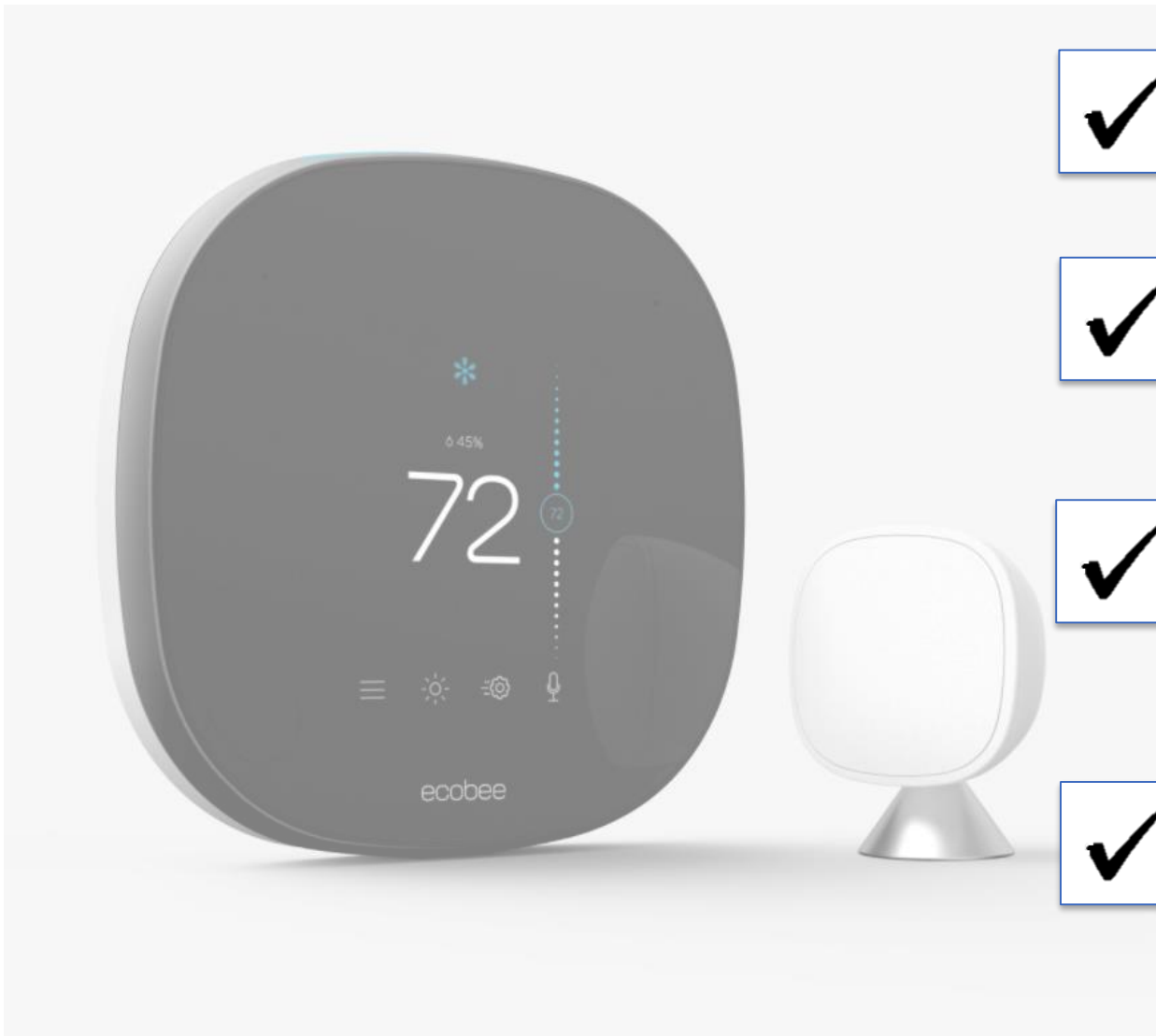
- Energy
- Capacity
- Ancillary Services

To enable wholesale market participation, grid operators will need to:

- Develop a continuous participation model that gives these resources credit for their full capacity value
- Allow these DERs to update energy offers in real-time to account for retail uses
- Allow submetering and/or create properly designed “baselines” to avoid baseline erosion due to frequent dispatch and give these resource fair compensation



# Order 2222 in Action: Residential Demand Response (DR), e.g., Smart Thermostats



Order 2222 allows residential customers and their homes to play a part in the power grid also



Residential devices such as smart thermostats and connected water heaters control the largest loads in homes



Enabling wholesale market participation for smart thermostats alone has the potential to contribute **40 GW** of load reductions through residential customers



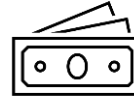
A separate possibility is commercial and industrial (C&I) customer who may be interested in providing DR through Order 2222 participation models

# The Opportunity and Barriers: Residential Demand Response, e.g., Smart Thermostats



## Potential Retail Services:

- Enhanced Home Comfort and Cost Savings
- Energy Efficiency and Demand Response
- Peak Load Shaving, Load Shifting and Load Smoothing



## Potential Wholesale Services:

- Energy
- Capacity
- Ancillary Services
- Reverse Demand Response

To avoid data access barriers and open up wholesale markets to these resources, grid operators should:

- Allow direct metering (or “submetering”) of residential DR resources
- Ensure that metering and telemetry requirements are based on data quality needs that provide the RTO/ISO with necessary, actionable information tailored to the services being provided
- Put procedures in place to avoid charging customers twice for the same energy if residential DERs are dispatched to both increase and reduce load

# Order 2222 in Action: Residential Behind-the-Meter, Solar + Storage, Storage, and EV Charging



DER aggregators will be seeking to bid customer-sited resources such as batteries, rooftop solar panels, and smart loads (e.g., EV chargers), and microgrid resources into wholesale markets



There is widespread interest in a transition to an electrified economy from consumers, states, and policymakers



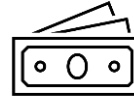
These DERs provide grid operators with reliability benefits and delivers cost savings to consumers while improving local resiliency and help meet state climate goals

# The Opportunity and Barriers: Residential Behind-the-Meter, Solar + Storage, Storage, and EV Charging



## Potential Retail Services:

- Customer Bill Management
- Peak Load Shaving
- On-Site Backup Generation
- Renewable Energy Credits (RECs)
- Resiliency Services



## Potential Wholesale Services:

- Energy
- Capacity
- Ancillary Services
- Enhanced Demand Response Service to Support Flexible Loads

To open up wholesale markets to these DERs, grid operators should:

- Create a participation option for smaller DERs that allows for sub-metering
- Limit the data and telemetry required for these small, sub-metered resources to what is actionable given the market services the resource is providing
- Ensure flexibility so that providers have the ability to design and bid in different configurations (e.g., different hybrid solar+storage resources)



# Order 2222 in Action: Front-of-the-Meter (FTM) Distribution-Connected Resources, e.g., Community Solar, Microgrids



Deployment of FTM distribution-connected resources has surged in recent years



States, municipalities, and local governments are interested in the expansion of larger DERs (such as community solar that is either standalone or paired with storage).



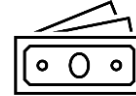
However, bulk power grid operators and distribution utilities have struggled to take full advantage of these unique resources.

# The Opportunity and Barriers: Front-of-the-Meter (FTM) Distribution-Connected Resources



## Potential Retail Services:

- Peak Load Shaving
- Net Metering
- Renewable Energy Credits (RECs)



## Potential Wholesale Services:

- Energy
- Capacity
- Ancillary Services

To open up wholesale markets to these DERs, grid operators should:

- Avoid maximum size requirements that exclude FTM eligibility in DERAs and ensure that FTM resources are eligible to provide the same products and services at the same rates as non-aggregated FTM DERs.
- Work with stakeholders to provide an opportunity for these resources to participate in the market with state-jurisdictional interconnection agreements (even when connected to a dual-use feeder). The translation of these rules into RTO-specific processes and models will be critical to their success.

# AEE Feedback on Stakeholder Recommendations at May DIRS

- Locational Requirements – AEE supports a multi-node approach and AEMA’s recommendation to further explore whether multi-node aggregations can be structured such that they do not span prevailing constraint locations.
- Registration Process - Order 2222 leaves the interconnection process solely within state jurisdiction. AEE agrees with PJM that “the impact of DER interconnected solely through state interconnection processes can be adequately represented in PJM power flow models for transmission planning purposes.”
- Cost Based Offers – AEE supports AEMA’s comments below and the recommendations introduced at the May 19 DIRS:
  - “DER costs can be expected to be highly variable from day to day and perhaps during days. This will be a barrier to entry and administrative nightmare for all parties.”
  - “DER with DR elements will have costs that can’t be reconciled to publicly available data”

# AEE Feedback on Stakeholder Recommendations at May DIRS

- Must Offer Requirements – No clear purpose for applying must-offer rules designed for large capacity resources to DER aggregations. Must-offer requirements may unnecessarily prevent dual participation, harming ability to maximize utilization.
- Sizing Requirements – Order 2222 requires that RTOs/ISOs ensure that size requirements do not become a barrier to entry. Maximum size requirements must be based on demonstrated modeling and metering verification needs per Order 2222; PJM should also provide flexibility for resources that may be larger than the maximum size required.
  - AEE supports PJM's proposal to establish no maximum size requirements for DER aggregations.
- Demand Response (DR) in DER Aggregations – AEE encourages PJM to give DR resources the flexibility to choose existing DR participation models or pursue the new DER participation model that accommodates injecting DR also (e.g., properly designed baselines).
  - Order No. 2222 explicitly includes DR within its definition of DER, and does not limit DR to a particular model.
- Double-Counting – Restrictions must be narrowly tailored to ensure that DERs are not compensated twice for the **same service** (e.g., net metered resources may be barred from providing energy but should not be barred from providing other services like capacity and ancillary services).



# Next Steps

- Review of PJM proposal with use cases as a lens to examine whether they allow DER aggregations to fully participate
- AEE report available at <https://info.aee.net/ferc-order-no.-2222-and-the-use-cases-it-can-unlock>

## **FERC ORDER NO. 2222: WHAT DER AGGREGATION USE CASES WILL IT UNLOCK?**

Order No. 2222 unleashes the power of distributed energy technologies — Here is how aggregators and developers plan to bring DERs to wholesale energy markets to create a more reliable and flexible grid

June 2021



San Francisco | Washington D.C. | Boston  
aee.net | powersubs.aee.net | @aee.net

# THANK YOU!

Jeff Dennis

[jdennis@aee.net](mailto:jdennis@aee.net)

Twitter: @EnergyLawJeff