FERC Order 2222: How it will level the playing field for distributed energy storage and other DERs

December 10, 2020
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The Energy Storage Technology Advancement Partnership (ESTAP) is a US DOE-OE funded federal/state partnership project conducted under contract with Sandia National Laboratories.

**ESTAP Key Activities:**

1. Facilitate public/private partnerships to support joint federal/state energy storage demonstration project deployment

2. Disseminate information to stakeholders
   - ESTAP listserv >5,000 members
   - Webinars, conferences, information updates, surveys.

3. Support state energy storage efforts with technical, policy and program assistance

**ESTAP Project Locations**
Thank You!

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Today’s Webinar Speakers

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FERC Order 2222: How it will level the playing field for distributed energy storage and other DERs

Clean Energy States Alliance

December 10, 2020
1. Background on FERC, ISOs/RTOs, DERs
2. Order 2222 Background and Overview
3. What 2222 Says, What it Doesn’t Say
4. Examples of DERs, Economics
5. Existing Barriers
6. What 2222 Means – New Opportunities
7. New Challenges, What to Watch Out for
8. Implementation Outlook
**Customized Energy Solutions**

Established in 1998, **Customized Energy Solutions (CES)** is a consulting and services company that assists clients in managing and staying ahead of the changes in the wholesale and retail electricity and natural gas markets. Serving hundreds of clients, Customized Energy Solutions offers best-in-class hosted energy market operations platforms and a wide spectrum of consulting services. CES is committed to promoting economic development through the advancement of transparent, efficient, and non-discriminatory wholesale and retail electricity and natural gas markets.

### Resources

- >11,000 MW assets under Active Management
- >300 MW Energy Storage assets under Management

### Awards and Recognitions

- 2016 Energy Storage Association Brad Roberts Award Winner

### Clients

500+ Clients Worldwide

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Our consulting services enables competitive suppliers, technology providers, marketers, utilities and customers to prosper through change, by turning knowledge into value.
CES has advised clean energy trade associations on wholesale market policy, and supported comments to FERC on what became Order 841 and Order 2222.
The Federal Energy Regulatory Commission (FERC) is an independent agency that regulates the interstate transmission and wholesale sales of electricity in the U.S.

Independent System Operators (ISOs) and Regional Transmission Organizations (RTOs) cover 2/3 of U.S. Grid Operation, Power System Planning, Market Administration

ISO/RTO Market Products:
- Capacity / Resource Adequacy (in some ISOs)
- Energy
- Ancillary Services (vary by ISO)
  - Frequency Response
  - Frequency Regulation
  - Ramping
- Operating Reserves
  - Spinning or Synchronized Reserves
  - Non-Spinning or Non-Synchronized Reserves
- Reactive Supply / Voltage Control
- Black Start
What are Distributed Energy Resources?

- Small-scale energy resources that can be aggregated to provide power
  - Connected to the distribution grid or behind customer meter
  - Generally <20 MWs
- Technologies include, but are not limited to:
  - Photovoltaics
  - Energy Storage
  - EVs & Charging Equipment
  - Fossil Fuel Generators
  - Energy Efficiency
  - Auxiliary Load Control

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Order 2222 Background and Overview

• History
  – Nov. 2015 panel on storage; 2016 ISO data requests and comments; NOPR
  – Feb. 2018 Order 841 on storage and new docket on DER; tech conf, comments; 2019 ISO data requests and comments

• Order issued September 2020. Directs ISOS to remove barriers to the participation of DER aggregations in ISO markets.
  – Defines DER, aggregator, ISO markets
  – Identifies existing barriers
  – Lists benefits
  – ISOs to establish “participation models” for DER aggregations that “accommodate physical and operational characteristics,” which is similar to Order 841, which was for electric storage resources

• Compliance filings due 270 days after pub in the Federal Register (due July 2021)
• Implementation – ISOs to propose a “reasonable” date
What the Order Says

Each ISO to propose revisions to its tariff that do the following:

1. allow DER aggregations to **participate directly** in ISO markets, and establish DER aggregators as a **type of market participant**
2. allow DER aggregators to register aggregations under one or more **participation models** that **accommodate the** physical and operational **characteristics** of the aggregations
3. establish a **minimum size** requirement for DER aggregations that does not exceed 100 kW
4. address **locational requirements** for DER aggregations
5. address **distribution factors** and **bidding parameters** for DER aggregations
6. address **information and data** requirements for DER aggregations
7. address **metering and telemetry** requirements for DER aggregations
8. address **coordination** between the ISO, the DER aggregator, the distribution utility, and the relevant electric retail regulatory authorities
9. address **modifications to the list** of resources in a DER aggregation
10. address **market participation agreements** for DER aggregators
Other Interesting Things the Order Says

Other items of note:

• FERC has the jurisdiction to do this
  - DC Circuit Court of Appeals recently upheld FERC jurisdiction on distributed storage per Order 841

• No state “opt-out”

• “Opt-in” for small (under 4 million MWh per year) utilities

• A demand response (DR) resource can be a DER

• Does not affect existing DR rules

• An aggregation can contain a single resource

• Allow heterogeneous aggregations
What the Order Doesn’t Say

• Not overly prescriptive for ISOs
• Interconnection
  - Declined to exercise jurisdiction over the interconnections of DERs to distribution facilities to participate in ISO markets as part of an aggregation
  - Does not require standard interconnection procedures and agreements
• FERC declined to take up any topics that were beyond the scope of the NOPR
  • E.g. Capacity market mitigation policies
• Doesn’t require that existing market product/service requirements must change to accommodate DER aggregations
  • Must be “technically capable of providing a service”
• Doesn’t require that ISO markets have to provide enough revenue to make project economics work
Notable DER Examples

- Sunrun aggregates 20MW into ISONE’s Forward Capacity Market*
- Green Mountain Power – Tesla team up for distributed storage
- ConEd’s Brooklyn Queens project
- SCE’s Preferred Resources program
- Proliferation of roof top and community solar systems
- Combined Heat and Power systems for large consumers

Common theme in most cases is singular focus on one particular revenue stream and non-market driven forces*
Other DER Projects

- Pennsylvania hospital system CHP co-gen sells excess capacity into PJM
  - *Required full PJM ISO interconnection process*
- A.F. Mensah aggregates BTM storage to participate in PJM frequency regulation market
  - *Project canceled when export limitations made it no longer economically feasible*
- Myriad NWA projects not advanced—most cited reason lack of cost effectiveness
DER Value

• Decarbonization of electricity supply
• Resiliency and Reliability
• T&D investment deferral
• Grid services
• DER can potentially provide value across a diverse spectrum from retail bill management to infrastructure reliability
• DER deployment to date largely driven by economics focused on one or a small number of potential value streams, most notably utility Net Energy Metering and/or retail demand charge management
• Broader adoption must be driven by ability to recognize multiple value streams (value stack) and (more) market-based forces

**FERC Order 2222** [is intended to] create this structure of value stackability
Value Stacking

- Are all potential value streams available
- If not, is it
  - By rule
  - Technically infeasible
- Order 2222 is intended to eliminate the ‘by rule’ unavailability
- Full(er) value stack ➔ greater DER deployment

Illustrative only
High minimum size to participate
Existing participation models (e.g. DR) not sufficient – limits operations and services
Lack of visibility of DERs by ISO / lack of coordination between DSO and ISO
Lack of clarity and specificity in rules
Onerous technical requirements
Some rules say, “you can’t do this.” e.g. can’t net inject from behind the meter
Inability to aggregate FOM resources
No or limited rules for hybrid / heterogeneous resources

Creative solutions to full(er) participation in multiple value streams have been achieved, demonstrating the indomitable spirit of innovators
New Opportunities

• Greater deployment as economic hurdles become less difficult to clear due to the ability to more effectively value stack
• Greater utilization of DER resulting from greater participation opportunity
• Value recognition across a broader range of the participation spectrum creates opportunities for new and creative business models—moving away from single revenue stream asset ownership/financing models to multiple revenue stream, energy as a service subscription models
• Ability to aggregate heterogenous resource types (technologies) across meter boundaries, i.e., FOM and BTM resources in same aggregation, should lead to realization of full promise of Virtual Power Plant concept
A network of decentralized generation, storage and flexible load operated as a single resource on the electric grid
New Challenges; What to Watch Out For

• Much flexibility left to individual ISOs
• Achieving coordination between ISOs, utilities, regulators – how will questions of jurisdiction be resolved? Particularly with regard to interconnection and deliverability
• Striking right balance between giving utilities a say and avoiding undue barriers?
• How will heterogeneous aggregations be handled?
  - Will this effort lay groundwork for hybrid resource enhancements?
• Will dual participation (wholesale + retail) really be fully enabled?
• Will maximum capacity requirements be too low?
• How broad will locational requirements for aggregations be?
• Will information / data requirements be too onerous?
Order 2222 Implementation Outlook

• Much flexibility left to individual ISOs
  • Just like Order 841, likely to be significant differences in market designs across ISOs
• First, ISOs will file compliance proposals with FERC, which will include proposed effective dates
  • Stakeholders can file comments
  • At some point, FERC will rule
• Either in parallel or once FERC rules, ISOs will work on non-tariff document changes and software changes
  • Software changes can take a long time
This webinar was presented by the DOE-OE Energy Storage Technology Advancement Partnership (ESTAP)

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Using Overbuilding + Curtailment to Achieve 100% Clean Electricity
*Tuesday, December 15, 3-4pm ET*

Closing the Energy and Transportation Affordability Gap for Connecticut’s Low- and Moderate-Income Households
*Thursday, December 17, 1-2pm ET*

Solar+Storage Fire Safety Training: Single and Multifamily Residential
*Tuesday, January 12, 1-2pm ET*

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