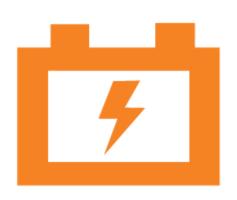


## FERC Order on Electric Storage



Laura Walter Lead Market Strategist, Emerging Markets Special MIC on ESR #1 May 10, 2018

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FERC order opens 'floodgates' for energy storage in wholesale markets

April 18, 2018

# 5 Key Takeaways from FERC's Recent Energy Storage Order



#### The Power Market Fix We've Been Waiting For

Federal regulators have a chance to create a universal data model for all grid recourses

A barrier to innovation nobody's talking about

#### A Rush of Cautious Optimism Reigns in Energy Storage Circles

United States: FERC Amends Regulations To Remedy
Barriers To Energy Storage Participation In Wholesale
Electricity Markets; Saves Distributed Energy Reform For A
Later Date





 The purpose of the special sessions of the MIC is to educate and receive stakeholder feedback for the FERC Order 841 Compliance Filing due in December.





- November 17, 2016: <u>FERC Notice of Proposed Rulemaking on Electric Storage and Distributed Electric Resources.</u>
- February 15, 2018 Final rule: <u>Electric Storage Participation in Markets</u>
   <u>Operated by RTOs and ISOs</u>
- March 16, 2018: <u>Motion for clarification of PJM Interconnection, L.L.C..</u>
- December 3, 2018: PJM Compliance Due
- December 3, 2019: Implementation





### Where PJM intends to receive feedback

Establish a participation model for Electric Storage Resources	Discussion Forum
1. Can sell* energy, <u>Capacity</u> , and A/S (incl. Black Start etc.) the resource is technically capable of providing	MIC on ESR
2. <u>Dispatched</u> and <u>sets price</u> as seller and buyer	MIC on ESR
3. Bid parameters that account for ESR characteristics	MIC on ESR
4. Min market threshold no larger than 100 kW	N/A
5. Stored MWh are billed at LMP as wholesale	Distributed Energy Resources Subcommittee (DERS)

<sup>\* &</sup>quot;Eligible to provide..."



### Stakeholder Discussions Scheduled so Far...

- April 4, 2018 Education Presentation at MIC
- April 16, 2018 Education Presentation at MC Webinar

#### **Special MIC Sessions:**

May 10, 2018 1-4 June 14, 2018 9-12 June 27, 2018 1-4

August 3, 2018 1-4

September 14, 2018 1-4

#### Report out:

OC: October 9, 2018

PC: October 11, 2018

MIC: October 14, 2018

MRC: October 25, 2018





## Electric Storage Resource Definition

- Electric Storage Resource (ESR)= "a resource capable of receiving electric energy from the grid and storing it for later injection of electric energy back to the grid."
- Connected at: transmission, distribution, or behind a customer meter.
  - PJM has ESR at both T and D today, none behind a meter that inject.
- Excludes demand response.
- Includes pumped hydro







## 15 FERC Directives to ISOs (Summarized)1/3

- 1. Establish an ESR Participation Model
- 2. Sale for Resale to ISO at LMP (discussion at DERS)
- 3. If ISO's want to do more: fine, do through 205
- 4. Define criteria for participation model
- 5. Propose changes to say
  - a. ESRs qualify under existing or new market rules and
  - b. which rules apply to ESRs in participation model





## 15 FERC Directives to ISOs (Summarized) cont. 2/3

- 6. Establish rules for ESRs participation in capacity, energy, and ancillary services that it is technically capable of providing (including non-market services)
- 7. Allow ESRs to de-rate their capacity to meet capacity market requirements
- 8. Consider the fast ESRs and whether they need an energy schedule (moot for PJM)
- 9. Allow ESRs to be dispatched and set price as supply and demand/ wholesale seller/buyer
- 10. No conflicting simultaneous supply offers and demand bids



## 15 FERC Directives to ISOs (Summarized) cont. 3/3

- 11. Manual dispatch eligible for make-whole payments
- 12. Account for physical and operational characteristics through bidding parameters or other
- 13. Account for specific Commission-defined ESR operational characteristics
- 14. Allow ESRs to self-manage state of charge
- 15. Min size no greater than 100 kw (moot for PJM)





Questions or concerns can be sent to <a>ESR@PJM.com</a>