

# FERC Order 2222 Implementation

Enel X North America Presentation to PJM DIRS

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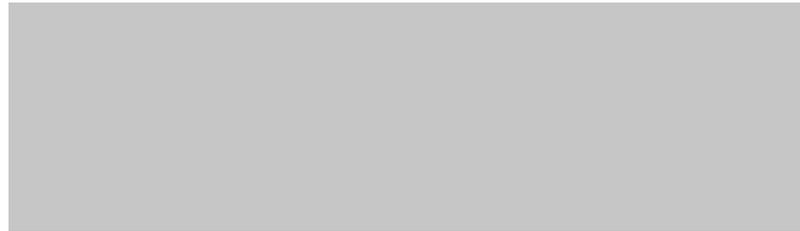


# Contents



- Disclaimer: These are Enel's preliminary considerations and recommendations, and are subject to change
- Barriers to DERs (e.g. storage and EVs) in wholesale markets; high-level recommendations
  - Currently, significant barriers exist across interconnection, baselines, etc.
- Discussion of areas for compliance and Enel recommendations
  - Applying existing exact DR rules to DERs will continue to maintain barriers
  - Customers should have the option to participate in existing DR model or future DER model

# Barriers to DERs in Wholesale Markets and Preliminary Solutions



# Barriers to DERs in Wholesale Markets

2010 style DR participation models often not compatible with newer, dynamic DERs



- Lack of continuous model to enable the same DER to provide and receive credit for on-site load reduction and injection; ISO-NE and NYISO models offer templates for a continuous model
- Baselines “erode” quickly for frequently dispatched resources like storage under X of Y with limited look back window; impact is these resources can’t provide any wholesale service
  - No ability to utilize sub-metering under current DR participation framework for non-regulation services
- Restrictions on economic offering if a “rational” customer would have already reduced their load regardless of LMPs; since many DERs serve primarily retail-level purposes, this jeopardizes wholesale participation
- Electric Vehicle Specific (Aggregated Registrations)
  - Baseline methodology requires each site to pass baseline test, or lengthy retesting period each time add/subtract site
  - Limitations by LSE on Aggregations, if utilized, makes it difficult to build and manage residential portfolios
  - Treatment of V2G

# Barriers to DERs in Wholesale Markets Cont'd

2010 style DR participation models often not compatible with newer, dynamic DERs



- Interconnection
  - Lack of clarity on retail/wholesale jurisdiction creates confusion and delays; trying to participate in the wholesale market can lengthen distribution process
  - Distribution and wholesale processes are often incredibly lengthy (distribution slightly better), jeopardizing project economics; can be 2-4 years
- Certain BTM resources (e.g. solar, wind) excluded from wholesale participation
- Telemetry requirements; six-second telemetry requirements for non-regulation products creates high fixed cost for smaller DERs; NYISO DER model has this flaw, while ISO-NE model correctly requires one-minute telemetry
- Importance of energy market “must offer” requirements recognizing retail-level opportunity costs and use cases, and not being overly burdensome from data collection standpoint

# Overcoming Existing Barriers Cont'd



Barrier	Preliminary Solutions to Consider
Lack of continuous model that values injection	1) Model should as seamlessly as possible allow same DER to provide on-site load relief and injection: ISO-NE + NYISO models
Baselines erode quickly for frequently dispatched resources	1) Allow for direct metering of BTM technologies (i.e. treat as FTM), while working with EDCs to net out wholesale charging costs 2) Add back event performance to baselines (NYISO DER model)
Restrictions on economic offering if “rational” customer already reducing load regardless of LMPs	1) Reconsider approach on preventing economic offering (NYISO model) 2) At a minimum, allow economic offering and credit for wholesale capacity purposes while limiting LMP payments
EV baseline + aggregation barriers	1) Ensure baseline tests are applied to the aggregate, and not the individual asset; 2) Don't require baseline retesting each time a site is added/subtracted from an aggregation; 3) Facilitate multi-LSE aggregation; alternatively or additionally, develop reasonable asset-level baselines (e.g., to utilize existing Dispatch Group model)

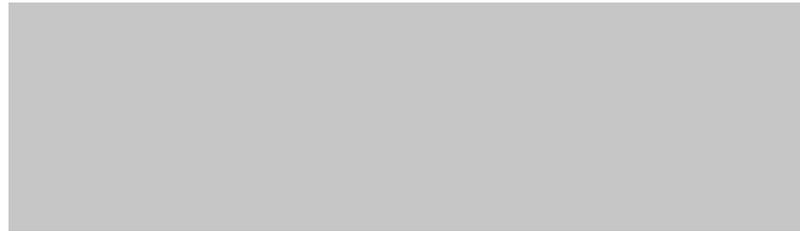
# Overcoming Existing Barriers Cont'd

Remaining barriers addressed in later slides



Barrier	Preliminary Solutions to Consider
Implementation of “must offer” requirements	Must offer mitigation practices must recognize retail-level opportunity costs and use cases, and not have such overly burdensome data requirements and risk that leads to DERs not participating
Certain BTM resources (e.g. solar, wind) excluded from wholesale participation	All FERC-defined DERs should have market access; could treat aggregate resource like generator, while limiting “must offer” and energy/ancillary participation to dispatchable resources; or have separate “passive DR” models for BTM non-dispatchable like ISO-NE

# Preliminary Recommendations on Areas for Compliance



# Key Provisions: Locational Requirements



What does Order say?	Preliminary Recommendation
<p>“Establish locational requirements for DER to participate in a DER Aggregation that are as geographically broad as technically feasible.” (204)</p> <p>“Provide detailed technical explanation for the geographical scope of proposed locational requirements.” (204)</p> <p>“This explanation could include, for example, a discussion of the RTO/ISO’s system topology and regional congestion patterns, or any other factors that necessitate proposed locational requirements.” (204)</p>	<p>Allow for broad aggregations across multiple nodes, but PJM can dispatch more granularly if/when concerns about exacerbating cross-nodal constraints</p> <p>Eliminate restrictions on limiting aggregated registrations to a customer’s LSE</p>

# Key Provisions: Dual participation and double counting



What does Order say?	Impact	Preliminary Recommendation
<p>Requires ISOs to allow same DER to participate in retail/wholesale (160)</p> <p>“it is appropriate for RTOs/ISOs to place restrictions on the ability of a distributed energy resource to participate in a wholesale aggregation where that distributed energy resource is ...included in retail program to reduce a utility’s or other load serving entity’s obligations to purchase services from the RTO/ISO market” (161)</p>	<p>If implemented in a broad fashion, could significantly restrict dual participation since any retail program (e.g. Non-Wires Solution) could have a wholesale impact, even if inadvertent. Puts ISOs in an untenable position and creates adversarial relationship with states</p>	<p>Existing PJM approach on the capacity side should be compliant. On net metering, states typically have protections against customers receiving wholesale energy revenues</p> <p>Several orgs seeking further clarification: FERC “should clarify that RTOs/ISOs do not need to place restrictions on wholesale participation from a DER participating in a retail program if the RTO/ISO has mechanisms in place or creates mechanisms to prohibit the same distributed energy resource from both reducing the amount of a service an RTO/ISO procures on a forward basis and the same distributed energy resource acting as a provider of that service in the same delivery period”</p>

# Key Provisions: Interconnection



## What does Order say?

“Decline to exercise our jurisdiction over interconnections of DER to distribution facilities for the purpose of participating in RTO/ISO markets exclusively as part of a DER aggregation.” (90)

...only a DER “requesting interconnection to the distribution facility for the purpose of directly engaging in wholesale transactions (i.e., not through a distributed energy resource aggregation) would create a ‘first use’ and any subsequent distributed energy resource interconnecting for the purpose of directly engaging in wholesale transactions would be considered a Commission-jurisdictional interconnection.”(51)

## Preliminary Recommendations/Questions

Seeking clarification at FERC on “directly engaging in wholesale transactions” since a single DER can be an aggregation. Also seeking clarification on what happens after “first use” if the next DER is not “directly engaging in wholesale transaction”

What does PJM envision its role? How will PJM address CIRs – will there be a minimum MW threshold for PJM requiring deliverability analysis? At the asset-level or aggregation level? Will it require knowing exact location of the DER?

NYISO requires capacity deliverability study process for DERs with > 2 MW of injection at the facility level – recommend at least this

# Key Provisions: Metering & telemetry



What does Order say?	Impact	Preliminary Recommendations
<p>“Explain... why proposed metering requirements are necessary (e.g., for the DER aggregator to provide the settlement and performance data to the RTO/ISO... or to prevent double counting of services...” and why its proposed telemetry requirements are necessary (e.g., for the RTO/ISO to have sufficient situational awareness to dispatch the aggregation and the rest of the system efficiently).” (264)</p> <p>“Should also include a discussion about whether, for example, the proposed requirements are similar to requirements already in existence for other resources and steps contemplated to avoid imposing unnecessarily burdensome costs on the DER aggregators and individual resources in DER aggregations that may create an undue barrier to their participation in RTO/ISO markets.” (264)</p>	<p>Requiring metering at the retail delivery point could be cost-prohibitive for residential + small commercial customers, especially where no AMI</p> <p>To date, telemetry has been a significant expense; in NY, the biggest concern was if we had to stream in real-time to each utility NOC as well, as the costs scale in a linear fashion to each point</p> <p>In terms of data granularity, anything more granular than one-minute (e.g. six second) would require DER Providers to use different metering than they have installed today</p>	<p>For EVSE, consider allowing sub-metering at the EVSE level</p> <p>For BTM storage, consider direct metering and treating as if it were FTM, while working with utilities to net out wholesale charging costs</p> <p>For telemetry, instead of having telemetry to each EDC, consider a central hub for telemetry, such that EDCs can pull from the central hub, and we don't need to stream to each utility</p> <p>No requirements for data granularity of &lt; 1 minute unless regulation</p>

# Key Provisions: Role of Distribution Utilities



What does Order say?	Preliminary Recommendations
<p>“On compliance with this final rule, we require that each RTO/ISO revise its tariff to include, -as part of its proposed distribution utility review processes, the distribution utility review criteria by which distribution utilities can determine that a distributed energy resource (1) is capable of participating in an aggregation, e.g., the distributed energy resource is not already participating in a retail distributed energy resource program in which the relevant electric retail regulatory authority conditioned the resource’s participation on not participating in RTO/ISO markets; and (2) does not pose significant risks to the reliable and safe operation of the distribution system (296).... Therefore, we require each RTO/ISO to revise its tariff to incorporate dispute resolution provisions as part of its proposed distribution utility review process.” (99) Dispute resolution within 60 day limit (295)</p>	<p>Since the INTx process should really determine whether these DERs can safely provide energy to the system, ISOs should create high burden of proof to actually ban DERs from participating (consistent with FERC directive)</p> <p>The distribution grid is indifferent to whether the energy from the DER is being sold for wholesale purposes</p> <p>Ensure fair resolution process within 60 day limit</p>

# Key Provisions: Operational Coordination



What does Order say?	Impact	Preliminary Recommendations
<p>We require each RTO/ISO to revise its tariff to “(1) establish a process for ongoing coordination, including operational coordination, that addresses data flows and communication among itself, the distributed energy resource aggregator, and the distribution utility; and (2) require the distributed energy resource aggregator to report to the RTO/ISO any changes to its offered quantity and related distribution factors that result from distribution line faults or outages. Further, we require each RTO/ISO to revise its tariff to include coordination protocols and processes for the operating day that allow distribution utilities to override RTO/ISO dispatch of a distributed energy resource aggregation in circumstances where such override is needed to maintain the reliable and safe operation of the distribution system.... that allow distribution utilities to override RTO/ISO dispatch must be contained in the tariff and must be non-discriminatory and transparent but still address distribution utility.....We also require each RTO/ISO to revise its tariff to apply any existing resource non-performance penalties to a distributed energy resource aggregation when the aggregation does not perform because a distribution utility overrides the RTO’s/ISO’s dispatch. (310)</p>	<p>Without clear rules of the road, creates undefined risk and a barrier to entry</p>	<p>Need to ensure there is clear communication from the distribution utility to the DER aggregator when there are faults or outages that impact ability to offer</p> <p>Need to have some process for scrutinizing override if on continual basis</p> <p>Need to reform PJM penalties to provide exceptions for when EDC overrides</p>