DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

18 CFR Part 35

[Docket No. RM18–9–000; Order No. 2222]

Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators

AGENCY: Federal Energy Regulatory Commission.

ACTION: Final rule.

SUMMARY: The Federal Energy Regulatory Commission (Commission) is amending its regulations to remove barriers to the participation of distributed energy resource aggregations in the capacity, energy, and ancillary service markets operated by Regional Transmission Organizations and Independent System Operators (RTO/ISO).

DATES: This rule is effective December 21, 2020. Each RTO/ISO must file the tariff changes needed to implement the requirements of this final rule by September 17, 2021.

FOR FURTHER INFORMATION CONTACT:

David Kathan (Technical Information), Office of Energy Policy and Innovation, Federal Energy Regulatory Commission, 888 First Street NE, Washington, DC 20426, (202) 502–6404

Karin Herzfeld (Legal Information), Office of General Counsel—Energy Markets, Federal Energy Regulatory Commission, 888 First Street NE, Washington, DC 20426, (202) 502–8459

SUPPLEMENTARY INFORMATION:

Table of Contents

I. Introduction

1. In this final rule, the Federal Energy Regulatory Commission (Commission) is adopting reforms to remove barriers to the participation of distributed energy resource [1] aggregations in the Regional Transmission Organization (RTO) and Independent System Operator (ISO) markets (RTO/ISO markets).[2] For the reasons discussed below, we find that existing RTO/ISO market rules are unjust and unreasonable in light of barriers that they present to the participation of distributed energy resource aggregations in the RTO/ISO markets, which reduce competition and fail to ensure just and reasonable rates. Therefore, pursuant to the Commission's authority under Federal Power Act (FPA) section 206,[3] the Commission modifies § 35.28 [4] of its regulations to require each RTO/ISO to revise its tariff to ensure that its market rules facilitate the participation of distributed energy resource aggregations, as discussed further below.

2. As the Commission explained in the NOPR, barriers to the participation of new technologies, such as many types of distributed energy resources, in the RTO/ISO markets can emerge when the rules governing participation in those

[1] We define a distributed energy resource as any resource located on the distribution system, any subsystem thereof or behind a customer meter. These resources may include, but are not limited to, electric storage resources, distributed generation, demand response, energy efficiency, thermal storage, and electric vehicles and their supply equipment. *See infra* P 114.

[2] For purposes of this final rule, we define RTO/ISO markets as the capacity, energy, and ancillary services markets operated by the RTOs and ISOs. We note that, in the Notice of Proposed Rulemaking (NOPR) in this proceeding, the Commission used ''organized wholesale electric markets'' and included that term in the proposed regulatory text. *See Electric Storage Participation in Markets Operated by Regional Transmission Organizations & Independent System Operators,* Notice of Proposed Rulemaking, 81 FR 86522, 157 FERC ¶ 61,121 (2016) (NOPR). We find that using ''RTO/ISO markets'' is sufficient to describe the markets at issue in this final rule and therefore will no longer use ''organized wholesale electric markets'' here or include that term in the regulatory text.

[3] 16 U.S.C. 824e.

[4] 18 CFR 35.28 (2020).

markets are designed for traditional resources and in effect limit the services that emerging technologies can provide.[5] For example, the Commission noted in the NOPR that, as a general matter, distributed energy resources tend to be too small to meet the minimum size requirements to participate in the RTO/ISO markets on a stand-alone basis, and may be unable to meet certain qualification and performance requirements because of the operational constraints they may have as small resources.[6] The Commission further stated that existing participation models [7] for aggregated resources, including distributed energy resources, often require those resources to participate in the RTO/ISO markets as demand response, which limits their operations and the services that they are eligible to provide.[8]

3. Where such barriers exist, resources that are technically capable of providing some services on their own or through aggregation are precluded from competing with resources that are already participating in the RTO/ISO markets.[9] These restrictions on competition can reduce the efficiency of the RTO/ISO markets, potentially leading an RTO/ISO to dispatch more expensive resources to meet its system needs. By removing barriers to the participation of distributed energy resource aggregations in the RTO/ISO markets, this final rule will enhance competition and, in turn, help to ensure that the RTO/ISO markets produce just and reasonable rates.

4. Facilitating distributed energy resource participation in RTO/ISO markets will provide a variety of benefits to those markets. Integrating these resources' capabilities into RTO/ISO planning and operations will help the RTOs/ISOs account for the impacts of these resources on installed capacity requirements and day-ahead energy demand, thereby reducing uncertainty in load forecasts and reducing the risk of over procurement of resources and the associated costs.[10] These resources are able to locate where price signals indicate that new capacity is most needed, potentially helping to alleviate congestion and congestion costs during peak load conditions and to reduce costs related to transmitting energy into persistently high-priced load pockets.[11] Indeed, in the NOPR, the Commission noted certain valuable characteristics that distributed energy resources can offer, including their ability to co-locate with load and provide associated benefits. Additionally, their relatively short development lead time allows distributed energy resources to respond rapidly to near-term generation or transmission reliability-related requirements, further improving their ability to enhance reliability and reduce system costs.

5. The rules that we adopt in this final rule will help enable the participation of distributed energy resources in the RTO/ISO markets by providing a means for these resources to, in the aggregate, satisfy minimum size and performance requirements that they may not meet on a stand-alone basis.[12] The Commission in the NOPR noted that distributed energy resource aggregations can help to address the commercial and transactional barriers to distributed energy resource participation in the RTO/ISO markets, such as sharing the significant costs of participating in those markets, including the costs of the necessary metering, telemetry, and communication equipment.[13]

6. To address barriers to the participation of distributed energy resource aggregations in the RTO/ISO markets, we require each RTO/ISO to revise its tariff to establish distributed energy resource aggregators as a type of market participant that can register distributed energy resource aggregations under one or more participation models in the RTO/ISO tariff that accommodate the physical and operational characteristics of each distributed energy resource aggregation.

7. Generally, we are adopting the specific reforms proposed in the NOPR, but with certain revisions based on the record in this proceeding, including input from the Commission technical conference convened April 10–11, 2018, responses to a post-technical conference notice, and responses to the Commission's September 5, 2019 Data Requests to RTOs/ISOs on policies and procedures that affect the interconnection of distributed energy resources. In particular, certain proposals in the NOPR have been altered in this final rule to better address the needs of different stakeholders, facilitate solutions to potential technical challenges, and to reflect the substantial efforts that have already been undertaken by some RTOs/ISOs to incorporate distributed energy resources into their markets, by providing for greater regional flexibility with respect to a number of proposed requirements.

8. For each RTO/ISO, the tariff provisions addressing distributed energy resource aggregations must (1) allow distributed energy resource aggregations to participate directly in RTO/ISO markets and establish distributed energy resource aggregators as a type of market participant; (2) allow distributed energy resource aggregators to register distributed energy resource aggregations under one or more participation models that accommodate the physical and operational characteristics of the distributed energy resource aggregations; (3) establish a minimum size requirement for distributed energy resource aggregations that does not exceed 100 kW; (4) address locational requirements for distributed energy resource aggregations; (5) address distribution factors and bidding parameters for distributed energy resource aggregations; (6) address information and data requirements for distributed energy resource aggregations; (7) address metering and telemetry requirements for distributed energy resource aggregations; (8) address coordination between the RTO/ISO, the distributed energy resource aggregator, the distribution utility, and the relevant electric retail regulatory authorities; (9) address modifications to the list of resources in a distributed energy resource aggregation; and (10) address market participation agreements for distributed energy resource aggregators. Additionally, each RTO/ISO must accept bids from a distributed energy resource aggregator if its aggregation includes distributed energy resources that are customers of utilities that distributed more than 4 million megawatt-hours in the previous fiscal

[5] *See* NOPR, 157 FERC ¶ 61,121 at P 2.

[6] *See id.* PP 13, 105.

[7] In addition to tariff provisions that apply to all market participants, the RTOs/ISOs create tariff provisions for specific types of resources when those resources have unique physical and operational characteristics or other attributes that warrant distinctive treatment from other market participants. The tariff provisions that are created for a particular type of resource are what we refer to in this final rule as a participation model.

[8] NOPR, 157 FERC ¶ 61,121 at P 106. Demand response means a reduction in the consumption of electric energy by customers from their expected consumption in response to an increase in the price of electric energy or to incentive payments designed to induce lower consumption of electric energy. 18 CFR 35.28(b)(4).

[9] In Order No. 841, the Commission clarified that ''technically capable'' of providing a service means meeting all of the technical, operational, and/or performance requirements that are necessary to reliably provide that service. *Electric Storage Participation in Markets Operated by Regional Transmission Organizations & Independent System Operators,* Order No. 841, 83 FR 9580, 162 FERC ¶ 61,127, at P 78 (2018), *order on reh'g,* Order No. 841–A, 84 FR 23902, 167 FERC ¶ 61,154 (2019), *aff'd sub nom. Nat'l Ass'n of Regulatory Util. Comm'rs* v. *FERC,* 964 F.3d 1177 (D.C. Cir. 2020).

[10] NOPR, 157 FERC ¶ 61,121 at P 129.

[11] *Id.* P 130.

[12] *See id.* PP 105, 125.

[13] *Id.* P 126.

year. An RTO/ISO must not accept bids from a distributed energy resource aggregator if its aggregation includes distributed energy resources that are customers of utilities that distributed 4 million megawatt-hours or less in the previous fiscal year, unless the relevant electric retail regulatory authority permits such customers to be bid into RTO/ISO markets by a distributed energy resource aggregator.

9. As discussed further below in Section IV.K (Compliance), each RTO/ISO must file the tariff changes needed to implement the requirements of this final rule within 270 days of the publication date of this final rule in the **Federal Register**.

II. Procedural History

10. This final rule arises out of the same Commission inquiry that led to Order No. 841,[14] in which the Commission amended its regulations under the FPA to remove barriers to the participation of electric storage resources in RTO/ISO markets. The Commission commenced that inquiry by hosting a panel to discuss electric storage resources at its November 19, 2015, open meeting. Subsequently, on April 11, 2016, Commission staff issued data requests to each of the six RTOs/ISOs seeking information about the rules in the RTO/ISO markets that affect the participation of electric storage resources. Concurrently, Commission staff issued a request for comments, seeking information from interested persons on whether barriers exist to the participation of electric storage resources in the RTO/ISO markets that may potentially lead to unjust and unreasonable wholesale rates. In addition to the responses from the RTOs/ISOs, Commission staff received 44 comments. Many of the responses and comments discussed types of distributed energy resources and general market participation issues beyond concerns specific to electric storage resources.[15]

11. On November 17, 2016, the Commission issued the NOPR in that proceeding. In addition to its proposed reforms to facilitate the participation of electric storage resources in RTO/ISO markets, the Commission proposed to amend its regulations under the FPA to remove barriers in current RTO/ISO market rules that may prevent new, smaller distributed energy resources that are technically capable of participating in the RTO/ISO markets from doing so.[16]

12. The Commission received 109 comments on the NOPR from a diverse set of stakeholders.[17] On February 15, 2018, the Commission issued Order No. 841. In that final rule, the Commission noted that more information was necessary to inform its consideration of its NOPR proposals regarding facilitating the participation of distributed energy resource aggregations in RTO/ISO markets and stated that it would continue to explore the proposed distributed energy resource aggregation reforms under Docket No. RM18–9–000.[18]

13. The Commission also announced that it would hold a technical conference to gather additional information regarding some distributed energy resource aggregation issues. The technical conference, which was held on April 10–11, 2018, addressed five issues related to this proceeding: Locational requirements, state and local regulator concerns, compensation for multiple services, coordination of distributed energy resource aggregations, and ongoing operational coordination.[19] During the technical conference, more than 50 individuals and entities offered a broad range of perspectives. The Commission issued a notice inviting post-technical conference comments and requesting comments on a number of follow-up questions related to each panel.[20] The Commission received 52 post-technical conference comments from a diverse set of stakeholders.

14. On September 5, 2019, Commission staff issued data requests to each of the six RTOs/ISOs seeking information regarding their policies and procedures that affect the interconnection of distributed energy resources. In addition to the responses from the RTOs/ISOs, Commission staff received 11 reply comments.

15. Some RTOs/ISOs in recent years have taken steps to facilitate the participation of distributed energy resource aggregations in their markets, and the Commission has approved these proposals. In June 2016 and January 2020, the Commission accepted proposals to allow distributed energy resource aggregations to participate in certain RTO/ISO markets.[21] In addition, RTOs/ISOs have implemented some participation models for distributed energy resource aggregations to participate in their markets, often as demand response resources, with a few exceptions.[22]

III. Need for Reform

16. In the NOPR, the Commission stated that its proposal is a continuation of efforts pursuant to its authority under the FPA to ensure that the RTO/ISO tariffs and market rules produce just and reasonable rates, terms, and conditions of service.[23] Specifically, the Commission noted that it had observed that market rules designed for traditional resources can create barriers to entry for emerging technologies. The Commission expressed its concern that existing RTO/ISO tariffs impede the participation of distributed energy resources in the RTO/ISO markets by providing limited opportunities for distributed energy resource aggregations.[24]

17. The Commission acknowledged in the NOPR that distributed energy resources can at times effectively provide the capacity, energy, and ancillary services that are purchased and sold in the RTO/ISO markets.[25] However, the Commission explained that sometimes these resources can be too small to participate in these markets individually. The Commission also noted that current RTO/ISO market

[14] Order No. 841, 162 FERC ¶ 61,127.

[15] *See, e.g.,* CAISO Response (AD16–20) at 2–3; ISO–NE Response (AD16–20) at 6–7, 26–27; PJM Response (AD16–20) at 20–21; Advanced Energy Economy Comments (AD16–20) on RTO/ISO Responses (AD16–20) at 16–18; RES Americas Comments (AD16–20) on RTO/ISO Responses (AD16–20) at 4–5.

[16] NOPR, 157 FERC ¶ 61,121 at PP 103, 124.

[17] *See* Appendix A for a list of entities that submitted comments and the shortened names used throughout this final rule to describe those entities.

[18] Order No. 841, 162 FERC ¶ 61,127 at P 5. The Commission incorporated by reference all comments filed in response to the NOPR in Docket No. RM16–23–000 into Docket No. RM18–9–000 and directed any further comments regarding the proposed distributed energy resource aggregation reforms should be filed henceforth in Docket No. RM18–9–000.

[19] *See* Supplemental Notice of Technical Conference, Docket Nos. RM18–9–000 and AD18–10–000 (Mar. 29, 2018), *https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14856384.*

[20] *See* Notice Inviting Post-Technical Conference Comments, Docket No. RM18–9–000 (Apr. 27, 2018), *https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=14* 882250.

[21] *See Cal. Indep. Sys. Operator Corp.,* 155 FERC ¶ 61,229 (2016); *N.Y. Indep. Sys. Operator, Inc.,* 170 FERC ¶ 61,033 (2020) (NYISO Aggregation Order).

[22] *E.g.,* CAISO Data Request Response (2019 RM18–9) at 6 (citing CAISO Tariff, Section 4.17); ISO–NE Data Request Response (2019 RM18–9) at 17–18 (stating that distributed energy resources may participate in wholesale markets as demand resources or Settlement Only Resources).

[23] NOPR, 157 FERC ¶ 61,121 at P 9 (citing *Integration of Variable Energy Resources,* Order No. 764, 139 FERC ¶ 61,246, *order on reh'g and clarification,* Order No. 764–A, 141 FERC ¶ 61,232 (2012), *order on clarification and reh'g,* Order No. 764–B, 144 FERC ¶ 61,222 (2013); *Wholesale Competition in Regions with Organized Electric Markets,* Order No. 719, 73 FR 64100 (Oct. 28, 2008), 125 FERC ¶ 61,071 (2008), *order on reh'g,* Order No. 719–A, 74 FR 37776 (Jul. 29, 2009), 128 FERC ¶ 61,059 (2009), *order on reh'g,* Order No. 719–B, 129 FERC ¶ 61,252 (2009)).

[24] *Id.* P 13.

[25] *See id.*

rules often limit the services that distributed energy resources are eligible to provide, in many cases only allowing these resources to be used as demand response or load-side resources when they are located behind a customer meter or by imposing prohibitively expensive or otherwise burdensome requirements.

18. The Commission preliminarily found that the barriers to the participation of distributed energy resources through distributed energy resource aggregations in the RTO/ISO markets may, in some cases, unnecessarily restrict competition, which could lead to unjust and unreasonable rates.[26] The Commission stated that effective wholesale competition encourages entry and exit and promotes innovation, incents the efficient operation of resources, and allocates risk appropriately between consumers and producers. Thus, the Commission stated that removing the barriers to participation by distributed energy resource aggregations will enhance the competitiveness, and in turn the efficiency, of RTO/ISO markets and thereby help to ensure just and reasonable and not unduly discriminatory or preferential rates for wholesale electric services.

A. Comments

19. Most commenters, including state entities and RTOs/ISOs, support requiring RTOs/ISOs to remove barriers to the participation of distributed energy resource aggregations in their markets, subject to the Commission's adopting certain modifications to the NOPR proposals and/or allowing for regional flexibility in implementing reforms in any eventual final rule.[27] Among other things, these commenters identify improved competition and reliability as benefits of the proposed reforms and note that they provide a better way to provide price signals to distributed energy resources than current retail programs,[28] which may reduce the cost of meeting power system needs.[29] AWEA notes that participation in wholesale markets allows distributed energy resources to receive real-time information about system needs.[30] Commenters also state that the removal of barriers to, and integration of, distributed energy resource aggregations could spur innovation, and allow these aggregations to serve important roles on the grid.[31] Several commenters emphasize that a distributed energy resource aggregation framework must ensure that aggregated distributed energy resources can provide all the services that they are capable of providing,[32] while competing on a level and technology-neutral playing field with other resources.[33] Some commenters note that distributed energy resources do not currently fit within existing paradigms, which were designed for, and favor, other resources.[34] Others state that for distributed energy resources and distributed energy resource aggregations to fairly participate, they must meet the same technical and commercial requirements as other resources, and pay equally for ancillary services and use of the transmission system.[35]

20. Several commenters assert that existing participation models discriminate against distributed energy resources. For instance, Public Interest Organizations argue that distributed energy resources in PJM are often forced into participating as demand response, or interconnecting as generation, which are cost prohibitive.[36] Stem asserts that CAISO's Non-Generator Resource and Distributed Energy Resource Provider models effectively prevent participation of behind-the-meter resources in CAISO.[37] Advanced Energy Economy contends that, despite the benefits that aggregated distributed energy resources provide,[38] performance penalties for deviation from the characteristics of traditional generation effectively preclude participation in the capacity market.[39]

21. Some commenters state that distributed energy resource aggregation integration can be accomplished in a reliable and cost-effective manner.[40] Other commenters argue that allowing distributed energy resource aggregations to participate in wholesale markets will create new opportunities and enhance the reliability and resilience of the grid, leading to benefits such as savings and efficiency.[41] Advanced Energy Buyers suggest that allowing distributed energy resources to participate in RTO/ISO markets will also provide such resources with additional revenue streams, making them more economic and candidates for greater investment, and provide additional benefit to the grid as a result of increased market activity.[42] Commenters also note that the pairing of dispatchable resources with non-dispatchable resources in an aggregation could create a portfolio that overall could be dispatchable to the bulk power system.[43] Other commenters assert that, if distributed energy resources are not able to participate in wholesale markets, it could result in system overbuild, inaccurate wholesale price formation, and lack of visibility into system conditions.[44]

22. Certain United States senators express support for the proposed rule which, they state, would help develop frameworks for how renewables can aggregate together to more effectively participate in energy markets, and provide useful guidance on how to better integrate these resources with existing energy providers. In addition,

[26] *See id.* P 14.

[27] *See, e.g.,* Advanced Energy Economy Comments (RM16–23) at 31–32; Connecticut Department of Energy Comments (RM16–23) at 4; IPKeys/Motorola Comments (RM16–23) at 4; Leadership Group Comments (RM16–23) at 2; MISO Comments (RM16–23) at 2; Ohio Commission Comments (RM16–23) at 2–3.

[28] AWEA Comments (RM16–23) at 1–2; City of New York Comments (RM16–23) at 3, 5, 7; Maryland and New Jersey Commissions Comments (RM16–23) at 2; Ohio Commission Comments (RM16–23) at 2; Public Interest Organizations Comments (RM16–23) at 5–6.

[29] AWEA Comments (RM16–23) at 2.

[30] *Id.*

[31] California Energy Storage Alliance Comments (RM16–23) at 4; Microgrid Resources Coalition Comments (RM16–23) at 10; Union of Concerned Scientists Comments (RM16–23) at 9, 15, 17 (noting the lack of participation models for potential market service providers like domestic electric water heaters and distributed solar resources).

[32] *See, e.g.,* Advanced Energy Management Comments (2018 RM18–9) at 3; Direct Energy Comments (2018 RM18–9) at 5, 11–13; Energy Storage Association Comments (2018 RM18–9) at 2; Microsoft Comments (2018 RM18–9) at 16–17; NRG Comments (2018 RM18–9) at 5–6.

[33] Advanced Energy Economy Comments (2018 RM18–9) at 5; Advanced Energy Management Comments (2018 RM18–9) at 3; Microsoft Comments (2018 RM18–9) at 15–16; NRG Comments (2018 RM18–9) at 3.

[34] Fresh Energy/Sierra Club/Union of Concerned Scientists Comments (RM16–23) at 1; Public Interest Organizations Comments (RM16–23) at 5–6.

[35] PJM Market Monitor Comments (RM16–23) at 10–11; New York Utility Intervention Unit Comments (RM16–23) at 3.

[36] Public Interest Organizations Comments (RM16–23) at 19.

[37] Stem Comments (RM16–23) at 12, 16.

[38] Advanced Energy Economy states that the benefits include the ability to provide a quick response to system emergencies, which gives other resources time to ramp up or procure fuel, the ability of demand response to prevent blackouts during times of peak demand, and the ability to be dispatched granularly to provide support to specific parts of the grid. Advanced Energy Economy Comments (RM16–23) at 42–43.

[39] *Id.* (arguing that PJM's capacity performance construct and ISO–NE's pay-for-performance construct both effectively require indefinite run times to avoid performance penalties that can amount to more than a year's worth of capacity revenue).

[40] Advanced Energy Economy Comments (2018 RM18–9) at 5.

[41] *See, e.g.,* Advanced Energy Buyers Comments (2018 RM18–9) at 3; CAISO Comments (2018 RM18–9) at 1; Direct Energy Comments (2018 RM18–9) at 11–13; NRG Comments (2018 RM18–9) at 5–6; Tesla Comments (2018 RM18–9) at 3.

[42] Advanced Energy Buyers Comments (2018 RM18–9) at 5.

[43] NYISO Indicated Transmission Owners Comments (2018 RM18–9) at 4.

[44] *Id.;* Microsoft Comments (2018 RM18–9) at 13.

these United States senators maintain that the rulemaking comes at a critical time for renewable energy because renewables led the way in 2016 for new additions onto the energy grid.[45] These United States senators, as well as members of the United States House of Representatives, urge the Commission to adopt a final rule that provides all distributed energy resources with the opportunity to participate in RTO/ISO markets, noting that the changes proposed in the NOPR will help improve the reliability and resilience of the bulk power system by providing operators with new local tools to manage unanticipated events and potentially lower costs for customers. They state that renewable energy provided 10% of electricity generation in 2018 due to state and federal policies as well as consumer interest in choosing cost-competitive technologies.[46]

23. Mensah asserts that one of the biggest limitations that needs to be addressed is the ability of behind-the-meter distributed energy resources to inject onto the grid.[47] Tesla requests the Commission extend to distributed energy resource aggregations the finding in Order No. 841 that existing tariffs do not recognize the operational characteristics of electric storage resources and limit their participation in the markets.[48] Tesla urges the Commission to require that RTO/ISO tariffs allow distributed energy resources, including those resources physically located behind an end-use customer meter, to employ their full operational range by injecting energy onto the grid in order to provide any wholesale service through participation in distributed energy resource aggregations.[49]

24. Some commenters argue that the Commission needs to provide general guidance on distributed energy resource aggregation, with straightforward rules, clearly defined responsibilities, and data-driven market signals.[50] They explain that distributed energy resource aggregations must have transparent and predictable parameters for participation that are not overly restrictive and do not contain undue administrative delay.[51] Microsoft suggests that the Commission provide ''directional guidance'' to RTOs/ISOs to remove barriers.[52]

25. In contrast, EEI states that the Commission should defer to regional stakeholder processes and coordination with state-jurisdictional entities to formulate the detailed provisions required to implement distributed energy resource aggregation participation in the wholesale market.[53] APPA states that the evidence is thin to show that there is a great demand for distributed energy resource aggregation programs or that such programs will bring meaningful benefits to consumers in the RTO/ISO regions.[54]

B. Commission Determination

26. For the reasons discussed below, in this final rule, we affirm the preliminary finding in the NOPR that existing RTO/ISO market rules are unjust and unreasonable because they present barriers to the participation of distributed energy resource aggregations in the RTO/ISO markets, and such barriers reduce competition and fail to ensure just and reasonable rates. Specifically, current RTO/ISO market rules present barriers that prevent certain distributed energy resources that are technically capable of participating in the RTO/ISO markets on their own or through aggregation from doing so.[55] Permitting distributed energy resource aggregations to participate in the RTO/ISO markets may allow these resources, in the aggregate, to meet certain qualification and performance requirements, particularly if the operational characteristics of different distributed energy resources in a distributed energy resource aggregation complement each other.[56] The reforms adopted in this final rule will remove the barriers that qualification and performance requirements currently pose to the participation of distributed energy resources in the RTO/ISO markets.[57]

27. The reforms adopted in this final rule are timely, as there has been significant development of distributed energy technologies and deployment of distributed energy resources in recent years. Moreover, this development has generated discussions on the potential for such resources—including new distributed energy resources that are smaller, interconnected at lower voltages, and geographically dispersed—to provide grid services through participation in RTO/ISO markets. Wider scale use of distributed energy resources is enabled by increased deployment of, and improvements in, metering, telemetry, and communication technologies. Aggregations of new and existing distributed energy resources can provide new cost-effective sources of energy and grid services and enhance competition in wholesale markets as new market participants.

28. Individual distributed energy resources often do not meet the minimum size requirements to participate in the RTO/ISO markets under existing participation models and often cannot satisfy all the performance requirements of the various participation models due to their small size. In order to participate in RTO/ISO markets, distributed energy resources tend to participate in RTO/ISO demand response programs. While these demand response programs have helped reduce barriers to load curtailment resources, they often limit the operations of some

[45] September 22, 2017 Letter to Chairman Neil Chatterjee from United States Senators Sheldon Whitehouse, Cory A. Booker, Edward J. Markey, Ron Wyden, Elizabeth Warren and Bernard Sanders (filed Sept. 25, 2017) (September 22 Letter); *see also* May 23, 2018 Letter to Chairman Kevin McIntyre from United States Senators Sheldon Whitehouse, Edward J. Markey, Martin Heinrich, Jeanne Shaheen, Richard Blumenthal, Margaret Wood Hassan, Angus S. King, Jr., Dianne Feinstein, Bernard Sanders, Catherine Cortez Masto, Jack Reed, Ron Wyden, Jeff Merkley, Kamala D. Harris, Cory A. Booker, and Brian Schatz (filed May 23, 2018) (discussing 2016 estimates from the Energy Information Administration that distributed energy resources accounted for about two percent of the installed generation capacity in the United States). In response to the September 22 Letter, Chairman Chatterjee stated that the Commission has a role in fostering resource neutral, non-discriminatory policies with respect to the wholesale markets, including removing barriers to the participation of distributed energy resources in the wholesale markets. Chairman's Response to September 22 Letter (filed Oct. 5, 2017).

[46] February 11, 2019 Letter to Chairman Neil Chatterjee from United States Congress members Peter Welch, Mike Levin, Mike Quigley, Paul D. Tonko, Daniel W. Lipinski, Jerry McNerney, James R. Langevin, Kathy Castor, Raul M. Grijalva, Mark Pocan, Donald S. Beyer Jr., Matt Cartwright, Nanette Diaz Barragán, Sean Casten, Jamie Raskin, James P. McGovern, and Mike Doyle (filed Feb. 11, 2019); February 11, 2019 Letter to Chairman Neil Chatterjee from United States Senators Sheldon Whitehouse, Edward J. Markey, Cory A. Booker, Catherine Cortez Masto, Martin Heinrich, Brian Schatz, Ron Wyden, Jeffrey A. Merkley, Kamala D. Harris, Richard Blumenthal, Jack Reed, Angus S. King, Jr., Tina Smith, Jacky Rosen, Margaret Wood Hassan, Jeanne Shaheen, Dianne Feinstein, and Bernard Sanders (filed Feb. 21, 2019).

[47] Mensah Comments (RM16–23) at 3.

[48] Tesla Comments (2018 RM18–9) at 7.

[49] *Id.* at 1, 7.

[50] Advanced Energy Buyers Comments (2018 RM18–9) at 2; Advanced Energy Economy Comments (2018 RM18–9) at 5.

[51] Advanced Energy Buyers Comments (2018 RM18–9) at 5.

[52] Microsoft Comments (2018 RM18–9) at 13.

[53] EEI Comments (2018 RM18–9) at 3.

[54] APPA Comments (2018 RM18–9) at 10.

[55] *See* NOPR, 157 FERC ¶ 61,121 at P 124.

[56] *See id.* P 125.

[57] *See infra* section IV.C.4 (Minimum and Maximum Size of Aggregation) (agreeing with commenters that a minimum size requirement not to exceed 100 kW will help improve competition in the RTO/ISO markets and avoid confusion about appropriate minimum size requirements for distributed energy resource aggregations under existing or new participation models); Section IV.C.6 (Single Resource Aggregation) (explaining that a consistent minimum size requirement will minimize barriers in the event that an individual distributed energy resource ceases to participant in RTO/ISO markets as a single qualifying distributed energy resource aggregation).

types of distributed energy resources, such as electric storage or distributed generation, as well as the services that they are eligible to provide.[58]

29. We find that adopting the reforms described below will enhance the competitiveness, and in turn the efficiency, of RTO/ISO markets and thereby help to ensure just and reasonable and not unduly discriminatory or preferential rates for wholesale electric services.[59] Further, the reforms required by this final rule will help the RTOs/ISOs account for the impacts of distributed energy resources on installed capacity requirements and day-ahead energy demand, thereby reducing uncertainty in load forecasts and the risk of over procurement of resources and the associated costs, and provide numerous other benefits.[60] Accordingly, as discussed further below, we adopt the NOPR proposal to add § 35.28(g)(12)(i) to the Commission's regulations and require each RTO/ISO to have tariff provisions that allow distributed energy resource aggregations to participate directly in RTO/ISO markets.[61] While we agree with commenters that there are operational, technological, and cost implications that must be evaluated and addressed, as explained below, we find that the record in this proceeding provides sufficient basis for taking action to require the implementation of the generic requirements discussed herein.

30. To the extent that an RTO/ISO proposes to comply with any or all of the requirements in this final rule using its currently effective requirements for distributed energy resources, it must demonstrate on compliance that its existing approach meets the requirements in this final rule.

IV. Discussion

A. Commission Jurisdiction

1. Scope of Final Rule

31. In the NOPR, the Commission stated that it was proposing reforms pursuant to its legal authority under section 206 of the FPA to ensure that the RTO/ISO tariffs are just and reasonable and not unduly discriminatory or preferential.[62]

a. Comments

32. Several commenters assert that the basis for the Commission's jurisdiction is straightforward because sales from distributed energy resource aggregators into wholesale markets are sales at wholesale in interstate commerce.[63] Other commenters question the Commission's authority to implement the proposed reforms, seek clarification of the NOPR's scope, or ask the Commission to respect existing federal, state, and local jurisdictional boundaries.[64]

33. Stem asserts that the Commission should clarify that it has jurisdiction over participation in the wholesale markets and the associated transactions, while relevant electric retail regulatory authorities[65] have jurisdiction over the physical dispatch and the resulting electrical activity on the distribution system.[66] Connecticut State Entities argue that, while the management of the impacts of new generation on the distribution system remains with the states, the comprehensive and effective integration of these emerging technologies into the wholesale markets rests with the Commission.[67]

34. Harvard Environmental Policy Initiative argues that the Commission's proposal to assert jurisdiction over a distributed energy resource aggregator's sale of sink-related services to RTOs/ISOs would fall under the Commission's jurisdiction under the test applied by the U.S. Supreme Court in *FERC* v. *Electric Power Supply Ass'n,*[68] and that the Commission has authority under FPA section 206 to require RTOs/ISOs to enable the participation of distributed energy resource aggregators.[69] Harvard Environmental Policy Initiative further contends that a company's distribution system investments, even if motivated by a Commission rule, are not evidence that the Commission has overstepped its legal authority, and that, even if a change in state law were necessary to allow consumers to participate, the NOPR does not force states to do anything and does not require states to facilitate the development of distributed energy resources.[70]

35. In contrast, some commenters question the Commission's authority to impose the proposed reforms or seek clarification of federal and state jurisdictional boundaries.[71] APPA/NRECA interpret the NOPR to be limited to reforms to the RTO/ISO tariff rules governing RTO/ISO markets and they urge the Commission not to expand the scope of the NOPR beyond RTO/ISO markets and to preserve state and local authority over retail sales, generation facilities, and local distribution facilities.[72] TAPS similarly asserts that any final rule should be limited to (1) the treatment by RTOs/ISOs of energy and ancillary services from distributed energy resources after those resources have already been delivered to the RTO's/ISO's markets; and (2) assuring that any such participation of distributed energy resource aggregations in RTO/ISO markets is compatible with the safe and reliable operation of the distribution system, as well as relevant electric retail regulatory authority and distribution utility tariffs, rules, and requirements.[73] FirstEnergy argues that any rules adopted by the Commission must preserve state jurisdictional authority over distribution-level resources.[74] Similarly, the Maryland and New Jersey Commissions ask the Commission to confirm that state decisions on distribution system design, resource interconnection access, operations, and costs will not be viewed

[58] For example, when participating through demand response programs, distributed energy resources generally can only operate to reduce customer demand at the meter, and any injection/generation cannot exceed customer demand. Consequently, these resources are prevented from injecting additional electricity into the grid to make sales of electricity in RTO/ISO markets.

[59] *See infra* Section IV.C.1 (Participation Model); Section IV.C.2 (Types of Technologies); Section IV.C.3 (Double Counting of Services); Section IV.H.2 (Role of Distribution Utilities); Section IV.J (Market Participation Agreements).

[60] *See infra* Section IV.C.4 (Minimum and Maximum Size of Aggregation); Section IV.D (Locational Requirements).

[61] In addition, we adopt the proposal to add sections 35.28(b)(10) and (11) to the Commission's regulations incorporating the definitions for distributed energy resource and distributed energy resource aggregator.

[62] NOPR, 157 FERC ¶ 61,121 at P 1.

[63] *See, e.g.,* Sunrun Comments (2018 RM18–9) at 3–4 (citing 16 U.S.C. 824(b)(1)); Connecticut State Entities Comments (RM16–23) at 7; Stem Comments (2018 RM18–9) at 3.

[64] *See, e.g.,* APPA/NRECA Comments (RM16–23) at 18–20; MISO Transmission Owners Comments (RM16–23) at 17–18; NESCOE Comments (RM16–23) at 16; TAPS Comments (RM16–23) at 4–5; Xcel Energy Services Comments (RM16–23) at 6–9, 23–24.

[65] The term ''relevant electric retail regulatory authority'' means the entity that establishes the retail electric prices and any retail competition policies for customers, such as the city council for a municipal utility, the governing board of a cooperative utility, or the state public utility commission. *See* Order No. 719, 125 FERC ¶ 61,071 at P 158.

[66] Stem Comments (2018 RM18–9) at 3.

[67] Connecticut State Entities Comments (RM16–23) at 7.

[68] Harvard Environmental Policy Initiative Comments (RM16–23) at 3 (citing *FERC* v. *Electric Power Supply Ass'n,* 136 S. Ct. 760, 776 (2016) (*EPSA*)).

[69] *Id.* at 4–5.

[70] *Id.* at 9, 12.

[71] *See* EEI Comments (RM16–23) at 25; Icetec Comments (2018 RM18–9) at 1–2; Maryland and New Jersey Commissions Comments (RM16–23) at 2–3; Massachusetts Commission Comments (RM16–23) at 10; Stem Comments (2018 RM18–9) at 3.

[72] APPA/NRECA Comments (RM16–23) at 18–20.

[73] TAPS Comments (RM16–23) at 9.

[74] FirstEnergy Comments (2019 RM18–9) at 5 n.13.

as a barrier to wholesale competition or subject to Commission review.[75] MISO Transmission Owners assert that any final rule must not disturb a state's jurisdiction over retail electricity sales and retail distribution service, including state regulation of retail rates, net metering programs, and participation in wholesale markets by resources located behind a retail distribution service meter.[76]

36. The Maryland and New Jersey Commissions ask the Commission to enunciate clear federal and state jurisdictional lines pertaining to both the distribution system and distributed energy resources, whether in front of or behind the meter.[77] The Massachusetts Commission and EEI ask the Commission to clarify whether distribution system-connected and behind-the-meter distributed energy resources that participate in wholesale markets are Commission-jurisdictional facilities.[78] EEI notes that the Commission has exclusive jurisdiction over sales for resale under the FPA.[79] The Harvard Environmental Policy Initiative states that EEI confuses Commission jurisdiction over energy sales with state jurisdiction over generation facilities and argues that states will retain authority over the resources themselves.[80]

37. Icetec asks the Commission either to (1) clarify that retail customers transmitting power from distributed energy resources behind their retail service point to their retail point of interconnection are not considered public utilities subject to Open Access Transmission Tariff (OATT) and Open Access Same-Time Information System (OASIS) requirements, or (2) require RTOs/ISOs to include a *pro forma* request for waiver of those requirements in distributed energy resource participation agreements.[81] The Harvard Environmental Policy Initiative states that the Commission should establish a jurisdictional line that distinguishes between sales by distributed energy resource aggregators and sales by individual distributed energy resources by determining that an energy sale from an individual distributed energy resource is not a ''wholesale sale in interstate commerce'' but is instead ''any other sale'' under FPA section 201 and therefore not subject to Commission regulation.[82]

b. Commission Determination

38. FPA section 201 authorizes the Commission to regulate the transmission of electric energy in interstate commerce and the wholesale sale of electric energy in interstate commerce, as well as all facilities used for such transmission or sale of electric energy.[83] FPA section 201 also defines a public utility as a person who owns or operates facilities subject to the jurisdiction of the Commission.[84] FPA sections 205[85] and 206[86] provide the Commission with jurisdiction over all rates and charges made, demanded, or received by any public utility for or in connection with the transmission or sale of electric energy subject to the Commission's jurisdiction. Those sections also provide the Commission with jurisdiction over all rules, regulations, practices, or contracts affecting jurisdictional rates, charges, or classifications.

39. The Commission's authority to issue regulations pertaining to distributed energy resource aggregations stems from both the Commission's jurisdiction over the wholesale sales by distributed energy resource aggregators into RTO/ISO markets and from its jurisdiction over practices affecting wholesale rates.[87]

40. First, we find that the sales of electric energy by distributed energy resource aggregators for purposes of participating in an RTO/ISO market are wholesale sales subject to the Commission's jurisdiction. In Order No. 841, the Commission observed that an electric storage resource that injects electric energy back to the grid for purposes of participating in an RTO/ISO market engages in a sale of electric energy at wholesale in interstate commerce.[88] Similarly, to the extent that a distributed energy resource aggregator's transaction in RTO/ISO markets entails the injection of electric energy onto the grid and a sale of that energy for resale in wholesale electric markets, we find that the Commission has jurisdiction over such wholesale sales.[89]

41. Second, we find that RTO/ISO market rules governing sales in RTO/ISO markets by distributed energy resource aggregators from demand resources (*e.g.,* demand response and energy efficiency) are practices affecting wholesale rates. This finding aligns with the decision of the U.S. Supreme Court in *EPSA,* which interpreted the FPA as providing the Commission with jurisdiction over the participation in RTO/ISO markets of demand response resources: A type of non-traditional resource that, by definition, is located behind a customer meter and generally is located on the distribution system.[90] First, the Court found that the Commission's regulation of demand response participation in wholesale markets met the ''affecting'' standard in FPA sections 205 and 206 ''with room to spare.'' [91] Second, the Court found that the Commission's regulation of demand response resources did not regulate retail sales in violation of FPA section 201(b).[92] These holdings apply equally to RTO/ISO market rules governing sales in RTO/ISO markets by distributed energy resource aggregators from demand resources.

42. We clarify that, to the extent a distributed energy resource aggregator makes sales of electric energy into RTO/ISO markets, it will be considered a public utility subject to the Commission's jurisdiction.[93] Such distributed energy resource aggregators must fulfill certain responsibilities set forth in the FPA and the Commission's rules and regulations.[94] If a distributed

[75] Maryland and New Jersey Commissions Comments (RM16–23) at 3.

[76] MISO Transmission Owners Comments (RM16–23) at 5–6.

[77] Maryland and New Jersey Commissions Comments (RM16–23) at 2.

[78] Massachusetts Commission Comments (RM16–23) at 11.

[79] EEI Comments (RM16–23) at 23–24 (citing 16 U.S.C. 824o(a)(1)).

[80] Harvard Environmental Policy Initiative Comments (RM16–23) at 12.

[81] Icetec Comments (2018 RM18–9) at 9.

[82] Harvard Environmental Policy Initiative Comments (RM16–23) at 13 (quoting 16 U.S.C. 824(b)(1)).

[83] 16 U.S.C. 824.

[84] *Id.* 824(e).

[85] *Id.* 824d.

[86] *Id.* 824e.

[87] *See Nat'l Ass'n of Regulatory Util. Comm'rs* v. *FERC,* 964 F.3d at 1186 (''FERC bears the responsibility of regulating the wholesale market, which encompasses 'both wholesale rates and the panoply of rules and practices affecting them.' '') (quoting *EPSA,* 136 S. Ct. at 773).

[88] Order No. 841, 162 FERC ¶ 61,127 at P 30.

[89] *See EnergyConnect, Inc.,* 130 FERC ¶ 61,031, at P 29 (2010). We note that injections of electric energy to the grid do not necessarily trigger the Commission's jurisdiction. *See Sun Edison LLC,* 129 FERC ¶ 61,146 (2009), *reh'g granted on other grounds,* 131 FERC ¶ 61,213 (2010) (the Commission's jurisdiction would arise only when a facility operating under a state net metering program produces more power than it consumes over the relevant netting period); *MidAmerican Energy Co.,* 94 FERC ¶ 61,340 (2001).

[90] *See* Order No. 841–A, 167 FERC ¶ 61,154 at P 33 (citing *EPSA,* 136 S. Ct. 760; 18 CFR 35.28(b)(4)).

[91] *EPSA,* 136 S. Ct. at 774 (referring to the Commission's jurisdiction under FPA sections 205 and 206 to regulate practices affecting jurisdictional rates).

[92] *Id.* at 784.

[93] *See EnergyConnect, Inc.,* 130 FERC ¶ 61,031 at P 29 (finding an aggregator of retail customers to be a public utility under FPA section 201(e) because its agreements to make sales of balancing energy for resale in RTO/ISO markets would constitute jurisdictional facilities under FPA section 201(b)).

[94] Examples of such responsibilities include filing rates under FPA section 205 (potentially including obtaining market-based rate authority); filing Electric Quarterly Reports; submitting FPA sections 203 and 204 filings related to corporate mergers and

Continued

energy resource aggregator (1) aggregates *only* demand resources; or (2) aggregates only customers in a net metering program that are not net sellers, that distributed energy resource aggregator would not become a public utility.[95]

43. We further clarify that we are only exercising jurisdiction in this final rule over the sales by distributed energy resource aggregators into the RTO/ISO markets. Hence, an individual distributed energy resource's participation in a distributed energy resource aggregation would not cause that individual resource to become subject to requirements applicable to Commission-jurisdictional public utilities.

44. As the Commission stated in Order Nos. 841 and 841–A, the Commission recognizes a vital role for state and local regulators with respect to retail services and matters related to the distribution system, including design, operations, power quality, reliability, and system costs.[96] As in Order No. 841, we reiterate that nothing in this final rule preempts the right of states and local authorities to regulate the safety and reliability of the distribution system and that all distributed energy resources must comply with any applicable interconnection and operating requirements.[97]

2. Opt-Out

45. In the NOPR, the Commission proposed to require each RTO/ISO to revise its tariff as necessary to accommodate the participation of distributed energy resource aggregations in RTO/ISO markets.[98] In the NOPR, the Commission stated that, to the extent existing rules or regulations explicitly prohibit certain technologies from participating in RTO/ISO markets, it did not intend to overturn those rules or regulations.[99] However, the Commission did not propose a mechanism by which relevant electric retail regulatory authorities could authorize or prohibit the participation of distributed energy resources or distributed energy resource aggregators in RTO/ISO markets. The Commission also explained that, because the individual resources in distributed energy resource aggregations likely will fall under the purview of multiple organizations (*e.g.,* the RTO/ISO, state regulatory commissions, relevant distribution utilities, and local regulatory authorities), the proposed market participation agreements [100] for distributed energy resource aggregators must require that the aggregator attest that its distributed energy resource aggregation is compliant with the tariffs and operating procedures of the distribution utilities and the rules and regulations of any other relevant regulatory authority.[101] The Commission stated that this may include any laws or regulations of the relevant electric retail regulatory authority that do not permit demand response resources to participate in RTO/ISO markets as the Commission considered in Order No. 719.[102]

46. After the technical conference, the Commission sought comments on whether states could require distributed energy resources to choose to participate in either an RTO/ISO market or retail compensation program, but not allow participation in both.[103] The Commission also sought comments on the benefits and drawbacks of such an approach.

a. Comments

47. As described above,[104] numerous commenters question the Commission's authority to require RTOs/ISOs to accommodate the participation of distributed energy resource aggregations in RTO/ISO markets. They believe that, to mitigate their jurisdictional concerns, relevant electric retail regulatory authorities and/or distribution utilities must be allowed to either authorize or prohibit the participation of distributed energy resources and/or distributed energy resource aggregators in the RTO/ISO markets (*i.e.,* to opt in or opt out, respectively).[105] Thus, they specifically request that the Commission adopt an opt-out/opt-in provision similar to that established in Order No. 719 to allow relevant electric retail regulatory authorities to decide whether distributed energy resources may participate in aggregations in RTO/ISO markets.[106]

48. Some of these commenters contend that the Commission would be exceeding its statutory authority if the final rule does not include an opt-out.[107] They argue that the Commission may determine *how* distributed energy resources participate in RTO/ISO markets, but *whether* they participate is the exclusive province of the states.[108] APPA points to the existing opt-out for demand response resources established in Order No. 719 to argue that the applicability of relevant electric retail regulatory authority should not turn on the wholesale participation model selected by the aggregator.[109] APPA asserts that the authority of relevant electric retail regulators over the terms and conditions of interconnection to the distribution system includes the authority to limit the manner in which a distributed energy resource uses the distribution system.[110] APPA argues that an opt-out is consistent with the NOPR's proposal that market participation agreements include an attestation that an aggregation is compliant with distribution utility tariffs and the rules and regulations of any other relevant regulatory authority. APPA further argues that an opt-out conforms with the requirement in Order No. 841 that an electric storage resource must be ''contractually permitted'' to inject electric energy back onto the grid (*e.g.,* per the interconnection agreement between an electric storage resource that is interconnected on a distribution system or behind the meter and the distribution utility to which it is

other activities; and fulfilling FPA section 301 accounting obligations and FPA section 305(b) interlocking directorate obligations. *See* 16 U.S.C. 824b, 824c, 824d, 825, 825d(b).

[95] *See EnergyConnect, Inc.,* 130 FERC ¶ 61,031 at P 30 (finding that ''where an entity is only engaged in the provision of demand response services, and makes no sales of electric energy for resale, that entity would not own or operate facilities that are subject to the Commission's jurisdiction and would not be a public utility that is required to have a rate on file with the Commission''); *Sun Edison LLC,* 129 FERC ¶ 61,146 (the Commission's jurisdiction would arise only when a facility operating under a state net metering program produces more power than it consumes over the relevant netting period); *MidAmerican Energy Co.,* 94 FERC ¶ 61,340.

[96] Order No. 841, 162 FERC ¶ 61,127 at P 36; Order No. 841–A, 167 FERC ¶ 61,154 at P 42.

[97] *See* Order No. 841–A, 167 FERC ¶ 61,154 at P 46.

[98] NOPR, 157 FERC ¶ 61,121 at P 124.

[99] *Id.* P 133.

[100] See Section IV.J (Market Participation Agreements) below for more discussion of market participation agreements.

[101] NOPR, 157 FERC ¶ 61,121 at P 157.

[102] *Id.* P 157 n.238 (citing Order No. 719, 125 FERC ¶ 61,071 at P 154).

[103] Notice Inviting Post-Technical Conference Comments at 6.

[104] *See supra* Section IV.A.1 (Scope of Final Rule).

[105] *See, e.g.,* APPA/NRECA Comments (RM16–23) at 21–22; DTE Electric/Consumers Energy Comments (RM16–23) at 7; MISO Transmission Owners Comments (RM16–23) at 6; NARUC Comments (RM16–23) at 4–5; TAPS Comments (RM16–23) at 10, 16–17.

[106] *See, e.g.,* AES Companies Comments (RM16–23) at 31; Kansas Commission Comments (2018 RM18–9) at 4; NRECA Comments (2018 RM18–9) at 6–7, 27–28; Organization of MISO States Comments (RM16–23) at 4–5; Southern Companies Comments (2018 RM18–9) at 3–4 (citing Order No. 719, 125 FERC ¶ 61,071; Order No. 719–A, 128 FERC ¶ 61,059); *see* discussion of opt-out/opt-in *infra* PP 59, 64.

[107] Kansas Commission Comments (2018 RM18–9) at 3; NARUC Comments (2018 RM18–9) at 2–3; *see* APPA Comments (2018 RM18–9) at 15.

[108] Kansas Commission Comments (2018 RM18–9) at 2–3; NARUC Comments (2018 RM18–9) at 2–3.

[109] APPA Comments (2018 RM18–9) at 17–18.

[110] *Id.* at 15–16 (noting that CAISO's Distributed Energy Resource Provider program requires compliance with applicable distribution utility tariffs and operating procedures, as well as applicable requirements of the relevant electric retail regulatory authority).

interconnected).[111] Xcel Energy Services argues that, to the extent distributed energy resource participation in RTO/ISO markets does occur, the applicable state has the authority to establish the parameters of the participation model, not the RTO/ISO.[112] Xcel Energy Services asserts that the Commission should not usurp the states' authority to address inappropriate arbitrage between retail and wholesale consumption.[113]

49. Multiple United States senators urge the Commission to preserve the authority of state and local authorities over distribution utilities with respect to distributed energy resource aggregators. They express concern that the final rule could have a negative effect on state and local authorities' ability to regulate retail and distribution service. They argue that, if the Commission authorizes the aggregation of distributed energy resources by entities other than the local distribution utility without authorization by the appropriate state or local regulator, the Commission would break precedent and expand Commission regulation into areas that are jurisdictional to state and localities under the FPA. They maintain that the relevant electric retail regulatory authority is best positioned to decide whether to authorize third-party distributed energy resource aggregators to transact with retail customers.[114]

50. Those commenters advocating for an opt-out also generally express concerns about the cost, and operational and reliability impacts, of distributed energy resource aggregations on distribution utilities and the distribution system.[115] With regard to cost impacts, some commenters suggest that costs borne by small utilities and their customer bases may outweigh the benefits of distributed energy resource aggregation participation in RTO/ISO markets, and that small to medium-sized distribution utilities may not have the resources needed to coordinate with distributed energy resource aggregators and RTOs/ISOs.[116] In addition, NRECA argues that opt-out/opt-in provisions would lessen the compliance burden on smaller entities and would be consistent with the deference to relevant electric retail regulatory authorities included in IEEE 1547.[117] NRECA also raises concerns that distributed energy resource aggregators may ''cherry-pick'' the more lucrative resources in a system, undermining reliability and the ability of utilities to develop and invest in their own integrated distributed energy resources portfolio.[118] Organization of MISO States suggests that even a temporary opt-out would allow for safe and reliable implementation with minimal disruption to the distribution system.[119]

51. Some commenters argue that, to relieve smaller entities of cost and coordination burdens, the Commission should at a minimum establish an express opt-in requirement for small distribution utilities similar to the one the Commission adopted in Order No. 719.[120] NRECA asserts that the distributed energy resource aggregation proposals would be costly for small cooperatives in rural, remote communities.[121] NRECA and TAPS recommend that the Commission require express permission from the relevant electric retail regulatory authority before the RTO/ISO may accept bids from distributed energy resource aggregations located on the system of a utility that distributes 4 million MWh or less, employing the same size threshold as the small utility opt-in allowed in Order No. 719–A.[122]

52. In contrast, other commenters caution against adopting the Order No. 719 construct.[123] Many of those commenters argue that an opt-out is not necessary because the Commission has exclusive jurisdiction over sales from distributed energy resource aggregators into RTO/ISO markets.[124] Moreover, several commenters argue that the responsibility for integrating emerging technologies into RTO/ISO markets rests with the Commission (while the states are responsible for managing the impacts on the distribution system) and that the Order No. 719 opt-out provision has effectively prevented the development of demand response in the Midwest and led to higher wholesale rates.[125] In addition, some commenters argue that providing states with an opt-out would be inconsistent with the Commission's denial of such an opt-out

[111] *Id.* at 16 (citing NOPR, 157 FERC ¶ 61,121 at P 157; Order No. 841, 162 FERC ¶ 61,127 at P 33).

[112] Xcel Energy Services Comments (RM16–23) at 23–24.

[113] *Id.* at 24.

[114] May 7, 2019 Letter to Chairman Neil Chatterjee from United States Senators John Hoeven, Kevin Cramer, John Barrasso, John Boozman, Lisa Murkowski, Michael B. Enzi, Joni K. Ernst, Roger F. Wicker, Shelley Moore Capito, Chuck Grassley, M. Michael Rounds, Steve Daines, John Thune, Thom Tillis, Mike Crapo, Cindy Hyde-Smith, Roy Blunt, James E. Risch, James Lankford, Deb Fischer, James M. Inhofe, and Bill Cassidy. In response to this letter, the Chairman noted that he asked state regulators participating at the April 2018 technical conference to discuss whether and why they view as important in the context of this rulemaking the type of flexibility that the Commission has provided to relevant electric retail regulatory authorities with respect to participation of demand response resources in wholesale electric markets. The Chairman also stated that he recognizes the important role of state and local regulators with respect to reliability and resilience, particularly with respect to the distribution system. Chairman's Response to May 7, 2019 Letter (filed June 4, 2019).

[115] *See, e.g.,* Vice Chairman Place Comments (2018 RM18–9) at 2–3; EEI Comments (2018 RM18–9) at 19–20; Eversource Comments (2018 RM18–9) at 12–13; NRECA Comments (2018 RM18–9) at 7–10, 12; *see also* AMP Comments (2019 RM18–9) at 1.

[116] APPA Comments (2018 RM18–9) at 7 (asserting that rate design challenges can be particularly acute for small to medium-sized distribution utilities), 9–10 (asserting that monitoring and responding to system impacts associated with distributed energy resource aggregation activity could be particularly difficult for small and medium-sized utilities); APPA/NRECA Comments (RM16–23) at 39 (asserting that the costs of installing new meters or new communication technology to capture wholesale market transactions would burden smaller distribution utilities in particular); NRECA Comments (2018 RM18–9) at 14 (asserting that smaller distribution cooperatives may not have staff or resources needed to conduct ongoing operational coordination with RTOs/ISOs and distributed energy resource aggregators), 26 (asserting that the considerable amount of funding required to potentially benefit a small number of customers imposes too large of a burden on small utilities); TAPS Comments (RM16–23) at 15–16 (asserting that, particularly for a small utility, the costs of ongoing coordination, metering, settlements, and rate-unbundling needed to support sales to RTO/ISO markets by distributed energy resources may far exceed the potential efficiency benefits from their participation in RTO/ISO markets).

[117] NRECA Comments (2018 RM18–9) at 27–28. IEEE–1547 is a standard of the Institute of Electrical and Electronics Engineers (IEEE) that provides a set of criteria and requirements for the interconnection of distributed energy resources.

[118] *Id.* at 22–23.

[119] Organization of MISO States Comments (2018 RM18–9) at 5–6.

[120] APPA Comments (2018 RM18–9) at 19–20; TAPS Comments (RM16–23) at 16; TAPS Comments (2018 RM18–9) at 19–21.

[121] NRECA Comments (2019 RM18–9) at 4–5.

[122] *Id.;* TAPS Comments (RM16–23) at 16–17; TAPS Comments (2018 RM18–9) at 19 & n.27.

[123] *See, e.g.,* Advanced Energy Buyers Comments (2018 RM18–9) at 6; Advanced Energy Management Comments (2018 RM18–9) at 7–8, 10–11; Icetec Comments (2018 RM18–9) at 10–11; SEIA Comments (2018 RM18–9) at 8; Stem Comments (2018 RM18–9) at 4–6.

[124] *See, e.g.,* Advanced Energy Economy Comments (2018 RM18–9) at 18; Energy Storage Association Comments (2018 RM18–9) at 5; Icetec Comments (2018 RM18–9) at 11; Stem Comments (2018 RM18–9) at 4–5 (arguing that the FPA does not permit a state to use its jurisdiction over generation or local distribution facilities to prevent distributed energy resources or distributed energy resource aggregators from accessing Commission-jurisdictional markets); Sunrun Comments (2018 RM18–9) at 3–4 (arguing that whether wholesale sales originate from facilities on the transmission system, the distribution system, or behind the meter is immaterial to the Commission's jurisdiction and that FPA section 201(b) distinguishes between authority to regulate transactions and authority to regulate facilities).

[125] Advanced Energy Economy Comments (RM16–23) at 44–45; Connecticut State Entities Comments (RM16–23) at 7; Organization of MISO States Comments (RM16–23) at 5 n.3 (noting concerns of Illinois Commission).

from electric storage participation in Order No. 841.[126]

53. With respect to the Commission's authority, some commenters assert that only the Commission has jurisdiction to determine eligibility for wholesale market participation [127] and that limiting or conditioning wholesale market participation through retail tariffs [128] or distribution interconnection agreements [129] would interfere with that jurisdiction. Advanced Energy Management asserts that because selling injections of electric energy in wholesale markets is governed under the FPA and distributed energy resources are not always behind the meter, there should not be a blanket opt-out available to relevant electric retail regulatory authorities.[130]

54. However, some commenters recognize that states do have the right to implement retail tariffs that disqualify a resource from participating in the state program if the resource elects to participate in RTO/ISO markets.[131] Several commenters caution that, if the Commission does consider an opt-out, it must be narrowly tailored.[132] Harvard Environmental Policy Initiative points to the Commission's proposed coordination provisions to demonstrate that the Commission will not preempt state authority over distribution system planning or create new authority for the Commission to allow distributed energy resources to connect to a distribution system without a utility's approval or knowledge.[133]

55. In response to concerns about the impact of distributed energy resource aggregations on the distribution system, several commenters argue that distributed energy resource aggregation participation in RTO/ISO markets does not introduce additional reliability or cost concerns beyond those that are addressed through the interconnection process.[134] In contrast with commenters that suggest that distributed energy resource aggregations introduce reliability or cost concerns, Advanced Energy Economy argues that an opt-out would limit RTO/ISO visibility into distributed energy resource operations, thereby preventing RTO/ISO operators from using them to maintain reliability and improve resilience, and would limit an RTO's/ISO's ability to efficiently optimize all of the resources available in its region, risking increased costs to consumers.[135]

b. Commission Determination

56. We decline to include a mechanism for all relevant electric retail regulatory authorities to prohibit all distributed energy resources from participating in the RTO/ISO markets through distributed energy resource aggregations (*i.e.,* to opt out). However, we modify the NOPR proposal in recognition of the potential indirect costs borne by smaller utilities due to this final rule. More specifically, and as discussed further below, we add § 35.28(g)(12)(iv) to the Commission's regulations to provide that RTOs/ISOs may not accept bids from distributed energy resource aggregators aggregating customers of small utilities [136] unless the relevant electric retail regulatory authority allows such customers of small utilities to participate in distributed energy resource aggregations (*i.e.,* to opt in).

57. We disagree with the suggestion that the Commission is legally required to grant an opt-out that enables all relevant electric retail regulatory authorities to prohibit all distributed energy resources from participating in the RTO/ISO markets through distributed energy resource aggregations. The Commission has exclusive jurisdiction over the wholesale markets and the criteria for participation in those markets, including the wholesale market rules for participation of resources connected at or below distribution-level voltages.[137] As the Commission previously has found, establishing the criteria for participation in RTO/ISO markets, including with respect to resources located on the distribution system or behind the meter, is essential to the Commission's ability to fulfill its statutory responsibility to ensure that wholesale rates are just and reasonable.[138]

58. This final rule addresses rules for participation in RTO/ISO markets by distributed energy resource aggregators. Like the Commission's rules governing demand response and electric storage resource participation in RTO/ISO markets, this final rule ''addresses—and addresses only—transactions occurring on the wholesale market.'' [139] Thus, we continue to find that the FPA and relevant precedent does not legally compel the Commission to adopt a relevant electric retail regulatory authority opt-out with respect to participation in RTO/ISO markets by all resources interconnected on a distribution system or located behind a retail meter.[140] As the United States Court of Appeals for the District of Columbia Circuit (D.C. Circuit) recently explained, the Commission has jurisdiction to decide which entities may participate in wholesale markets, which means that a relevant electric

[126] *E.g.,* Advanced Energy Management Comments (2018 RM18–9) at 7–8 (citing Order No. 841, 162 FERC ¶ 61,127 at P 35).

[127] Advanced Energy Economy Comments (2018 RM18–9) at 18 (citing *Advanced Energy Econ.,* 161 FERC ¶ 61,245 (2017) (AEE Declaratory Order), *reh'g denied,* 163 FERC ¶ 61,030 (2018) (AEE Rehearing Order); Order No. 841, 162 FERC ¶ 61,127 at P 35); Advanced Energy Management Comments (2018 RM18–9) at 18; Icetec Comments (2018 RM18–9) at 11, 16.

[128] Advanced Energy Economy Comments (2018 RM18–9) at 18.

[129] Icetec Comments (2018 RM18–9) at 11; *see* Stem Comments (2018 RM18–9) at 15.

[130] Advanced Energy Management Comments (RM16–23) at 7. Advanced Energy Management states that there should be no restriction on where distributed energy resource aggregators can recruit customers to participate in the wholesale market. Advanced Energy Management Comments (2018 RM18–9) at 11.

[131] *See* Advanced Energy Management Comments (2018 RM18–9) at 11; Stem Comments (2018 RM18–9) at 11; Sunrun Comments (2018 RM18–9) at 8.

[132] *See* Advanced Energy Economy Comments (2018 RM18–9) at 21; Public Interest Organizations Comments (2018 RM18–9) at 8–10 (suggesting a Commission waiver process with a notice and comment period); Stem Comments (2018 RM18–9) at 6 (suggesting, as one basis to restrict distributed energy resource participation, the demonstration of a reliability violation that cannot be resolved through effective distribution system management).

[133] Harvard Environmental Policy Initiative Comments (RM16–23) at 12.

[134] *See, e.g.,* Advanced Energy Economy Comments (2018 RM18–9) at 17–18; Advanced Energy Management Comments (2018 RM18–9) at 9–10; Stem Comments (2018 RM18–9) at 9, 15; Sunrun Comments (2018 RM18–9) at 6; *see also* New Jersey Board Comments (2018 RM18–9) at 4.

[135] Advanced Energy Economy Comments (2018 RM18–9) at 15–16.

[136] As discussed below, we will consider small utilities to be those with a total electric output for the preceding fiscal year not exceeding 4 million MWh.

[137] Order No. 841–A, 167 FERC ¶ 61,154 at P 38; Order No. 841, 162 FERC ¶ 61,127 at P 35 (citing *EPSA,* 136 S. Ct. 760; AEE Declaratory Order, 161 FERC ¶ 61,245 at PP 59–60; *see also Nat'l Ass'n of Regulatory Util. Comm'rs,* 964 F.3d at 1187 (''FERC has the exclusive authority to determine who may participate in the wholesale markets.''); *Nat'l Ass'n of Regulatory Util. Comm'rs* v. *FERC,* 475 F.3d 1277, 1280–82 (D.C. Cir. 2007); *Transmission Access Policy Study Grp.* v. *FERC,* 225 F.3d 667, 696 (D.C. Cir. 2000).

[138] Order No. 841–A, 167 FERC ¶ 61,154 at P 31; *see also id.* P 38 (citing AEE Rehearing Order, 163 FERC ¶ 61,030 at P 36). The Supreme Court also has recognized that the Commission extensively regulates the structure and rules of wholesale auctions, in order to ensure that they produce just and reasonable results. *See Hughes* v. *Talen Energy Mktg., LLC,* 136 S. Ct. 1288, 1293–94 (2016) (*Hughes*); *EPSA,* 136 S. Ct. at 769.

[139] *EPSA,* 136 S. Ct. at 776; *see also Nat'l Ass'n of Regulatory Util. Comm'rs,* 964 F.3d at 1186, 1189 (finding that ''Order No. 841 solely targets the manner in which an [electric storage resource] may participate in wholesale markets'' and that Order Nos. 841 and 841–A ''do nothing more than regulate matters concerning federal transactions''); Order No. 841–A, 167 FERC ¶ 61,154 at P 44.

[140] Order No. 841–A, 167 FERC ¶ 61,154 at P 32; *see also* AEE Declaratory Order, 161 FERC ¶ 61,245 at P 62 (citing *EPSA,* 136 S. Ct. at 776).

retail regulatory authority cannot broadly prohibit the participation in RTO/ISO markets of all distributed energy resources or of all distributed energy resource aggregators as doing so would interfere with the Commission's statutory obligation to ensure that wholesale electricity markets produce just and reasonable rates.[141]

59. As commenters point out, the Commission in Order No. 719 granted relevant electric retail regulatory authorities an opt-out from allowing retail customers to participate directly in wholesale markets through aggregations of demand response resources.[142] As noted above, the Commission was not obligated to provide such an opt-out, but rather did so as an exercise of its discretion.[143] Consistent with that previous exercise of the Commission's discretion, we clarify that this final rule does not affect the ability of relevant electric retail regulatory authorities to prohibit retail customers' demand response from being bid into RTO/ISO markets by aggregators.[144]

60. However, unlike aggregators of demand response, distributed energy resource aggregators are capable of engaging in sales for resale of electricity and those distributed energy resource aggregators making such sales in the RTO/ISO markets are public utilities subject to the Commission's jurisdiction.[145] We recognize that the participation of distributed energy resource aggregators in RTO/ISO markets necessarily has effects on the distribution system,[146] and, as in Order No. 841, we have considered those effects in evaluating whether to exercise our discretion to grant an opt-out. Upon such consideration, we find that the benefits of allowing distributed energy resource aggregators broader access to the wholesale market outweigh the policy considerations in favor of an opt-out. Specifically, we find that the reliability, transparency, and market-related benefits of removing barriers to the participation of distributed energy resource aggregators in RTO/ISO markets are significant. Considering those benefits,[147] we are not persuaded that concerns about potential effects on the distribution system justify adopting an opt-out that could substantially limit that participation.[148] As discussed below, there are several ways that relevant electric retail regulatory authorities may address any such concerns without broadly prohibiting the participation of distributed energy resources or distributed energy resource aggregators in RTO/ISO markets. Therefore, we do not find it appropriate and thus decline to exercise discretion to adopt a broad opt-out with respect to distributed energy resource aggregations in this final rule.

61. We continue to recognize the important role that state and local authorities play with respect to distributed energy resources and their potential aggregation. This final rule does not curtail that authority. As in Order No. 841, the reforms adopted in this final rule do not preclude or limit state or local regulation of: Retail rates; distribution system planning, distribution system operations, or distribution system reliability; distributed energy resource facility siting; and interconnection of resources to the distribution system that are not subject to Commission jurisdiction, as discussed further below.[149] In addition, and again as recognized in Order No. 841, under a relevant electric retail regulatory authority's jurisdiction over its retail programs, such a regulatory authority is able to condition a distributed energy resource's participation in a retail distributed energy resource program on that resource not also participating in the RTO/ISO markets.[150] This should allow

[141] *See Nat'l Ass'n of Regulatory Util. Comm'rs,* 964 F.3d at 1187 (''[B]ecause FERC has the exclusive authority to determine who may participate in the wholesale markets, the Supremacy Clause . . . requires that [s]tates not interfere. . . . FERC's statement in Order No. 841–A that [s]tates may not block RTO/ISO market participation 'through conditions on the receipt of retail service,' or impose any 'condition[ ] aimed *directly* at the RTO/ISO markets, even if contained in the terms of retail service,' is simply a restatement of the well-established principles of federal preemption.'') (quoting Order No. 841–A, 167 FERC ¶ 61,154 at P 41) (finding that states cannot intrude on the Commission's jurisdiction by prohibiting all consumers from selling into the wholesale market) (citing AEE Rehearing Order, 163 FERC ¶ 61,030 at P 37; AEE Declaratory Order, 161 FERC ¶ 61,245 at P 61); *see also Hughes,* 136 S. Ct. at 1298 (''States may not seek to achieve ends, however legitimate, through regulatory means that intrude on FERC's authority over interstate wholesale rates . . . .''); *Oneok, Inc.* v. *Learjet, Inc.,* 575 U.S. 373, 386 (2015) (finding that the proper test for determining whether a state action is preempted is ''whether the challenged measures are 'aimed directly at interstate purchasers and wholesalers for resale' or not'') (quoting *N. Natural Gas Co.* v. *State Corp. Comm'n of Kan.,* 372 U.S. 84, 94 (1963)); *Nat'l Ass'n of Regulatory Util. Comm'rs,* 964 F.3d at 1187 (similar).

[142] Order No. 719, 125 FERC ¶ 61,071 at PP 154–55.

[143] *See EPSA,* 136 S. Ct. at 779 (describing the opt-out as a ''notable solicitude toward the States,'' in recognition of ''the linkage between wholesale and retail markets and the States' role in overseeing retail sales''); *Nat'l Ass'n of Regulatory Util. Comm'rs,* 964 F.3d at 1190 (''Local Utility Petitioners correctly acknowledge that *EPSA* did not condition its holdings on the existence of an opt-out.'').

[144] *See* 18 CFR 35.28(g)(1)(iii). Similarly, we recognize Kentucky's existing right to exclude energy efficiency resources from wholesale market participation. AEE Declaratory Order, 161 FERC ¶ 61,245 at P 66.

[145] *See Nat'l Ass'n of Regulatory Util. Comm'rs,* 964 F.3d at 1190 (citing Order No. 841–A, 167 FERC ¶ 61,154 at PP 51–52 (distinguishing [electric storage resource] participation in wholesale sales from demand response resources participating in wholesale bids)).

[146] *See* Order No. 841–A, 167 FERC ¶ 61,154 at P 56 (citing *EPSA,* 136 S. Ct. at 776).

[147] *See, e.g., supra* PP 4 (explaining that integrating distributed energy resources' capabilities into RTO/ISO planning and operations will help the RTOs/ISOs account for the impacts of these resources on installed capacity requirements and day-ahead energy demand, thereby reducing uncertainty in load forecasts and reducing the risk of over procurement of resources), 27 (stating that distributed energy resource aggregations can provide new grid services and enhance competition in wholesale markets as new market participants), 29 (finding that the reforms in this final rule will enhance the competitiveness, and in turn the efficiency, of RTO/ISO markets); *see, e.g., infra* PP 114 (explaining that the revised definition of distributed energy resource adopted in this final rule is technology-neutral, thereby ensuring that any resource that is technically capable of providing wholesale services through aggregation is eligible to do so, which enhances competition in the RTO/ISO markets), 142 (stating that requiring RTOs/ISOs to allow heterogeneous aggregations will further enhance competition in RTO/ISO markets by ensuring that complementary resources, including those with different physical and operational characteristics, can meet qualification and performance requirements), 160, 163 (discussing how the final rule enhances competition and improves reliability by requiring RTOs/ISOs to allow participation of distributed energy resources in both wholesale and retail or multiple wholesale programs), 173 (finding that requiring RTOs/ISOs to establish a minimum size requirement not to exceed 100 kW will remove a barrier to distributed energy resource aggregations, improve competition in RTO/ISO markets, avoid confusion about appropriate requirements, and help ensure just and reasonable rates), 205 (discussing the benefits of single-node and multi-node aggregations).

[148] The list of benefits catalogued in the preceding footnote includes many of the same benefits that the D.C. Circuit pointed to when explaining why the Commission's decision not to provide an opt-out in Order No. 841 was not an unreasoned departure from Order No. 719. *See Nat'l Ass'n of Regulatory Util. Comm'rs,* 964 F.3d at 1190 (explaining that the Commission's decision to forgo an opt-out was ''neither unexplained nor unsupported'' and pointing to the Commission's consideration of the benefits of enabling broad participation of electric storage resources, including on ''competition,'' ''prices,'' and the ''diversity'' of resource types that can participate in RTO/ISO markets).

[149] *See Nat'l Ass'n of Regulatory Util. Comm'rs,* 964 F.3d at 1188 (noting that the similar decision in ''Order No. 841 does not 'usurp[ ] state power' '' and pointing to the fact that ''States retain their authority to impose safety and reliability requirements without interference from FERC, and [electric storage resources] must still obtain all requisite permits, agreements, and other documentation necessary to participate in federal wholesale markets'') (quoting *EPSA,* 136 S. Ct. at 777).

[150] *See Nat'l Ass'n of Regulatory Util. Comm'rs,* 964 F.3d at 1188 (''States retain their authority to prohibit local [electric storage resources] from participating in the interstate and intrastate markets simultaneously, meaning [s]tates can force local [electric storage resources] to choose which market they wish to participate in.''); Order No. 841–A, 167 FERC ¶ 61,154 at P 41 (acknowledging that states

Continued

a retail regulatory authority to address any specific concerns.

62. As to commenters' concerns regarding cost impacts on the distribution system, we note that, in Order No. 841, with respect to concerns about electric storage resources' use of the distribution system, the Commission observed that, in *PJM Interconnection L.L.C.,* the Commission permitted a distribution utility to assess a wholesale distribution charge to an electric storage resource participating in the PJM markets. Consistent with this precedent, the Commission found that it may be appropriate, on a case-by-case basis, for distribution utilities to assess a charge on electric storage resources similar to those assessed to the market participant in that proceeding.[151] Consistent with that conclusion, we find that it may also be appropriate, on a case-by-case basis, for distribution utilities to assess a wholesale distribution charge on distributed energy resource aggregators participating in RTO/ISO markets.

63. Moreover, we recognize that, where appropriate, the Commission previously has taken steps to address a potential burden imposed by a Commission final rule on smaller entities. For instance, the Commission has distinguished small utilities whose total electric output for the preceding fiscal year did not exceed 4 million MWh [152] for purposes of granting waivers from Order No. 889's [153] standards of conduct for transmission providers [154] and determining whether a specific cooperative should be considered a non-public utility outside the scope of a refund obligation involving the California energy crisis.[155] In Order No. 719–A, the Commission provided an opt-in for small utilities, which requires the relevant electric retail regulatory authority to give affirmative permission for the demand response of customers of utilities that distributed 4 million MWh or less in the previous fiscal year to be bid into RTO/ISO markets by an aggregator of those retail customers.[156]

64. Notwithstanding our finding that the benefits of this final rule outweigh the policy considerations in favor of a broad opt-out, we acknowledge that this final rule may place a potentially greater burden on smaller utility systems.[157] Recognizing this potentially greater burden on small utility systems, we will exercise our discretion to include in this final rule an opt-in mechanism for small utilities similar to that provided in Order No. 719–A. Specifically, we determine that customers of utilities that distributed 4 million MWh or less in the previous fiscal year may not participate in distributed energy resource aggregations unless the relevant electric retail regulatory authority affirmatively allows such customers to participate in distributed energy resource aggregations.

65. We therefore direct each RTO/ISO to amend its market rules as necessary to (1) accept bids from a distributed energy resource aggregator if its aggregation includes distributed energy resources that are customers of utilities that distributed more than 4 million MWh in the previous fiscal year, and (2) not accept bids from distributed energy resource aggregators if its aggregation includes distributed energy resources that are customers of utilities that distributed 4 million MWh or less in the previous fiscal year, unless the relevant electric retail regulatory authority permits such customers to be bid into RTO/ISO markets by a distributed energy resource aggregator. We conclude that this opt-in mechanism appropriately balances the benefits that distributed energy resource aggregation can provide to RTO/ISO markets with a recognition of the burdens that such aggregation may create for small utilities in particular. Accordingly, we find that adopting this mechanism helps to ensure that any ''negative effects'' of this final rule are ''outweighed by the benefits,'' [158] listed above,[159] that it provides to RTO/ISO markets.

66. On compliance, we require each RTO/ISO to explain how it will implement this small utility opt-in. We note that an RTO/ISO may choose to implement this requirement in a similar manner as it currently implements the small utility opt-in provision under Order No. 719–A.

67. Although the Small Business Administration (SBA) no longer defines small utilities based on total electric output for the preceding fiscal year of 4 million MWh or less,[160] we use this standard for purposes of this final rule, as it is consistent with the Commission's use of this standard for the opt-in adopted in Order No. 719–A,[161] and is supported by commenters asking the Commission to include an opt-in as part of this rule.[162]

3. Interconnection

68. The NOPR did not propose any changes to RTO/ISO policies and procedures for the interconnection of distributed energy resources. However, the Commission stated that comments demonstrated that current RTO/ISO market rules often limit the services that distributed energy resources are eligible to provide, including by imposing prohibitively expensive or otherwise burdensome interconnection requirements.[163] The Commission also recognized that RTO/ISO demand response models often prohibit distributed energy resources from injecting power back onto the grid in

have the authority to include conditions in their own retail distributed energy resource or retail electric storage resource programs that prohibit any participating resources from also selling into RTO/ISO markets because, in that scenario, the owner of a resource has a choice between participating in the retail market or wholesale market); *see also* Arkansas Commission Comments (2019 RM18–9) at 2–4.

[151] Order No. 841, 162 FERC ¶ 61,127 at P 296 (citing *PJM Interconnection L.L.C.,* 149 FERC ¶ 61,185, at P 12 (2014) (wholesale distribution charge that ComEd will assess to Energy Vault is a weighted average carrying charge that is applied on a case-by-case basis, depending on the distribution facilities expected to be used in providing wholesale distribution service), *order on reh'g,* 151 FERC ¶ 61,231, at PP 16–18 (2015)).

[152] The 4 million MWh cutoff stems from the Small Business Size Standards component of the North American Industry Classification System, which previously defined a small utility as one that, including its affiliates, is primarily engaged in the generation, transmission, or distribution of electric energy for sale, and whose total electric output for the preceding fiscal year did not exceed 4 million MWh. 13 CFR 121.201 (2013) (Sector 22, Utilities, North American Industry Classification System (NAICS)). Currently, the number of employees is the basis used to measure whether electric power generation, transmission, and distribution industries are small businesses. 13 CFR 121.201 (2020) (Sector 22, Utilities, NAICS).

[153] *Open Access Same-Time Information System & Standards of Conduct,* Order No. 889, FERC Stats. & Regs. ¶ 31,035 (1996) (cross-referenced at 75 FERC ¶ 61,078), *clarified,* 76 FERC ¶ 61,009 (1996), *order on reh'g,* Order No. 889–A, FERC Stats. & Regs. ¶ 31,049 (cross-referenced at 78 FERC ¶ 61,221), *reh'g denied,* Order No. 889–B, 81 FERC ¶ 61,253 (1997), *aff'd in relevant part sub nom. Transmission Access Policy Study Grp.* v. *FERC,* 225 F.3d 667 (D.C. Cir. 2000).

[154] *See Wolverine Power Supply Coop.,* 127 FERC ¶ 61,159, at P 15 (2009).

[155] *See San Diego Gas & Elec. Co.* v. *Sellers of Energy & Ancillary Servs. in Mkts. Operated by the CAISO,* 125 FERC ¶ 61,297, at P 24 (2008).

[156] Order No. 719–A, 128 FERC ¶ 61,059 at PP 51, 59–60.

[157] *See supra* P 50 (citing APPA Comments (2018 RM18–9) at 7, 9–10; APPA/NRECA Comments (RM16–23) at 39; NRECA Comments (2018 RM18–9) at 14, 26–28; TAPS Comments (RM16–23) at 15–16).

[158] *Nat'l Ass'n of Regulatory Util. Comm'rs,* 964 F.3d at 1190.

[159] *See supra* n.147.

[160] The SBA now defines small utilities based on the number of employees. 13 CFR 121.201 (establishing a threshold of 1,000 employees for electric power distribution utilities).

[161] Order No. 719–A, 128 FERC ¶ 61,059 at PP 51, 59–60.

[162] NRECA Comments (2019 RM18–9) at 4–5; TAPS Comments (RM16–23) at 16–17; TAPS Comments (2018 RM18–9) at 19 & n.27.

[163] *See* NOPR, 157 FERC ¶ 61,121 at P 13 & n.30 (citing Energy Storage Association's comment that interconnection processes can pose prohibitively high transaction costs for the small project sizes that characterize behind-the-meter storage, which creates undue burdens on behind-the-meter storage participation in most RTOs/ISOs).

part because they are not studied in the interconnection process.[164]

69. On September 5, 2019, Commission staff issued data requests to each of the six RTOs/ISOs seeking information regarding their policies and procedures that affect the interconnection of distributed energy resources. The RTOs/ISOs filed their responses in October 2019, and several commenters subsequently submitted reply comments.

a. Comments and Data Request Responses

70. Several commenters state that any final rule should make clear that the interconnection of resources on a state-jurisdictional distribution system remains the responsibility of the distribution utilities and the states.[165] The Maryland and New Jersey Commissions seek confirmation that state jurisdiction would remain unchanged as to the siting and costs associated with interconnecting resources to the distribution system, and would apply to all resources, including distributed energy resources, having or seeking interconnection or access to the wholesale market.[166] The Maryland and New Jersey Commissions request that the Commission confirm that, in the context of interconnection requests for wholesale market access, states will continue to have discretion to review distribution utility company tariffs to justify how costs are allocated or how the resources and their proposed interconnection locations benefit ultimate ratepayers.[167] The Massachusetts Commission makes similar arguments.[168]

71. In order to avoid uncertainty and litigation, Duke Energy and EEI ask for additional clarity with respect to state-versus-Commission jurisdiction affecting interconnection, distribution planning, and investments to enable distributed energy resource aggregation.[169] TAPS asks that any final rule make clear that, absent proper application of a Commission-jurisdictional Generator Interconnection Agreement, the Commission does not seek to alter or preempt local and state rules governing interconnection to the distribution system.[170] Furthermore, TAPS asserts that, given the limited circumstances in which the Commission has the authority to require interconnection to, or deliveries over, distribution facilities, the NOPR appropriately does not attempt to establish new rules or requirements governing the details of interconnection of distributed energy resources.[171]

72. As to their own interconnection procedures and experience with distributed energy resources, ISO–NE, NYISO, and PJM's data request responses reference Order Nos. 2003 and 2006 and indicate that they apply the jurisdictional test for dual-use facilities established in those orders.[172] As explained in more detail below, Order Nos. 2003 and 2006 established what some RTOs/ISOs have labeled the ''first use'' test, under which the first interconnection to a distribution facility for the purpose of making wholesale sales is not subject to Commission jurisdiction, but triggers jurisdiction for any subsequent wholesale interconnection requests to the same distribution facility.[173] MISO explains that no distributed energy resources have requested to interconnect to distribution facilities subject to the MISO tariff but indicates that it would apply the jurisdictional test in Order Nos. 2003 and 2006 in processing subsequent interconnection requests to such facilities.[174] SPP states that it would consider an interconnection to be Commission jurisdictional only if the relevant distribution facilities were under SPP's functional control, and SPP's data request response appears to indicate that, even after the first wholesale use, such distribution facilities would not be subject to its tariff.[175] CAISO states that, if a distributed energy resource plans to participate in CAISO's markets, the interconnection is Commission jurisdictional pursuant to the utility distribution company's Wholesale Distribution Access Tariff.[176]

73. In response to CAISO's data request response, SoCal Edison clarifies that every SoCal Edison distribution facility with which a new resource seeks interconnection pursuant to the Wholesale Distribution Access Tariff is already subject to an OATT for purposes of making wholesale sales.[177] Pacific Gas & Electric states that the Commission-jurisdictional Wholesale Distribution Access Tariff is not only the primary, but also should be the exclusive, means of interconnecting certain distributed energy resources that wish to export energy for purposes of participating in the wholesale markets.[178] It states that this is important because California's Rule 21, a state-jurisdictional tariff, does not currently provide a methodology to separate wholesale from retail use and

[164] *See id.* P 15 & n.32 (citing PJM's response that demand-side resources are not studied by PJM through the generation interconnection process and are not allowed to inject energy beyond the customer's meter and onto the distribution or transmission system).

[165] *See, e.g.,* IRC Comments (RM16–23) at 9–10; Massachusetts Municipal Electric Comments (RM16–23) at 4; Massachusetts State Entities Comments (2019 RM18–9) at 11; NESCOE Comments (RM16–23) at 16; TAPS Comments (RM16–23) at 15.

[166] Maryland and New Jersey Commissions Comments (RM16–23) at 2–3.

[167] *Id.* at 3.

[168] Massachusetts Commission Comments (RM16–23) at 11.

[169] Duke Energy Comments (RM16–23) at 4; EEI Comments (RM16–23) at 25.

[170] TAPS Comments (RM16–23) at 15.

[171] *Id.* at 5–9.

[172] ISO–NE Data Request Response (2019 RM18–9) at 3–4, 9–10; NYISO Data Request Response (2019 RM18–9) at 1–2; PJM Data Request Response (2019 RM18–9) at 2, 5.

[173] *Standardization of Generator Interconnection Agreements & Procedures,* Order No. 2003, 104 FERC ¶ 61,103, at P 804 (2003), *order on reh'g,* Order No. 2003–A, 106 FERC ¶ 61,220, *order on reh'g,* Order No. 2003–B, 109 FERC ¶ 61,287 (2004), *order on reh'g,* Order No. 2003–C, 111 FERC ¶ 61,401 (2005), *aff'd sub nom. Nat'l Ass'n of Regulatory Util. Comm'rs* v. *FERC,* 475 F.3d 1277 (D.C. Cir. 2007), *cert. denied,* 552 U.S. 1230 (2008); *Standardization of Small Generator Interconnection Agreements and Procedures,* Order No. 2006, 111 FERC ¶ 61,220, *order on reh'g,* Order No. 2006–A, 113 FERC ¶ 61,195 (2005), *order granting clarification,* Order No. 2006–B, 116 FERC ¶ 61,046 (2006), *corrected,* 71 FR 53,965 (Sept. 13, 2006); *see also Reform of Generator Interconnection Procedures and Agreements,* Order No. 845, 163 FERC ¶ 61,043 (2018), *errata notice,* 167 FERC ¶ 61,123, *order on reh'g,* Order No. 845–A, 166 FERC ¶ 61,137 (2019), *errata notice,* 167 FERC ¶ 61,124, *order on reh'g,* Order No. 845–B, 168 FERC ¶ 61,092 (2019). We note that Order No. 845 did not make any changes to the ''first use'' test for distribution interconnection at issue here.

[174] *See* MISO Data Request Response (2019 RM18–9) at 6–7 (''If the [distributed energy resource] interconnection customer intends to connect the [distributed energy resource] unit to facilities listed on [MISO's list of transmission facilities transferred to its functional control] or a distribution facility that provides Wholesale Distribution Service, then the Interconnection Customer is required to follow the Generator Interconnection Procedures (Attachment X) of MISO Tariff. If [the distributed energy resource] is not interconnecting to such facilities, then the interconnection customer is required to follow the interconnection rules of the Host Distribution Provider.'').

[175] *See* SPP Data Request Response (2019 RM18–9) at 2–3, 6 (''Such distribution facilities are not subject to the Tariff in this situation. The Tariff would not apply to non-jurisdictional facilities; however, there might be an obligation for the utility to coordinate with SPP regarding potential impacts to the SPP Transmission System.'').

[176] CAISO Data Request Response (2019 RM18–9) at 2–4 (explaining that ''each CAISO transmission owner that is [Commission] jurisdictional and operates distribution facilities has a Wholesale Distribution Access Tariff with the express purpose of enabling [distributed energy resources] to interconnect to the distribution grid and still participate in the CAISO wholesale markets'').

[177] SoCal Edison Comments (2019 RM18–9) at 2.

[178] Pacific Gas & Electric Comments (2019 RM18–9) at 4. It states, however, that some wholesale market-participating distributed energy resources interconnect today under California's Rule 21, a state-jurisdictional tariff. For instance, it asserts that Rule 21 applies to Qualifying Facilities (QF) that make net surplus sales under California's net metering program, which are considered qualifying sales under the Public Utilities Regulatory Policy Act (PURPA).

thus could allow bypass of retail rates for behind-the-meter distributed energy resources that both consume and export electricity for both retail and wholesale purposes.[179]

74. Pacific Gas & Electric notes that CAISO's existing Demand Response Provider participation model allows existing retail loads interconnected under state-approved tariffs to participate in wholesale markets as non-exporting Proxy Demand Response resources without the risk of bypassing retail rates.[180] Pacific Gas & Electric explains that it and CAISO can avoid the risk of retail bypass by requiring any individual distributed energy resources in a distributed energy resource aggregation that had previously interconnected as non-exporting resources under California's Rule 21 and that now wish to export electricity to participate in wholesale markets to seek a new interconnection pursuant to, or to convert their existing interconnection to an agreement under, the Wholesale Distribution Access Tariff. Pacific Gas & Electric states that this framework complies with the Commission's implementation of the jurisdictional boundaries set forth in federal law.[181]

75. AMP asserts that some of the RTO/ISO responses erroneously state that a distribution facility becomes Commission jurisdictional when a wholesale sale occurs over that distribution facility. AMP asserts that it is the wholesale transaction, not the distribution line itself, that is subject to the Commission's jurisdiction.[182] AMP also notes that RTO/ISO processes should refer to local jurisdiction and interconnection processes in addition to state processes because decision making is often done at the local level pursuant to local jurisdictional authority separate and distinct from state regulatory authority.

76. Several commenters request that the Commission revise its interconnection policy as it applies to distributed energy resources.[183] Advanced Energy Economy states that the Commission could work with relevant electric retail regulatory authorities and distribution utilities to address interconnection requirements through standard interconnection tariffs in those states where distributed energy resources are not classified as QFs under PURPA [184] and for which no retail tariff exists.[185]

77. Eversource argues that, because the participation of distributed energy resources in RTO/ISO markets could convert a previously state-jurisdictional distribution facility into a Commission-jurisdictional distribution facility and potentially necessitate hundreds or thousands of interconnection agreement filings, the Commission should revisit the interconnection agreement filing criteria for distributed energy resources and develop a process that fairly balances the administrative burden on parties with respect for Commission and state jurisdictional lines.[186] Icetec requests that the Commission reinforce the traditional bright line between Commission and state jurisdiction at the transmission–distribution boundary by confirming that relevant electric retail regulatory authorities have sole jurisdiction over the interconnection of resources to the distribution system, while ensuring that that jurisdiction may not be used to discriminatorily restrict or condition distributed energy resource participation in RTO/ISO markets.[187]

78. Advanced Energy Management requests that the Commission recognize the clear distinction between the distribution interconnection process and the wholesale market registration process.[188] Advanced Energy Management states that the Commission has authority over the criteria for wholesale market registration and participation, and that state and local regulators have authority over the criteria for a non-discriminatory distribution interconnection process that ensures that interconnecting distributed energy resources that wish to participate in the wholesale market do not create distribution reliability issues.[189] According to Advanced Energy Management, if a distributed energy resource imposes costs on the grid when it interconnects, regardless of reason, those costs can be recovered as interconnection costs under the authority of state regulators.[190]

79. Stem recommends that the Commission initiate a process to revise distribution utilities' interconnection tariffs (*e.g.,* the Wholesale Distribution Access Tariffs in California) so that (1) individual distributed energy resources, participating through an aggregator, are not required to do more than satisfy the local interconnection requirements in order to offer residual capability through the RTO/ISO markets, and (2) the tariffs accommodate the potential for coordinated dispatch of a distributed energy resource aggregation such as including limitations on aggregated behavior due to distribution system constraints, which would be communicated to the RTO/ISO as a reduced size resource during registration as a market participant.[191] Microgrid Resource Coalition similarly asserts that a responsive distributed energy resource needs to specify its expected modes of operation during the interconnection process by establishing its physical capabilities subject to any residual distribution system constraints, which will establish the limits of its ability to provide services to the grid.[192]

80. Public Interest Organizations argue that some RTO/ISO tariffs present significant barriers to distributed energy resource interconnection, particularly those that require individual distributed energy resources to complete a wholesale interconnection process.[193] Therefore, Public Interest Organizations propose that distributed energy resource interconnection be solely under retail jurisdiction, and that RTO/ISO purview over distributed energy resource aggregations be limited to market rules, and where cause is shown, for transmission system impacts.[194]

81. Some commenters contend that PJM's interconnection processes impose significant transaction costs on distributed energy resources.[195] Icetec asserts that every distributed energy resource that wishes to participate in PJM markets, no matter how small, must go through PJM's interconnection queue; that an individual residential owner must file an OATT with the Commission registering the 120 volt wiring in its house as a transmission

[179] *Id.* at 5.

[180] *Id.* at 6.

[181] *Id.* at app. A.

[182] AMP Comments (2019 RM18–9) at 2.

[183] *See, e.g.,* Advanced Energy Economy Comments (2018 RM18–9) at 19–21; Eversource Comments (2018 RM18–9) at 9–10; Icetec Comments (2018 RM18–9) at 2–3, 11.

[184] 16 U.S.C. 796(17)–(18), 824a–3.

[185] Advanced Energy Economy Comments (2018 RM18–9) at 20–21 (asserting that resources in such states have no clear path to interconnection to the distribution system and a limited ability to participate in any wholesale distributed energy resource aggregation program).

[186] Eversource Comments (2018 RM18–9) at 9–10.

[187] Icetec Comments (2018 RM18–9) at 2–3, 11.

[188] Advanced Energy Management Comments (2018 RM18–9) at 18; Advanced Energy Management Comments (2019 RM18–9) at 3.

[189] Advanced Energy Management Comments (2018 RM18–9) at 18–19; Advanced Energy Management Comments (2019 RM18–9) at 3.

[190] Advanced Energy Management Comments (2018 RM18–9) at 10.

[191] Stem Comments (2018 RM18–9) at 9–10, 15–16.

[192] Microgrid Resources Coalition Comments (2018 RM18–9) at 12.

[193] Public Interest Organizations Comments (2019 RM18–9) at 3.

[194] *Id.* at 3–4.

[195] Icetec Comments (2018 RM18–9) at 7–9; UofD/Mensah Comments (2019 RM18–9) at 2–5.

provider before a third party can apply to interconnect distributed energy resources located behind a residential meter; and that PJM refers most distribution-connected projects to distribution utilities for further study, even if the resource is already interconnected and injecting power under a distribution interconnection tariff.[196] Icetec claims that, in contrast, distribution utilities may operate distributed energy resources attached to their systems without going through RTO/ISO interconnection, which creates partially discriminatory market access by placing merchant distributed energy resource developers at a significant disadvantage relative to incumbent utilities.[197] Icetec requests that the Commission require RTOs/ISOs to accept a distributed energy resource as deliverable to the wholesale transmission system, with further studies limited to the transmission system, when it is properly connected to the distribution system under an arrangement approved by the relevant electric retail regulatory authority.[198] Icetec also asks the Commission to both allow distributed energy resources that deliver to the transmission system at a bus that is primarily load-serving to participate in wholesale markets without further transmission studies and to direct RTOs/ISOs to file tariff revisions setting procedures and timelines for interconnection studies carried out by distribution utilities for interconnection of distributed energy resources intending to participate in RTO/ISO markets.[199]

82. UofD/Mensah similarly contend that PJM's existing processes are unjust and unreasonable in light of barriers that they present to small resources that interconnect under state or local jurisdiction.[200] According to UofD/Mensah, PJM imposes a more burdensome market participation process on resources that interconnect under state or local jurisdiction than on resources that interconnect under Commission jurisdiction.[201] Specifically, they contend that PJM's Small Generator Interconnection Procedures use screens based only on the local distribution system rather than studies to assess safety and reliability, require PJM to provide interconnection customers that pass the screens an Interconnection Service Agreement within 15–20 days of the request, and only cost $500—$5,000 depending on the circumstances. They assert, however, that for non-jurisdictional interconnections, each resource must wait up to six months for the queue study process to begin and undergo a Feasibility Study and sometimes a System Impact Study, expected to take three months each, before approval. They assert that UofD was required to provide deposits totaling $27,000 for its 933 kW electric vehicle project, which is nine times the deposit that they would have been charged if the interconnection was Commission jurisdictional.

83. UofD/Mensah therefore request that the Commission align the RTO/ISO market participation process requirements for non-Commission-jurisdictional interconnections with the Commission's Small Generator Interconnection Procedures.[202] UofD/Mensah also recommend that the current distributed energy resource interconnection process be improved by permitting a subset of small, behind-the-meter resources that already have state or local interconnection approval to be automatically approved to provide wholesale services.[203] For those resources not automatically approved, UofD/Mensah recommend that the Commission limit the allowable cost and time of existing RTO/ISO processes and allow aggregations to be studied as a group. Finally, after correcting the non-Commission-jurisdictional interconnection process, UofD/Mensah recommend that the Commission consider declining to exercise its authority over the interconnection of distributed energy resources that seek to provide wholesale services or at least clarify the ''dual-use doctrine'' in specific cases so that developers need not rely on RTOs/ISOs to interpret it.[204] In response to UofD/Mensah, PJM notes that its stakeholder process is currently considering reforms designed to provide a ''fast-track'' avenue for processing energy-only resources under 2 MW.[205]

84. Advanced Energy Economy asserts that the Commission does not need to address interconnection practices in order to issue a final rule, and suggests that, if the Commission is interested in exploring a different approach for interconnection of distributed energy resources, it should do so in a separate proceeding.[206] Advanced Energy Economy also asserts that each of the RTOs/ISOs described processes that are generally consistent with the Commission's long-standing ''dual use'' policy.[207]

85. Several commenters argue that distribution interconnection requirements should address distribution-level reliability concerns that are raised by the interconnection of distributed energy resources to distribution systems.[208] Vice Chairman Place of the Pennsylvania Public Utilities Commission argues for primacy of a distribution utility's interconnection requirements in determining the eligibility of distributed energy resources to participate in distributed energy resource aggregations, and asserts that distributed energy resource aggregations may necessitate new interconnection requirements or study.[209] Vice Chairman Place asserts that distribution utilities are authorized by state regulators to protect distribution operations, and that distributed energy resources participating in aggregations will need to comply with state-level interconnection agreements.[210] FirstEnergy argues that states must address the development of distributed energy resource interconnection standards and technical requirements, and that distribution utilities are best situated to identify system issues that may affect ongoing reliable operations on local systems.[211]

86. Several commenters argue that the RTOs/ISOs should perform some sort of study of a distributed energy resource aggregation because distribution-level interconnection reviews are only a reliability and safety check for individual resources, and do not evaluate the combined impact that an aggregation would have on the system or the impact that the distributed energy resource will have on the system if it chooses to participate in an aggregation.[212] EEI, PJM Utilities Coalition, and San Diego Gas & Electric recommend that an aggregation study be done if a distributed energy resource joins an aggregation and if the composition of an aggregation changes

[196] Icetec Comments (2018 RM18–9) at 7–8.

[197] *Id.* at 8.

[198] *Id.* at 8–9.

[199] *Id.* at 9.

[200] UofD/Mensah Comments (2019 RM18–9) at 2, 4.

[201] *Id.* at 2.

[202] *Id.* at 4–5.

[203] *Id.* at 5.

[204] *Id.* at 5–6.

[205] PJM Reply Comments (2019 RM18–9) at 4.

[206] Advanced Energy Economy Comments (2019 RM18–9) at 1–2, 7–8.

[207] *Id.* at 2–3.

[208] *See, e.g.,* Advanced Energy Economy Comments (2018 RM18–9) at 17; PJM Comments (2018 RM18–9) at 18–19; Stem Comments (2018 RM18–9) at 15.

[209] Vice Chairman Place Comments (2018 RM18–9) at 2.

[210] *Id.* at 2–3.

[211] FirstEnergy Comments (2019 RM18–9) at 4–5.

[212] EEI Comments (2018 RM18–9) at 14–16; Organization of MISO States Comments (2018 RM18–9) at 8–9; San Diego Gas & Electric Comments (2018 RM18–9) at 5; SoCal Edison Comments (2018 RM18–9) at 11.

after registration.[213] TAPS agrees, and notes that, even for distribution utilities with robust generation interconnection processes that include rigorous modeling and studies, it may be impossible to anticipate and fully evaluate every possible combination of loads, resources, and distribution system configurations to determine in advance whether potential RTO/ISO and distributed energy resource aggregator dispatch decisions might have adverse impacts.[214] Similarly, NRECA asserts that an interconnection agreement with the distributed energy resource is necessary but not sufficient; NRECA argues that distribution utilities need to be able to conduct an integration study within a reasonable timeline that considers grid topology, as well as to modify their interconnection procedures to ensure third-party distributed energy resource participation in RTO/ISO markets will not create any safety, reliability or power quality concerns, and that implementation will conform with IEEE standards (such as IEEE 1547).[215] Pacific Gas & Electric concurs with the need to modify existing processes and protocols for distribution review requirements for assessing aggregation impacts and points to an ongoing collaborative process underway in California that requires additional time to complete.[216]

87. On the other hand, several commenters raise concerns about the use of distribution interconnection processes to limit participation of distributed energy resources in wholesale markets. Advanced Energy Economy argues that the distribution interconnection process should not be used as a lever to unduly limit participation in wholesale markets.[217] Similarly, Stem asserts that the Commission must prevent a distribution utility from imposing discriminatory state-level interconnection requirements that are intended to foreclose distributed energy resources from participating in the RTO/ISO markets.[218] Stem asserts that, for instance, the Commission should not allow the distribution utilities to effectively veto distributed energy resource participation in wholesale markets by unreasonably delaying necessary updates to interconnection tariffs.[219] Advanced Energy Management and Icetec agree that distributed energy resources should comply with distribution interconnection requirements, but argue that the exercise of state and local regulatory and distribution utility authority should occur prior to a distributed energy resource's registration in an RTO/ISO.[220] Specifically, they argue that state and local regulatory authorities and distribution utilities should define non-discriminatory interconnection procedures that ensure the distribution grid can accommodate distributed energy resources.[221] NRG argues that distributed energy resources should only be required to have one interconnection study and should not be subject to additional review, noting that collaboration on transmission and distribution impact studies may be necessary, and that NYISO, PJM, and CAISO are already engaged in some form of collaboration with distribution utilities on these matters.[222]

88. Several commenters argue that the relevant electric retail regulatory authorities must have discretion to allocate any distribution system-related costs incurred by utilities as a result of distributed energy resource participation in RTO/ISO markets.[223] Some commenters warn that, without proper cost allocation methods, retail customers effectively would be subsidizing wholesale market participation.[224] EEI argues that distribution utilities should not have to absorb any stranded costs if they invest in upgrades needed for distributed energy resource aggregation that are ultimately not utilized.[225] APPA and EEI argue that there is little evidence of significant demand for distributed energy resource aggregation programs, and so distribution utilities may have to invest in upgrades to the distribution system that are ultimately never needed.[226] The Indiana Commission asserts that distribution utilities may have to procure additional capacity to account for uncertainty in their forecasts regarding the amount of future distributed generation available to them.[227]

89. Other commenters argue that any cost allocation associated with a distributed energy resource aggregator participating in RTO/ISO markets would fall under the Commission's jurisdiction because the aggregator would be acting as a wholesale entity engaged in a Commission-jurisdictional transaction.[228] Hence, a few commenters suggest that, to the extent a distribution utility incurs additional costs to provide service to distributed energy resource aggregations, those costs should be recovered through a wholesale distribution tariff filed with the Commission.[229] NRECA asserts that the impact of a distributed energy resource or distributed energy resource aggregation interconnection on a host distribution utility must be considered in the interconnection process, whether under RTO/ISO procedures or state-jurisdictional procedures.[230] NRECA notes that to do so will require that cooperatives in RTO/ISO regions develop new distributed energy resource interconnection agreements and procedures.[231]

b. Commission Determination

90. For the reasons discussed below, we decline to exercise our jurisdiction over the interconnections of distributed energy resources to distribution facilities for the purpose of participating in RTO/ISO markets exclusively as part of a distributed energy resource aggregation. Thus, we will not require standard interconnection procedures and agreements or wholesale distribution tariffs for such interconnections.

91. In Order Nos. 2003 and 2006, the Commission first adopted standard interconnection procedures and agreements that apply when an interconnection customer ''that plans to engage in a sale for resale in interstate commerce or to transmit electric energy

[213] EEI Comments (2018 RM18–9) at 15–16; PJM Utilities Coalition Comments (2018 RM18–9) at 14; San Diego Gas & Electric Comments (2018 RM18–9) at 5.

[214] TAPS Comments (2018 RM18–9) at 12.

[215] NRECA Comments (2018 RM18–9) at 29, 30.

[216] Pacific Gas & Electric Comments (2018 RM18–9) at 14–15, 18.

[217] Advanced Energy Economy Comments (2018 RM18–9) at 18.

[218] Stem Comments (2018 RM18–9) at 15.

[219] *Id.* at 16.

[220] Advanced Energy Management Comments (2018 RM18–9) at 18; Icetec Comments (2018 RM18–9) at 18.

[221] Advanced Energy Management Comments (2018 RM18–9) at 18; Icetec Comments (2018 RM18–9) at 18–19.

[222] NRG Comments (2018 RM18–9) at 8–9.

[223] Vice Chairman Place Comments (2018 RM18–9) at 3; APPA Comments (2018 RM18–9) at 21; EEI Comments (2018 RM18–9) at 20; New Jersey Board Comments (2018 RM18–9) at 4.

[224] APPA Comments (2018 RM18–9) at 10; Indiana Commission Comments (2018 RM18–9) at 8; NRECA Comments (2018 RM18–9) at 12.

[225] EEI Comments (2018 RM18–9) at 20.

[226] APPA Comments (2018 RM18–9) at 10–12; EEI Comments (2018 RM18–9) at 21.

[227] Indiana Commission Comments (2018 RM18–9) at 8.

[228] Icetec Comments (2018 RM18–9) at 12 (citing *PJM Interconnection, LLC,* 149 FERC ¶ 61,185, *order on reh'g,* 151 FERC ¶ 61,231); SoCal Edison Comments (2018 RM18–9) at 6 (citing *Detroit Edison Co.,* 334 F.3d 48 (D.C. Cir. 2003)).

[229] Advanced Energy Economy Comments (2018 RM18–9) at 18 (citing Order No. 841, 162 FERC ¶ 61,127 at P 301); Icetec Comments (2018 RM18–9) at 12; Stem Comments (2018 RM18–9) at 3.

[230] NRECA Comments (2019 RM18–9) at 6–7.

[231] *Id.* at 7.

in interstate commerce'' [232] requests interconnection to the facilities of a public utility's Transmission System [233] or Distribution System [234] that, at the time that the interconnection is requested, are used either to transmit electric energy in interstate commerce or to sell electric energy at wholesale in interstate commerce pursuant to a Commission-filed OATT.[235] The Commission recognized that ''some [lower-voltage facilities] are used for jurisdictional service such as carrying power to a wholesale power customer for resale and are included in a public utility's OATT,'' and that ''in some instances, there is a separate OATT rate for using them, sometimes called a Wholesale Distribution Rate.'' [236] The Commission also noted that, with respect to a Commission-jurisdictional interconnection to a distribution facility, the cost of upgrades needed on the Distribution System to accommodate the interconnection must be directly assigned to the interconnection customer because an upgrade to the Distribution System generally does not benefit all transmission customers.[237] In Order No. 2003–C, the Commission concluded that, while it does not have the authority to directly regulate a ''local distribution'' facility that is used to transmit energy being sold at wholesale, ''the Commission may regulate the entire transmission component (rates, terms and conditions) of the wholesale transaction.'' [238]

92. In practice, Order Nos. 2003 and 2006 established what some RTOs/ISOs have labeled the ''first use'' test, under which the first interconnection to a distribution facility for the purpose of making wholesale sales is not subject to Commission jurisdiction. This is because, at the time of the request, the distribution facility is not used to transmit electric energy in interstate commerce or subject to wholesale open access under an OATT. Therefore, the first interconnecting resource ''that plans to engage in a sale for resale in interstate commerce or to transmit electric energy in interstate commerce'' [239] on a distribution facility is not required to use the transmission provider's Commission-jurisdictional Generator Interconnection Procedures or obtain a Commission-jurisdictional Generator Interconnection Agreement.[240] As a result, such interconnections are governed by the applicable state or local law.

93. However, under the ''first use'' test, subsequent interconnections of resources to the same distribution facility for the purpose of engaging in wholesale sales or transmission in interstate commerce *are* subject to Commission jurisdiction because the distribution facilities are already being used to facilitate wholesale transactions and therefore are subject to an OATT. Thus, any subsequent resources interconnecting to the same distribution facility for Commission-jurisdictional purposes (*e.g.,* to make wholesale sales in interstate commerce) must use the Commission-jurisdictional Generator Interconnection Procedures and Generator Interconnection Agreement established in Order Nos. 2003 and 2006 and later amended in Order No. 845. The United States Court of Appeals for the District of Columbia Circuit upheld this jurisdictional application as consistent with the FPA.[241]

94. The Commission adopted this limited jurisdictional approach to avoid ''allow[ing] a potential wholesale seller to cause the involuntary conversion of a facility previously used exclusively for state jurisdictional interconnections and delivery, and subject to the exclusive jurisdiction of the state, into a facility also subject to the Commission's interconnection jurisdiction,'' believing that this outcome would cross the jurisdictional line established by Congress.[242] Nevertheless, the Commission anticipated that its standard interconnection procedures and agreement terms would rarely apply to distributed generation: ''We recognize that Order No. 2003 does not apply to most distributed generation, since these facilities almost always interconnect to facilities that are not subject to an OATT.'' [243]

95. We agree with commenters that the integration of distributed energy resource aggregations into the RTO/ISO markets warrants our addressing the application of the Commission's interconnection policy to the distributed energy resource aggregations enabled by this final rule. As the Commission recognized in Order No. 792, renewable portfolio standards, state policies promoting distributed generation, and decreases in capital costs have driven a substantial increase in small generator interconnection requests.[244] In the intervening years, those trends have only intensified, further stimulating distributed energy resource development.[245] We anticipate that increased participation of distributed energy resources in RTO/ISO markets via distributed energy resource aggregations will substantially increase the number of distributed energy resource interconnections to distribution facilities for the purpose of engaging in wholesale transactions and/or transmission in interstate commerce. Such growth could increase the number of distribution-level interconnections subject to the Commission's jurisdiction. As Public Interest Organizations suggest, a large influx of distribution-level interconnections could create uncertainty as to whether certain interconnections are subject to Commission jurisdiction or state/local jurisdiction, and whether they would require the use of the Commission's

[232] Order No. 2003, 104 FERC ¶ 61,103 at P 804; *see also* Order No. 845, 163 FERC ¶ 61,043.

[233] The Commission defined ''Transmission System'' as ''[t]he facilities owned, controlled or operated by the Transmission Provider or the Transmission Owner that are used to provide transmission service under the Tariff.'' Order No. 2006, 111 FERC ¶ 61,220 at P 6.

[234] The Commission defined ''Distribution System'' as ''[t]he Transmission Provider's facilities and equipment used to transmit electricity to ultimate usage points such as homes and industries directly from nearby generators or from interchanges with higher voltage transmission networks which transport bulk power over longer distances. The voltage levels at which Distribution Systems operate differ among areas.'' *Id.* P 7.

[235] Order No. 2003, 104 FERC ¶ 61,103 at P 804; *see* Order No. 2006, 111 FERC ¶ 61,220 at P 5; *see also* Order No. 845, 163 FERC ¶ 61,043.

[236] Order No. 2003, 104 FERC ¶ 61,103 at P 803; *see also* Order No. 845, 163 FERC ¶ 61,043.

[237] Order No. 2003, 104 FERC ¶ 61,103 at P 697; *see also* Order No. 845, 163 FERC ¶ 61,043.

[238] Order No. 2003–C, 111 FERC ¶ 61,401 at P 53; *see also* Order No. 845, 163 FERC ¶ 61,043.

[239] Order No. 2003, 104 FERC ¶ 61,103 at P 804; *see also* Order No. 845, 163 FERC ¶ 61,043.

[240] *See* Order No. 2003–C, 111 FERC ¶ 61,401 at P 53; Order No. 2006, 111 FERC ¶ 61,220 at P 7*;* Order No. 845, 163 FERC ¶ 61,043; *see also PJM Interconnection, L.L.C.,* 114 FERC ¶ 61,191, at P 14, *order on reh'g,* 116 FERC ¶ 61,102 (2006).

[241] *See Nat'l Ass'n of Regulatory Util. Comm'rs* v. *FERC,* 475 F.3d at 1280–82 (''By establishing standard agreements FERC has exercised its jurisdiction over the *terms* of those relationships.'') (citing *Transmission Access Policy Study Grp.* v. *FERC,* 225 F.3d 667, 696 (D.C. Cir. 2000) (''FPA [section] 201 makes clear that *all aspects* of wholesale sales are subject to federal regulation, regardless of the facilities used.'')).

[242] Order No. 2003–C, 111 FERC ¶ 61,401 at P 51; *see also* Order No. 845, 163 FERC ¶ 61,043.

[243] Order No. 2003–A, 106 FERC ¶ 61,220 at P 739; *see also* Order No. 2006, 111 FERC ¶ 61,220 at P 8 (''Because of the limited applicability of this Final Rule, and because the majority of small generators interconnect with facilities that are not subject to an OATT, this Final Rule will not apply to most small generator interconnections.''); Order No. 845, 163 FERC ¶ 61,043.

[244] *Small Generator Interconnection Agreements & Procedures,* Order No. 792, 145 FERC ¶ 61,159, at P 23 (2013), *as modified, errata notice,* 146 FERC ¶ 61,019, *as modified, errata notice,* 148 FERC ¶ 61,215, *clarified,* Order No. 792–A, 146 FERC ¶ 61,214 (2014).

[245] *See* Public Interest Organizations Comments (2019 RM18–9) at 6–7. *See also* EIA, *August 2019 Monthly Energy Review* at Figure 7.2a, *https://www.eia.gov/totalenergy/data/monthly;* Office of Energy Projects, *Energy Infrastructure Update For July2019* at 4 (July 2019), *https://www.ferc.gov/legal/staff-reports/2019/july-energy-infrastructure.pdf*).

standard interconnection procedures and agreement.[246] It could additionally burden RTOs/ISOs with an overwhelming volume of interconnection requests.[247]

96. Given these concerns and the confluence of local, state, and federal authority over distributed energy resource interconnections, in this final rule, we decline to exercise jurisdiction over the interconnections of distributed energy resources to distribution facilities for those distributed energy resources that seek to participate in RTO/ISO markets exclusively as part of a distributed energy resource aggregation. We do not believe that requiring standard interconnection procedures and agreement terms for these interconnections is necessary to advance the objectives of Order Nos. 2003, 2006 and 845, which established standard interconnection procedures and agreements in order to prevent undue discrimination, preserve reliability, increase energy supply, lower wholesale prices for customers by increasing the number and types of new generation that would compete in the wholesale electricity market, reduce interconnection time and costs, and facilitate development of non-polluting alternative energy sources.[248] Rather, we agree with commenters that state and local authorities, which have traditionally regulated distributed energy resource interconnections, have the requisite experience, interest, and capacity to oversee these distribution-level interconnections.

97. Because we decline here to exercise our jurisdiction over the interconnection of a distributed energy resource to a distribution facility for the purpose of participating in RTO/ISO markets exclusively through a distributed energy resource aggregation, the interconnection of such a resource for the purpose of participating in a distributed energy resource aggregation would not constitute a first interconnection for the purpose of making wholesale sales under the ''first use'' test. As such, only a distributed energy resource 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. We believe that this approach will minimize any increase in the number of distribution-level interconnections subject to the Commission's jurisdiction that this final rule may cause.

98. This final rule does not require any changes to the *pro forma* Generator Interconnection Procedures or Generator Interconnection Agreements. To the extent that the jurisdictional conditions described in Order Nos. 2003 and 2006 are met, those standard interconnection procedures and agreement terms originally established in Order Nos. 2003 and 2006 and later amended by Order No. 845 will continue to apply to the interconnections of distributed energy resources that participate in RTO/ISO markets individually, independent of a distributed energy resource aggregation. This final rule also does not revise the Commission's jurisdictional approach to the interconnections of QFs that participate in distributed energy resource aggregations.[249]

99. With respect to arguments that distributed energy resources should only be required to have one interconnection study—at the distribution interconnection stage—and should not be subject to additional review in connection with the possibility of RTO/ISO market participation, and competing arguments that both distribution interconnection studies and separate distributed energy resource aggregation studies are needed when distributed energy resources join an aggregation, we believe that there could be different approaches to this issue that would work in appropriate circumstances. We therefore decline to create new universal requirements or initiate a process to standardize tariffs with respect to these matters at this time. In response to increased demand for distributed energy resource aggregations for wholesale market participation, some state or local authorities may choose to voluntarily update their distribution interconnection processes to assess the impacts of distributed energy resource aggregations on the distribution system at the initial interconnection stage, while other state and local authorities may not. In the latter scenario, it may be both necessary and appropriate for the RTO/ISO, in coordination with affected distribution utilities, to conduct separate studies of the impact on the distribution system after a distributed energy resource joins a distributed energy resource aggregation. Moreover, as the individual distributed energy resources in an aggregation may change over time,[250] we cannot discount the possibility that the electrical characteristics of the aggregation will change significantly enough to require restudy. In practice, we expect that modifications to the list of resources in a distributed energy resource aggregation could occasionally indicate changes to the electrical characteristics of the distributed energy resource aggregation that are significant enough to potentially adversely impact the reliability of the distribution or transmission systems and justify restudy of the full distributed energy resource aggregation; therefore, RTOs/ISOs and distribution utilities may perform such aggregation restudies if necessary. Similarly, while the interconnections of distributed energy resources seeking to participate in RTO/ISO markets as part of a distributed energy resource aggregation would be subject to state or local interconnection procedures, we believe that coordination between RTOs/ISOs and distribution utilities, as discussed in Section IV.H below, should ensure that RTOs/ISOs have the information that they need to study the impact of the aggregations on the transmission system. In general, where needed, such studies of the impact of an aggregation as a whole on the transmission system should be the only aggregation-related studies that the RTO/ISO needs to undertake.[251]

100. In response to the comments of Advanced Energy Economy, we decline to require standard interconnection tariffs in those states where no retail tariff exists for distributed energy resources that are not QFs under PURPA. We believe that such a situation should be addressed at the state level, as discussed above.

101. While some commenters raise concerns that declining to create new

[246] Public Interest Organizations Comments (2019 RM18–9) at 9.

[247] *Id.* at 5.

[248] *See* Order No. 2003, 104 FERC ¶ 61,103 at P 1; Order No. 2006, 111 FERC ¶ 61,220 at P 1; Order No. 845, 163 FERC ¶ 61,043; *see also New York* v. *FERC,* 535 U.S. 1, 26–27 (2002) (upholding the Commission's discretion to issue a tailored remedy where ''the remedy it ordered constituted a sufficient response to the problems . . . identified in the wholesale market''). In issuing Order Nos. 2003 and 2006, the Commission acknowledged that their requirements would rarely apply to the interconnections of distributed energy resources. *See* Order No. 2003–A, 106 FERC ¶ 61,220 at P 739; Order No. 2006, 111 FERC ¶ 61,220 at P 8; Order No. 845, 163 FERC ¶ 61,043.

[249] *See* Order No. 2003, 104 FERC ¶ 61,103 at PP 813–815; Order No. 2006, 111 FERC ¶ 61,220 at PP 516–518; Order No. 845, 163 FERC ¶ 61,043.

[250] *See infra* Section IV.I (Modifications to List of Resources in Aggregation).

[251] However, as explained earlier, RTOs/ISOs may still need to study individually those distributed energy resources intending to individually participate in RTO/ISO markets rather than through aggregations.

universal distribution interconnection requirements or initiate a process to standardize distribution interconnection tariffs could result in uncertainty and delay, or could be used to unduly limit participation of distributed energy resource aggregations in wholesale markets, we believe that such concerns are speculative at this time. In this regard, we note that, while we are herein declining to exercise jurisdiction over the interconnections of distributed energy resources to distribution facilities for the purpose of participating in distributed energy resource aggregations, the Commission may revisit this policy decision in the future, should we discover abuses of the distribution interconnection process or the rise of unnecessary barriers to the participation of distributed energy resource aggregations in RTO/ISO markets.

102. With respect to the related arguments that the distribution interconnection process and the distributed energy resource aggregation registration process are separate but require coordination, we agree, and believe that the coordination requirements discussed in Section IV.H of this final rule appropriately address this need.

103. Although we find it appropriate to decline to exercise jurisdiction over the interconnections of distributed energy resources intending to participate in RTO/ISO markets exclusively through a distributed energy resource aggregation, we recognize that such distributed energy resources may already have interconnected pursuant to procedures that were accepted by the Commission prior to the effective date of this final rule. Therefore, to minimize disruption to existing interconnection agreements for distributed energy resources, we are not requiring distributed energy resources that already interconnected under Commission-jurisdictional procedures to convert to state or local interconnection agreements.

104. Accordingly, in its compliance filing, we require each RTO/ISO to make any necessary tariff changes to reflect the guidance above.

B. Definitions of Distributed Energy Resource and Distributed Energy Resource Aggregator

1. NOPR Proposal

105. In the NOPR, the Commission proposed to define a distributed energy resource as ''a source or sink of power that is located on the distribution system, any subsystem thereof, or behind a customer meter.'' [252] The Commission added that these resources may include, but are not limited to, electric storage resources, distributed generation, thermal storage, and electric vehicles and their supply equipment. The Commission proposed to define a distributed energy resource aggregator as ''an entity that aggregates one or more distributed energy resources for purposes of participation in the capacity, energy and ancillary service markets of the regional transmission operators and independent system operators.'' [253]

2. Comments

106. Several commenters raise concerns with the proposed definition of distributed energy resource. EEI suggests that the Commission use a term besides ''source or sink of power'' to reflect the Commission's desire to include all electric devices that can produce or consume energy because a source or sink is a location and not a resource.[254] AES Companies, MISO Transmission Owners, and NYISO Indicated Transmission Owners seek clarification whether the definition of distributed energy resources includes resources that are behind and in front of the meter. AES Companies explain that it is not out of the ordinary for resources such as solar or batteries to be interconnected at the distribution system but not behind the meter, and NYISO Indicated Transmission Owners state that aggregations of front-of-the-meter distributed energy resources should be able to elect to participate in wholesale markets as part of a distributed energy resource aggregation.[255]

107. NYISO Indicated Transmission Owners caution that, while a general definition of a distributed energy resource is appropriate, rules for elective participation in RTO/ISO markets may still require individual classifications for types of distributed energy resources because differences in their capabilities may warrant specific operational, reliability, and compensation considerations.[256] NYISO points out that it has a broader definition of distributed energy resource than that proposed in the NOPR and therefore asks the Commission to permit regional flexibility to allow NYISO to fashion rules and market designs that meet its needs while still achieving the Commission's goal of integrating distributed energy resources into the wholesale markets.[257] NYISO notes that it has also proposed to allow small aggregations of community distributed generation to provide wholesale market services as distributed energy resources.[258] NRG encourages the Commission to direct the RTOs/ISOs to use a definition of distributed energy resources based on technology-neutral principles, including the capability to provide load curtailment, load consumption or charging, injection, and ancillary services (*e.g.,* regulation, reserves, and flexible ramping services).[259] According to NRG, regulatory authorities may differ in their definition of distributed energy resources, but generally reference their ability to ''generate and inject power into the distribution and/or transmission systems.'' Thus, NRG states, distributed energy resources should be defined as a class of assets that can both inject and curtail electricity.[260]

108. EEI asks the Commission to clarify the types of distributed energy resources that qualify as ''thermal storage,'' noting that if the thermal energy cannot be readily transformed into electric energy, then the storage device cannot be used as an electric resource.[261] Public Interest Organizations seek clarification that thermal storage includes, but is not limited to, both grid-enabled water heaters and grid-enabled thermostats, which can precool or preheat to avoid energy usage during peak demand, make and store ice to use as air conditioning, and direct control of smart-home energy management.[262]

109. Some commenters seek to capture a broad range of distributed

[252] NOPR, 157 FERC ¶ 61,121 at PP 1 n.2, 104.

[253] *Id.* P 5 n.13.

[254] EEI Comments (RM16–23) at 16 n.23.

[255] AES Companies Comments (RM16–23) at 40–41; NYISO Indicated Transmission Owners Comments (RM16–23) at 13.

[256] NYISO Indicated Transmission Owner Comments (RM16–23) at 15.

[257] NYISO Comments (RM16–23) at 11 (stating it defines distributed energy resource as ''a resource, or a set of resources, typically located on an end-use customer's premises that can provide wholesale market services but are usually operated for the purpose of supplying the customer's electric load''). We note that, on January 23, 2020, the Commission accepted NYISO's proposed tariff revisions related to aggregations, including its proposal to define Distributed Energy Resource as: (i) A facility comprising two or more Resource types behind a single point of interconnection with an Injection Limit of 20 MW or less; or (ii) a Demand Side Resource; or (iii) a Generator with an Injection Limit of 20 MW or less, that is electrically located in the [New York Control Area]. NYISO Aggregation Order, 170 FERC ¶ 61,033; *see* NYISO, NYISO Tariffs, NYISO MST, Section 2.4 MST Definitions—D (15.0.0).

[258] NYISO Comments (RM16–23) at 11.

[259] NRG Comments (2018 RM18–9) at 3.

[260] *Id.* at 5–6.

[261] EEI Comments (RM16–23) at 16 n.23.

[262] Public Interest Organizations Comments (RM16–23) at 15–16 & nn.45–46.

energy resources in the definition. Advanced Energy Economy asks the Commission to revise the definition to explicitly include energy efficiency and demand response resources of all types as well as ''customer site[s] capable of demand reduction.'' [263] Other commenters also request or support including energy efficiency resources in the definition of distributed energy resource.[264] NYISO Indicated Transmission Owners request clarification that intermittent generation may be considered a distributed energy resource, which can be aggregated into dispatchable distributed energy resource aggregations.[265] They add that certain behind-the-meter intermittent generation may not be a distributed energy resource if it participates in a distribution utility's net metering or other program regarding which the Commission has clarified that the resource is not engaging in a wholesale sale for jurisdictional purposes.[266]

110. Advanced Energy Management requests that the Commission clarify that its definition of distributed energy resources includes demand response resources, or that demand response resources can choose to participate in distributed energy resource participation models where they are a better fit.[267]

111. Commenters ask for assurance that the NOPR does not change existing demand response rules, and that resources currently participating as demand response could continue to do so, even if they would fall under the definition of a distributed energy resource.[268] They note that certain reforms may drive existing, low-cost commercial and industrial demand response from the market.[269] Advanced Energy Management argues that the NOPR may be more applicable to newer forms of distributed energy resources that currently are not accommodated by a demand response model and that the demand response model should not be changed.[270]

112. PJM, however, states that it does not view energy efficiency or load curtailment as distributed energy resources, based upon PJM's distinction between its existing and robust participation models for energy efficiency and demand response.[271] To limit disruption to its models, PJM distinguishes distributed energy resources by limiting them to generation and electric storage resources capable of injecting energy onto the distribution system.[272]

113. A few commenters discuss the definition of a distributed energy resource aggregator. E4TheFuture supports the Commission's proposal to require each RTO/ISO to revise its tariff to define distributed energy resource aggregators as a type of market participant.[273] Efficient Holdings asks the Commission to create a universal and comprehensive market participant definition for distributed energy resource aggregators that would be flexible enough to incorporate emerging technologies and provide these resources the same ability to offer multiple products afforded to large scale generators.[274] MISO Transmission Owners also assert that the term ''distributed energy resource aggregator'' should be formally defined; in addition, they ask whether that term is inclusive of behind- and front-of-the-meter products and whether a utility could bid its existing demand response peak shaving assets into the market as a distributed energy resource aggregator.[275] Advanced Energy Management requests clarification on the distinction between demand response and distributed energy resource aggregators, arguing that the former should consist of behind-the-meter resources that participate only in the demand response framework, while the latter could be either behind- or front-of-the-meter resources and participate in any model.[276]

3. Commission Determination

114. Upon consideration of the comments received, we modify the definition of distributed energy resource proposed in the NOPR. Specifically, we amend § 35.28(b) of the Commission's regulations to define a distributed energy resource as ''any resource located on the distribution system, any subsystem thereof or behind a customer meter.'' These resources may include, but are not limited to, resources that are in front of and behind the customer meter, electric storage resources, intermittent generation, distributed generation, demand response, energy efficiency, thermal storage, and electric vehicles and their supply equipment—as long as such a resource is ''located on the distribution system, any subsystem thereof or behind a customer meter.'' [277] The revised definition of distributed energy resource that we adopt in this final rule is technology-neutral, thereby ensuring that any resource that is technically capable of providing wholesale services through aggregation is eligible to do so, which enhances competition in the RTO/ISO markets and, in turn, helps to ensure that these markets produce just and reasonable rates.[278]

115. In response to Advanced Energy Economy's request, we clarify that energy efficiency and demand response resources are capable of providing demand reductions at customer sites, and therefore ''customer sites capable of demand reduction'' may meet the definition of a distributed energy resource.[279] In response to requests for regional flexibility, we further note that RTOs/ISOs can propose their own definitions for the Commission's evaluation as long as the scope and applicability of the proposed definitions are consistent with the Commission's definition of distributed energy resource and consistent with all aspects of this final rule.

116. We find that the NOPR proposal to define a distributed energy resource as a source or sink of power risked creating unnecessary confusion because it was not clear as to which resources could qualify and the definition inadvertently excluded some resources

[263] Advanced Energy Economy Comments (RM16–23) at 21.

[264] E4TheFuture Comments (RM16–23) at 1; Efficient Holdings Comments (RM16–23) at 6–7; Public Interest Organizations Comments (RM16–23) at 15–16.

[265] NYISO Indicated Transmission Owners Comments (RM16–23) at 15.

[266] *Id.* at n.17.

[267] Advanced Energy Management Comments (RM16–23) at 8–10.

[268] Advanced Energy Economy Comments (RM16–23) at 50–51 (noting that existing market rules recognize a distinction between demand response and distributed energy resource aggregations, such as in CAISO, where there are separate programs for exporting distributed energy resources and non-exporting distributed energy resources that operate as demand response); Advanced Energy Management Comments (RM16–23) at 6 (noting specifically the reforms in Section III.B.4 of the NOPR for distributed energy resource aggregators as it applies to commercial and industrial demand response); IRC Comments (RM16–23) at 7; PJM Comments (RM16–23) at 6.

[269] Advanced Energy Management Comments (RM16–23) at 7.

[270] *Id.* at 6–8.

[271] PJM Comments (2018 RM18–9) at 1.

[272] *Id.* at 2.

[273] E4TheFuture Comments (RM16–23) at 2.

[274] Efficient Holdings Comments (RM16–23) at 7.

[275] MISO Transmission Owners Comments (RM16–23) at 17–18.

[276] Advanced Energy Management Comments (RM16–23) at 6.

[277] As discussed further in Section IV.C.2 below, we find that RTOs/ISOs may not prohibit any particular type of distributed energy resource technology from participating in distributed energy resource aggregations. We note that the types of thermal storage described by EEI and Public Interest Organizations may qualify as demand response or energy efficiency resources under RTO/ISO market rules.

[278] *See infra* Section IV.C.2 (Types of Technologies).

[279] *See* Advanced Energy Economy Comments (RM16–23) at 21.

that could be aggregated to sell energy, capacity, or ancillary services. The revised definition of distributed energy resource is intended to be broad enough to encompass current and future technologies that qualify as distributed energy resources with no further need to clarify or revise the definition as new technologies are developed.

117. As discussed further below in Sections IV.C, IV.F, and IV.H, we clarify that distributed energy resource aggregations must be able to meet the qualification and performance requirements to provide the service that they are offering into RTO/ISO markets. For example, because a type of resource like energy efficiency cannot be dispatched, metered, or telemetered, it would likely be impossible for distributed energy resource aggregations comprised exclusively of energy efficiency resources to be able to provide energy or ancillary services to the RTOs/ISOs because the aggregation would not be technically capable of providing those services.

118. We also adopt a modified definition of distributed energy resource aggregator than was proposed in the NOPR, and therefore amend § 35.28(b) of the Commission's regulations to define a distributed energy resource aggregator as ''the entity that aggregates one or more distributed energy resources for purposes of participation in the capacity, energy and/or ancillary service markets of the regional transmission organizations and/or independent system operators.'' [280] We clarify that, because demand response falls under the definition of distributed energy resource, an aggregator of demand response could participate as a distributed energy resource aggregator. However, this final rule does not affect existing demand response rules.

C. Eligibility To Participate in RTO/ISO Markets Through a Distributed Energy Resource Aggregator

1. Participation Model

a. NOPR Proposal

119. In the NOPR, the Commission proposed to require each RTO/ISO to revise its tariff as necessary to allow distributed energy resource aggregators to offer to sell capacity, energy, and ancillary services in RTO/ISO markets.[281] Specifically, the Commission proposed to require that each RTO/ISO revise its tariff to define distributed energy resource aggregators as a type of market participant that can participate in RTO/ISO markets under the participation model that best accommodates the physical and operational characteristics of its distributed energy resource aggregation. The Commission explained that this means that the distributed energy resource aggregator would register as, for example, a generation asset if that is the participation model that best reflects its physical characteristics.[282] The Commission stated that, while it expects efficiencies to be gained by allowing distributed energy resource aggregations to participate under existing participation models, it also acknowledges that the use of existing participation models may not be possible in every RTO/ISO based on how market participation is structured. However, the Commission emphasized that, where participation under existing participation models is possible, the distributed energy resource aggregation must still satisfy the eligibility requirements of the applicable participation model before it can participate in RTO/ISO markets under that participation model. Therefore, to accommodate the participation of distributed energy resource aggregations, the Commission proposed that each RTO/ISO modify the eligibility requirements for existing participation models as necessary to allow for such participation.

b. Comments

120. Several commenters assert that a new participation model for distributed energy resource aggregations is necessary.[283] The Ohio Commission, Tesla/SolarCity, and Public Interest Organizations support the Commission's efforts to require each RTO/ISO to modify its tariff to provide a participation model for distributed energy resource aggregators.[284] AES Companies explain that a new and separate participation model is necessary to facilitate market participation of distributed energy resource aggregations due to their unique impacts on the bulk electric system and state-jurisdictional considerations.[285] Stem also asserts that each RTO/ISO needs to implement a model that accommodates behind-the-meter exporting resources or, if that is impractical, to implement a model in which behind-the-meter non-exporting resources can fully participate.[286] Microgrid Resources Coalition notes its support for allowing aggregations of behind-the-meter distributed energy resources to participate fully and notes that it is important to allow for the participation of distributed energy resources that have flexible controllable output.[287]

121. Commenters offer a range of views regarding how distributed energy resource aggregations should be treated under an RTO's/ISO's participation model. Some commenters suggest that when acting as a generator, distributed energy resource aggregations should be treated like any generator.[288] Other commenters focus on the need for clarity around what services distributed energy resources will be allowed to provide and how they can be aggregated.[289] For example, Xcel Energy Services contends that distributed energy resources will likely not have firm transmission service and may not be able to deliver services to the system that depend on firm transmission such as capacity or black start capability.[290] Some commenters argue that an aggregation of distributed energy resources should be treated as a single resource by the wholesale market operator, noting that this would reduce barriers and may improve performance.[291] Other commenters similarly support the ability of an aggregator to transact directly in the wholesale market without a load serving entity or electric distribution company as agent.[292]

122. Some commenters posit that the Commission should allow the

[280] As discussed further in Section IV.C.6, consistent with Order No. 719, we require each RTO/ISO to allow a single qualifying distributed energy resource to serve as its own distributed energy resource aggregator. *See* Order No. 719, 125 FERC ¶ 61,071 at P 158(d) (''An [aggregator of retail customers] can bid demand response either on behalf of only one retail customer or multiple retail customers.'').

[281] NOPR, 157 FERC ¶ 61,121 at P 124.

[282] *Id.* P 128.

[283] *See, e.g.,* Microsoft Comments (2018 RM18–9) at 15; NRG Comments (2018 RM18–9) at 4.

[284] Ohio Commission Comments (RM16–23) at 4; Public Interest Organizations Comments (RM16–23) at 21; Tesla/SolarCity Comments (RM16–23) at 20.

[285] AES Companies Comments (RM16–23) at 32 (noting that, because the proposed definition of a distributed energy resource aggregation includes resources that are both a source and a sink, the aggregation can be a distributed generation entity or a micro grid (includes generation, load, and distribution lines)).

[286] Stem Comments (RM16–23) at 12–13.

[287] Microgrid Resources Coalition Comments (2018 RM18–9) at 3, 4–5.

[288] NYISO Comments (RM16–23) at 13; PJM Comments (RM16–23) at 5–6.

[289] AES Companies Comments (RM16–23) at 39; Avangrid Comments (RM16–23) at 10; Tesla/SolarCity Comments (RM16–23) at 20; Xcel Energy Services Comments (RM16–23) at 12–13.

[290] Xcel Energy Services Comments (RM16–23) at 12–13.

[291] Advanced Microgrid Solutions Comments (RM16–23) at 7; NRG Comments (RM16–23) at 10; Stem Comments (RM16–23) at 5; Tesla/SolarCity Comments (RM16–23) at 20–21.

[292] Mosaic Power Comments (RM16–23) at 5.

distributed energy resource aggregator to determine the participation model for distributed energy resource aggregations based on the characteristics of the aggregation as a whole, even if it includes diverse technologies,[293] and that aggregators should be able to define the capabilities of the resources in their aggregations.[294] Some commenters stress the importance of allowing diverse technologies (*e.g.,* solar, storage, and demand response) [295] to be in the same aggregation, while others argue that entities that own multiple distributed energy resources should be allowed to participate in more than one aggregation.[296] Stem asserts that, if behind-the-meter resources are directed to an existing participation model, then the Commission should require a detailed review to show that the existing model does not discriminate against the capabilities of new resources.[297]

123. Advanced Energy Management states that, if an end-use customer is capable of curtailing load and discharging a battery located behind its meter, it is unclear whether the customer's distributed energy resource aggregator could aggregate both the storage and load curtailment into the same resource. Advanced Energy Management also states that it would be inefficient to have the same customer participate as part of two different resources or through two unnecessarily separate participation models.[298] MISO Transmission Owners request clarity on the interplay between the rules that apply to storage and the rules that apply to distributed energy resources, noting that some resources may fall into both categories, and any potential conflicts should be resolved. For example, MISO Transmission Owners seek clarity on whether an aggregator of electric vehicles is considered storage or a distributed energy resource aggregator, or both.[299]

124. Microgrid Resources Coalition argues that RTOs/ISOs should allow aggregators to bid their resources together or separately as demand response and delivered power.[300] Energy Storage Association also argues that any final rule should account for distributed energy resources' provision of bi-directional services,[301] and Icetec asserts that a participation model should allow sites that mix load reductions and distributed energy resources to offer their combined capacity as a single market resource.[302] Microgrid Resources Coalition also argues that distributed energy resource aggregations, particularly microgrids, do not fit neatly into existing participation models or the new participation model for electric storage resources proposed in the NOPR.[303]

125. Other commenters recommend that the Commission require the RTOs/ISOs to incorporate sufficient flexibility into their participation models. Public Interest Organizations suggest that, in order to take advantage of distributed energy resources' ability to absorb excess electricity, shift load, and reinject electricity onto the grid at peak times, participation models should be flexible and enable resources to act as demand-side resources and/or as generation and should not require resources to choose one participation model exclusively.[304] Efficient Holdings similarly contends that participation models should not force distributed energy resources to choose between individual categories of services to offer into the market at any given time.[305] NYISO Indicated Transmission Owners request that energy-only distributed energy resource aggregations be allowed in the distributed energy resource participation model, and consistent with existing practice for other energy-only resources, should not be required to offer in the day-ahead market and should be permitted in both the day-ahead and real-time markets.[306] NYISO also asks the Commission to permit regional flexibility that would allow NYISO to create rules and market designs that meet its needs while meeting the Commission's desire to integrate distributed energy resources into the wholesale energy, ancillary service, and capacity markets.[307]

126. New York State Entities ask the Commission to grant RTOs/ISOs the flexibility to devise participation models that reflect market conditions and ongoing initiatives such as those described in NYISO's Distributed Energy Resource Roadmap.[308] New York State Entities highlight that NYISO is attempting to harmonize the developing wholesale market enhancements with the complementary retail programs emerging from New York's Reforming the Energy Vision initiative.[309]

127. Some commenters note that the RTOs/ISOs need new and revised market rules to incorporate distributed energy resources, but not necessarily a new participation model.[310] ISO–NE argues that a new participation model would be costly and disruptive and create no additional value because distributed energy resources can monetize their value to the grid through several existing avenues.[311]

128. Advanced Energy Management argues that a final rule should not require RTOs/ISOs to replace their existing programs, such as demand response programs.[312] Icetec argues, however, that existing ''interconnected generation'' models and demand response models are not sufficient for distributed energy resource participation, and states that capacity market requirements for year-round performance in PJM prevent distributed energy resources from offering their full capacity value.[313] Tesla argues that, regardless of model, distributed energy resources should receive comparable compensation.[314]

c. Commission Determination

129. In this final rule, we adopt the NOPR proposal to require each RTO/ISO to have tariff provisions that allow

[293] Advanced Energy Economy Comments (RM16–23) at 21.

[294] Microgrid Resources Coalition Comments (RM16–23) at 6.

[295] Advanced Energy Economy Comments (RM16–23) at 21.

[296] NextEra Comments (RM16–23) at 14; Public Interest Organizations Comments (RM16–23) at 16.

[297] Stem Comments (RM16–23) at 13.

[298] Advanced Energy Management Comments (RM16–23) at 9.

[299] MISO Transmission Owners Comments (RM16–23) at 20.

[300] Microgrid Resources Coalition Comments (2018 RM18–9) at 8.

[301] Energy Storage Association Comments (2018 RM18–9) at 2.

[302] Icetec Energy Services Comments (2018 RM18–9) at 6.

[303] Microgrid Resources Coalition Comments (RM16–23) at 5–6 (noting that demand response participation models that are based on shutting down an industrial process or activating a seldom used generator are not appropriate for resources like a microgrid that uses multiple conventional and unconventional resources to manage multiple loads of varying flexibility and is optimized by sophisticated controls).

[304] Public Interest Organizations Comments (RM16–23) at 19.

[305] Efficient Holdings Comments (RM16–23) at 7–8.

[306] NYISO Indicated Transmission Owners Comments (RM16–23) at 10–11 (citing *Cal. Indep. Sys. Operator Corp.,* 155 FERC ¶ 61,229 at P 11 (accepting CAISO model that allows intermittent resources to participate in a dispatchable aggregation)).

[307] NYISO Comments (RM16–23) at 11.

[308] New York State Entities Comments (RM16–23) at 12, 13 (citing *Distributed Energy Resources Roadmap for New York's Wholesale Electricity Markets,* (January 2017), New York Independent System Operator, Inc.) (Distributed Energy Resource Roadmap); *see supra* note 21.

[309] New York State Entities Comments (RM16–23) at 13 (citing Distributed Energy Resource Roadmap at 4–6).

[310] Advanced Energy Economy Comments (2018 RM18–9) at 5–6; Advanced Energy Management Comments (2018 RM18–9) at 3; Icetec Energy Comments (2018 RM18–9) at 3–4, 6; NYISO Indicated Transmission Owners Comments (2018 RM18–9) at 5.

[311] ISO–NE Comments (2018 RM18–9) at 2–4.

[312] Advanced Energy Management Comments (2018 RM18–9) at 3.

[313] Icetec Comments (2018 RM18–9) at 5

[314] Tesla Comments (2018 RM18–9) at 1, 9.

distributed energy resource aggregations to participate directly in RTO/ISO markets. We conclude that existing participation models may create barriers to the participation of distributed energy resource aggregators in RTO/ISO markets by limiting the operation of distributed energy resource aggregations and the services that they may be eligible to provide.

130. We therefore adopt the NOPR proposal to add § 35.28(g)(12)(i) to the Commission's regulations and require each RTO/ISO to establish distributed energy resource aggregators as a type of market participant and to allow distributed energy resource aggregators to register distributed energy resource aggregations under one or more participation models in the RTO's/ISO's tariff that accommodate the physical and operational characteristics of the distributed energy resource aggregation. However, upon consideration of the comments, we modify the NOPR proposal to provide each RTO/ISO with greater flexibility to determine how best to revise the participation models set forth in its market rules to facilitate the participation of distributed energy resource aggregations. Specifically, to meet the goals of the final rule, each RTO/ISO can comply with the requirement to allow distributed energy resource aggregators to participate in its markets by modifying its existing participation models to facilitate the participation of distributed energy resource aggregations, by establishing one or more new participation models for distributed energy resource aggregations, or by adopting a combination of those two approaches. The Commission will evaluate each proposal submitted on compliance to determine whether it meets the goals of this final rule to allow distributed energy resources to provide all services that they are technically capable of providing through aggregation.

131. This approach will provide each RTO/ISO with the flexibility to facilitate the participation of distributed energy resource aggregations in its markets in a way that is efficient and cost-effective as well as fits the market design of the RTO/ISO. Permitting each RTO/ISO to create one or more new participation models for distributed energy resources addresses commenter concerns about the limitations of existing models. Likewise, permitting each RTO/ISO to modify existing participation models, instead of requiring creation of one or more new participation models, addresses commenter concerns that creating a new participation model may be too costly or disruptive, or that existing models do not need to be replaced.

132. Providing RTOs/ISOs with the flexibility to determine whether to modify existing participation models, create one or more new participation models, or use a combination of existing and new participation models will allow each RTO/ISO to reflect varying regional needs in its approach to allow distributed energy resource aggregators to participate in its markets.

2. Types of Technologies

a. NOPR Proposal

133. In the NOPR, the Commission stated that distributed energy resources may include, but are not limited to, electric storage resources, distributed generation, thermal storage, and electric vehicles and their supply equipment.[315] The Commission also preliminarily found that limiting the types of technologies that are allowed to participate in the RTO/ISO markets through distributed energy resource aggregators would create a barrier to entry for emerging or future technologies, potentially precluding them from being eligible to provide all of the capacity, energy and ancillary services that they are technically capable of providing.[316] The Commission stated that, while some individual resources or certain technologies may not be able to meet the qualification or performance requirements to provide services to the RTO/ISO markets on their own, they may satisfy such requirements as part of a distributed energy resource aggregation where resources complement one another's capabilities. The Commission further stated that combining electric storage resources with distributed generation could allow the aggregate resource to achieve performance requirements (such as minimum run times) that an electric storage resource could not meet on its own and provide services (such as regulation) that distributed generation may not be able to provide on its own.[317]

134. In the NOPR, the Commission proposed to require that each RTO/ISO revise its tariff so that it does not prohibit the participation of any particular type of technology in the RTO/ISO markets through a distributed energy resource aggregator.[318] This was to help ensure that the market rules that RTOs/ISOs develop to comply with any final rule issued in this proceeding were sufficiently flexible to accommodate the participation of new distributed energy resources as technology evolves, and to acknowledge the potential that a distributed energy resource may meet qualification or performance requirements by participating in a distributed energy resource aggregation that it cannot on its own. The Commission stated, however, that, to the extent that existing rules or regulations explicitly prohibit certain technologies from participating in RTO/ISO markets, it did not intend to overturn those rules or regulations.

b. Comments

135. Several commenters support the Commission's proposal not to prohibit the participation of any particular type of technology in RTO/ISO markets through a distributed energy resource aggregation.[319] Generally, they state that it is important for the market rules to be resource neutral, allowing other attributes such as cost, quality, flexibility, and other attributes sought by market participants, to dictate which resources can successfully participate in RTO/ISO markets. They assert that resource neutrality reduces risk for investment in new technologies and preserves flexibility for the participation of future technologies and avoid unnecessary barriers to entry.

136. Several commenters argue that distributed energy resource aggregation participation models must allow a variety of technology configurations. Efficient Holdings argues that third party aggregators of behind-the-meter resources must have better access to the markets, which can be achieved through reforms including refined product definitions, reduction of burdensome and expensive operational requirements, and rules to address distribution utility non-compliance, embracing the broadest array of technologies possible.[320] Energy Storage Association and Stem seek to ensure that front-of-the-meter resources, behind-the-meter exporting and non-exporting resources, and heterogeneous groups of resources are all able to participate in distributed energy

[315] NOPR, 157 FERC ¶ 61,121 at P 104; *see supra* Section IV.B. (Definitions of Distributed Energy Resource and Distributed Energy Resource Aggregation).

[316] NOPR, 157 FERC ¶ 61,121 at P 133.

[317] *Id.* P 133 n.231.

[318] *Id.* P 133.

[319] *See, e.g.,* AES Companies (RM16–23) at 32–33; CAISO Comments (RM16–23) at 23; City of New York Comments (RM16–23) at 8; Massachusetts Commission Comments (RM16–23) at 8–10; R Street Institute Comments (RM16–23) at 8.

[320] Efficient Holdings Comments (RM16–23) at 7–9.

resource aggregations.[321] Stem states that it is reasonable to restrict the mixing of front-of-the-meter, behind-the-meter exporting, and behind-the-meter non-exporting resources within a single aggregation.[322]

137. Commenters also note that allowing distributed energy resource aggregations to include multiple types of distributed technologies allows multi-technology aggregations such as microgrids and complementary resources such as solar and storage to participate in RTO/ISO markets, will provide RTOs/ISOs another source of flexible controllable output. CAISO states that, consistent with the Commission's proposal, its Commission-approved Distributed Energy Resource Provider model allows aggregations to consist of different distributed energy resource types.[323] AES Companies encourage the Commission to review the validity of any prohibitions on the participation of existing technologies (*i.e.,* rules currently exist prohibiting certain types of resources in the tariffs for direct market participation) in a separate docket rather than in this proceeding.[324]

138. In contrast, some commenters express general concerns about aggregations that include different types of technologies.[325] American Petroleum Institute contends that aggregating different types of distributed energy resources will make market optimization more difficult.[326] TAPS urges the Commission to give RTOs/ISOs discretion, claiming that combining multiple types of distributed energy resources within a single aggregation may be beneficial but could pose issues when determining locational and minimum size requirements for mixed aggregations.[327]

139. Several commenters state that RTOs/ISOs will need flexibility to avoid imposing additional costs or barriers to entry on different types and configurations of prospective distributed energy resource aggregations.[328] SPP argues that managing an aggregation as a discrete set of different assets may be infeasible in commitment and dispatch and that sub-categorizing different types of distributed energy resources within a single aggregation would be extremely complex.[329] PJM Market Monitor states that distributed generation and distributed storage should not be mixed within aggregations and that resources should be aggregated by type for each wholesale market node. For example, according to PJM Market Monitor, distributed generation should be aggregated, at the same node with other distributed generation, while distributed storage should be aggregated at the same node with other distributed storage.[330]

140. ISO–NE also asks for flexibility and provides several arguments as to why certain heterogeneous aggregations are not desirable.[331] More specifically, ISO–NE argues that (1) demand-side load resources should only be allowed to participate in aggregations with other load because of how certain charges and credits are allocated to load; [332] (2) electric storage resources would not benefit from participating in aggregations with non-storage distributed energy resources because of state-of-charge management issues; [333] and (3) aggregations of non-intermittent resources with different physical and economic characteristics would need to self-schedule, potentially adding financial risk for the participant, reducing the efficiency of the dispatch, and contributing to uplift or excess generation conditions.[334] In addition, ISO–NE states that demand response resources should not be allowed to participate in distributed energy resource aggregations because of their distinct settlement rules.[335] According to ISO–NE, in order to accommodate aggregations that include both demand response and non-demand response resource components, ISO–NE would need to establish rules to disaggregate these components for purposes of settlement. ISO–NE requests that, if they are not required to participate separately, the Commission clarify which rules must apply to such resources.[336] ISO–NE adds that its region is steadily transitioning its energy market away from self-scheduling and toward requiring all energy supply and demand to be priced and that being required to implement rules that accommodate aggregations composed of heterogenous resource types would be a significant step backwards in that effort.[337]

c. Commission Determination

141. To implement § 35.28(g)(12)(ii)(a) of the Commission's regulations, we require that each RTO's/ISO's rules do not prohibit any particular type of distributed energy resource technology from participating in distributed energy resource aggregations. We find that limiting the types of technologies that are allowed to participate in RTO/ISO markets through a distributed energy resource aggregator would create a barrier to entry for emerging or future technologies, potentially precluding them from being eligible to provide all of the capacity, energy, and ancillary services that they are technically capable of providing. Requiring that each RTO's/ISO's rules do not exclude any particular types of technology from participating in distributed energy resource aggregations in RTO/ISO markets will ensure a technology-neutral approach to distributed energy resource aggregations, which will ensure that more resources are able to participate in such aggregations, thereby helping to enhance competition and ensure just and reasonable rates.

142. We agree with commenters that generally support requiring RTOs/ISOs to allow groupings of different technology types in distributed energy resource aggregations.[338] Additionally, we agree with NRG that, while some individual resources or certain technologies may not be able to meet the qualification or performance requirements to provide certain services to RTO/ISO markets on their own, they may be able to satisfy such requirements as part of a distributed energy resource aggregation where resources complement one another's capabilities.[339] For instance, in the NOPR, the Commission stated that aggregating electric storage resources with distributed generation could allow the aggregation to achieve performance requirements (such as minimum run times) that an electric storage resource could not meet on its own and provide services (such as regulation) that

[321] Energy Storage Association (RM16–23) at 24–25; Stem Comments (RM16–23) at 7, 12, 13.

[322] Stem Comments (RM16–23) at 12, 13.

[323] CAISO Comments (RM16–23) at 23.

[324] AES Companies Comments (RM16–23) at 32–33.

[325] American Petroleum Institute Comments (RM16–23) at 10; ISO–NE Comments (RM16–23) at 31–35; TAPS Comments (RM16–23) at 27.

[326] American Petroleum Institute Comments (RM16–23) at 10.

[327] TAPS Comments (RM16–23) at 27.

[328] CAISO Comments (RM16–23) at 38; Fresh Energy/Sierra Club/Union of Concerned Scientists Comments (RM16–23) at 3; New York State Entities Comments (RM16–23) at 21.

[329] SPP Comments (RM16–23) at 22.

[330] PJM Market Monitor Comments (RM16–23) at 15–16.

[331] ISO–NE Comments (RM16–23) at 31–36.

[332] *Id.* at 33.

[333] *Id.* at 33–34.

[334] *Id.* at 34–35.

[335] *Id.* at 32.

[336] *Id.* at 32–33.

[337] *Id.* at 34–35.

[338] *See, e.g.,* AES Companies (RM16–23) at 32–33; CAISO Comments (RM16–23) at 23; City of New York Comments (RM16–23) at 8; Energy Storage Association (RM16–23) at 24–25; Fresh Energy/Sierra Club/Union of Concerned Scientists Comments (RM16–23) at 3; Massachusetts Commission Comments (RM16–23) at 8–10; New York State Entities Comments (RM16–23) at 21; R Street Institute Comments (RM16–23) at 8; Stem Comments (RM16–23) at 7, 12, 13.

[339] NRG Comments (RM16–23) at 19.

distributed generation may not be able to provide on its own.[340] Therefore, to implement § 35.28(g)(12)(ii)(a) of the Commission's regulations, we clarify the NOPR proposal and require each RTO/ISO to revise its tariff to allow different types of distributed energy resource technologies to participate in a single distributed energy resource aggregation (*i.e.,* allow heterogeneous distributed energy resource aggregations).[341] Requiring that RTOs/ISOs allow heterogeneous aggregations will further enhance competition in RTO/ISO markets by ensuring that complementary resources, including those with different physical and operational characteristics, can meet qualification and performance requirements such as minimum run times, which will help ensure that these markets produce just and reasonable rates.

143. We are unconvinced by arguments in favor of homogeneous aggregations. We find that the benefits of allowing heterogeneous aggregations outweigh the concerns regarding complexity of implementation. While SPP and ISO–NE indicate that market rules allowing for heterogeneous aggregations would be challenging to develop and implement,[342] neither explains why their markets are unique such that it would be necessary for the Commission to permit regional flexibility. In addition, concerns about RTOs'/ISOs' ability to manage a diverse set of distributed energy resources are misplaced because the distributed energy resource aggregator, not an individual distributed energy resource in the aggregation, is the market participant with whom the RTO/ISO would be interacting. Moreover, the aggregator, not the RTO/ISO, would be responsible for ensuring that the distributed energy resource aggregation meets applicable RTO/ISO performance and registration requirements.

144. We also are not persuaded by ISO–NE's reservations related to state-of-charge management and self-scheduling. We find that market participants are best positioned to make these participation decisions. If ISO–NE is correct that self-scheduling adds financial risk for the participant and that, because of state-of-charge management issues, electric storage resources would not benefit from participating in distributed energy resource aggregations, then we would expect market participants to act in their economic interest.

145. As to ISO–NE's concerns about incorporating demand response resources into distributed energy resource aggregations, we note that demand response aggregations and the resources in them that effectuate load reductions currently are not necessarily composed of the same types of technologies and are already providing services in numerous RTO/ISO markets. Therefore, similar to the Commission's finding in Order No. 745–A, from the perspective of the RTO/ISO, the means by which an aggregation is able to provide wholesale services does not change the value of that service to the wholesale grid.[343] In response to ISO–NE's request for clarification about which settlement rules apply to distributed energy resource aggregations composed of both demand response and non-demand response resources, we clarify that the requirements in Order No. 745 would apply to demand response resources participating in heterogeneous aggregations. In addition, while ISO–NE would prefer to exclude demand response resources from distributed energy resource aggregations to simplify settlement and the allocation of charges and credits to load, we reiterate that the benefits of allowing heterogeneous aggregations outweigh ISO–NE's preference to limit the types of resources that can participate in aggregations. We clarify, however, that the participation of demand response in distributed energy resource aggregations is subject to the opt-out and opt-in requirements of Order Nos. 719 and 719–A. Therefore, if the relevant electric retail regulatory authority where a demand response resource is located has either chosen to opt out or has not opted in, then the demand response resource may not participate in a distributed energy resource aggregation.[344]

146. As to ISO–NE's concern that self-scheduling will reduce the efficiency of the dispatch and contribute to uplift or excess generation conditions, we note that no other RTOs/ISOs raise this concern. Market rules allowing for heterogeneous aggregations are already in place in CAISO,[345] and the Commission recently accepted market rules allowing for heterogeneous aggregations in NYISO.[346] Based on the record before us, ISO–NE has not sufficiently demonstrated why it is uniquely unable to implement market rules that can overcome these dispatch, uplift, and excess generation challenges.

3. Double Counting of Services

a. NOPR Proposal

147. In the NOPR, the Commission stated that it is appropriate for each RTO/ISO to limit the participation of resources in RTO/ISO markets through a distributed energy resource aggregator that are receiving compensation for the same services as part of another program.[347] The Commission explained that, because resources able to register as part of a distributed energy resource aggregation will be located on the distribution system, they may also be eligible to participate in retail compensation programs, such as net metering, or other wholesale programs, such as demand response programs. Therefore, to ensure that there is no duplication of compensation, the Commission proposed that distributed energy resources that are participating in one or more retail compensation programs such as net metering or another wholesale market participation program will not be eligible to participate in RTO/ISO markets as part of a distributed energy resource aggregation.

b. Comments

148. Most commenters that address the issue of double counting agree that distributed energy resources should not be compensated twice for providing the same service but disagree on what constitutes ''the same service,'' how to implement such a requirement, or who should be responsible.[348] In this regard, Pacific Gas & Electric supports prevention of double compensation and discusses the processes in California that protects against the bypass of retail rates for behind-the-meter distributed energy resources that both consume and

[340] NOPR, 157 FERC ¶ 61,121 at P 133 n.231.

[341] ISO–NE defines a heterogeneous aggregation as consisting of ''different resource types, such that, for example, a single aggregation might consist of a battery, distributed generation assets, and electric vehicles.'' ISO–NE Comments (RM16–23) at 31.

[342] ISO–NE Comments (RM16–23) at 32; SPP Comments (RM16–23) at 21–22.

[343] As the Commission stated in Order No. 745–A, ''[f]rom the perspective of the grid, the manner in which a customer is able to produce such a load reduction from its validly established baseline (whether by shifting production, using internal generation, consuming less electricity, or other means) does not change the effect or value of the reduction to the wholesale grid.'' *Demand Response Compensation in Organized Wholesale Energy Markets,* Order No. 745–A, 137 FERC ¶ 61,215, at P 66 (2011), *reh'g denied,* Order No. 745–B, 138 FERC ¶ 61,148 (2012), *vacated sub nom. Elec. Power Supply Ass'n* v. *FERC,* 753 F.3d 216 (D.C. Cir. 2014), *rev'd & remanded sub nom. EPSA,* 136 S. Ct. 760.

[344] *See supra* P 59.

[345] *Cal. Indep. Sys. Operator Corp.,* 155 FERC ¶ 61,229 at P 11.

[346] NYISO Aggregation Order, 170 FERC ¶ 61,033.

[347] NOPR, 157 FERC ¶ 61,121 at P 134.

[348] *See, e.g.,* Advanced Energy Economy Comments (RM16–23) at 33–34; Calpine Comments (2018 RM18–9) at 6–7; Dominion Comments (RM16–23) at 9–10; Microsoft Corporation Comments (2018 RM18–9) at 17; New York State Entities Comments (RM16–23) at 13.

export electricity for both retail and wholesale purposes.[349] Some commenters also assert that the NOPR proposal provides a solution to prevent double compensation,[350] provides clear jurisdictional lines,[351] reduces confusion,[352] and could ease coordination issues for distributed energy resources and alleviate the limitations of metering and accounting practices to distinguish between wholesale and retail activities.[353] In addition, some commenters posit that allowing distributed energy resources that earn compensation in out-of-market retail programs to participate in RTO/ISO markets may distort price formation, skewing market results and clearing prices.[354] Other commenters express concern that dual wholesale and retail participation could enable distributed energy resources to arbitrage between retail and wholesale markets, creating opportunities for market manipulation,[355] or to cherry pick between retail and wholesale constructs, preventing effective distribution system planning.[356] To address this concern, some commenters suggest that the Commission should require RTOs/ISOs to restrict the ability of distributed energy resources to switch between wholesale and retail participation by imposing a waiting period of at least one year.[357]

149. CAISO comments that, consistent with the NOPR proposal, its Distributed Energy Resource Provider model specifies that resources participating in a wholesale market aggregation may not participate in a retail net energy metering program if that program does not expressly also permit wholesale market participation.[358] CAISO states that this rule extends to various aspects of retail net metering programs such as net metering with storage or virtual net metering.[359] CAISO explains that the rationale for this rule is that CAISO's Distributed Energy Resource Provider model requires continuous wholesale participation.[360] Additionally, CAISO states that under California's current net energy metering program rules, a participating resource already benefits from netting its excess energy against subsequent electricity bills.[361] Based on this netting approach, there is no energy available to offer into the CAISO markets because the excess energy is banked for later withdrawal. CAISO believes the Commission's approach in the NOPR is consistent with Commission orders determining that exports to the transmission grid under a net energy metering program do not constitute a sale for resale of electricity under the FPA because these customers are, on a net basis, consumers.

150. Some commenters ask the Commission to modify or clarify certain issues related to the NOPR proposal to prevent double counting. For instance, several commenters urge the Commission to give clear guidance about the definition of a retail compensation program or to clarify the scope of the retail prohibition.[362] A number of commenters argue that the RTOs/ISOs should be responsible for demonstrating how they will prevent duplicate compensation for the same service.[363] To that end, some commenters urge the Commission to, at a minimum, direct RTOs/ISOs to establish protocols that address duplicate compensation,[364] monitor distributed energy resource offers for true cost, and hold distributed energy resources accountable for performance, among other measures.[365] ISO–NE notes that if distributed energy resources have to choose between wholesale and retail participation, retail programs and behind-the-meter demand response may be more attractive in New England.[366]

151. Conversely, numerous commenters assert that the Commission should permit distributed energy resource aggregations to participate in both wholesale and retail markets,[367] provided that the distributed energy resources are technically capable of doing so and there are not physical system limitations that would prevent such participation.[368] Some of these commenters argue that distributed energy resources should not receive duplicate compensation for the same service but should receive compensation for each distinct or incremental value they provide at the retail or wholesale level, and that being allowed to do so will improve efficiency and lower overall costs.[369] Some commenters that are in favor of RTOs/ISOs allowing dual participation also note that relevant electric retail regulatory authorities have the ability to prevent it.[370] Several commenters contend that there is precedent for dual participation [371] and argue that a blanket ban would create a barrier to distributed energy resource participation, underestimating their capabilities, and inhibit competition, undermining the NOPR.[372] Icetec and Tesla point out that capacity markets have long avoided duplicate compensation for demand response and for generators providing multiple services at once (*e.g.,* energy and reserves) and urge the Commission to apply the logic of these constructs to

[349] Pacific Gas & Electric Comments (2019 RM18–9) at 5.

[350] Avangrid Comments (RM16–23) at 11; Pacific Gas & Electric Comments (RM16–23) at 17.

[351] Delaware Commission Comments (RM16–23) at 4.

[352] *See, e.g.,* Calpine Comments (2018 RM18–9) at 6; Organization of MISO States Comments (2018 RM18–9) at 8; PJM Utilities Coalition Comments (2018 RM18–9) at 13.

[353] *See, e.g.,* APPA/NRECA Comments (RM16–23) at 39–40; EEI Comments (RM16–23) at 25–26; Massachusetts Municipal Electric Comments (RM16–23) at 3; National Hydropower Association Comments (RM16–23) at 11; Six Cities Comments (RM16–23) at 6.

[354] Calpine Comments (2018 RM18–9) at 6; EPSA Comments (2018 RM18–9) at 15; TAPS Comments (2018 RM18–9) at 25.

[355] TAPS Comments (2018 RM18–9) at 26.

[356] PJM Utilities Coalition Comments (2018 RM18–9) at 13.

[357] APPA Comments (2018 RM18–9) at 25 (suggesting a waiting period of one year); Calpine Comments (2018 RM18–9) at 7 (suggesting a waiting period of five years as in PJM's Fixed Resource Requirement process).

[358] CAISO Comments (RM16–23) at 24 (citing *Cal. Indep. Sys. Operator Corp.,* 155 FERC ¶ 61,229 at P 6).

[359] *Id.* at 24.

[360] CAISO Comments (2018 RM18–9) at 15.

[361] CAISO Comments (RM16–23) at 24.

[362] ISO–NE Comments (RM16–23) at 54; SEIA Comments (RM16–23) at 16–17; TAPS Comments (RM16–23) at 11.

[363] *See, e.g.,* Advanced Microgrid Solutions Comments (RM16–23) at 6; Dominion Comments (RM16–23) at 9–10; EEI Comments (RM16–23) at 25–26; Gridwise Comments (RM16–23) at 2; Public Interest Organizations Comments (RM16–23) at 23–24; Stem Comments (RM16–23) at 4, 7–8.

[364] EPSA Comments (2018 RM18–9) at 14; TAPS Comments (2018 RM18–9) at 26–27.

[365] Calpine Comments (2018 RM18–9) at 7; EPSA Comments (2018 RM18–9) at 20.

[366] ISO–NE Comments (2018 RM18–9) at 3.

[367] *See, e.g.,* Advanced Energy Buyers Comments (2018 RM18–9) at 2; Genbright Comments (RM16–23) at 2–4; Global Cold Chain Alliance Comments (2018 RM18–9) at 2; MISO Transmission Owners Comments (RM16–23) at 6; New York Commission Comments (2018 RM18–9) at 16.

[368] Energy Storage Association (2018 RM18–9) at 2; Microsoft Corporation Comments (2018 RM18–9) at 17; NRG Comments (2018 RM18–9) at 6–8; SEIA Comments (RM16–23) at 16; Sunrun Comments (RM16–23) at 3.

[369] *See, e.g.,* Advanced Energy Economy Comments (2018 RM18–9) at 8, 12–13; American Petroleum Institute Comments (RM16–23) at 13; Direct Energy Comments (2018 RM18–9) at 11–13; EPSA Comments (2018 RM18–9) at 15; NARUC Comments (RM16–23) at 5; Viking Cold Solutions Comments (2018 RM18–9) at 2.

[370] California Commission Comments (2018 RM18–9) at 10–11; New York Commission Comments (2018 RM18–9) at 17–18.

[371] *See, e.g.,* Advanced Energy Economy Comments (RM16–23) at 39; Advanced Energy Management Comments (RM16–23) at 11–14; City of New York Comments (RM16–23) at 10–11; NRG Comments (2018 RM18–9) at 7–8; NYPA Comments (2018 RM18–9) at 2.

[372] *See, e.g.,* California Energy Storage Alliance Comments (RM16–23) at 4–6; Genbright Comments (RM16–23) at 3–4; Microgrid Resources Coalition Comments (RM16–23) at 12; SEIA Comments (RM16–23) at 16; Stem Comments (RM16–23) at 4, 7.

distributed energy resources.[373] Advanced Energy Economy claims that the NOPR proposal would prevent the RTOs/ISOs from accessing a growing pool of resources located close to load that can be cost-effectively dispatched to ensure reliability.[374] Several commenters argue that requiring resources to choose between markets would diminish the incremental value of distributed energy resources, leading to less efficient and flexible markets and reducing distributed energy resources' commercial viability.[375] Commenters contend that, even if some services could qualify generally as the same service, it would be possible to distinguish them.[376] Some commenters identify a number of scenarios in which providing distinct wholesale and retail services is feasible and explain that dispatch triggers for these programs usually do not overlap, which further indicates that they are not the same services.[377] Additional commenters note potential discrepancies between the NOPR proposal and the Commission's recent policy statement enabling multiple-use applications for electric storage resources,[378] and contend that experience in CAISO has demonstrated that it is possible to differentiate between services.[379]

152. However, many commenters disagree over how the Commission should assess what constitutes ''the same service.'' Some commenters assert that ''same service'' should refer narrowly to retail and wholesale programs that compensate a distributed energy resource for the exact same kW or kWh for the same value, providing no incremental value to the system.[380] Other commenters argue that tools are necessary to prevent double compensation for the same service and suggest using performance requirements and dispatch triggers, contracting, market/participation rules, registration,protections, mathematical/accounting solutions, and/or a coordination framework, among other measures, to prevent double counting.[381] According to some of these commenters, market rules could prevent double compensation when a resource is dispatched simultaneously for multiple programs or to prevent a resource from being permitted to sell the same market product as both an individual resource and as part of an aggregation in the same timeframe.[382] Some commenters suggest using certain criteria to determine when a service provides incremental value to the retail or wholesale system or using metrics to enable segmentation of time or service provided.[383] PJM asks the Commission not to prohibit PJM from using accounting rules to delineate between a behind-the-meter distributed energy resource aggregation's wholesale and retail transactions, as applicable.[384]

153. IRC urges the Commission to work with states to set forth clear processes for resolving jurisdictional and rate issues to prevent double compensation based on the details of a particular retail program.[385] Some commenters suggest that the Commission collaborate with local regulatory authorities because local conditions may warrant special rules and restrictions for distributed energy resource participation in multiple markets or defer to state jurisdictions.[386] Some commenters request that the Commission clarify the right of state regulators to monitor and regulate potential duplicate compensation [387] and request that the Commission provide guidance to distribution utilities regarding the proposal.[388]

154. In addition, several commenters seek clarification that RTOs/ISOs are not precluded from allowing distributed energy resources to provide multiple non-overlapping wholesale services.[389] NYISO requests clarification on whether distributed energy resources are permitted to offer the ''same service'' to the wholesale markets and distribution system-level retail programs.[390] Lastly, some commenters state that the Commission should revisit and further examine the issue of dual participation in the future.[391]

155. Other commenters argue that the NOPR proposal would undermine state policy.[392] Numerous commenters argue that the NOPR proposal conflicts with the Commission's findings in *New York State Public Service Commission* v. *New York Independent System Operator, Inc.,* in which the Commission stated that ''[w]hile the wholesale- and the retail-level demand response programs may complement each other, they serve different purposes, provide different benefits, and compensate distinctly different services,'' [393] and would interfere with New York's existing programs and state objectives.[394] The California Commission maintains that dual participation of a distributed energy resource in retail programs and RTO/ISO markets is a retail matter under state jurisdiction.[395] The

[373] Icetec Comments (2018 RM18–9) at 14; Tesla Comments (2018 RM18–9) at 4.

[374] Advanced Energy Economy Comments (RM16–23) at 33–34.

[375] *See, e.g.,* Advanced Energy Management Comments (RM16–23) at 10–11; Advanced Microgrid Solutions Comments (RM16–23) at 6; Energy Storage Association Comments (RM16–23) at 22–23; Public Interest Organizations Comments (RM16–23) at 22–24; Tesla/SolarCity Comments (RM16–23) at 3.

[376] Energy Storage Association Comments (2018 RM18–9) at 2; New York Commission Comments (2018 RM18–9) at 15; NYISO Indicated Transmission Owners Comments (2018 RM18–9) at 13. *See also* California Commission Comments (2018 RM18–9) at 8 (noting that the California Commission declined to categorize the 22 services defined for the multiple use application framework adopted in D.18–01–003 by their service elements, which are either energy or capacity).

[377] *See, e.g.,* Advanced Energy Economy Comments (RM16–23) at 34–35; California Energy Storage Alliance Comments (RM16–23) at 5–6; DER/Storage Developers Comments (RM16–23) at 2–3; Tesla/SolarCity Comments (RM16–23) at 5–7. Advanced Energy Management notes that dispatch for the Consolidated Edison programs only overlapped with dispatch for the NYISO programs in six percent of hours from 2011 to 2015. Advanced Energy Management Comments (RM16–23) at 12–13.

[378] Institute for Policy Integrity Comments (RM16–23) at 7; Open Access Technology Comments (RM16–23) at 4–5; Stem Comments (RM16–23) at 4 (citing *Utilization of Elec. Storage Res. for Multiple Servs. When Receiving Cost-Based Rate Recovery,* 158 FERC ¶ 61,051 (2017)).

[379] Leadership Group Comments (RM16–23) at 3 (citing *Cal. Indep. Sys. Operator Corp.,* 155 FERC ¶ 61,229 at P 11).

[380] Advanced Energy Management Comments (2018 RM18–9) at 13; New York Commission Comments (2018 RM18–9) at 15.

[381] *See, e.g.,* California Commission Comments (2018 RM18–9) at 9–10; Microgrid Resources Coalition Comments (2018 RM18–9) at 12–14; New York Commission Comments (2018 RM18–9) at 16, 18–19; NYISO Indicated Transmission Owners Comments (2018 RM18–9) at 13–14; Tesla Comments (2018 RM18–9) at 3–7.

[382] Advanced Energy Management Comments (RM16–23) at 13; AES Companies Comments (RM16–23) at 39; New York State Entities Comments (RM16–23) at 15–16.

[383] Advanced Energy Buyers Comments (2018 RM18–9) at 6; Advanced Energy Economy Comments (2018 RM18–9) at 13; Advanced Energy Management Comments (2018 RM18–9) at 14–15.

[384] PJM Comments (RM16–23) at 23.

[385] IRC Comments (RM16–23) at 3–5.

[386] EEI Comments (RM16–23) at 26–27; Pacific Gas & Electric Comments (2018 RM18–9) at 10.

[387] Massachusetts Commission Comments (RM16–23) at 11.

[388] ISO–NE Comments (RM16–23) at 54.

[389] NextEra Comments (RM16–23) at 14; NYISO Comments (RM16–23) at 14–15; Public Interest Organizations Comments (RM16–23) at 21–22.

[390] NYISO Comments (RM16–23) at 14–15.

[391] EEI Comments (RM16–23) at 25; New York Utility Intervention Unit Comments (RM16–23) at 6; Pacific Gas & Electric Comments (RM16–23) at 17–18; SoCal Edison Comments (RM16–23) at 10.

[392] California Commission Comments (RM16–23) at 6–7; City of New York Comments (RM16–23) at 13; New York State Entities Comments (RM16–23) at 18.

[393] *N.Y. Pub. Serv. Comm'n* v. *N.Y. Indep. Sys. Operator, Inc.,* 158 FERC ¶ 61,137, at P 33 (2017).

[394] *See, e.g.,* Advanced Energy Economy Comments (RM16–23) at 35–36; Advanced Energy Management Comments (RM16–23) at 11–13; Harvard Environmental Policy Initiative Comments (RM16–23) at 7; New York State Entities Comments (RM16–23) at 14,16–18; Union of Concerned Scientists Comments (RM16–23) at 19.

[395] California Commission Comments (2018 RM18–9) at 10–11.

Arkansas Commission, with support from Advanced Energy Economy, states that dual participation of distributed energy resource aggregations in RTO/ISO and retail markets requires a cooperative federalism approach in which the Commission has authority over RTO/ISO eligibility rules, states have exclusive jurisdiction over retail customer programs and may set terms and conditions so long as they do not conflict with Commission orders, and state regulators play a complementary role.[396]

156. In addition, some commenters assert that the Commission does not have authority to prevent distributed energy resources from selling retail services.[397] The Harvard Environmental Policy Initiative argues that there is no legal barrier that prevents distributed energy resources from participating in both state and Commission programs, and that the Commission has the authority to allow each RTO/ISO to determine how to allow distributed energy resources to participate in both state-level and wholesale programs, though they note it may be operationally complex.[398] Tesla/SolarCity asserts that differences in jurisdiction must not prevent distributed energy resources from receiving compensation for distinct services [399] and argues that effects on retail rates should not be relevant.[400] Several commenters add that the Commission's decision in this final rule will not affect the ability of relevant electric retail regulatory authorities to restrict wholesale participation for distributed energy resources wishing to participate in retail programs.[401]

157. However, some commenters disagree with other commenters' proposed approaches to differentiate between wholesale and retail services. APPA contends that the methods proposed by some commenters of determining what constitutes the same service are flawed, an incremental value approach is conceptually complicated, and using dispatch triggers to distinguish services is problematic because a resource could not respond to a reliability event in both the wholesale and retail markets at once.[402] Similarly, Sunrun argues that a universal characterization of services would create litigation and confusion.[403] PJM asserts that the Commission should not ''over-define'' the services that distributed energy resources provide but instead should focus on the services traditionally addressed in the wholesale market (*e.g.,* capacity, energy and ancillary services), and require that any unit of capacity/resource adequacy only be compensated once across the wholesale and retail domains.[404] NYISO Indicated Transmission Owners point out that the ability to differentiate services is dependent on particular programs and markets, and suggest that the Commission consider programs as they are filed by the relevant RTOs/ISOs.[405] MISO states that it defers to relevant electric retail regulatory authorities to address any double compensation matters.[406] NYISO states that if competing dispatch obligations still arise, it will be the aggregator's responsibility to resolve the conflict and face penalties, as appropriate.[407]

158. NRG and Stem argue that the Commission should only be concerned with double compensation if retail participation interferes with the provision of wholesale services.[408] Similarly, other commenters argue that the Commission should focus on preventing distributed energy resources from receiving double payment for the same *wholesale* service and not whether those resources are also receiving retail level compensation.[409] NYISO Indicated Transmission Owners note that many distribution utilities have established programs to accommodate technology within retail service programs and argue that any changes to market rules for participation of distributed energy resource aggregations in wholesale markets should avoid encroaching upon or abrogating the jurisdictional status of these distribution-level programs, which, they state, do not involve wholesale sales.[410]

c. Commission Determination

159. To implement § 35.28(g)(12)(ii)(a) of the Commission's regulations and upon consideration of the comments received, we adopt the NOPR proposal, as modified and clarified below, to allow RTOs/ISOs to limit the participation of resources in RTO/ISO markets through a distributed energy resource aggregator that are receiving compensation for the same services as part of another program.

160. However, we agree with many commenters that the NOPR proposal to prohibit distributed energy resources that are receiving compensation in a retail program from being eligible to participate in the RTO/ISO markets as part of a distributed energy resource aggregation was overly broad. Commenters identify multiple examples where participation in both wholesale and retail markets is feasible [411] and is already permitted and occurring,[412] and they identify a variety of existing and potential approaches to address reasonable concerns about double counting and overcompensation.[413] Therefore, rather than barring participation in both wholesale and retail or multiple wholesale programs, we modify the NOPR proposal to require each RTO/ISO to revise its tariff to: (1) Allow distributed energy resources that participate in one or more retail programs to participate in its wholesale markets; (2) allow distributed energy resources to provide multiple wholesale services; and (3) include any appropriate restrictions on the distributed energy resources' participation in RTO/ISO markets through distributed energy resource aggregations, if narrowly designed to avoid counting more than once the services provided by distributed energy resources in RTO/ISO markets. In compliance with this final rule, we

[396] Supplemental Comments of Arkansas Commission (2018 RM18–9–000) at 1–2; Answer of Advanced Energy Economy to Supplemental Comments of Arkansas Commission (2018 RM18–9) at 2.

[397] California Commission Comments (RM16–23) at 6; DER/Storage Developers Comments (RM16–23) at 2; SEIA Comments (RM16–23) at 16; Stem Comments (RM16–23) at 7.

[398] Harvard Environmental Policy Initiative Comments (RM16–23) at 6–7 (citing NOPR, 157 FERC ¶ 61,121 at P 134).

[399] Tesla/SolarCity Comments (RM16–23) at 2–3.

[400] *Id.* at 3 (quoting *EPSA,* 136 S. Ct. 760 at 776 (''When FERC regulates what takes place on the wholesale market, as a part of carrying out its charge to improve how that market runs, then no matter that effect on retail rates . . .'')).

[401] APPA Comments (2018 RM18–9) at 25–26; PJM Utilities Coalition Comments (2018 RM18–9) at 13; TAPS Comments (2018 RM18–9) at 25.

[402] APPA Comments (2018 RM18–9) at 24–25.

[403] Sunrun Comments (2018 RM18–9) at 9–10.

[404] PJM Comments (2018 RM18–9) at 14.

[405] NYISO Indicated Transmission Owners Comments (2018 RM18–9) at 7–8.

[406] MISO Comments (2018 RM18–9) at 22.

[407] NYISO Comments (2018 RM18–9) at 9–11.

[408] NRG Comments (RM16–23) at 8; Stem Comments (RM16–23) at 7.

[409] Advanced Energy Economy Comments (2018 RM18–9) at 13; Energy Storage Association Comments (2018 RM18–9) at 5; New York Commission Comments (2018 RM18–9) at 18; Stem Comments (RM16–23) at 7.

[410] NYISO Indicated Transmission Owners Comments (RM16–23) at 8.

[411] *See, e.g.,* Advanced Microgrid Solutions Comments (RM16–23) at 5–6; American Petroleum Institute Comments (RM16–23) at 13; NRG Comments (RM16–23) at 8; Open Access Technology Comments (RM16–23) at 5; Public Interest Organizations Comments (RM16–23) at 22.

[412] Direct Energy Comments (2018 RM18–9) at 11–13; Energy Storage Association Comments (2018 RM18–9) at 5; NRG Comments (2018 RM18–9) at 6–8.

[413] NESCOE Comments (RM16–23) at 14–15 (citing *Utilization of Electric Storage Resources for Multiple Services When Receiving Cost-Base Rate Recovery,* 158 FERC ¶ 61,051 at P 2); SEIA Comments (RM16–23) at 16 (citing *Utilization of Electric Storage Resources for Multiple Services When Receiving Cost-Based Rate Recovery,* 158 FERC ¶ 61,051).

require each RTO/ISO to describe how it will properly account for the different services that distributed energy resources provide in the RTO/ISO markets.

161. We find that it is appropriate for RTOs/ISOs to place narrowly designed restrictions on the RTO/ISO market participation of distributed energy resources through aggregations, if necessary to prevent double counting of services. For instance, if a distributed energy resource is offered into an RTO/ISO market and is not added back to a utility's or other load serving entity's load profile, then that resource will be double counted as both load reduction and a supply resource. Also, if a distributed energy resource is registered to provide the same service twice in an RTO/ISO market (*e.g.,* as part of multiple distributed energy resource aggregations, as part of a distributed energy resource aggregation and a standalone demand response resource, and/or a standalone distributed energy resource), then that resource would also be double counted and double compensated if it clears the market as part of both market participants. Thus, we find that it is appropriate for RTOs/ISOs to place restrictions on the RTO/ISO market participation of distributed energy resources through aggregations after determining whether a distributed energy resource that is proposing to participate in a distributed energy resource aggregation is (1) registered to provide the same services either individually or as part of another RTO/ISO market participant;[414] or (2) included in a retail program to reduce a utility's or other load serving entity's obligations to purchase services from the RTO/ISO market.

162. This restriction is similar to that adopted by the Commission in Order No. 719 in the context of aggregations of demand response, which states that ''[a]n RTO or ISO may place appropriate restrictions on any customer's participation in an [aggregation of retail customers]-aggregated demand response bid to avoid counting the same demand response resource more than once.''[415] In addition, as discussed in Section IV.A.2 above, relevant electric retail regulatory authorities may decide whether to permit the customers of small utilities to participate in the RTO/ISO markets through distributed energy resource aggregations and relevant electric retail regulatory authorities continue to have authority to condition participation in their retail distributed energy resource programs on those resources not also participating in RTO/ISO markets,[416] which should allow them to mitigate any double-compensation concerns.

163. We agree with many commenters that the NOPR proposal could undermine the effectiveness of existing retail and wholesale programs, render current RTO/ISO market participants ineligible to continue their participation, and reduce competition in RTO/ISO markets, which could lead to unjust and unreasonable rates. Further, there may be instances in which an individual distributed energy resource could technically, reliably, and economically provide multiple, distinct services at wholesale and retail levels, and therefore preventing it from doing so may undermine the final rule by creating a new barrier to participation in RTO/ISO markets, thereby inhibiting competition and decreasing reliability. We believe the modified rules that we adopt herein will enable efficient outcomes in RTO/ISO markets by capturing the full value of distributed energy resources and enabling efficient resource allocation while also requiring RTOs/ISOs to address double-counting concerns.

164. In addition to addressing the potential market and reliability impacts of the NOPR proposal described above, we find that the reforms we adopt here are consistent with the Commission's determination that a single distributed energy resource can participate in both retail and wholesale programs and be compensated in each for providing ''distinctly different services.''[417] While commenters suggest several tests to identify duplicate services, the record does not include a consistent or practical method for the Commission to universally define ''same services'' across wholesale and retail markets, and we therefore do not believe that it is appropriate to prescribe an approach across all RTOs/ISOs. For this reason, we will grant RTOs/ISOs regional flexibility with respect to the restrictions they propose in their tariffs to minimize market impacts caused by the double counting of services provided by distributed energy resources in the RTO/ISO markets.

4. Minimum and Maximum Size of Aggregation

a. NOPR Proposal

165. In the NOPR, the Commission proposed that distributed energy resource aggregations must meet any minimum size requirements of the participation model under which they elect to participate in RTO/ISO markets.[418] The Commission stated that, for example, if a distributed energy resource aggregator decides to register using the participation model for electric storage resources given the cumulative physical and operational characteristics of the distributed energy resources in its aggregation, then its distributed energy resource aggregation would be required to meet the 100 kW minimum size requirement that the Commission required for that participation model. The Commission stated that, alternatively, if the distributed energy resource aggregator registered as a generator, then its aggregation would be required to meet the minimum size requirement for the generator participation model in the relevant RTO/ISO market.

166. After the April 2018 technical conference, the Commission sought comments on whether reducing the minimum size of distributed energy resource aggregations to participate in RTO/ISO markets would help alleviate concerns about requiring distributed energy resource aggregations to locate only at a single node.[419]

b. Comments

167. SPP agrees with the Commission's proposal for aggregations to meet any minimum size requirements of the participation model under which they elect to participate, noting that that is consistent with SPP's registration requirements for any resource type.[420]

168. In contrast, several commenters argue that the Commission should require RTOs/ISOs to adopt a minimum size requirement of 100 kW for all distributed energy resource aggregations, regardless of the participation model in which they elect to participate.[421] NYISO states that it is currently working with stakeholders on a distributed energy resource market design proposal that would set a minimum aggregation size of 100 kW

[414] For example, as part of another distributed energy resource aggregation, a demand response resource, and/or a standalone distributed energy resource.

[415] Order No. 719, 125 FERC ¶ 61,071 at P 158.

[416] Supplemental Comments of Arkansas Commission (RM16–23–000) at 2.

[417] *N.Y. Pub. Serv. Comm'n* v. *N.Y. Indep. Sys. Operator, Inc.,* 158 FERC ¶ 61,137 at P 33.

[418] NOPR, 157 FERC ¶ 61,121 at P 136.

[419] Notice Inviting Post-Technical Conference Comments at 3.

[420] SPP Comments (RM16–23) at 16.

[421] *See, e.g.,* Advanced Energy Management Comments (RM16–23) at 16–17, 25–26; Mensah Comments (RM16–23) at 3; Efficient Holdings Comments (RM16–23) at 8; NYISO Comments (RM16–23) at 15–16; Tesla/SolarCity Comments (RM16–23) at 17, 26.

because this is the smallest increment that NYISO believes it can accurately model, commit, and dispatch with its current grid operations software.[422] Some of those commenters contend that a minimum size requirement above 100 kW runs counter to the NOPR's goal of improving competition in the wholesale markets while avoiding excessive registration of individual small resources and modeling complexity.[423] Tesla/SolarCity state that a minimum size requirement of 100 kW across all markets would avoid any confusion caused by artificial differences between the electric storage and distributed energy resource aggregation participation models.[424] Some commenters argue that minimum size requirements greater than 100 kW pose a significant barrier to entry.[425] Direct Energy disagrees with ISO–NE's assertion at the technical conference that there is no real need for aggregation because there is no minimum size limitation for participating in ISO–NE's markets, stating that while Direct Energy is supportive of establishing a framework without minimum size limitations for distributed energy resources, the lack of such limitations should not serve as an alternative for aggregation.[426] NRG states that 100 kW is an efficient minimum size requirement but that the participation model for distributed energy resource aggregations should set minimum resource participation thresholds only to the extent necessary to accommodate existing metering and data management systems infrastructure.[427]

169. Several commenters argue that the Commission should provide the RTOs/ISOs with flexibility to establish any minimum size requirement for distributed energy resource aggregations based on their ability to model and dispatch these resources.[428] SoCal Edison states that each RTO/ISO should be allowed to determine its own minimum size requirements, providing the example of CAISO's requirement that distributed energy resource aggregations be at least 500 kW to help ensure that an aggregation is large enough to have a measurable impact on the transmission system.[429] EPRI and SoCal Edison both highlight the software challenges and potential costs associated with implementing a minimum size requirement at or below 100 kW.[430] Pacific Gas & Electric asserts that RTOs/ISOs must be allowed to account for the differences between interacting with aggregations and stand-alone resources in their markets.[431] MISO states that, to the extent the Commission deems it necessary to set a volume threshold for aggregated participation, the threshold should apply to registration minimums and not be related to how RTOs/ISOs model or dispatch resources.[432] NYISO Indicated Transmission Owners assert that aggregations should be subject to the same minimum size requirements as traditional resources that are based on the services they are providing.[433]

170. Energy Storage Association agrees that a lower limit is necessary but asserts that the Commission should not allow RTOs/ISOs to place upper limits on the size of distributed energy resource aggregations.[434] In contrast, CAISO believes that the Commission should adopt an upper limit on the size of these aggregations to ensure reliable operation of the transmission system while obtaining more experience with distributed energy resource aggregations. CAISO notes that its Distributed Energy Resource Provider model imposes a maximum capacity requirement of 20 MW on aggregations that span multiple pricing nodes to limit the impact of these aggregations on congestion on the CAISO grid without severely constraining the ability of distributed energy resource providers to form viable aggregations.[435] Similarly, SPP argues that the Commission should consider a maximum size requirement for aggregations across multiple nodes but that no maximum requirement is necessary for aggregations located at a single node.[436] University of Delaware's EV R&D Group argues that upper power limits should allow for an aggregation of 100–200 kW resources as this will better permit the participation of electric bus fleets.[437]

c. Commission Determination

171. We adopt the NOPR proposal, with modifications, and add § 35.28(g)(12)(iii) to the Commission's regulations to require each RTO/ISO to implement a minimum size requirement not to exceed 100 kW for all distributed energy resource aggregations. We agree with commenters that a minimum size requirement not to exceed 100 kW will help improve competition in the RTO/ISO markets and avoid confusion about appropriate minimum size requirements for distributed energy resource aggregations under existing or new participation models. We do not expect this requirement to overburden RTO/ISO modeling software with an excessive number of small resources because 100 kW is currently a commonly used resource size. In contrast, larger minimum size requirements that may have been designed for different types of resources could pose a significant barrier to entry for distributed energy resource aggregations. In addition, this minimum size requirement is consistent with the Commission's minimum size requirement for electric storage resources in Order No. 841.[438]

172. Several RTOs/ISOs support a minimum size requirement not to exceed 100 kW. PJM and SPP have a minimum size requirement of 100 kW for all resources and support the same requirement for distributed energy resource aggregations, and all of the RTOs/ISOs have at least one participation model that allows resources as small as 100 kW to

[422] NYISO Comments (RM16–23) at 15–16; PJM Comments (RM16–23) at 27. On January 23, 2020, the Commission accepted NYISO's tariff revisions establishing a new participation model for aggregations of resources, including distributed energy resources, which requires that each energy, ancillary service, and capacity transaction on behalf of an aggregation must have a minimum offer of 100 kW, and if an aggregation offers a combination of withdrawals, injections, and/or demand reductions, it must offer at least 100 kW of each. *See* NYISO Aggregation Order, 170 FERC ¶ 61,033 at P 14.

[423] Advanced Energy Management Comments (RM16–23) at 16–17; Advanced Energy Economy Comments (RM16–23) at 51–52 (citing NOPR, 157 FERC ¶ 61,121 at P 94); California Energy Storage Alliance Comments (RM16–23) at 7–8.

[424] Tesla/SolarCity Comments (RM16–23) at 26.

[425] Fresh Energy/Sierra Club/Union of Concerned Scientists Comments (RM16–23) at 2 (citing MISO Market Subcommittee Presentation, November 29th, 2016, *https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/MSC/2016/20161129/20161*) (stating that the integration of distributed energy resources and smaller-scale resources is within the ''probable limit of current systems''); Tesla/SolarCity Comments (RM16–23) at 27 (citing *N.Y. Indep. Sys. Operator, Inc.,* 155 FERC ¶ 61,166 (2016)).

[426] Direct Energy Comments (2018 RM18–9) at 8–9 (citing Technical Conference Transcript at 22).

[427] NRG Comments (RM16–23) at 12; NRG Comments (2018 RM18–9) at 4.

[428] *See, e.g.,* AES Companies Comments (RM16–23) at 34; IRC Comments (RM16–23) at 7; ISO–NE Comments (RM16–23) at 36; MISO Comments (RM16–23) at 20; Pacific Gas & Electric Comments (RM16–23) at 17.

[429] SoCal Edison Comments (RM16–23) at 11 (citing CAISO Tariff, Section 4.17.5.1; CAISO, Transmittal Letter, Docket No. ER16–1085, at 9 (filed March 4, 2016)).

[430] EPRI Comments (2018 RM18–9) at 7–8; SoCal Edison Comments (2018 RM18–9) at 5.

[431] Pacific Gas & Electric Comments (RM16–23) at 17.

[432] MISO Comments (2018 RM18–9) at 16–17.

[433] NYISO Indicated Transmission Owners Comments (RM16–23) at 12.

[434] Energy Storage Association Comments (RM16–23) at 25–26.

[435] CAISO Comments (RM16–23) at 25–26.

[436] SPP Comments (RM16–23) at 16.

[437] University of Delaware EV R&D Group Comments (2018 RM18–9) at 1.

[438] Order No. 841, 162 FERC ¶ 61,127 at P 270.

participate in their markets.[439] However, we recognize concerns about the ability of modeling and dispatch software to handle a large number of small distributed energy resource aggregations. Therefore, while we require each RTO/ISO to implement on compliance a minimum size requirement not to exceed 100 kW for all distributed energy resource aggregations, we will consider any future post-implementation requests to increase the minimum size requirement above 100 kW if the RTO/ISO demonstrates that it is experiencing difficulty calculating efficient market results and there is not a viable software solution for improving such calculations.[440]

173. We agree with the post-technical conference comments that a minimum size requirement that is lower than some existing RTO/ISO minimum size requirements will help alleviate concerns about the ability of single node aggregations to achieve the necessary minimum size, particularly given our findings on locational requirements for distributed energy resource aggregations.[441] NYISO recently adopted this approach, stating that because it decided to limit distributed energy resource aggregations to a single pricing node in its distributed energy resources roadmap, NYISO thought it was appropriate to lower the minimum size threshold for distributed energy resource aggregations to 100 kW.[442] Therefore, not only will a minimum size requirement that does not exceed 100 kW remove a barrier to distributed energy resource aggregations, improve competition in RTO/ISO markets, avoid confusion about appropriate requirements, and help ensure just and reasonable rates, but application of this requirement in conjunction with our findings on locational requirements, discussed in Section IV.D below, will help alleviate any adverse competitive impacts that single node aggregations may have.[443]

174. We are not persuaded by commenters to adopt a maximum size requirement for distributed energy resource aggregations that span multiple pricing nodes. We do not see a need to adopt such a requirement because, as explained in Section IV.E below, to the extent that RTOs/ISOs allow for multi-node distributed energy resource aggregations, distribution factors and bidding parameters should provide the RTOs/ISOs with the information from geographically dispersed resources in a distributed energy resource aggregation necessary to reliably operate their systems regardless of the size of the aggregation.[444] We also note that, given our findings on locational requirements, we are not requiring RTOs/ISOs to establish multi-node distributed energy resource aggregations.[445]

5. Minimum and Maximum Capacity Requirements for Distributed Energy Resources Participating in an Aggregation

a. NOPR Proposal

175. The Commission proposed not to establish a minimum or maximum capacity requirement for an individual distributed energy resource to be able to participate in RTO/ISO markets through a distributed energy resource aggregator.[446] The Commission stated that it believes participation in RTO/ISO markets through a distributed energy resource aggregator should not be conditioned on the size of the resource but recognized that existing RTO/ISO market rules may require distributed energy resources to meet certain minimum or maximum capacity requirements under certain participation models. Therefore, the Commission sought comment on whether to establish a minimum or maximum capacity limit for individual distributed energy resources seeking to participate in RTO/ISO markets through a distributed energy resource aggregator, or whether to allow each RTO/ISO to propose such a minimum or maximum capacity requirement on compliance with any final rule issued in this rulemaking proceeding. To the extent that commenters believe that the Commission should adopt a minimum or maximum capacity requirement for individual distributed energy resources participating in RTO/ISO markets through a distributed energy resource aggregator, the Commission sought comment on what that requirement should be.

b. Comments

176. Several commenters support the Commission's proposal not to establish a minimum capacity requirement for individual distributed energy resources participating in RTO/ISO markets through distributed energy resource aggregations.[447] Some commenters state that minimum or maximum capacity requirements are not necessary for individual distributed energy resources because the aggregator will interact with the wholesale market as a single resource and, as such, that aggregation will be subject to eligibility rules.[448] Fluidic, Fresh Energy/Sierra Club/Union of Concerned Scientists, and Tesla/SolarCity argue that aggregators should be allowed to optimize their portfolio with any mix of resources to ensure the most cost-effective aggregation.[449] Energy Storage Association notes that, while many behind-the-meter electric storage resources are relatively small (only a few kW in some cases), in aggregate, they can operate nearly identically to a single, much larger electric storage resource.[450]

177. Several commenters ask the Commission to defer to the RTOs/ISOs to propose and justify to the Commission any minimum and maximum capacity requirements for individual distributed energy resources participating in RTO/ISO markets through distributed energy resource aggregations.[451] EEI argues that the RTO/ISO-established requirements should be based on their individual market rules and their ability to verify the accuracy of the metering and the verification process for the resource.[452] NYISO notes that it is evaluating whether there should be a maximum size for a distributed energy resource in an aggregation in order to permit

[439] *See, e.g.,* CAISO Data Request Response (AD16–20) at 10–11; ISO–NE Data Request Response (AD16–20) at 13–14; MISO Data Request Response (AD16–20) at 10; NYISO Data Request Response (AD16–20) at 9; PJM Data Request Response (AD16–20) at 10.

[440] The Commission offered the RTOs/ISOs a similar accommodation for the minimum size requirement for electric storage resources. *See* Order No. 841, 162 FERC ¶ 61,127 at P 275.

[441] *See infra* Section IV.D (Locational Requirements).

[442] Technical Conference Transcript at 27; *see* NYISO Aggregation Order, 170 FERC ¶ 61,033.

[443] *See infra* Section IV.D (Locational Requirements).

[444] *See infra* Section IV.E (Distribution Factors and Bidding Parameters).

[445] *See infra* Section IV.D (Locational Requirements).

[446] NOPR, 157 FERC ¶ 61,121 at P 135.

[447] *See, e.g.,* APPA/NRECA Comments (16–23) at 43; Fluidic Comments (RM16–23) at 5; Fresh Energy/Sierra Club/Union of Concerned Scientists Comments (RM16–23) at 2; ISO–NE Comments (RM16–23) at 36; NYISO Indicated Transmission Owners Comments (RM16–23) at 12.

[448] *See, e.g.,* NYISO Indicated Transmission Owners Comments (RM16–23) at 12; R Street Institute Comments (RM16–23) at 8; SEIA Comments (RM16–23) at 18; SPP Comments (RM16–23) at 16; Tesla/SolarCity Comments (RM16–23) at 27.

[449] Fluidic Comments (RM16–23) at 5, Fresh Energy/Sierra Club/Union of Concerned Scientists Comments (RM16–23) at 2; Tesla/SolarCity Comments (RM16–23) at 27.

[450] Energy Storage Association Comments (RM16–23) at 25–26.

[451] *See, e.g.,* Advanced Energy Economy Comments (RM16–23) at 51; Duke Energy Comments (RM16–23) at 5; ISO–NE Comments (RM16–23) at 36; MISO Transmission Owners Comments (RM16–23) at 20; Pacific Gas & Electric Comments (RM16–23) at 16.

[452] EEI Comments (RM16–23) at 27.

independent modeling of relatively large distributed energy resources and provide grid operators more operational awareness and control over distributed energy resources that may be needed to address system conditions.[453]

178. MISO Transmission Owners argue that capacity limits should be identified at the RTO/ISO level unless a distribution utility is impacted, in which case the distribution utility should have discretion to set its own requirements so that any minimum size requirement respects capacity limitations on a distribution circuit, whether individual or in the aggregate.[454] Similarly, APPA/NRECA assert that the Commission has no jurisdiction over facilities used for generation or local distribution and that state and local regulators are likely best equipped to address minimum or maximum capacity requirements.[455]

c. Commission Determination

179. To implement § 35.28(g)(12)(ii)(a) of the Commission's regulations, we adopt the NOPR proposal, as modified below, and will not establish a minimum or maximum capacity requirement for individual distributed energy resources to participate in RTO/ISO markets through a distributed energy resource aggregation. Although we decline to establish a specific maximum capacity requirement for individual distributed energy resources in an aggregation, we direct each RTO/ISO to propose a maximum capacity requirement for individual distributed energy resources participating in its markets through a distributed energy resource aggregation or, alternatively, to explain why such a requirement is not necessary, as discussed further below.

180. We decline to require RTOs/ISOs to adopt minimum capacity requirements for individual distributed energy resources to participate in their markets through a distributed energy resource aggregation. We agree with commenters that minimum capacity requirements for distributed energy resources to participate in an aggregation are not necessary because each individual resource will participate in the market via an aggregation, which acts as a single resource. To this end, we note that distributed energy resource aggregators, as market-interfacing entities, are responsible for meeting applicable RTO/ISO qualification and performance requirements, including minimum size requirements, and for determining how any performance penalties or deratings determined by the RTO/ISO would apply to the individual resources in an aggregation.

181. While we find that minimum capacity requirements are unnecessary, we recognize the concerns raised by EEI and NYISO with respect to each RTO's/ISO's ability to accurately model and verify the metering of larger distributed energy resources. We believe that capping the maximum capacity size of an individual distributed energy resource participating in a distributed energy resource aggregation would ensure that larger resources are required to participate individually, thereby allowing RTOs/ISOs to independently model and verify the metering of these larger resources. Independent modeling and verification may provide system operators with greater operational awareness and control to address changing system conditions. Therefore, to implement § 35.28(g)(12)(ii)(a) of the Commission's regulations, we require each RTO/ISO, in compliance with this final rule, to either propose a maximum capacity requirement for individual distributed energy resources participating in its markets through a distributed energy resource aggregation or, alternatively, to explain why such a requirement is not necessary.

6. Single Resource Aggregation

a. NOPR Proposal

182. The NOPR proposed, consistent with Order No. 719, that each RTO/ISO revise its tariff to allow a single qualifying distributed energy resource to avail itself of the proposed distributed energy resource aggregation rules by serving as its own distributed energy resource aggregator.[456]

b. Comments

183. AES Companies, NextEra, and NYISO agree with the Commission's proposal to require each RTO/ISO to revise its tariff to allow a single qualifying distributed energy resource to avail itself of the proposed distributed energy resource aggregation rules by serving as its own distributed energy resource aggregator.[457] CAISO states that, consistent with the NOPR proposal, CAISO allows a distributed energy resource provider to aggregate one or more distributed energy resources for purposes of wholesale market participation.[458]

184. Xcel Energy Services suggests that a higher minimum threshold size should be established for single distributed energy resource aggregations because a proliferation of individual aggregators could increase administrative costs.[459]

c. Commission Determination

185. To implement § 35.28(g)(12)(ii)(a) of the Commission's regulations, we adopt the NOPR proposal to require each RTO/ISO to revise its tariff to allow a single qualifying distributed energy resource to avail itself of the proposed distributed energy resource aggregation rules by serving as its own distributed energy resource aggregator.[460]

186. We decline to require a minimum size greater than 100 kW for a single qualifying distributed energy resource that serves as its own distributed energy resource aggregator, as requested by Xcel Energy Services. We find that such a requirement is unnecessary at this time as the 100 kW minimum size requirement is a commonly used resource size that should not overburden RTO/ISO modeling software even if many individual resources choose to participate as such single distributed energy resource aggregations. In addition, a consistent minimum size requirement for aggregations of both single and multiple distributed energy resources will minimize barriers in the event that an individual distributed energy resource ceases to participate in a multi-resource aggregation and subsequently seeks to participate in RTO/ISO markets as a single qualifying distributed energy resource aggregation. As discussed above in Section IV.C.5, a single distributed energy resource aggregation would need to comply with all of the applicable RTO's/ISO's requirements, including any minimum or maximum capacity requirements for individual distributed energy resources.[461] We clarify that, like other distributed energy resources seeking to participate in RTO/ISO markets exclusively through a distributed energy resource aggregation, we will not exercise jurisdiction over the interconnection to a distribution facility of a distributed energy resource for the purpose of participating in RTO/ISO markets exclusively through a single-

[453] NYISO Comments (RM16–23) at 15. The Commission accepted NYISO's proposal to limit the size of resources in an aggregation to 20 MW or less. NYISO Aggregation Order, 170 FERC ¶ 61,033 at P 9.

[454] MISO Transmission Owners Comments (RM16–23) at 20.

[455] APPA/NRECA Comments (RM16–23) at 43.

[456] NOPR, 157 FERC ¶ 61,121 at P 137 (citing Order No. 719, 125 FERC ¶ 61,071 at P 158(d)).

[457] AES Companies Comments (RM16–23) at 39; NextEra Comments (RM16–23) at 14; NYISO Comments (RM16–23) at 16.

[458] CAISO Comments (RM16–23) at 26.

[459] Xcel Energy Services Comments (RM16–23) at 24.

[460] *See supra* P 118 n.280.

[461] *See supra* Section IV.C.5 (Minimum and Maximum Capacity Requirements).

resource aggregation. We also clarify that a single qualifying distributed energy resource that serves as its own aggregator would also be subject to any requirements applicable to distributed energy resource aggregators.

D. Locational Requirements

a. NOPR Proposal

187. In the NOPR, the Commission stated that it was concerned that some existing requirements for aggregations to be located behind a single point of interconnection or pricing node may be overly stringent and may unnecessarily restrict opportunities for distributed energy resources to participate in the RTO/ISO markets through a distributed energy resource aggregator.[462] The Commission noted that recent improvements in metering, telemetry, and communication technology should facilitate better situational awareness and enable management of geographically dispersed distributed energy resource aggregations, potentially rendering such restrictive locational requirements unnecessary.

188. Thus, the Commission proposed to require each RTO/ISO to revise its tariff to establish locational requirements for distributed energy resources to participate in a distributed energy resource aggregation that are as geographically broad as technically feasible.[463] The Commission stated that this proposal would give each RTO/ISO flexibility to adopt locational requirements that both allow for the participation of geographically dispersed distributed energy resources in the RTO/ISO markets through a distributed energy resource aggregation, where technically feasible, and also account for the modeling and dispatch of the RTO's/ISO's transmission system. The Commission further acknowledged that the appropriate locational requirements may differ based on the services that a distributed energy resource aggregator seeks to provide (*e.g.,* the locational requirements for participation in the day-ahead energy market may differ from those for participation in ancillary service markets).

189. To the extent that commenters would prefer that the Commission require the RTOs/ISOs to adopt consistent locational requirements, the Commission sought comment on what locational requirements it could require each RTO/ISO to adopt that would allow distributed energy resources to be aggregated as widely as possible without threatening the reliability of the transmission grid or the efficiency of RTO/ISO markets.[464] The Commission noted that, in some RTOs/ISOs and for some services, the only geographic limitations imposed on distributed energy resource aggregations are by zone or due to modeled transmission constraints.[465] The Commission also sought comment on potential concerns about dispatch, pricing, or settlement that the RTOs/ISOs must address if the distributed energy resources in a particular distributed energy resource aggregation are not limited to the same pricing node or behind the same point of interconnection.[466]

190. At the April 2018 technical conference, the Commission sought comment on how to establish locational requirements for distributed energy resource aggregations that are as broad as technically feasible.[467] After the technical conference, the Commission sought further comment on how RTOs/ISOs can accurately represent distributed energy resources in each node within a multi-node aggregation.[468]

b. Comments

191. Several commenters support the Commission's proposal to require distributed energy resource aggregations that are as geographically broad as technically feasible and cite numerous benefits of broad aggregation.[469] IRC states that this proposal strikes the appropriate balance between accommodating smaller distributed energy resources and providing the necessary flexibility to RTOs/ISOs.[470] Advanced Energy Economy contends that aggregation across a broad geographic area is fundamental to the distributed energy resource business model.[471] Advanced Energy Management contends that the larger the aggregation, the lower the chance of underperformance.[472] Several commenters support multi-node aggregation, stating that it will improve market entry and overall competitive benefits.[473] Others assert that multi-node aggregation will improve the services that distributed energy resource aggregations can provide, enhancing grid resilience and reliability.[474]

192. Several commenters highlight examples of current RTO/ISO activities supporting broad geographic aggregation. Advanced Energy Economy states that PJM and NYISO have allowed aggregation at a broad level for behind-the-meter resources.[475] Several commenters note that CAISO allows aggregation across nodes by permitting an aggregator to submit distribution factors.[476] Advanced Energy Management highlights that ISO–NE allows aggregation at the dispatch zone level, stating that this suggests that it is technically feasible to aggregate behind-the-meter resources to that level even for energy and ancillary services participation.[477]

193. Multiple commenters also articulate concerns regarding limiting distributed energy resource aggregations to a single node.[478] Advanced Energy Economy and Advanced Energy Management contend that aggregation limited to the nodal level will not meet the ''geographically broad as technically feasible'' standard, and Advanced Energy Management asks the Commission to clarify that it does not.[479] Advanced Energy Economy and CAISO further caution against the economic effects of single-node aggregation, stating that it would erode

[462] NOPR, 157 FERC ¶ 61,121 at P 138.

[463] *Id.* P 139.

[464] *Id.* P 140.

[465] *Id.* n.233 (citing CAISO and NYISO tariff provisions).

[466] *Id.* P 141. The Commission noted that its proposal to allow the relevant distribution utility or utilities to review the list of distributed energy resources in a distributed energy resource aggregation would help ensure that dispatch of the aggregated distributed energy resources as a single resource will not cause any reliability concerns.

[467] Supplemental Notice of Technical Conference at 2–3.

[468] Notice Inviting Post-Technical Conference Comments at 2–3.

[469] *See, e.g.,* Advanced Energy Management Comments (RM16–23) at 24; DER/Storage Developers Comments (RM16–23) at 4; Efficient Holdings Comments (RM16–23) at 17–18; IRC Comments (RM16–23) at 8; NRG Comments (RM16–23) at 10–11.

[470] IRC Comments (RM16–23) at 8.

[471] Advanced Energy Economy Comments (RM16–23) at 45.

[472] Advanced Energy Management Comments (RM16–23) at 24.

[473] *See, e.g.,* Advanced Energy Buyers Comments (2018 RM18–9) at 7; CAISO Comments (2018 RM18–9) at 10–11; EPRI Comments (2018 RM18–9) at 6; NRG Comments (2018 RM18–9) at 4–5; SEIA Comments (2018 RM18–9) at 14.

[474] Advanced Energy Management Comments (2018 RM18–9) at 5; Direct Energy Comments (2018 RM18–9) at 2–3; Lorenzo Kristov Comments (2018 RM18–9) at 14; SEIA Comments (2018 RM18–9) at 14.

[475] Advanced Energy Economy Comments (RM16–23) at 45.

[476] *Id.;* DER/Storage Developers Comments (RM16–23) at 4; Tesla/SolarCity Comments (RM16–23) at 28. CAISO uses load distribution factors to reflect the relative amount of load at each node. The sum of all load distribution factors for a single aggregation is one. *See* CAISO Tariff, Appendix A.

[477] Advanced Energy Management Comments (RM16–23) at 25.

[478] *See, e.g.,* AES Companies Comments (RM16–23) at 36; Efficient Holdings Comments (RM16–23) at 18; Public Interest Organizations Comments (RM16–23) at 24; R Street Institute Comments (RM16–23) at 9; Sunrun Comments (2018 RM18–9) at 14.

[479] Advanced Energy Economy Comments (RM16–23) at 46–47; Advanced Energy Management Comments (RM16–23) at 24.

the economics of aggregating distributed energy resources and create a barrier to their wholesale market participation.[480]

194. Several commenters state that, at the technical conference, CAISO and PJM described workable approaches to mitigate any reliability concerns and to achieve proper price formation for multi-node aggregations of distributed energy resources.[481] Other commenters point to approaches used elsewhere, such as multi-node aggregations of demand response resources in other regions.[482] Organization of MISO States comments that, in MISO, multi-node aggregation is allowed for purposes of capacity accreditation, but only for a limited set of resource types.[483]

195. Other commenters further express support for the feasibility of dispatching and settling distributed energy resource aggregations across multiple nodes. For instance, PJM explains that it already dispatches demand response resources across varying levels of geographic areas, including across different pricing nodes, which could be used as a foundation for developing similar rules to dispatch distributed energy resources injecting past the applicable retail meter.[484] Xcel Energy Services states that it is not concerned with aggregations across multiple nodes if the region has accurate topology models, volumetric weightings, and billing/settlement metering at each location (and penalties are assessed at the individual resource level to disincentivize gaming, manipulation, and price formation errors).[485] Avangrid contends that provisions that would allow ''settlement-only'' generation treatment for aggregated distributed energy resources would allow aggregation of these resources on a broader load zone basis for energy market settlement.[486]

196. Some commenters address the relationship between the minimum and maximum size requirement for distributed energy resource aggregations and the locational requirements for them. Eversource and other commenters state that limiting the maximum size of a distributed energy resource aggregation can also mitigate any negative operational impacts of geographically broad aggregations.[487] Tesla/Solar City state that a minimum size requirement of 100 kW would allow the reasonable development of aggregations within any locational requirement established for distributed energy resource aggregations.[488] In their comments in response to the Notice Inviting Post-Technical Conference Comments, multiple commenters agree that reducing the minimum size requirement for distributed energy resource aggregations to 100 kW may alleviate concerns about requiring aggregations to be located at a single node.[489] Organization of MISO States observes that lowering the minimum size requirement for distributed energy resource aggregations would decrease the need for broad aggregation across Local Balancing Authorities and that this could also reduce the size of resources, which inherently lowers any related reliability risk to the system.[490] Lorenzo Kristov states that single-node distributed energy resource aggregations that meet the minimum size threshold would be useful resources for the wholesale market, so the question is whether the additional complexity of multi-node distributed energy resource aggregations has commensurate benefits.[491] SEIA states that it supports a 100 kW minimize size limit, but does not support limiting aggregations to single pricing nodes.[492]

197. Other commenters, however, recommend that the Commission restrict aggregation to one pricing node or interconnection point.[493] Some commenters are concerned that a geographically broad locational requirement could have potential reliability impacts on the distribution system or the bulk electric system.[494] For instance, several RTOs/ISOs, including those that support multi-node aggregations, express concerns related to managing the aggravation of transmission constraints and resulting pricing and operational implications in real time if aggregated resources were to span both sides of a constraint.[495] PJM Market Monitor states that the potential addition of more distributed energy resources means they should be aggregated at a single node to allow operators to have visibility and control.[496] PJM Market Monitor asserts that it is impossible to ensure that dispatch of a multi-node aggregation of distributed energy resources does not exacerbate a transmission constraint in a nodal system.[497]

198. NYISO Indicated Transmission Owners argue that aggregations spanning more than one transmission zone could present both administrative and operational difficulties for the RTO/ISO and the distribution utility and that aggregations should be limited to a single transmission node unless price separation does not exist.[498] EPSA and the PJM Market Monitor argue that because all the RTOs/ISOs rely on nodal security constrained economic dispatch, it is appropriate for a generic rule to limit aggregations to a single node to ensure that the markets continue to be

[480] Advanced Energy Economy Comments (2018 RM18–9) at 22; CAISO Comments (2018 RM18–9) at 10–11.

[481] Advanced Energy Economy Comments (2018 RM18–9) at 22; Advanced Energy Management Comments (2018 RM18–9) at 5–6; Direct Energy Comments (2018 RM18–9) at 6 (citing Technical Conference Transcript at 17, 18, 53); Sunrun Comments (2018 RM18–9) at 14.

[482] *See, e.g.,* Advanced Energy Economy Comments (2018 RM18–9) at 22; Advanced Energy Management Comments (2018 RM18–9) at 6 (citing ISO–NE Comments, Docket No. AD16–20–000 (filed Feb. 13, 2017) (''ISO–NE explains that, for the capacity market, demand resources may consist of an aggregation of multiple end-use customers, though they must be at least 100 kW and located within a dispatch zone or load zone as required under the participation model through which they are participating. ISO–NE further explains that for the energy and reserve markets, demand response resources may also be aggregated as long as they are individually at least 10 kW, have an expected maximum interruptible capacity of 5 MW or less, and are located within a dispatch zone and reserve zone.'')); CAISO Comments (2018 RM18–9) at 10, 12–13; Lorenzo Kristov Comments (2018 RM18–9) at 14; PJM Market Monitor Comments (2018 RM18–9) at 7–8.

[483] Organization of MISO States Comments (2018 RM18–9) at 2 (citing Midcontinent Independent System Operator, Open Access Transmission, Energy, and Operating Reserve Markets Tariff, Module E–1, Section 69A.3.5).

[484] PJM Comments (RM16–23) at 28.

[485] Xcel Energy Services Comments (RM16–23) at 25.

[486] Avangrid Comments (RM16–23) at 12.

[487] Advanced Energy Economy Comments (2018 RM18–9) at 22 (citing Technical Conference Transcript, Comments of Andrew Levitt, Senior Market Strategist, PJM Interconnection, L.L.C., at p. 20, lines 2–8, and P 49, lines 21–24 (noting the ability of economic dispatch engines to manage any constraints that may be caused by dispatching individual resources within an aggregation)); CAISO Comments (2018 RM18–9) at 5; Eversource Comments (2018 RM18–9) at 13; PJM Comments (2018 RM18–9) at 5, 11–12; SEIA Comments (2018 RM18–9) at 14.

[488] Tesla/SolarCity Comments (RM16–23) at 26.

[489] *See, e.g.,* EPRI Comments (2018 RM18–9) at 7–8; Lorenzo Kristov Comments (2018 RM18–9) at 14; Organization of MISO States Comments (2018 RM18–9) at 2; PJM Comments (2018 RM18–9) at 12.

[490] Organization of MISO States Comments (2018 RM18–9) at 2.

[491] Lorenzo Kristov Comments (2018 RM18–9) at 14.

[492] SEIA Comments (2018 RM18–9) at 14.

[493] ISO–NE Comments (RM16–23) at 37–40; NYISO Comments (RM16–23) at 17; NYISO Indicated Transmission Owners Comments (RM16–23) at 13–14; PJM Market Monitor Comments (RM16–23) at 13.

[494] *See, e.g.,* American Petroleum Institute Comments (RM16–23) at 10–11; Duke Energy Comments (RM16–23) at 3, 5–6; EEI Comments (RM16–23) at 28–29; Institute for Policy Integrity Comments (RM16–23) at 9; Pacific Gas & Electric Comments (RM16–23) at 18–19.

[495] *See, e.g.,* CAISO Comments (RM16–23) at 27; ISO–NE Comments (RM16–23) at 37; MISO Comments (RM16–23) at 21–22; NYISO Comments (2018 RM18–9) at 6, 16; SPP Comments (RM16–23) at 17–19.

[496] PJM Market Monitor Comments (2018 RM18–9) at 12.

[497] *Id.* at 4.

[498] NYISO Indicated Transmission Owners Comments (RM16–23) at 13–14.

efficient and competitive.[499] EPRI states that aggregations at single nodes would generally be the most beneficial for the distributed energy resources financially, for the RTOs/ISOs with respect to reliability, and for consumers economically.[500] NYISO states that single-node aggregation allows NYISO to telemeter only the aggregation rather than each individual resource within the aggregation, reducing the cost of participation and better allowing smaller resources to participate in the NYISO markets.[501]

199. Commenters also address the dynamic nature of managing multi-node aggregations of distributed energy resources—such as the challenges that come from frequent changes in congestion patterns and system topology.[502] Several commenters express concerns that a geographically broad locational requirement for distributed energy resource aggregations could disrupt nodal pricing methods and result in different treatment of resources located at a single node (*i.e.,* among multi-node distributed energy resource aggregations and generators).[503] Calpine states that it may be possible to revisit procedures for multi-node aggregation of distributed energy resources as the system topology changes due to congestion, but that rules associated with locational requirements may not provide the flexibility necessary for the RTOs/ISOs to manage dynamic grid conditions in real time.[504]

200. With respect to whether the Commission should require the RTOs/ISOs to adopt consistent locational requirements for distributed energy resource aggregations, commenters provide varied recommendations. Tesla/SolarCity recommend that the Commission establish consistent locational requirements across the RTOs/ISOs, similar to CAISO's Distributed Energy Resource Provider framework.[505] Mensah supports locational requirements by distribution utility zones or defined sub-zones, while noting locational requirements may vary across RTOs/ISOs.[506] Mensah asserts that locational requirements should be consistent for all wholesale market services within an individual RTO/ISO in order to avoid unnecessary complications.

201. Other commenters suggest that the RTOs/ISOs should have flexibility to determine the locational requirements appropriate for their region. Noting CAISO's approach to distributed energy resource aggregation within ''sub-zones,'' ISO–NE's approach to self-scheduling distributed energy resources, and the PJM Market Monitor's desire for nodal aggregations, MISO argues that the Commission should allow each RTO/ISO to establish tailored approaches based on its regional needs.[507] Similarly, Calpine and SoCal Edison assert that the Commission should allow regional variations.[508] PJM asserts that the Commission should require RTOs/ISOs to adopt measures necessary to ensure control of congestion, but should allow flexibility to tailor those measures for individual systems.[509]

202. Other commenters, including AES Companies and MISO Transmission Owners, argue for regional flexibility but recommend that other entities besides the RTOs/ISOs, such as affected balancing authorities, distribution utilities, states, and non-regulated distribution cooperatives, determine the locational requirements.[510]

203. Several of the commenters that support the Commission adopting rules for multi-node aggregations suggest that the RTOs/ISOs could be permitted to present evidence in their compliance filings demonstrating that limiting aggregations is necessary for reliability reasons.[511] Direct Energy and NRG argue that any limits or boundaries on aggregations of distributed energy resources must be supported by a transparent, comprehensive, and data-driven regional analysis, and that a distributed energy resource's participation should only be precluded if its participation would undermine reliability.[512]

c. Commission Determination

204. We adopt the NOPR proposal and add § 35.28(g)(12)(ii)(b) to the Commission's regulations to require each RTO/ISO to revise its tariff to establish locational requirements for distributed energy resources to participate in a distributed energy resource aggregation that are as geographically broad as technically feasible. However, given the variety of approaches to locational requirements proposed by commenters, we will provide each RTO/ISO with flexibility to determine the locational requirements for its region, as long as it demonstrates that those requirements are as geographically broad as technically feasible. To the extent that an RTO/ISO seeks to continue its currently effective locational requirements for distributed energy resources, it must demonstrate on compliance that its approach meets this requirement. To comply with this rule, each RTO/ISO must provide a detailed, technical explanation for the geographical scope of its proposed locational requirements. 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 its proposed locational requirements.

205. We recognize the arguments for both multi-node and single-node aggregations. There are several benefits of multi-node aggregations, such as improved market entry and competition, lower chance of underperformance, and improved services that aggregations can provide. However, single-node aggregations may reduce the cost of participation for smaller resources by telemetering the aggregation rather than each individual resource and allows RTOs/ISOs to better manage intra-zonal price congestion. Additionally, as discussed above, the reduction of the minimum size requirement for distributed energy resource aggregations will help alleviate commenters' concerns about requiring aggregations to locate only at a single node.[513]

206. We are persuaded by comments that identify the various benefits of multi-node distributed energy resource

[499] EPSA Comments (2018 RM18–9) at 8–9; PJM Market Monitor Comments (2018 RM18–9) at 2–3.

[500] EPRI Comments (2018 RM18–9) at 6.

[501] NYISO Comments (2018 RM18–9) at 6, 8.

[502] CAISO Comments (2018 RM18–9) at 5–6; EPRI Comments (2018 RM18–9) at 3–4; MISO Comments (2018 RM18–9) at 18; NYISO Comments (2018 RM18–9) at 6; PJM Market Monitor Comments (2018 RM18–9) at 3.

[503] *See, e.g.,* American Petroleum Institute Comments (RM16–23) at 10–11; EEI Comments (RM16–23) at 28–30; ISO–NE Comments (RM16–23) at 37–40; NYISO Indicated Transmission Owners at 16–17; PJM Market Monitor Comments (RM16–23) at 13.

[504] Calpine Comments (2018 RM18–9) at 4–5 (citing comments of Dr. Joseph Bowring, Technical Conference Transcript at 37; comments of Jeff Bladen, Technical Conference Transcript at 36).

[505] Tesla/SolarCity Comments (RM16–23) at 27.

[506] Mensah Comments (RM16–23) at 3.

[507] MISO Comments (2018 RM18–9) at 20 (citing Technical Conference Transcript at 9–11, 14–15, 20–23).

[508] Calpine Comments (2018 RM18–9) at 5–6; SoCal Edison Comments (2018 RM18–9) at 3.

[509] PJM Comments (2018 RM18–9) at 6–7.

[510] AES Companies Comments (RM16–23) at 10, 34; MISO Transmission Owners Comments (RM16–23) at 21.

[511] Advanced Energy Economy Comments (2018 RM18–9) at 22–23; Advanced Energy Management Comments (2018 RM18–9) at 6; Direct Energy Comments (2018 RM18–9) at 3–4 (describing examples of distributed energy resource aggregations being operated in Belgium, France and Australia); NRG Comments (2018 RM18–9) at 5.

[512] Direct Energy Comments (2018 RM18–9) at 4–5, 6–7 (citing Technical Conference Transcript at 9, 34).

[513] *See supra* Section IV.C.4 (Minimum and Maximum Size of Aggregation).

aggregations. In particular, we are persuaded by CAISO's arguments that multi-node aggregations allow for greater market participation by reducing transaction costs and assembling appropriately sized resources optimized for the wholesale electricity markets, and by PJM's assertion that it already dispatches demand response resources across different pricing nodes.[514] We believe that the challenges of managing a multi-node aggregation—especially around a transmission constraint—can be overcome through coordination between RTOs/ISOs, aggregators, and distribution system operators. However, we also recognize that existing differences—both operational and administrative—among RTOs/ISOs make such a uniform requirement challenging. Those differences are relevant here because some RTOs/ISOs already aggregate resources in a different manner, dynamic changes in system topology and congestion patterns vary across each RTO/ISO, and each RTO/ISO may have different solutions addressing reliability impacts on their respective systems. Accordingly, while each RTO/ISO must provide a detailed, technical explanation for the geographical scope of its proposed locational requirements, this final rule provides RTOs/ISOs with a certain degree of flexibility as to the technical aspects of a locational requirement that is as geographically broad as possible.

207. As to arguments regarding the relative merits of single node and multi-node aggregations, we find that providing RTOs/ISOs with the flexibility to establish their own locational requirements on compliance that are as geographically broad as technically feasible will allow such arguments to be considered in the stakeholder process and in each RTO/ISO-specific compliance proceeding. We also are not persuaded by Mensah's and Tesla/SolarCity's arguments for consistent locational requirements either across the RTOs/ISOs or for all wholesale market services within an individual RTO/ISO. We find that there is no need to standardize the locational requirements and therefore instead provide the RTOs/ISOs the flexibility to develop more tailored approaches based on their regional needs. In addition, we are not persuaded by AES Companies' and MISO Transmission Owners' arguments that entities other than the RTO/ISO should determine the locational requirements of distributed energy resources. We find that RTOs/ISOs have the primary responsibility of administering the regional markets and reliably operating the system, and are therefore in the best position to propose on compliance the appropriate locational requirements, as long as they demonstrate that those requirements are as geographically broad as technically feasible, to enable distributed energy resources to participate in a distributed energy resource aggregation for their regions.

E. Distribution Factors and Bidding Parameters

a. NOPR Proposal

208. In the NOPR, the Commission proposed to require each RTO/ISO to revise its tariff to include the requirement that distributed energy resource aggregators (1) provide default distribution factors [515] when they register their distributed energy resource aggregation; and (2) update those distribution factors if necessary when they submit offers to sell or bids to buy into the RTO/ISO markets.[516] The Commission also proposed to require each RTO/ISO to revise the bidding parameters for each participation model in its tariff to allow distributed energy resource aggregators to update their distribution factors when participating in RTO/ISO markets. The Commission sought comment on this proposal as well as comment on alternative approaches that may provide the RTOs/ISOs with the information from geographically or electrically dispersed resources in a distributed energy resource aggregation necessary to reliably operate their systems. The Commission also sought comment on whether bidding parameters in addition to those already incorporated into existing participation models may be necessary to adequately characterize the physical or operational characteristics of distributed energy resource aggregations.

209. After the April 2018 technical conference, the Commission sought additional information about bidding parameters or other potential mechanisms needed to represent the physical and operational characteristics of distributed energy resource aggregations in RTO/ISO markets.[517]

b. Comments

210. A number of commenters support the Commission's proposed requirement for distributed energy resource aggregators to provide default distribution factors to the RTO/ISO when registering distributed energy resource aggregations and to update those distribution factors as necessary.[518] Tesla/SolarCity states that this method strikes the proper balance between providing flexibility and market access to distributed energy resource aggregators while providing sufficient information to RTOs/ISOs about the locations of the individual distributed energy resources and how dispatching them will affect the system.[519] DER/Storage Developers assert that distribution factors would provide the RTO/ISO with sufficient information to maintain reliability without requiring unnecessary information about individual distributed energy resources.[520]

211. CAISO generally supports the Commission's proposal and notes that its Distributed Energy Resource Provider model rules require an aggregator to submit generation distribution factors with its bid.[521] CAISO states that multi-node aggregations require distribution factors to model the impact of the resource on the transmission system and that allowing resources to update distribution factors in the bid submission process mitigates the potential for inaccuracies. If an aggregator does not submit distribution factors with its bid, CAISO states that it uses the aggregation's default generation distribution factors registered in CAISO's Master File for a reasonable expectation of how the resource will perform across applicable pricing nodes.[522] CAISO notes that using distribution factors to schedule load is an acceptable and feasible practice despite inherent inaccuracies.[523] Microgrid Resources Coalition notes that CAISO's Distributed Energy Resource Provider model permits participation in aggregations of separately metered resources independent of the various attributes of the other loads and resources behind the meter and that the critical feature of this arrangement is the ability to define the limits of participation so that the aggregator and the system operator can dispatch the aggregation within those

[514] *See* CAISO Comments (2018 RM18–9) at 10; PJM Comments (RM16–23) at 28.

[515] Distribution factors indicate how much of the total response from a distributed energy resource aggregation would be coming from each node at which one or more resources participating in the aggregation are located.

[516] NOPR, 157 FERC ¶ 61,121 at P 143.

[517] Notice Inviting Post-Technical Conference Comments at 4–5.

[518] *See, e.g.,* CAISO Comments (RM16–23) at 30; DER/Storage Developers Comments (RM16–23) at 4; NextEra Comments (RM16–23) at 15; SEIA Comments (RM16–23) at 19; Xcel Energy Services Comments (RM16–23) at 25.

[519] Tesla/SolarCity Comments (RM16–23) at 28.

[520] DER/Storage Developers Comments (RM16–23) at 4.

[521] CAISO Comments (2018 RM18–9) at 11.

[522] CAISO Comments (RM16–23) at 30–31.

[523] CAISO Comments (2018 RM18–9) at 11.

limits.[524] Lorenzo Kristov also notes that the CAISO Distributed Energy Resource Provider structure enables multi-node aggregations using both default and biddable distribution factors.[525] Lorenzo Kristov states, however, that these provisions have not yet been practically tested by a non-demand-response resource. Conversely, NYISO states that it does not need distribution factors to dispatch distributed energy resource aggregations accurately because it intends to limit distributed energy resource aggregations to resources at a single transmission node.[526]

212. Other RTOs/ISOs assert that implementing the Commission's proposal may be technically difficult. SPP states that implementing distribution factors in the software is not trivial.[527] MISO states that it currently updates the distribution factors daily and that updating more frequently may result in a significantly large amount of data exchange and processing in the market system.[528]

213. Several RTOs/ISOs also describe the limitations of distribution factor requirements. SPP notes that distribution factors provide the reliability coordinator with the distribution of the resources in the aggregation, but those factors do not guarantee that the resources in the aggregation will move pro-rata. SPP asserts that the uncertainty in the aggregate response may cause a reliability issue by introducing uncertainty in its effective dispatch to resolve constraints. SPP adds that the economics and pricing of the aggregate may not reflect the actual response on the sub-aggregate level.[529] Similarly, ISO–NE also argues that distribution factors may vary based on the actual level of dispatch of the aggregate, for example, there could be a large difference between distribution factors based upon the maximum MW output and the minimum MW output of an aggregation.[530] Pacific Gas & Electric suggests that, because the distribution factors will impact settlements and congestion, distributed energy resource aggregations should use an outage management-like system to report if real-time distribution factors differ from those that are used for the market award.[531]

214. Some commenters assert that the Commission should not impose the distribution factor requirements in all regions. NYISO Indicated Transmission Owners state that the application of distribution factors may not be the optimal approach for dispatching resources within an aggregation in all systems, especially if it leads to dispatching resources on either side of a single constraint.[532] NYISO Indicated Transmission Owners argue that the Commission should require RTOs/ISOs to develop solutions that are regionally appropriate and that promote efficient dispatch of resources with effective resolution of constraints on both the transmission and distribution systems.

215. Similarly, ISO–NE asks the Commission to allow each RTO/ISO to develop an approach that works well in light of each region's particular network configuration, infrastructure, and existing operational processes.[533] ISO–NE explains that, rather than providing distribution factors, an aggregator could, for example, report the expected MW capability at each node, or that size limits for being dispatchable in the markets could be lowered, reducing the need to aggregate across multiple nodes to participate.[534] ISO–NE states that, for a mesh network such as most of New England, using distribution factors as the basis for dispatch is problematic.[535] ISO–NE explains that a participant would be unable to predict the changing power flows to multiple connected nodes without possessing the same detailed knowledge of grid configuration used by ISO–NE and the distribution utilities in real-time operations. As a result, ISO–NE contends that any stated distribution factors could bear little relation to real-time operations.

216. ISO–NE contends that, in scenarios where the distribution system is not radial to the transmission system, a single resource located in the distribution network may have sensitivities to multiple nodes in the transmission system.[536] ISO–NE argues that it is not reasonable for an aggregator to try to submit distribution factors for each node as they would not have visibility to these sensitivities. ISO–NE notes that it has addressed this problem with Asset-Related Demand by only supporting aggregations of Asset-Related Demand that have similar sensitivities to each node, so that an aggregated node can be modeled to reflect the impacts to the system of the Asset-Related Demand for which the Asset-Related Demand has a 100% distribution factor. ISO–NE states that this approach may or may not be appropriate for distributed energy resource aggregations and would require further evaluation and coordination with the distribution utilities.[537]

217. In response to the Commission's request for comment on whether bidding parameters in addition to those already incorporated into existing participation models may be necessary to adequately characterize the physical or operational characteristics of distributed energy resource aggregations, some commenters argue that RTOs/ISOs should be allowed to require additional bidding parameters for distributed energy resource aggregations to reliably operate the bulk power system and accurately reflect resources in the wholesale markets.[538] Stem suggests that bidding parameters in current RTO/ISO rules assume that a resource's physical attributes, such as ramp rate or maximum charge limit, are fixed values and that the resource is dispatchable to those levels at all times, which will need to change.[539] Stem argues that behind-the-meter resources should be able to elect to be out of the market at certain times, as long as their existing service obligations are met.[540] PJM Market Monitor asserts that, as long as distributed energy resources are priced and dispatched locationally, the existing offer parameters should address the characteristics of the resources.[541] Dominion argues that distributed energy resource aggregators should be allowed to communicate distributed energy resource aggregations' operating limitations to the RTO/ISO and control their dispatch to the same extent as other resources.[542] Dominion adds that certain distributed energy resources, such as solar generators, should also have the option to only be curtailed for reliability concerns.

218. NYISO Indicated Transmission Owners assert that distributed energy resource aggregations participating in capacity markets should bid a capacity value that reflects the aggregation's

[524] Microgrid Resources Coalition (2018 RM18–9) at 9.

[525] Lorenzo Kristov Comments (2018 RM18–9) at 14.

[526] NYISO Comments (RM16–23) at 17. The Commission accepted NYISO's tariff provisions related to aggregations, which require that facilities within an aggregation are electrically connected to the same transmission node. NYISO Aggregation Order, 170 FERC ¶ 61,033 at PP 6, 11.

[527] SPP Comments (RM16–23) at 19.

[528] MISO Comments (RM16–23) at 23.

[529] SPP Comments (RM16–23) at 19–20.

[530] ISO–NE Comments (RM16–23) at 42–43.

[531] Pacific Gas & Electric Comments (RM16–23) at 19.

[532] NYISO Indicated Transmission Owners Comments (RM16–23) at 20.

[533] ISO–NE Comments (RM16–23) at 41.

[534] *Id.* at 45.

[535] *Id.* at 42.

[536] *Id.* at 44.

[537] *Id.* at 44–45.

[538] Dominion Comments (RM16–23) at 11; NYISO Comments (RM16–23) at 17.

[539] Stem Comments (RM16–23) at 15, 16.

[540] *Id.* at 16.

[541] PJM Market Monitor Comments (2018 RM18–9) at 5.

[542] Dominion Comments (RM16–23) at 11.

value in satisfying the peak period resource adequacy requirements.[543] NYISO Indicated Transmission Owners state that the capacity value for distributed energy resource aggregations should take into account various factors, such as variability of the aggregation, extent to which the distributed energy resource aggregation is energy limited, and composition of technologies that comprise the aggregation, but underscores that solutions should be addressed during implementation in each RTO's/ISO's stakeholder process to ensure regional variations are accommodated.[544]

219. MISO states that it needs more time to further investigate and better understand the potential need for additional bidding parameters for distributed energy resource aggregations.[545] MISO asserts that such parameters will likely be needed to the extent a distributed energy resource may involve an aggregation of electric storage resources and if the RTO/ISO is expected to manage their state of charge. MISO explains that, as an example, distributed energy resource aggregations might need to provide information describing sub-aggregations for MISO to address security constraints associated with separate distribution networks or separate nodes within a distribution network.[546]

220. Advanced Microgrid Solutions asserts that RTOs/ISOs must have separate rules regarding attributes, bidding parameters, and dispatch in order to recognize the multiple uses for behind-the-meter electric storage resources.[547] Advanced Microgrid Solutions further explains that some requirements relevant to a single-site resource are irrelevant for an aggregation.[548] For instance, Advanced Microgrid Solutions states that an aggregation of behind-the-meter resources does not have an equivalent to a state of charge for a single-site distributed energy resource to be used as a bidding parameter for a fleet of aggregated distributed energy resources and, instead, the aggregator must bid based on calculated availability and should be penalized if the fleet does not perform as bid. Furthermore, Microgrid Resources Coalition asserts that microgrids can also provide wholesale services with suitable metering and controls but that their participation is frequently restricted.[549] Microgrid Resources Coalition argues that it is important that the resource be able to define the limits of participation within the aggregation, so that it can be dispatched within its own limits, noting that an aggregation would be subject to penalties if it cannot comply.

221. EPRI states that an injection of energy from a resource on the distribution system usually results in reduced losses as compared to the same injection on the transmission bus.[550] EPRI argues that this reduction of losses is one of the substantial values that distributed energy resources can provide and that this value should be reflected in marginal prices at distributed energy resource locations.[551] EPRI states that the RTO/ISO may not be able to calculate the value without information on the distribution system, so this value may need to be included as a bidding parameter, which may require verification by the distribution utility.

222. Several RTOs/ISOs do not believe that the Commission should mandate additional universal bidding parameters. SPP believes that each RTO/ISO should have the discretion to develop bidding parameters that reflect their unique needs relative to their individual software and applications.[552] CAISO notes that its existing market participation models available to distributed energy resource aggregations provide the means to account for the physical and operational characteristics of an aggregation and argues that no universal bidding parameters need to be established.[553]

223. Duke Energy argues that any RTO/ISO bidding parameters must treat all resources comparably and not favor certain new technologies or resources over others.[554] NRG contends that, for aggregations, bidding parameters should generally match the appropriate participation model. For example, NRG states generation bidding parameters should apply to aggregations composed strictly of distributed generators, and demand response bidding parameters should apply to aggregations containing only load resources with no ability to net inject into the system.[555] NRG notes that the bidding parameters for bi-directional resources should be general enough to encompass requirements of distributed energy resource aggregators as well as storage-only resources.

224. EPRI states that distribution factors are the primary unique parameter, noting that they may need to be allowed to vary dynamically in order for values to be as accurate as possible.[556] EPRI also suggests that the value of marginal distribution losses on the distribution system is unique and may help the RTO/ISO determine economically efficient resources.

c. Commission Determination

225. In this final rule, we adopt the NOPR proposal, as modified below, and add § 35.28(g)(12)(ii)(c) to the Commission's regulations to require each RTO/ISO to establish market rules that address distribution factors and bidding parameters for distributed energy resource aggregations. Specifically, we require each RTO/ISO that allows multi-node aggregations to revise its tariff to (1) require that distributed energy resource aggregators give to the RTO/ISO the total distributed energy resource aggregation response that would be provided from each pricing node, where applicable, when they initially register their aggregation and to update these distribution factors if they change; [557] and (2) incorporate appropriate bidding parameters into its participation models as necessary to account for the physical and operational characteristics of distributed energy resource aggregations.[558]

226. As the Commission explained in the NOPR, RTOs/ISOs need to know which resources in a distributed energy resource aggregation will be responding to their dispatch signals and where those resources are located.[559] As the Commission also explained in the NOPR, this information is particularly important if the resources in a distributed energy resource aggregation are located across multiple points of interconnection, multiple transmission or distribution lines, or multiple nodes on the grid.

227. Additionally, we agree with commenters that some bidding parameters for existing participation models may not accommodate the

[543] NYISO Indicated Transmission Owners Comments (RM16–23) at 11.

[544] *Id.* at 11–12.

[545] MISO Comments (RM16–23) at 23.

[546] *Id.* at 23–24.

[547] Advanced Microgrid Solutions Comments (RM16–23) at 7.

[548] *Id.* at 8.

[549] Microgrid Resources Coalition Comments (RM16–23) at 6.

[550] EPRI Comments (RM16–23) at 28.

[551] *Id.* at 29.

[552] SPP Comments (RM16–23) at 20.

[553] CAISO Comments (RM16–23) at 31.

[554] Duke Energy Comments (RM16–23) at 6–7.

[555] NRG Comments (RM16–23) at 14.

[556] EPRI Comments (2018 RM18–9) at 5.

[557] We note that distribution factors are only necessary to the extent that distributed energy resources participating in an aggregation are located at different nodes. This methodology would apply only when distributed energy resources located at different nodes participate in the same aggregation to provide a particular market service.

[558] For example, such bidding parameters could include response rates, ramp rates, and upper and lower operating limits. *See* CAISO Tariff, Section 30.5.2.1; NYISO Tariffs, NYISO MST, Section 4.2.1.3.3 (18.0.0).

[559] NOPR, 157 FERC ¶ 61,121 at P 142.

unique features of certain distributed energy resource aggregations, and that different bidding parameters may be needed to recognize distributed energy resources' multiple uses. Therefore, we further modify the NOPR proposal to require that each RTO/ISO incorporate appropriate bidding parameters into its participation models as necessary to account for the physical and operational characteristics of distributed energy resource aggregations. In meeting this requirement, each RTO/ISO must either (1) incorporate appropriate bidding parameters that account for the physical and operational characteristics of distributed energy resource aggregations into its one or more new participation models for such aggregations; and/or (2) adjust the bidding parameters of the existing participation models to account for the physical and operational characteristics of distributed energy resource aggregations.

228. We find that the revisions directed by this final rule will provide distributed energy resource aggregators with the flexibility to update their distribution factors and provide RTOs/ISOs with the information needed to model aggregations accurately enough to issue feasible dispatch instructions and maintain reliability.

229. However, several commenters contend that requiring the RTOs/ISOs to account for distribution factors and other bidding parameters as described in the NOPR may be technically difficult to implement, or of little benefit considering the RTO's/ISO's network configuration. In light of this concern, we find that, in meeting this requirement, each RTO/ISO may revise its tariff to manage the locational attributes of distributed energy resource aggregations in a manner that reflects the RTO's/ISO's unique network configuration, infrastructure, and existing operational processes. We will evaluate, upon compliance, the RTO's/ISO's proposal to ensure that it will provide the RTO/ISO with sufficient information from resources in a multi-node distributed energy resource aggregation that is necessary to reliably operate its systems without imposing undue burden on individual distributed energy resources or utility distribution companies.[560] RTOs/ISOs that allow multi-node aggregations must, at a minimum, propose clear protocols explaining how a distributed energy resource aggregation can provide the required information and update that information when needed.

[560] *Id.* P 143.

F. Information and Data Requirements

a. NOPR Proposal

230. In the NOPR, the Commission proposed that the distributed energy resource aggregator must initially provide to the RTO/ISO a description of the physical parameters of the distributed energy resource aggregation, including (1) the total capacity; (2) the minimum and maximum operating limits; (3) the ramp rate; (4) the minimum run time; and (5) the default distribution factors, if applicable.[561] The Commission also proposed to require each RTO/ISO to revise its tariff to require each distributed energy resource aggregator to provide the RTO/ISO with a list of the distributed energy resources in the distributed energy resource aggregation that includes information about each of those distributed energy resources, including each resource's capacity, location on the distribution system, and operating limits. In addition, the Commission proposed to require each RTO/ISO to revise its tariff to require distributed energy resource aggregators to maintain aggregate settlement data for the distributed energy resource aggregation so that the RTO/ISO can regularly settle with the distributed energy resource aggregator for its market participation.[562] Lastly, the Commission proposed to require distributed energy resource aggregators to maintain data, for a length of time consistent with the RTO's/ISO's auditing requirements, for each individual resource in its distributed energy resource aggregation so that each resource can verify its performance if audited. The Commission sought comment on these proposed data requirements and on whether there are information and data requirements imposed by RTOs/ISOs that apply to other market participants that should not apply to individual distributed energy resources participating in RTO/ISO markets through a distributed energy resource aggregation.[563]

b. Comments

231. Some commenters support the NOPR proposal to require information and data requirements for individual distributed energy resources. CAISO, EEI, and Organization of MISO States support requiring distributed energy resource aggregators to provide a list of individual resources and their location and technical capabilities.[564] The New York Commission asserts that local distribution utilities must have information on the activities of distributed energy resources, even when they are only providing wholesale services.[565] However, Mosaic Power requests that electric distribution companies address their operational need for information in the least restrictive manner possible, given that account owner registration requirements would create prohibitive costs under its business model.[566] ISO–NE and NYISO request that the Commission give them flexibility to develop their own information and data requirements and urge the Commission to provide only high-level guidance.[567]

232. In contrast, many developers argue that information and data requirements should only apply to the distributed energy resource aggregation as a whole because (1) it is the single interface with the RTO/ISO; and (2) it is not necessary for the RTO/ISO to model each and every resource included in an aggregation to effectively model and dispatch the aggregation.[568] Efficient Holdings claims that failure to account for the dynamic nature of a distributed energy resource aggregation asset's performance capabilities and the likely turnover of individual resources within a distributed energy resource aggregation will place undue burden on these assets.[569]

233. Several commenters believe RTOs/ISOs currently have information and data requirements for other market participants that should not apply to individual distributed energy resources participating in RTO/ISO markets through an aggregation.[570] For example, CAISO explains that it has certain requirements that do not apply to distributed energy resources in an aggregation (*e.g.,* its meteorological data requirements that apply to eligible intermittent resources do not extend to a distributed energy resource aggregation) and urges the Commission to maintain a degree of flexibility on this issue.[571] R Street Institute similarly

[561] *Id.* P 145.

[562] *Id.* P 147.

[563] *Id.* PP 146, 147.

[564] CAISO Comments (RM16–23) at 32; EEI Comments (RM16–23) at 31; Organization of MISO States Comments (RM16–23) at 8.

[565] New York Commission Comments (RM16–23) at 14.

[566] Mosaic Power Comments (RM16–23) at 6.

[567] ISO–NE Comments (RM16–23) at 46–47; NYISO Comments (RM16–23) at 17.

[568] *See, e.g.,* Advanced Microgrid Solutions Comments (RM16–23) at 8; AES Companies Comments (RM16–23) at 41, 45–46; DER/Storage Developer Comments (RM16–23) at 3–4; MISO Transmission Owners Comments (RM16–23) at 22; Stem Comments (RM16–23) at 13–14.

[569] Efficient Holdings Comments (RM16–23) at 20.

[570] CAISO Comments (RM16–23) at 33; Efficient Holdings Comments (RM16–23) at 11, 19–20; R Street Institute Comments (RM16–23) at 10.

[571] CAISO Comments (RM16–23) at 32–34.

argues that requiring the same meteorological data for distributed energy resource aggregators as stand-alone variable energy resources could impose undue burdens on individual distributed energy resources.[572] MISO argues that current data communication methods between MISO, the local balancing authority, and the generation operator may be cost prohibitive for distributed energy resource aggregators.[573] However, several distribution utilities argue that information and data requirements should be comparable for all wholesale market participants.[574]

234. Some commenters generally support the requirements for distributed energy resource aggregators to maintain aggregate settlement data [575] and maintain data for a defined length of time, consistent with the RTO's/ISO's auditing requirements, for each individual resource in the aggregation so that each resource can verify its performance if audited.[576] However, Sunrun requests that RTOs/ISOs only apply these requirements to the aggregation and not to individual resources within the aggregation.[577]

235. Advanced Energy Buyers state that RTOs/ISOs should facilitate streamlined data collection and sharing, including from the RTO/ISO to the distribution utility, to enable data-driven planning and operation to maximize efficiency, as well as to send good investment signals to enable customers to prioritize delivery of distributed energy resources where they will add maximum value.[578]

c. Commission Determination

236. Upon consideration of the comments, we adopt the NOPR proposal, with modifications, and add § 35.28(g)(12)(ii)(d) to the Commission's regulations to require each RTO/ISO to establish market rules that address information requirements and data requirements for distributed energy resource aggregations. Specifically, we require each RTO/ISO to revise its tariff to (1) include any requirements for distributed energy resource aggregators that establish the information and data that a distributed energy resource aggregator must provide about the physical and operational characteristics of its aggregation; (2) require distributed energy resource aggregators to provide a list of the individual resources in its aggregation; and (3) establish any necessary information that must be submitted for the individual distributed energy resources. We also require each RTO/ISO to revise its tariff to require distributed energy resource aggregators to provide aggregate settlement data for the distributed energy resource aggregation and to retain performance data for individual distributed energy resources in a distributed energy resource aggregation for auditing purposes.

237. With respect to the NOPR proposal that the distributed energy resource aggregator initially provide to the RTO/ISO ''a description of the physical parameters of the distributed energy resource aggregation,'' [579] we believe that the physical attributes of the distributed energy resource aggregation as a whole may already be captured by an RTO's/ISO's registration requirements for all market participants or may otherwise be inapplicable to distributed energy resource aggregations. Therefore, to avoid creating unnecessary or redundant requirements for distributed energy resource aggregations and to provide flexibility to the RTOs/ISOs, we do not adopt that proposal. Rather, we require the RTOs/ISOs to revise their tariffs to establish any necessary physical parameters that distributed energy resource aggregators must submit as part of their registration process only to the extent these parameters are not already represented in general registration requirements or bidding parameters applicable to distributed energy resource aggregations.

238. With respect to information requirements for individual distributed energy resources, we do not adopt the NOPR proposal to require each RTO/ISO to revise its tariff to require distributed energy resource aggregators to provide the RTO/ISO with specific information about each of the distributed energy resources in an aggregation, including each resource's capacity, location on the distribution system, and operating limits. Instead, we direct each RTO/ISO to revise its tariff to require distributed energy resource aggregators to provide a list of the individual distributed energy resources participating in their aggregations to the RTO/ISO. If an RTO/ISO needs additional information beyond this list, the RTO/ISO should identify and explain in its compliance filing what additional specific information about the individual distributed energy resources within an aggregation that the RTO/ISO needs. The RTO/ISO should also propose how the information requested must be shared with the RTO/ISO and affected distribution utilities. As part of these tariff revisions, and as further discussed in Section IV.I. below, each RTO/ISO must also require that the distributed energy resource aggregator update that list of individual resources and associated information as it changes. We find that this approach provides greater flexibility to RTOs/ISOs and imposes potentially less onerous requirements upon distributed energy resource aggregators, while ensuring that necessary information is conveyed to RTOs/ISOs.

239. We also clarify that the distributed energy resource aggregator, not an individual distributed energy resource in the aggregation, is the single point of contact with the RTO/ISO, and the aggregator would be responsible for managing, dispatching, metering, and settling the individual distributed energy resources in its aggregation. As such, the RTO/ISO may only need the information necessary to model and dispatch the distributed energy resource aggregation as a whole, and thus we agree with commenters that sharing detailed information about the individual distributed energy resources may be an unnecessary and unduly burdensome requirement. We believe that the modified approach described above strikes a reasonable balance between the information needs of RTOs/ISOs and the burden that providing such information can place on distributed energy resource aggregators seeking to participate in RTO/ISO markets.

240. With respect to the aggregate settlement data for a distributed energy resource aggregation, as well as performance data for individual distributed energy resources in a distributed energy resource aggregation, we find that these sets of information are necessary for the participation of any type of resource in RTO/ISO markets and to enable RTOs/ISOs to perform necessary audit functions. Therefore, we adopt the NOPR proposal to require each RTO/ISO to revise its tariff to require each distributed energy resource aggregator to maintain and submit aggregate settlement data for the distributed energy resource aggregation, so that the RTO/ISO can regularly settle with the distributed energy resource aggregator for its market participation,

[572] R Street Institute Comments (RM16–23) at 10.

[573] MISO Comments (2018 RM18–9) at 19.

[574] EEI Comments (RM16–23) at 31; Duke Energy Comments (RM16–23) at 6; Xcel Energy Services Comments (RM16–23) at 26.

[575] CAISO Comments (RM16–23) at 34; MISO Comments (RM16–23) at 25; Xcel Energy Services at 26.

[576] CAISO Comments (RM16–23) at 34; IRC Comments (RM16–23) at 10; SoCal Edison Comments (RM16–23) at 12–13.

[577] Sunrun Comments (RM16–23) at 5.

[578] Advanced Energy Buyers Comments (2018 RM18–9) at 7.

[579] NOPR, 157 FERC ¶ 61,121 at P 145.

and to provide, upon request from the RTO/ISO, performance data for individual resources in a distributed energy resource aggregation for auditing purposes.[580] However, we clarify that the requirements for settlement and performance data should be consistent with the settlement and auditing data requirements for other market participants. Additionally, while we believe that performance data for individual distributed energy resources will be necessary for distributed energy resource aggregations to comply with the data retention and auditing procedures of the RTOs/ISOs, we are also sympathetic to the concerns that data requirements for individual distributed energy resources in a distributed energy resource aggregation can be unduly burdensome. To reduce the burden on distributed energy resource aggregators and the RTOs/ISOs, we find that distributed energy resource aggregators should only be required to retain that performance data for individual distributed energy resources in an aggregation that the RTO/ISO deems necessary for auditing purposes. Therefore, to the extent that an RTO/ISO does not need certain performance data from individual distributed energy resources in a distributed energy resource aggregation for auditing purposes, it should not require a distributed energy resource aggregator to retain that information for individual distributed energy resources participating in a distributed energy resource aggregation. With respect to Advanced Energy Buyers' assertion that RTOs/ISOs should facilitate streamlined data collection and sharing, we decline to prescribe the specific manner in which information and data should be collected and shared with distribution utilities.

G. Metering and Telemetry System Requirements

a. NOPR Proposal

241. In the NOPR, the Commission stated that, while the distributed energy resources in an aggregation will need to be directly metered, the metering and telemetry system, *i.e.,* hardware and software, requirements RTOs/ISOs impose on distributed energy resource aggregators and individual resources in distributed energy resource aggregations can pose a barrier to the participation of these aggregations in RTO/ISO markets.[581] The Commission recognized that RTOs/ISOs need metering data for settlement purposes and telemetry data to determine a resource's real-time operational capabilities so that they can efficiently dispatch resources. The Commission found, however, that metering and telemetry systems are often expensive, potentially creating a burden for small distributed energy resources. The Commission stated that, while telemetry data about a distributed energy resource aggregation is necessary for the RTO/ISO to efficiently dispatch the aggregation, telemetry data for each individual resource in the aggregation may not be.

242. The Commission stated that, while it did not propose to require specific metering and telemetry systems for distributed energy resource aggregators, it proposed to require each RTO/ISO to revise its tariff to identify any necessary metering and telemetry hardware and software requirements for distributed energy resource aggregators and the individual resources in a distributed energy resource aggregation.[582] The Commission stated that these requirements must ensure that the distributed energy resource aggregator can provide necessary information and data to the RTO/ISO,[583] but must not impose unnecessarily burdensome costs on the distributed energy resource aggregators or individual resources in a distributed energy resource aggregation that may create a barrier to their participation in the RTO/ISO markets.

243. The Commission noted that there may be different types of resources in these aggregations, some in front of the meter, some behind the meter with the ability to inject energy back to the grid, and some behind the meter without the ability to inject energy to the grid.[584] The Commission therefore sought comment on whether the RTOs/ISOs need to establish metering and telemetry hardware and software requirements for each of the different types of distributed energy resources that participate in the RTO/ISO markets through distributed energy resource aggregations as well as whether the Commission should establish specific metering and telemetry system requirements and, if so, what requirements would be appropriate.

244. With respect to telemetry, the Commission stated that the distributed energy resource aggregator should be able to provide to the RTO/ISO the real-time capability of its aggregated resource in a manner similar to the requirements for generators, including the operating level of the resource and how much that resource can ramp up or ramp down over its full range of capability, including its charging capability for distributed energy resource aggregations that include electric storage resources.[585] The Commission further noted that these telemetry system requirements may also need to be in place at different locations for geographically dispersed distributed energy resource aggregations that have to provide distribution factors or other similar information.

245. With respect to metering, the Commission recognized that distributed energy resources may be subject to metering system requirements established by the distribution utility or local regulatory authority.[586] Therefore, the Commission proposed that each RTO/ISO rely on meter data obtained through compliance with these distribution utility or local regulatory authority metering system requirements whenever possible for settlement and auditing purposes, only applying additional metering requirements for distributed energy resource aggregations when this data is insufficient.

b. Comments

246. In their comments, the various RTOs/ISOs describe slightly different approaches to metering and telemetry requirements for distributed energy resource aggregations. CAISO states that, under its Distributed Energy Resource Provider model, the aggregator must follow the same metering and telemetry standards as other resources.[587] NYISO states that it will propose to require distributed energy resource aggregators to have six-second real-time metering and telemetry that will be sent either directly to NYISO or through the utility and to provide after-the-fact meter data uploads for settlement purposes.[588] ISO–NE states that individual distributed energy resources in an aggregation should meet

[580] *See id.* P 147.

[581] NOPR, 157 FERC ¶ 61,121 at P 150.

[582] *Id.* P 151.

[583] *Id.* (citing the Commission's proposal pertaining to information and data requirements).

[584] *Id.* P 151.

[585] *Id.* P 152.

[586] *Id.*

[587] CAISO Comments (RM16–23) at 38.

[588] NYISO Comments (RM16–23) at 18–19. NYISO's Aggregation Participation Model, accepted by the Commission on January 23, 2020, requires that (1) aggregations provide real-time telemetry every six seconds; (2) NYISO send real-time base point signals to, receive revenue-quality meter data for settlement purposes from, and receive real-time telemetry from an aggregation, not the individual facilities within an aggregation; (3) aggregations of like resource types are subject to the existing metering and telemetry rules for that resource type; and (4) metering and telemetry of the individual facilities in an aggregation derive from either directly measured or calculated values, or a combination thereof, in accordance with the requirements set forth in NYISO's procedures. *See* NYISO Aggregation Order, 170 FERC ¶ 61,033 at PP 57–74.

the same product-based metering and telemetry requirements as all other resources, whether the distributed energy resource is behind the meter or in front and whether or not it can inject power into the grid.[589] PJM states that, generally, it is reasonable for behind-the-meter distributed energy resources that seek to inject power onto the grid (either individually or as part of a distributed energy resource aggregation) to follow existing telemetry and metering rules from the generation framework for similarly sized resources, noting that metering and telemetry rules for generation may vary by resource size.[590]

247. A number of commenters support the Commission's proposal to provide the RTOs/ISOs with flexibility to establish and implement metering and telemetry rules to suit their individual needs.[591] CAISO states that local regulatory authorities already impose metering and telemetry standards and that RTOs/ISOs need flexibility to incorporate those local requirements without imposing additional costs or barriers to entry on prospective distributed energy resource aggregations.[592] A number of other commenters make similar points.[593] ISO–NE recommends that the Commission avoid being overly prescriptive so that ISO–NE can apply existing metering and telemetry requirements to distributed energy resources.[594] SoCal Edison asks that the Commission not issue a standard directive but rather encourage the distribution utilities in an RTO/ISO to work together with the RTO/ISO to continue the development of appropriate metering and telemetry technologies.[595] IRC asserts that RTOs/ISOs should be given the flexibility to define metering and telemetry requirements outside of their tariffs.[596] Tesla argues that RTOs/ISOs should allow alternatives to metering and telemetry requirements that could provide the needed information, such as sampling, end-use metering devices, or verifiable behavioral actions.[597]

248. Other commenters contend that the Commission should take a more active role in establishing specific metering and telemetry requirements for distributed energy resource aggregations. MISO believes that it is appropriate for the Commission to define the telemetry and metering requirements,[598] while others suggest that the Commission establish a set of standards or generally applicable criteria but allow RTOs/ISOs flexibility on how those standards are implemented or to exceed the Commission's requirements.[599]

249. Several commenters acknowledge that metering and telemetry requirements for distributed energy resource aggregators and individual resources participating in distributed energy resource aggregations can pose a barrier to the participation of these resources in RTO/ISO markets.[600] Advanced Energy Management and R Street Institute note that the costs of metering, telemetry, and communication equipment pose a disproportionately high burden for small distributed energy resources because they cannot spread the cost across as many MWs as large generators.[601] Advanced Energy Economy requests that the Commission clarify that real-time and short interval telemetry is not required for distributed energy resource aggregations and individual distributed energy resources.[602]

250. Several commenters argue that telemetry requirements comparable to those of traditional generators would be too burdensome, even if imposed only at the aggregation level.[603] Advanced Energy Economy asserts that such requirements would be prohibitively expensive and unnecessary to ensure reliability because equipment would need to be installed at every distributed energy resource site to obtain accurate readings.[604] These commenters and others instead suggest that telemetry requirements, particularly with respect to timing granularity, should be commensurate to the need of the system and service provided.[605] Advanced Energy Management recommends that virtual telemetry with after-the-fact meter data be allowed for aggregators of small resources.[606] Further, Advanced Energy Management recommends that the Commission not require that distributed energy resource aggregators that participate only in capacity markets implement new telemetry requirements.[607]

251. Several commenters assert that metering and/or telemetry requirements are necessary only at the aggregation level, and that telemetry requirements on individual distributed energy resources would be cost prohibitive and unnecessarily burdensome.[608] Public Interest Organizations, New York State Entities, and Advanced Energy Economy state that grid operators do not need telemetry information about each distributed energy resource in an aggregation because the loss of one would not interfere with system reliability or with the operation of the aggregation, and these parties request clarification that such telemetry is not required.[609] NRG and Advanced Energy Economy contend that the aggregator should be responsible for providing metering and telemetry that meets the RTO/ISO requirements to ensure that the aggregated performance of the distributed energy resources meets the

[589] ISO–NE Comments (RM16–23) at 48–50.

[590] PJM Comments (RM16–23) at 22 (citing PJM Manual 14D: Generation Operational Requirements, rev. 40, section 4.2.2 (Jan. 1, 2017)).

[591] *See, e.g.,* CAISO Comments (RM16–23) at 38; IRC Comments (RM16–23) at 10; ISO–NE Comments (RM16–23) at 48; New York State Entities Comments (RM16–23) at 21; SoCal Edison Comments (RM16–23) at 14–15.

[592] CAISO Comments (RM16–23) at 38.

[593] *See, e.g.,* Advanced Energy Economy Comments (2018 RM18–9) at 9; Advanced Energy Management Comments (2018 RM18–9) at 22–23; Microsoft Comments (2018 RM18–9) at 18 (citing Justin Gundlach & Romany Webb, *Distributed Energy Res. Participation in Wholesale Markets: Lessons from the California ISO,* 39 ENERGY L. REV. 47, 68–69 (2018)); NRG Comments (2018 RM18–9) at 3; Tesla Comments (2018 RM18–9) at 10–11 (citing NOPR, 157 FERC ¶ 61,121 at P 150).

[594] ISO–NE Comments (RM16–23) at 48.

[595] SoCal Edison Comments (RM16–23) at 14–15.

[596] IRC Comments (RM16–23) at 10.

[597] Tesla Comments (2018 RM18–9) at 10–11.

[598] MISO Comments (RM16–23) at 25.

[599] Fresh Energy/Sierra Club/Union of Concerned Scientists Comments (RM16–23) at 3; Independent Energy Producers Association Comments (RM16–23) at 5; PJM Comments (RM16–23) at 22.

[600] *See, e.g.,* Advanced Energy Management Comments (RM16–23) at 17–18; New York State Entities Comments (RM16–23) at 21; NextEra Comments (RM16–23) at 15–16; Public Interest Organizations Comments (RM16–23) at 14; R Street Institute Comments (RM16–23) at 10.

[601] Advanced Energy Management Comments (RM16–23) at 18; R Street Institute Comments (RM16–23) at 10.

[602] Advanced Energy Economy Comments (RM16–23) at 47.

[603] *Id.* at 48; Advanced Energy Management Comments (RM16–23) at 17; City of New York Comments (RM16–23) at 9.

[604] Advanced Energy Economy Comments (RM16–23) at 48.

[605] *Id.;* Advanced Energy Management Comments (RM16–23) at 18; City of New York Comments (RM16–23) at 9; Energy Storage Association Comments (RM16–23) at 25; Public Interest Organizations Comments (RM16–23) at 24.

[606] Advanced Energy Management Comments (RM16–23) at 18–19. Advanced Energy Management describes virtual telemetry as statistical forecasting of an aggregated resource's performance, generally monitored by some form of communications to confirm aggregated resource performance, which provides the aggregator or scheduling coordinator a signal to send to the RTO/ISO.

[607] *Id.*

[608] *See, e.g.,* AES Companies Comments (RM16–23) at 36; Energy Storage Association Comments (RM16–23) at 25; New York State Entities Comments (RM16–23) at 20; Public Interest Organizations Comments (RM16–23) at 14–15; R Street Institute Comments (RM16–23) at 10.

[609] Advanced Energy Economy Comments (RM16–23) at 49; New York State Entities Comments (RM16–23) at 20; Public Interest Organizations Comments (RM16–23) at 14–15.

claimed and offered performance.[610] Stem asks that each RTO/ISO be required to justify any metering and telemetry rules regarding individual resources in an aggregation.[611]

252. Other commenters argue that metering and telemetry requirements are important for reliability and should be the same for distributed energy resource aggregations as for any other resource type.[612] EEI argues that this is important so the RTO/ISO knows the operating level of the resource and how much that resource can ramp up or ramp down over its full range of capability.[613] Energy Storage Association agrees, as long as the telemetry allows distributed energy resource aggregations to provide the same products and services as traditional generators.[614] PJM also agrees, but notes that smaller resources have lower-cost telemetry requirements in its market.[615] EPSA asserts that estimation, sampling, and other inexact methods provide insufficient precision and, therefore argues that distributed energy resources should be subject to the same metering requirements as traditional supply resources.[616] NYISO Indicated Transmission Owners contend that the cost of new or additional communications requirements should be considered a prerequisite to maintain the reliability of the system rather than a barrier to entry.[617]

253. Some commenters argue that metering and telemetry requirements should be placed on individual distributed energy resources within an aggregation.[618] Multiple commenters argue that distributed energy resources need to be directly metered to distinguish between wholesale and retail actions.[619] MISO believes that it is appropriate for the Commission to identify the criteria and process for differentiating retail versus wholesale transactions of distributed energy resources.[620] TAPS states that RTOs/ISOs should require telemetry on individual distributed energy resources for situational awareness and so that facilities are not inadvertently directed to operate beyond physical capabilities.[621] Moreover, ISO–NE argues that statistical estimation of an aggregation's output rather than direct metering and telemetry of individual distributed energy resources introduces error and that the impact of using estimation to determine distribution factors is not clear.[622] PJM and the IRC request that the Commission establish that RTOs/ISOs have the right to require metering and telemetry for individual distributed energy resources comparable to traditional resources in order to avoid seams issues and inconsistent industry roll-out.[623] Avangrid cautions that even with separate metering, ownership and reconciliation of the data for retail billing and wholesale settlement may be impractically complex.[624] NYISO Indicated Transmission Owners assert that resources above a certain size and within an aggregation may require additional metering to mitigate issues on a utility's distribution system.[625]

254. Several commenters agree with the Commission that telemetry system requirements may need to be in place at different locations for geographically dispersed distributed energy resource aggregations that have to provide distribution factors.[626] PJM Market Monitor argues that meter and telemetry information should be disaggregated at each node and that the RTO/ISO should provide nodal settlement.[627] MISO Transmission Owners argue that it is not clear how multi-node aggregations would be settled.[628] AES Companies contend that the Commission should permit the aggregation to include more than one metering point where the system characteristics indicate more are needed.[629] Duke Energy maintains that RTOs/ISOs should have access to telemetry information at individual points of interconnection and that the distribution utility may need to access similar data.[630]

255. Most commenters support the proposal in the NOPR that, when existing distribution utility metering requirements for distributed energy resources are sufficient, RTOs/ISOs should rely on that technology rather than impose new requirements.[631] Avangrid argues that the distribution utility might be able to provide the necessary data to the RTO/ISO on behalf of the distributed energy resource aggregator via a third-party agreement.[632]

256. APPA/NRECA express concern that the proposal to rely on meter data from the distribution utility would place significant burdens on distribution utilities and introduce new cybersecurity and privacy implications, issues which will require significant time and resources for utilities to address.[633] APPA asserts that such costs could undermine the benefits of distribution utilities' existing retail distributed energy resource programs, effectively imposing costs on retail customers to subsidize wholesale market participation.[634] Advanced Energy Management asserts that telemetry requirements to participate in a wholesale program should be driven by the RTO/ISO system needs, which are less granular than at the distribution level.[635] Advanced Energy Management adds that a distributed energy resource that only seeks participation in the wholesale market should only be required to fulfill the RTO's/ISO's metering requirements. Advanced Energy Economy states that RTOs/ISOs should adopt procedures that provide for regular information and communications flows to occur from the aggregator, to the RTO/ISO, and then to distribution utilities.[636]

257. Several commenters generally agree with the Commission that individual distributed energy resources in an aggregation will need to be

[610] Advanced Energy Economy Comments (RM16–23) at 49–50; NRG Comments (RM16–23) at 10.

[611] Stem Comments (RM16–23) at 14.

[612] *See, e.g.,* EEI Comments (RM16–23) at 34; Energy Storage Association Comments (RM16–23) at 25; ISO–NE Comments (RM16–23) at 48–50; New York Utility Intervention Unit Comments (RM16–23) at 3–5; TAPS Comments (RM16–23) at 23.

[613] EEI Comments (RM16–23) at 34.

[614] Energy Storage Association Comments (RM16–23) at 25.

[615] PJM Comments (RM16–23) at 22.

[616] EPSA Comments (2018 RM18–9) at 10, 13.

[617] NYISO Indicated Transmission Owners Comments (RM16–23) at 19.

[618] *See, e.g.,* DER/Storage Developers Comments (RM16–23) at 4; Independent Energy Producers Association Comments (RM16–23) at 8; ISO–NE Comments (RM16–23) at 48–50; NYISO Indicated Transmission Owners Comments (RM16–23) at 19; Organization of MISO States Comments (RM16–23) at 9.

[619] Avangrid Comments (RM16–23) at 15; Independent Energy Producers Association Comments (RM16–23) at 8; ISO–NE Comments (RM16–23) at 48–50; Organization of MISO States Comments (RM16–23) at 9.

[620] MISO Comments (RM16–23) at 25.

[621] TAPS Comments (RM16–23) at 23.

[622] ISO–NE Comments (RM16–23) at 51.

[623] PJM Comments (RM16–23) at 22.

[624] Avangrid Comments (RM16–23) at 15.

[625] NYISO Indicated Transmission Owners Comments (RM16–23) at 7.

[626] AES Comments (RM16–23) at 36; Duke Energy Comments (RM16–23) at 5; EEI Comments (RM16–23) at 34; MISO Transmission Owners Comments (RM16–23) at 24.

[627] PJM Market Monitor Comments (RM16–23) at 15.

[628] MISO Transmission Owners Comments (RM16–23) at 24.

[629] AES Companies Comments (RM16–23) at 37.

[630] Duke Energy Comments (RM16–23) at 5.

[631] *See, e.g.,* Advanced Energy Management Comments (RM16–23) at 18–19; EEI Comments (RM16–23) at 33; Mosaic Power Comments (RM16–23) at 5–6; SoCal Edison Comments (RM16–23) at 14–15; TAPS Comments (RM16–23) at 24.

[632] Avangrid Comments (RM16–23) at 15. Avangrid adds that the electric distribution companies should be allowed to charge for this service.

[633] APPA Comments (2018 RM18–9) at 9–10; NRECA Comments (2018 RM18–9) at 11–12, 30.

[634] APPA Comments (2018 RM18–9) at 10.

[635] Advanced Energy Management Comments (2018 RM18–9) at 22–23.

[636] Advanced Energy Economy Comments (2018 RM18–9) at 9 n.11.

directly metered. These commenters argue that behind-the-meter distributed energy resources should be metered separately from the host site's load due to the need to distinguish between wholesale and retail actions.[637] DER/Storage Developers ask the Commission to direct all RTOs/ISOs to allow direct metering of resources as an optional alternative to traditional baselines to determine performance.[638] Independent Energy Producers Association notes that dual-metering can serve other Commission goals such as minimizing cost shifts, ensuring reliability, and ensuring market integrity.[639] MISO states that visibility at the point of injection is needed to mitigate transmission risks and ensure that a distributed energy resource is following dispatch instructions, particularly as the volume of distributed energy resources grows.[640] EPSA argues that netting retail and wholesale services reduces RTO/ISO visibility which makes it difficult for RTOs/ISOs to efficiently dispatch resources, measure and verify resource performance, calculate baseline load levels, and support the reliability, planning, and modeling of system capabilities.[641] Avangrid cautions that even with separate metering, ownership and reconciliation of the data for retail billing and wholesale settlement may be impractically complex.[642]

258. Some commenters question the authority of the Commission or the RTOs/ISOs to impose specific metering and telemetry requirements on distributed energy resources. AES Companies argue that the only metering and telemetry requirements that the Commission or the RTOs/ISOs can dictate are for the aggregator's node or point of interconnection to the transmission system under RTO/ISO control.[643] IRC asks the Commission to acknowledge in any final rule that the RTOs/ISOs have no jurisdiction to require state-regulated utilities to install specific retail metering technology, but that wholesale metering rules for distributed energy resources must be met.[644] California Energy Storage Alliance recommends that local regulatory authorities develop and implement metering and telemetry requirements to avoid the Commission imposing any requirements outside the Commission's jurisdiction.[645] The Delaware Commission recommends that the Commission require distributed energy resources to employ separate metering and telemetry capability if they are providing both wholesale and retail services.[646]

259. Some state regulators, distribution utilities, and their representatives note that upgrades may be needed to current metering technology and associated networking and cyber security in order to support RTO/ISO needs [647] and argue that associated costs must be borne by the distributed energy resources or their aggregators or through wholesale level cost allocation, and not by distribution utilities.[648]

260. Several commenters discuss the relationship between RTOs/ISOs and distribution utilities and their respective metering and telemetry requirements. Fresh Energy/Sierra Club/Union of Concerned Scientists encourage the development of a framework to share metering data between the RTO/ISO, distribution utility, and distributed energy resource aggregator.[649] Duke Energy recommends that the final rule not preclude the transfer of telemetry data between the RTO/ISO and the electric distribution utility.[650] Similarly, EEI asserts that both the RTO/ISO and the distribution utility should be provided telemetry information,[651] while IRC states that wholesale and retail metering requirements need to be harmonized to prevent undue barriers to participation.[652] Xcel Energy Services recommends that the RTOs/ISOs and distribution utilities should define the role of a meter data management agent to provide needed meter data.[653]

261. NARUC, EEI, and MISO argue that, before metering and telemetry requirements can be established, additional information must be gathered about the type and purpose of metering and telemetry data needed, the access to and provision of this data, and the cost allocation involved.[654] On the other hand, Fresh Energy/Sierra Club/Union of Concerned Scientists ask the Commission to not let this debate hinder progress on establishing necessary distributed energy resource requirements.[655]

c. Commission Determination

262. We adopt the NOPR proposal and add § 35.28(g)(12)(ii)(f) to the Commission's regulations to require each RTO/ISO to revise its tariff to establish market rules that address metering and telemetry hardware and software requirements necessary for distributed energy resource aggregations to participate in RTO/ISO markets.

263. We understand the need to balance, on one hand, the RTO's/ISO's need for metering and telemetry data for settlement and operational purposes, and, on the other hand, not imposing unnecessary burdens on distributed energy resource aggregators. Therefore, we will not prescribe the specific metering and telemetry requirements that each RTO/ISO must adopt; rather, we provide the RTOs/ISOs with flexibility to establish the necessary metering and telemetry requirements for distributed energy resource aggregations, and require that each RTO/ISO explain in its compliance filing why such requirements are just and reasonable and do not pose an unnecessary and undue barrier to individual distributed energy resources joining a distributed energy resource aggregation.

264. To implement this requirement, we direct each RTO/ISO to explain, in its compliance filing, why its proposed metering requirements are necessary (*e.g.,* for the distributed energy resource aggregator to provide the settlement and performance data to the RTO/ISO discussed in Section IV.F or to prevent double counting of services as discussed in Section IV.C.3) and why its proposed telemetry requirements are necessary (*e.g.,* for the RTO/ISO to have sufficient situational awareness to dispatch the

[637] Avangrid Comments (RM16–23) at 15; Independent Energy Producers Association Comments (RM16–23) at 8; Microsoft Comments (2018 RM18–9) at 17; Organization of MISO States Comments (RM16–23) at 9; Stem Comments (2018 RM18–9) at 3, 19.

[638] DER/Storage Developers Comments (RM16–23) at 4.

[639] Independent Energy Producers Association Comments (RM16–23) at 8.

[640] MISO Comments (2018 RM18–9) at 19.

[641] EPSA Comments (2018 RM18–9) at 10–13 (citing Distributed Energy Resources Roadmap at 29–30).

[642] Avangrid Comments (RM16–23) at 15.

[643] AES Companies Comments (RM16–23) at 47.

[644] IRC Comments (RM16–23) at 6.

[645] California Energy Storage Alliance Comments (RM16–23) at 9.

[646] Delaware Commission Comments (RM16–23) at 5–7 (citing *FPC* v. *Fla. Power & Light Co.,* 404 US 461, 463 (1972)), 8.

[647] *See, e.g.,* Avangrid Comments (RM16–23) at 15; Dominion Comments (RM16–23) at 12; EEI Comments (RM16–23) at 13; NARUC Comments (RM16–23) at 6; SoCal Edison Comments (RM16–23) at 14.

[648] *See, e.g.,* Delaware Commission Comments (RM16–23) at 7; EEI Comments (RM16–23) at 33–34; IRC Comments (RM16–23) at 6; Massachusetts Municipal Electric Comments (RM16–23) at 4; Six Cities Comments (RM16–23) at 3; TAPS Comments (RM16–23) at 24.

[649] Fresh Energy/Sierra Club/Union of Concerned Scientists Comments (RM16–23) at 3.

[650] Duke Energy Comments (RM16–23) at 5.

[651] EEI Comments (RM16–23) at 34.

[652] IRC Comments (RM16–23) at 6.

[653] Xcel Energy Services Comments (RM16–23) at 27.

[654] EEI Comments (RM16–23) at 33; MISO Comments (RM16–23) at 25; NARUC Comments (RM16–23) at 7.

[655] Fresh Energy/Sierra Club/Union of Concerned Scientists Comments (RM16–23) at 3.

aggregation and the rest of the system efficiently). This explanation 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 distributed energy resource aggregators and individual resources in distributed energy resource aggregations that may create an undue barrier to their participation in RTO/ISO markets. We find that this approach will provide each RTO/ISO with the flexibility to develop metering and telemetry requirements appropriate for the needs of its systems.

265. Given the variety of potential aggregation business models, as well as the variety of existing distribution utility requirements to which the distributed energy resources participating in aggregations will be subject, we find that imposing standard requirements is unwarranted. Standard metering and telemetry requirements could run the risk of imposing unnecessary costs on RTOs/ISOs, distributed energy resource aggregators, and the individual distributed energy resources. For example, imposing standard requirements could impede RTOs/ISOs from adequately incorporating metering and telemetry requirements already imposed on distributed energy resources by local regulatory authorities and thereby create a barrier to the participation of distributed energy resources in RTO/ISO markets. We find that adopting the NOPR proposal minimizes these risks and the costs associated with implementing these requirements because it allows RTOs/ISOs to propose metering and telemetry requirements in addition to those already in place only when they determine that such additional requirements are needed.

266. As clarified in Section IV.F, the distributed energy resource aggregator, not the individual distributed energy resources in the aggregation, is the single point of contact with the RTO/ISO, responsible for managing, dispatching, metering, and settling the individual distributed energy resources in its aggregation. We further clarify here that the distributed energy resource aggregator is also the entity responsible for providing any required metering and telemetry information to the RTO/ISO.

267. We decline the requests of some commenters to explicitly limit metering and/or telemetry requirements to the distributed energy resource aggregation level, or to require telemetry of individual distributed energy resources participating in an aggregation. Rather, consistent with the flexibility provided in Section IV.F, we will not require uniform metering requirements across all RTOs/ISOs, nor will we require each RTO/ISO to impose uniform metering requirements on individual distributed energy resources. Rather, we provide flexibility to RTOs/ISOs to propose specific metering requirements, including any that may apply to individual distributed energy resources that the RTO/ISO demonstrates are needed to obtain any required performance data for auditing purposes and to address double compensation concerns. Similarly, we provide flexibility to the RTO/ISO as to whether to propose specific telemetry requirements for individual distributed energy resources in an aggregation. The need for such requirements may depend, for example, on whether the RTO/ISO allows multi-node aggregations or how multi-node aggregations are implemented. By providing flexibility while also requiring that the RTO/ISO explain why any proposed metering and telemetry requirements are necessary, we allow the RTO/ISO to obtain the metering and telemetry information it needs without burdening the distributed energy resource aggregator to provide data that may not be necessary.

268. We also clarify that, consistent with this flexible approach, we are not requiring RTOs/ISOs to establish metering and telemetry hardware and software requirements for distributed energy resource aggregations that are identical to those placed on existing resources, or to establish different or additional metering and telemetry requirements for distributed energy resource aggregations. Rather, we expect that RTOs/ISOs will base any proposed metering and telemetry hardware and software requirements for distributed energy resource aggregations on the information needed by the RTO/ISO while avoiding unnecessary requirements that may act as a barrier to individual distributed energy resources joining distributed energy resource aggregations or to distributed energy resource aggregations participating in the wholesale markets. However, as explained in Section IV.F, we require that metering data for settlement purposes at the distributed energy resource aggregation level be consistent with settlement data requirements for other resource types. We recognize that metering and telemetry requirements may vary depending on the types of distributed energy resources participating in an aggregation, the size of the individual distributed energy resources or aggregated resource, or the particular service provided. For example, more granular or precise telemetry may be necessary for a distributed energy resource aggregation that is participating in the frequency regulation market than one that is exclusively providing energy or capacity. To ensure that the flexible approach outlined here provides the RTO/ISO with sufficient information to administer the wholesale markets and ensure reliability of the transmission system while not unduly burdening distributed energy resources and distributed energy resource aggregations, we require that each RTO/ISO explain in its compliance filing why its proposed metering and telemetry requirements for distributed energy resource aggregations are just and reasonable and do not pose an unnecessary and undue barrier to individual distributed energy resources joining a distributed energy resource aggregation.

269. We also adopt the NOPR proposal that each RTO's/ISO's proposed metering requirements should rely on meter data obtained through compliance with distribution utility or local regulatory authority metering system requirements whenever possible for settlement and auditing purposes. We further clarify that this requirement also applies to existing telemetry infrastructure. By using existing infrastructure whenever possible, RTOs/ISOs should be able to obtain the data they need and avoid proposing new metering and telemetry requirements that would be duplicative and could erect unnecessary barriers to entry for distributed energy resource aggregators and individual distributed energy resources participating in an aggregation. With respect to jurisdictional concerns raised by some commenters, we note that any additional RTO/ISO metering and telemetry requirements would not change those required by state or local regulatory authorities and would be required solely to assist with settlements and audits of activity in RTO/ISO markets, or to provide RTOs/ISOs with the real-time information needed to reliably and efficiently dispatch their systems.

270. In response to concerns about the potential costs and burdens that could be imposed on distribution utilities as a result of the requirement that RTOs/ISOs rely on metering and telemetry data obtained through compliance with distribution utility or local regulatory authority metering system requirements whenever possible, we expect that in

general, this information will be provided by individual distributed energy resources to distributed energy resource aggregators, and from distributed energy resource aggregators to RTOs/ISOs. However, to the extent that the RTO/ISO proposes that such information come from or flow through distribution utilities, we require that RTOs/ISOs coordinate with distribution utilities and relevant electric retail regulatory authorities to establish protocols for sharing metering and telemetry data, and that such protocols minimize costs and other burdens and address concerns raised with respect to privacy and cybersecurity.

271. In response to IRC's request for flexibility to define metering and telemetry requirements outside the RTO/ISO tariffs, we find that the RTO/ISO tariffs should include a basic description of the metering and telemetry practices for distributed energy resource aggregations as well as references to specific documents that will contain further technical details. Decisions as to whether an item should be placed in a tariff or in a business practice manual are guided by the Commission's rule of reason policy,[656] under which provisions that ''significantly affect rates, terms, and conditions'' of service, are readily susceptible of specification, and are not generally understood in a contractual agreement must be included in the tariff, while items better classified as implementation details may be included only in the business practice manual. We find that metering and telemetry requirements significantly affect the terms and conditions of the participation of distributed energy resource aggregations in RTO/ISO markets and, therefore, must be included in the RTO/ISO tariffs.

H. Coordination Between the RTO/ISO, Aggregator, and Distribution Utility

1. Market Rules on Coordination

a. NOPR Proposal

272. In the NOPR, the Commission noted that the market rules that each RTO/ISO adopts to facilitate the participation of distributed energy resource aggregations must address coordination between the RTO/ISO, the distributed energy resource aggregator, and the distribution utility to ensure that the participation of these resources in RTO/ISO markets does not present reliability or safety concerns for the distribution or transmission system.[657] Thus, the Commission proposed to require each RTO/ISO to revise its tariff to provide for coordination among the RTO/ISO, a distributed energy resource aggregator, and the relevant distribution utilities with respect to (1) the registration of new distributed energy resource aggregations; and (2) ongoing coordination, including operational coordination, between the RTO/ISO, a distributed energy resource aggregator, and the relevant distribution utility or utilities.

273. After the April 2018 technical conference, the Commission sought further information on certain proposals regarding detailed aspects of the coordination requirements.[658]

b. Comments

274. Many commenters support the coordination processes proposed in the NOPR because it will ensure that participation of distributed energy resource aggregations in RTO/ISO markets does not compromise these markets or the reliability or safety of the transmission and distribution systems.[659] For example, based on its experience with implementing CAISO's Distributed Energy Resource Provider framework, Pacific Gas & Electric states that it is vitally important that RTOs/ISOs coordinate with distribution utilities with respect to both registration of distributed energy resource aggregations and their ongoing operation.[660]

275. Advanced Energy Economy states that it recognizes that the RTOs/ISOs need visibility into distributed energy resource operations and that coordination among the RTO/ISO, the distribution utility, and distributed energy resource aggregators is necessary to ensure reliable operations.[661] Advanced Energy Economy asserts that these visibility and operational issues are surmountable and that certain RTOs/ISOs (particularly CAISO and ISO–NE) have made great progress in developing standards and rules to address these issues. Advanced Energy Economy states that fully integrating advanced energy technologies that are already available and growing rapidly will only enhance the ability to quickly address visibility and operational issues.

276. Commenters note that coordination would be further enhanced with the development of distribution system operators.[662] PJM believes that value may be added if an RTO/ISO were to coordinate with a distribution system operator, but states that without a true distribution system operator operating in the PJM region (or anywhere else in the country) it cannot opine on the specific benefits that such coordination could achieve.[663] SoCal Edison notes that, in California, distribution utilities are already performing the initial functions of a distribution system operator and that the utility is uniquely situated to provide this role in the future.[664]

277. While supportive of the coordination requirements in the NOPR, Mensah argues that the cost of registering an aggregation as well as ongoing operational coordination should not place any unnecessary burden on distributed energy resource aggregations.[665]

c. Commission Determination

278. We adopt the NOPR proposal, as modified and clarified below, and add § 35.28(g)(12)(ii)(g) to the Commission's regulations to require each RTO/ISO to revise its tariff to establish market rules that address coordination between the RTO/ISO, the distributed energy resource aggregator, the distribution utility, and the relevant electric retail regulatory authorities.

[656] *See, e.g., Energy Storage Ass'n* v. *PJM Interconnection, L.L.C.,* 162 FERC ¶ 61,296, at P 103 (2018) (*Energy Storage Ass'n* v. *PJM*) (citing *Midcontinent Indep. Sys. Operator, Inc.,* 158 FERC ¶ 61,003, at P 69 (2017); *PacifiCorp,* 127 FERC ¶ 61,144, at P 11 (2009); *City of Cleveland* v. *FERC,* 773 F.2d 1368, 1376 (D.C. Cir. 1985) (finding that utilities must file ''only those practices that affect rates and service *significantly,* that are reasonably *susceptible* of specification, and that are not so generally understood in any contractual arrangement as to render recitation superfluous''); *Pub. Serv. Comm'n of N.Y.* v. *FERC,* 813 F.2d 448, 454 (D.C. Cir. 1987) (holding that the Commission properly excused utilities from filing policies or practices that dealt with only matters of ''practical insignificance'' to serving customers)).

[657] NOPR, 157 FERC ¶ 61,121 at P 153.

[658] Notice Inviting Post-Technical Conference Comments at 7–11.

[659] *See, e.g.,* CAISO Comments (RM16–23) at 39; Connecticut State Entities Comments (RM16–23) at 6; Dominion Comments (RM16–23) at 13; Institute for Policy Integrity Comments (RM16–23) at 9; NYISO Comments (RM16–23) at 19.

[660] Pacific Gas & Electric Comments (RM16–23) at 21.

[661] Advanced Energy Economy Comments (RM16–23) at 13.

[662] De Martini and Kristov define a distribution system operator as ''the entity responsible for planning and operational functions associated with a distribution system that is modernized for high levels of [distributed energy resources].'' Paul De Martini and Lorenzo Kristov, ''Distribution Systems in a High DER Future: Planning, Market Design, Operation and Oversight,'' Future Electric Utility Regulation Series, Lawrence Berkeley National Laboratory, October 2015, p. vi.

[663] PJM Comments (RM16–23) at 28.

[664] SoCal Edison Comments (RM16–23) at 8.

[665] Mensah Comments (RM16–23) at 4.

279. We agree with commenters that coordination requirements should not create undue barriers to entry for distributed energy resource aggregations. However, we must also consider the substantial role of distribution utilities and state and local regulators in ensuring the safety and reliability of the distribution system. We believe that the reforms adopted herein appropriately balance those needs.

280. Further, as discussed in Section IV.H.4 below,[666] although the NOPR did not discuss the role of state and local regulatory authorities in coordination efforts, we recognize that state and local regulatory authorities have a key role to play in such coordination efforts. Therefore, we have modified the NOPR proposal to ensure that the RTO/ISOs also coordinate with these entities.

2. Role of Distribution Utilities

a. NOPR Proposal

281. In the NOPR, the Commission proposed that the market rules on coordination provide the relevant distribution utility or utilities with the opportunity to review the list of individual resources that are located on their distribution systems and that enroll in a distributed energy resource aggregation before those resources may participate in RTO/ISO markets through the aggregation.[667] The Commission explained that the purpose of this coordination would be to ensure that all of the individual resources in the distributed energy resource aggregation are technically capable of providing services to the RTO/ISO through the aggregator and are eligible to be part of the aggregation.[668] The Commission further explained that the opportunity for the relevant distribution utility to review the list of these resources would allow them to assess whether the resources would be able to respond to RTO/ISO dispatch instructions without posing any significant risk to the distribution system and to ensure these resources are not participating in any other retail compensation programs. The Commission proposed to give the relevant distribution utility or utilities the opportunity to report such concerns or issues to the RTO/ISO for its consideration prior to the RTO/ISO allowing the new or modified distributed energy resource aggregation to participate in the organized wholesale electric market.

b. Comments

282. Numerous commenters generally support the NOPR proposal for distribution utility review,[669] but differ about the scope and the timing of this review.

283. While generally supportive of the NOPR proposal, several distribution utilities voice a broad range of concerns about their role in coordination and the impact of distributed energy resource aggregations on their distribution systems. In particular, distribution utilities generally argue for an even greater and decision-making role in reviewing distributed energy resource registrations.[670] NRECA argues for distribution utility review of individual distributed energy resource participation in distributed energy resource aggregations before the resources participate in RTO/ISO markets.[671] Additional commenters argue that distribution utilities and RTOs/ISOs must be afforded enough time to perform impact studies, preferably using study parameters adopted and implemented by state and local regulators, for each distributed energy resource and for the aggregation to ensure safe and reliable grid operation,[672] and other commenters specifically request that the Commission address the timing of the distribution utility review in the final rule.[673] MISO Transmission Owners request that any final rule require distribution utility approval of any aggregation arrangement to ensure that all of the appropriate distribution utility requirements for interconnection and other relevant regulations and processes have been met.[674] NRECA asserts that distribution utilities need detailed information in order to assess whether distributed energy resource participation is beneficial.[675]

284. Moreover, several distribution utilities seek more than review capability and assert that the distribution utility's consent to the participation of a distributed energy resource in an aggregation is a necessary prerequisite before the aggregation may operate.[676] According to these commenters, distribution utilities, who have the knowledge and understanding of distribution system challenges, should have the authority to make decisions regarding the participation of a distributed energy resource aggregation.[677] EEI further argues that distribution utilities must be able to restrict participation until the reliability and/or safety issue is addressed, and must be notified in real-time if a resource that is connected to its distribution system joins a distributed energy resource aggregation.[678]

285. Electric storage resource developers and advocates support the NOPR proposal, but raise concerns about the proposed distribution utility review process.[679] They are concerned that distribution utility review will act as a barrier by providing the distribution utility a ''gatekeeper'' role.[680] Furthermore, some commenters argue that distribution utilities do not have the right or the jurisdiction to veto what distributed energy resources may join aggregations or what aggregations may participate in organized wholesale electric markets.[681] Advanced Energy Management states that giving distribution utilities discretionary authority to approve distributed energy resources ''could usurp FERC's clear jurisdiction over the conditions for wholesale market eligibility.'' [682] Similarly, SEIA suggests that the discretion of distribution utilities should be limited to violations of interconnection agreements and that it

[666] *See infra* Section IV.H.4 (Role of Relevant Electric Retail Regulatory Authorities).

[667] NOPR, 157 FERC ¶ 61,121 at PP 149, 154.

[668] *Id.* P 154.

[669] *See, e.g.,* Avangrid Comments (RM16–23) at 16; Pacific Gas & Electric Comments (RM16–23) at 21; PJM Comments (2018 RM18–9) at 19; Robert Borlick Comments (RM16–23) at 5–7; SoCal Edison Comments (RM16–23) at 6; TAPS Comments (2018 RM18–9) at 27.

[670] *See, e.g.,* Dominion Comments (RM16–23) at 10; EEI Comments (RM16–23) at 35–36; MISO Transmission Owners Comments (RM16–23) at 19; SoCal Edison Comments (RM16–23) at 11–12; Xcel Energy Services Comments (RM16–23) at 28.

[671] NRECA Comments (2018 RM18–9) at 29.

[672] *See, e.g.,* Dominion Comments (RM16–23) at 10; EEI Comments (RM16–23) at 35–36; PJM Utilities Coalition Comments (2018 RM18–9) at 14–15.

[673] *See, e.g.,* Advanced Energy Economy Comments (RM16–23) at 40; Advanced Energy Management Comments (RM16–23) at 21; NextEra Comments (RM16–23) at 17.

[674] MISO Transmission Owners Comments (RM16–23) at 19.

[675] NRECA Comments (2018 RM18–9) at 29.

[676] *See, e.g.,* EEI Comments (2018 RM18–9) at 10, 13; NRECA Comments (2018 RM18–9) at 29; PJM Utilities Coalition Comments (2018 RM18–9) at 14; TAPS Comments (RM16–23) at 25; TAPS Comments (2018 RM18–9) at 28.

[677] *See, e.g.,* EEI Comments (2018 RM18–9) at 13; TAPS Comments (2018 RM18–9) at 28.

[678] EEI Comments (2018 RM18–9) at 13.

[679] *See, e.g.,* Advanced Energy Economy Comments (RM16–23) at 39, 40; Advanced Energy Management Comments (RM16–23) at 21, 22; Center for Biological Diversity Comments (RM16–23) at 3; Stem Comments (RM16–23) at 15.

[680] *See, e.g.,* Advanced Energy Economy Comments (RM16–23) at 39, 40; Advanced Energy Management Comments (RM16–23) at 21, 22; Stem Comments (RM16–23) at 14–15.

[681] *See, e.g.,* Advanced Energy Economy Comments (2018 RM18–9) at 11; Advanced Energy Management Comments (2018 RM18–9) at 18; SEIA Comments (2018 RM18–9) at 16; Stem Comments (2018 RM18–9) at 15; Sunrun Comments (2018 RM18–9) at 6.

[682] Advanced Energy Management Comments (2018 RM18–9) at 18.

would be inappropriate for distribution utilities to have veto rights over distributed energy resource participation.[683] SEIA further draws a distinction between existing and new distributed energy resources. For existing distributed energy resources that are already operating on the grid, so long as the distributed energy resource does not modify the generation system outside of what has already been approved, SEIA recommends that the Commission ensure that there is a streamlined process to ensure that the existing distributed energy resources can participate through a distributed energy resource aggregator participation model.

286. Commenters in support of the NOPR proposal urge the Commission to include limits on the scope of this review or adopt specific parameters for this review. Global Cold Chain Alliance and Viking Cold Solutions raise concerns about distribution review processes that prevent development and adoption of new technologies.[684] Advanced Energy Management and Advanced Energy Economy further argue that distribution utilities should (1) be required to identify to RTOs/ISOs specific areas of their network where they have limited ability to accommodate additional distributed energy resource registrations, with a notification requirement only when the local ability has been exceeded; (2) allow customers and their distributed energy resource aggregators to see information provided by the utility if the RTO/ISO uses that information in a decision to prohibit a distributed energy resource registration, and provide the ability to appeal such a rejection; and (3) be prohibited from registering customers in their own distributed energy resource aggregations that they had previously disqualified for reliability reasons.[685] Advanced Energy Management also recommends that there should be no requirement for distribution utilities to review distributed energy resource registrations unless the customers are exporting to the grid.[686] After a specific timeline of review, Advanced Energy Management and Tesla recommend that the distribution utility still be given the opportunity to notify the RTO/ISO if the distributed energy resource does not have the necessary interconnection agreements or is participating in a retail tariff that did not allow wholesale participation.[687] In these limited ''exception only'' models, distribution utilities are not provided the ability to approve distributed energy resource participation in Commission-jurisdictional markets, but may review and raise objections.[688] Advanced Energy Management and Stem state that distribution utilities should exercise their authority prior to a distributed energy resource's registration in a RTO/ISO by defining non-discriminatory interconnection procedures that ensure the distribution grid can accommodate distributed energy resources, whether or not a distributed energy resource aggregation participated in a wholesale transaction.[689]

287. Multiple commenters suggest specific review criteria that the distribution utilities should adhere to. Several commenters assert that any denial of participation in distributed energy resource aggregation should only be based on specified operational coordination and reliability concerns, such as violation of state-regulated interconnection protocols and agreements that address binding distribution system constraints and reflect non-discriminatory agreements on exporting energy to the grid, or reflect customers who already participate in tariffs or other agreements that disallow wholesale participation.[690] NRECA offers the following criteria: That the participation of a distributed energy resource in an aggregation will not create any safety, reliability or power quality concerns on their systems, and that implementation of distributed energy resource aggregation will conform to the requirements of the IEEE standards.[691] NYISO Indicated Transmission Owners suggest that any interconnection agreement for a distributed energy resource participating in an aggregation must demonstrate the ability of an individual distributed energy resource to (1) participate in an aggregation; (2) communicate essential information to the distribution system operator and RTO/ISO using RTO/ISO communication and operating protocols, as appropriate; and (3) meet RTO/ISO performance standards.[692] Pacific Gas & Electric recommends that an individual distributed energy resource wishing to participate in an aggregation (1) will not cause voltage problems or overload existing equipment; (2) is able to comply with requirements in its individual interconnection agreement when operated in the aggregate; and (3) is not already participating in another distributed energy resource aggregation.[693] EEI argues that the criteria to determine distributed energy resource participation should be ''good utility practice.'' [694] In a similar vein, several commenters request clear standards or guidelines for distribution utility review, while APPA conversely urges the Commission to allow for flexibility in the criteria adopted by distribution utilities.[695]

288. Stem and Tesla/SolarCity do not support the NOPR proposal on distribution utility review and recommend that limits be placed on this review if the Commission chooses to include the requirement in a final rule. Stem argues that the Commission should not give local distribution utilities carte blanche to deny a distributed energy resource eligibility to participate in a distributed energy resource aggregation, RTO/ISO markets, or other participation model.[696] Stem recommends an alternative default approach that allows participation unless the local utility provides a specific, credible safety or reliability risk.[697] Tesla/SolarCity argue that having an appropriate level of communication between the RTO/ISO and distribution utility eliminates the need for distribution utility review.[698]

289. Commenters also express differing opinions on the length of time required to conduct the review of distributed energy resource participation. Several distribution utilities recommend that a reasonable timetable or no time limits be established for review, and argue that sufficient time is needed for review and/

[683] SEIA Comments (2018 RM18–9) at 16.

[684] Global Cold Chain Alliance Comments (2018 RM18–9) at 2–3; Viking Cold Solutions Comments (2018 RM18–9) at 3.

[685] Advanced Energy Economy Comments (RM16–23) at 39, 40; Advanced Energy Management Comments (RM16–23) at 21, 22.

[686] Advanced Energy Management Comments (RM16–23) at 21.

[687] Advanced Energy Management Comments (2018 RM18–9) at 19; Tesla Comments (2018 RM18–9) at 10.

[688] *See, e.g.,* Advanced Energy Management Comments (2018 RM18–9) at 17; Icetec Comments (2018 RM18–9) at 17–18; Sunrun Comments (2018 RM18–9) at 7; Tesla Comments (2018 RM18–9) at 9–10.

[689] Advanced Energy Management Comments (2018 RM18–9) at 18; Stem Comments (2018 RM18–9) at 15.

[690] *See, e.g.,* Advanced Energy Economy Comments (2018 RM18–9) at 11; Icetec Comments (2018 RM18–9) at 16; SEIA Comments (2018 RM18–9) at 16; Stem Comments (2018 RM18–9) at 14–15; Tesla Comments (2018 RM18–9) at 9.

[691] NRECA Comments (2018 RM18–9) at 30.

[692] NYISO Indicated Transmission Owners Comments (2018 RM18–9) at 15, 17.

[693] Pacific Gas & Electric Comments (2018 RM18–9) at 17–18.

[694] EEI Comments (2018 RM18–9) at 14.

[695] *See, e.g.,* Advanced Energy Economy Comments (RM16–23) at 39; APPA Comments (2018 RM18–9) at 27; Center for Biological Diversity Comments (RM16–23) at 3.

[696] Stem Comments (RM16–23) at 4, 15.

[697] *Id.* at 4.

[698] Tesla/SolarCity Comments (RM16–23) at 30.

or consultation between the distributed energy resource aggregator and distribution utility to ensure the distribution grid can be operated in a safe and reliable manner during the aggregated distributed energy resource operating conditions.[699] Distributed energy resource providers, such as Stem, take the opposite view and assert that RTOs and ISOs are not obligated to wait for the distribution utility to review the registration of a distributed energy resource if the distributed energy resource can prove it has completed an applicable state-level interconnection process.[700] Nevertheless, several commenters agree that it would be reasonable for an RTO/ISO to pause registration of a distributed energy resource to provide time (*e.g.,* 10 days or CAISO's 30-day timeline) for the distribution utility to ensure that sufficient interconnection procedures have been followed and approved interconnection agreements are in place, but they do not recommend the Commission require a specific timeline.[701] Icetec specifically requests that RTO/ISO rules be developed on the procedures and timelines for distribution-level studies if there is no state and local regulatory tariff governing these studies.[702]

290. RTOs/ISOs support the NOPR proposal but raise questions about their role in aggregation approvals and dispute resolution, communication system requirements, and the extent of the coordination proposed by the Commission.[703] PJM argues that the registration process and timing needed to participate in an RTO/ISO market should be straight forward, predictable, and transparent, and that any basis for the RTO/ISO to prohibit wholesale market participation should be set forth in its tariff.[704] CAISO, IRC, and PJM would also like the Commission to provide guidance on how and where disputes between the RTO/ISO and distribution utilities regarding coordination of distributed energy resources are to be resolved.[705] CAISO requests additional processes beyond sharing information, arguing that processes are needed to resolve or mitigate any problems the distribution utility may find during its review, including developing a solution with the distributed energy resource provider.[706]

291. Finally, while most comments focus on initial registration, TAPS states that a distribution utility should also be able to reopen the approval of an individual distributed energy resource's enrollment in a distributed energy resource aggregation if the distribution system is reconfigured.[707]

c. Commission Determination

292. To implement § 35.28(g)(12)(ii)(g) of the Commission's regulations, we adopt the NOPR proposal to require each RTO/ISO to modify its tariff to incorporate a comprehensive and non-discriminatory process for timely review by a distribution utility of the individual distributed energy resources that comprise a distributed energy resource aggregation, which is triggered by initial registration of the distributed energy resource aggregation or incremental changes to a distributed energy resource aggregation already participating in the markets. As described below, each RTO/ISO must coordinate with distribution utilities to develop a distribution utility review process that includes criteria by which the distribution utilities would determine whether (1) each proposed distributed energy resource is capable of participation in a distributed energy resource aggregation; and (2) the participation of each proposed distributed energy resource in a distributed energy resource aggregation will not pose significant risks to the reliable and safe operation of the distribution system. To support this review process, RTOs/ISOs must share with distribution utilities any necessary information and data collected under Section IV.F of this final rule about the individual distributed energy resources participating in a distributed energy resource aggregation. In addition, the results of a distribution utility's review must be incorporated into the distributed energy resource aggregation registration process.

293. To balance the need for distribution utility review with the need to avoid creating potential barriers to distributed energy resource aggregation, as noted by commenters, we require each RTO/ISO to demonstrate on compliance with this final rule, as discussed further below,[708] that its proposed distribution utility review process is transparent, provides specific review criteria that the distribution utilities should use, and provides adequate and reasonable time for distribution utility review.[709] A transparent review process with specific review criteria will allow distribution utilities to review and identify concerns regarding the ability of distributed energy resources to participate in a distributed energy resource aggregation without posing significant reliability risk to the distribution system. We also find that allowing an RTO/ISO to design this new process allows regional flexibility in developing review procedures appropriate for each particular RTO/ISO.

294. As explained above,[710] we decline to exercise jurisdiction over the interconnection of an individual distributed energy resource seeking to participate in RTO/ISO markets exclusively as part of an aggregation. We expect that the state and local interconnection processes for distributed energy resources will provide the appropriate platform to address and study potential distribution system impacts and provide the necessary information to inform distribution utility review during distributed energy resource aggregation registration. However, to the extent that some existing state and local interconnection processes do not already capture such information, this final rule in no way prevents state and local regulators from amending their interconnection processes to address potential distribution system impacts that the participation of distributed energy resources through distributed energy resource aggregations may cause. In addition, coordination between RTOs/ISOs, distributed energy resource aggregators, relevant electric retail regulatory authorities, and distribution utilities during the registration and distribution utility review processes should provide RTOs/ISOs with the information they need to study the impact of distributed energy resource aggregations on the transmission system.

295. We agree with commenters[711] that a lengthy review time or the lack of a deadline could erect a barrier to distributed energy resource

[699] *See, e.g.,* NRECA Comments (2018 RM18–9) at 29; Pacific Gas & Electric Comments (2018 RM18–9) at 13.

[700] Stem Comments (2018 RM18–9) at 15.

[701] *See, e.g.,* Icetec Comments (2018 RM18–9) at 17–18; Stem Comments (2018 RM18–9) at 15; Sunrun Comments (2018 RM18–9) at 7.

[702] Icetec Comments (2018 RM18–9) at 9.

[703] CAISO Comments (RM16–23) at 39, 41–43, 46; IRC Comments (RM16–23) at 9; ISO–NE Comments (RM16–23) at 54–55; PJM Comments (RM16–23) at 8, 26; SPP Comments (RM16–23) at 24.

[704] PJM Comments (2018 RM18–9) at 19.

[705] CAISO Comments (RM16–23) at 41; IRC Comments (RM16–23) at 9; PJM Comments (RM16–23) at 8.

[706] CAISO Comments (RM16–23) at 41.

[707] TAPS Comments (2018 RM18–9) at 28.

[708] *See infra* PP 295–297.

[709] For example, the approach used in the CAISO Distributed Energy Resource Provider program.

[710] *See supra* Section IV.A.3 (Interconnection).

[711] *See, e.g.,* Advanced Energy Management Comments (2018 RM18–9) at 19; Stem Comments (2018 RM18–9) at 15; Tesla Comments (2018 RM18–9) at 9.

participation in the RTO/ISO markets and may unduly delay participation. In response to these concerns, we clarify that any distribution utility review must be completed within a limited, but reasonable amount of time.[712] We expect a reasonable amount of time may vary among RTOs/ISOs but should not exceed 60 days. An RTO/ISO, on compliance, should propose a timeline that reflects its regional needs. In compliance with this final rule, we require each RTO/ISO to revise its tariff to specify, as part of its proposed distribution utility review process, the time that a distribution utility has to identify any concerns regarding a distributed energy resource seeking to participate in the RTO/ISO markets through an aggregation.

296. In addition, we agree with commenters that argue for specific standards and criteria to guide and govern the distribution utility review process. However, we are not standardizing the criteria that the RTOs/ISOs must adopt. We believe there are sufficient differences among the regions, such as their rules limiting participation in different programs, to warrant flexibility in determining specific standardized criteria. 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.

297. We agree with multiple commenters, such as EEI and Advanced Energy Economy, that the RTOs/ISOs must include potential impacts on distribution system reliability as a criterion in the distribution utility review process. For example, if a distribution utility determines during the distribution utility review process that a distributed energy resource operated as part of an aggregation may increase voltage above acceptable limits or create potential equipment overloads, the distribution utility should have the opportunity to alert the RTO/ISO and recommend removal of that distributed energy resource from the distributed energy resource aggregation. In addition, the distribution utility should have the opportunity to request that the RTO/ISO place operational limitations on an aggregation or removal of a distributed energy resource from an aggregation based on specific significant reliability or safety concerns that it clearly demonstrates to the RTO/ISO and distributed energy resource aggregator on a case-by-case basis. For example, the RTOs/ISOs may consider requiring a signed affidavit or other evidence from the distribution utility that a distributed energy resource's participation in RTO/ISO markets would pose a significant risk to the safe and reliable operation of the distribution system, and processes to contest the distribution utility's recommendation for removal or for operational limitations to be placed on the aggregation.

298. In response to comments from EEI, TAPS, and multiple distribution utilities that argue for a larger and decision-making role for the distribution utilities during the review of distributed energy resource registrations, we decline to provide such a role. We find that requiring or permitting distribution utilities to authorize the participation of distributed energy resources in RTO/ISO markets directly or as part of an aggregation could create a barrier to distributed energy resource aggregation.[713] The distribution utility review processes and interconnection protocols discussed above should address and resolve the key distribution reliability concerns raised by these commenters. We find that the ability of distribution utilities to review and comment on distributed energy resource participation in aggregations, as well as the Commission's finding that individual distributed energy resources that will participate in aggregations will interconnect under state and local interconnection protocols, represents a balanced approach to removing barriers to the participation of distributed energy resource aggregations in RTO/ISO markets, while protecting reliability and the fundamental role of distribution utilities in operating their distribution systems.

299. In response to concerns raised by IRC and PJM regarding disputes about distribution utility review,[714] we find that any disputes over the application of coordination and distribution utility review processes between the RTO/ISO, the distribution utilities, and the distributed energy resource aggregators must be subject to a process for resolving disputes in the RTO/ISO tariff. Therefore, we require each RTO/ISO to revise its tariff to incorporate dispute resolution provisions as part of its proposed distribution utility review process. In its compliance filing, each RTO/ISO should describe how existing dispute resolution procedures are sufficient or, alternatively, propose amendments to its procedures or new dispute resolution procedures specific to this subject. Ensuring that disputes regarding the distribution utility review process are subject to dispute resolution provisions in RTO/ISO tariffs provides a formal mechanism for the interested party to attempt to resolve the issue with the RTO/ISO. Any parties in conflict over the distribution utility review processes may also bring such disputes to the Commission's Dispute Resolution Service, or file complaints pursuant to FPA section 206 at any time.[715]

3. Ongoing Operational Coordination

a. NOPR Proposal

300. In the NOPR, the Commission proposed to require that each RTO/ISO revise its tariff to establish a process for ongoing coordination, including operational coordination, among itself, the distributed energy resource aggregator, and the distribution utility to maximize the availability of the distributed energy resource aggregation consistent with the safe and reliable operation of the distribution system.[716] The Commission explained that the purpose of this ongoing coordination would be to ensure that the distributed energy resource aggregator disaggregates dispatch signals from the RTO/ISO and dispatches individual resources in a distributed energy resource aggregation consistent with the limitations of the distribution system. To account for the possibility that distribution facilities may be out of service and impair the operation of certain individual resources in a distributed energy resource aggregation, the Commission also proposed to require each RTO/ISO to revise its tariff to require the distributed energy resource aggregator to report to the RTO/ISO any changes to its offered quantity and related distribution

[712] For instance, CAISO utilizes a 30-day review period in its Distributed Energy Resource Provider program.

[713] *See supra* Section IV.A.2 (Opt-Out) for further discussion.

[714] *See, e.g.,* IRC Comments (RM16–23) at 9; PJM Comments (2018 RM18–9) at 8.

[715] For example, a dispute over how the RTO/ISO managed and implemented the distribution review process during a distributed energy resource aggregation registration could be brought to the Commission.

[716] NOPR, 157 FERC ¶ 61,121 at P 155.

factors that result from distribution line faults or outages.

301. In addition, the Commission sought comment on any related reliability, safety, and operational concerns and how they may be effectively addressed.

b. Comments

302. Several commenters express their support for ongoing coordination and emphasize the importance of real-time coordination to ensure safe and reliable operation of the transmission and distribution systems.[717] Many distribution utilities in support of the NOPR proposal suggest specific roles or priorities for distribution utilities as part of ongoing coordination. Pacific Gas & Electric states that services in support of distribution system safety and reliability must be prioritized, as determined by the distribution company, over wholesale market participation when distributed energy resources are providing multiple services.[718] NYISO Indicated Transmission Owners and Xcel Energy Services request that the Commission permit distribution utilities to limit the energy injections and ancillary services from specific distributed energy resources with advanced notice.[719] Other commenters argue that distribution utilities must have the ability to limit distributed energy resource generation in order to ensure safety and reliability because RTOs/ISOs do not have sufficient information to maintain the safety and reliability of the distribution grid.[720]

303. Several commenters provide input on the processes needed to alert distributed energy resource aggregators about problems on distribution systems. Dominion agrees with the NOPR requirement that a distributed energy resource aggregator should be responsible for reporting to the RTO/ISO when its offered quantity changes due to distribution facilities being out of service.[721] SPP notes it will require significant effort to coordinate with entities with which the RTO/ISO has not previously had two-way communications.[722] CAISO recommends that the approach being developed for its Distributed Energy Resource Provider program be used as a means to allow distribution utilities to identify problems on their distribution systems.[723] CAISO believes that a process is needed for distribution utilities to notify a distributed energy resource aggregator of changes to distribution system conditions that will affect the aggregated resource's ability to perform to its maximum capability, such as a red/green traffic signal.[724] The Organization of MISO States argues that distribution system operators must have the ability to communicate information on topology changes in real-time which may impact the ability of aggregations to participate in the wholesale market.[725] Several commenters indicate that the current data acquisition technologies are largely manual, but will be adequate initially for ongoing coordination.[726]

304. Multiple commenters state that, at higher distributed energy resource penetrations, enhanced equipment and information to increase coordination and communication between the distribution utility, distributed energy resource aggregator, and the RTO/ISO will be necessary and are still in the process of being developed.[727] TAPS and EEI argue that distribution utilities will need timely information on planned dispatch, and that there must be a realistic timeline for preventing a dispatch and notifying the distributed energy resource aggregator or the RTO/ISO if a dispatch would adversely affect retail service.[728]

305. Some commenters address the role of the distribution utility in ongoing operational coordination. Advanced Energy Economy and EEI state that the distribution utility should be made aware of all information collected by the aggregator.[729] More fundamentally, EEI comments that the distribution utility is in the best position to serve as the coordinator of distribution operations to ensure the complete provision of information is being provided to all parties.[730]

306. Several commenters offer suggestions or request guidance on aspects of ongoing coordination. Avangrid advocates that all communication during ongoing coordination be channeled through distributed energy resource aggregators.[731] Furthermore, Avangrid states that distributed energy resource aggregators should assume the responsibility for the performance of their aggregated resource and be responsible for any costs incurred by distribution utilities to mitigate and resolve power quality issues caused by distributed energy resources. TeMix states that dispatch of end customer load, distributed generation, and storage must be coordinated with the operators of the distribution grid circuits, which can be complex.[732]

307. Several commenters claim that the RTO/ISO tariffs should be less specific about what is required for ongoing coordination processes and rules. ISO–NE states that the Commission should not be overly prescriptive regarding the level of detail required in each RTO/ISO tariff regarding coordination among these entities on operational coordination, and requests that the Commission allow each RTO/ISO to develop these requirements in conjunction with stakeholders.[733] Pacific Gas & Electric states that it may be appropriate to include high-level requirements for information sharing and operational coordination, but more technical issues associated with distributed energy resource aggregation implementation are fluid and evolving, and thus tariff language may not be flexible or adaptable enough to account for needed useful, timely changes.[734] Advanced Energy Economy and Union of Concerned Scientists emphasize that ongoing coordination already occurs with other resources, such as remote and dispersed hydroelectric generation, and argue that existing protocols are sufficient.[735]

308. Most commenters agree that distribution utilities should have the right to override RTO/ISO dispatch instructions for distributed energy resources located on their distribution systems to resolve or avoid distribution

[717] *See, e.g.,* APPA/NRECA Comments (RM16–23) at 45; Duke Energy Comments (RM16–23) at 7; EEI Comments (RM16–23) at 37; Exelon Comments (RM16–23) at 2, 11; Guannan He Comments (RM16–23) at 2; NYISO Comments (RM16–23) at 19.

[718] Pacific Gas & Electric Comments (RM16–23) at 21.

[719] NYISO Indicated Transmission Owners Comments (RM16–23) at 15–16; Xcel Energy Services Comments (RM16–23) at 28.

[720] Organization of MISO States Comments (2018 RM18–9) at 5; SoCal Edison Comments (RM16–23) at 7–8.

[721] Dominion Comments (RM16–23) at 13–14.

[722] SPP Comments (RM16–23) at 24.

[723] CAISO Comments (RM16–23) at 42–43.

[724] *Id.* at 42–44.

[725] Organization of MISO States Comments (2018 RM18–9) at 5.

[726] *See, e.g.,* NYISO Indicated Transmission Owners Comments (2018 RM18–9) at 22; PJM Comments (2018 RM18–9) at 27.

[727] *See, e.g.,* Advanced Energy Management Comments (2018 RM18–9) at 21–22; NYISO Indicated Transmission Owners Comments (2018 RM18–9) at 23; Pacific Gas & Electric Comments (2018 RM18–9) at 22–23; PJM Comments (2018 RM18–9) at 27; TAPS Comments (2018 RM18–9) at 14.

[728] EEI Comments (2018 RM18–9) at 12; TAPS Comments (2018 RM18–9) at 14.

[729] Advanced Energy Economy Comments (2018 RM18–9) at 11; EEI Comments (2018 RM18–9) at 17.

[730] EEI Comments (2018 RM18–9) at 17.

[731] Avangrid Comments (RM16–23) at 17.

[732] TeMix Comments (RM16–23) at 4.

[733] ISO–NE Comments (RM16–23) at 55.

[734] Pacific Gas & Electric Comments (RM16–23) at 22.

[735] Advanced Energy Economy Comments (RM16–23) at 38; Union of Concerned Scientists Comments (RM16–23) at 9.

reliability issues.[736] Lorenzo Kristov indicates that the manner in which a distribution utility can override a dispatch instruction should be clarified so that distributed energy resource providers will be better able to estimate their risk of being curtailed due to distribution system conditions.[737] NYISO Indicated Transmission Owners state that the distribution utility should communicate potential issues with dispatch schedules to the distributed energy resource aggregators to provide them with an opportunity to re-adjust the distributed energy resource aggregation dispatch schedule.[738] Conversely, Stem argues that, because a distribution utility does not have visibility into the exact distribution level impacts of a wholesale market dispatch, the distribution utility should not be able to override a dispatch.[739]

309. Commenters disagree about how performance penalties should be applied in the event that a distribution utility overrides an RTO/ISO dispatch. Several commenters generally argue that distributed energy resource aggregators should be subject to performance penalties, like all other resources.[740] PG&E and PJM assert that non-deliverability penalties are subject to bilateral and contractual agreement between the distributed energy resource aggregator and the RTO/ISO.[741] Developers argue that the aggregator should not be assessed penalties due to an outage caused by the distribution system operator's controls.[742] Distribution utilities argue that, in the event of a curtailment, they must have protection from liability.[743]

c. Commission Determination

310. We agree with commenters that emphasize the importance of real-time coordination to ensure safe and reliable operation of the transmission and distribution systems. Consequently, to implement § 35.28(g)(12)(ii)(g) of the Commission's regulations, we adopt the NOPR proposal to 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. These processes 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 reliability and safety concerns. We find these operational coordination requirements will maximize the availability of the distributed energy resource aggregation consistent with the reliable and safe operation of the distribution system.

311. Commenters disagree over the level of specificity needed in RTO/ISO tariffs and describe different approaches to ongoing coordination. To account for different regional approaches and to provide flexibility, we are not prescribing specific protocols or processes for the RTOs/ISOs to adopt as part of the operational coordination requirements, but rather we will allow each RTO/ISO to develop an approach to ongoing operational coordination in compliance with this final rule.

312. 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. We find that this requirement will ensure that distributed energy resource aggregations are subject to non-performance penalties similarly to other resources participating in RTO/ISO markets. We note that this requirement will incent distributed energy resource aggregators to register individual distributed energy resources on less-constrained portions of distribution networks in order to minimize the likelihood of incurring non-performance penalties from the RTO/ISO.

313. We acknowledge that the timing and location of distribution utility overrides of dispatch instructions are outside of the control of distributed energy resource aggregators, and that aggregators may not have advance notice of overrides during an operating day. In response to commenters who state that distribution utilities must have protection from liability in the event of a curtailment or an outage caused by the distribution system operator's actions to preserve the safety and reliability of the distribution system,[744] we decline to impose any specific liability provisions. Given the arguments advanced by commenters, we are not persuaded that all distribution providers face similar liability concerns and that these concerns should be addressed through standardized liability provisions in RTO/ISO tariffs. Accordingly, we decline to establish a generic requirement for RTOs/ISOs with respect to liability provisions.

4. Role of Relevant Electric Retail Regulatory Authorities

a. NOPR Proposal

314. The NOPR did not directly address the role of relevant electric retail regulatory authorities in coordination with the RTO/ISO, the distributed energy resource aggregator, and the distribution utility when a distributed energy resource aggregation seeks to participate in an RTO/ISO market. However, after the April 2018 technical conference, the Commission sought comment on the role of relevant electric retail regulatory authorities in coordination.

b. Comments

315. Most commenters assert that relevant electric retail regulatory authorities have a central and key role in coordination and that the responsibilities of such authorities should be focused on setting rules and supervising distribution utility review of distributed energy resource participation in aggregations.

316. Some relevant electric retail regulatory authorities argue that they must have a central role in coordination to ensure that their jurisdiction is preserved as it relates to market activities on the distribution system by distributed energy resources participating in RTO/ISO markets.[745]

[736] *See, e.g.,* California Commission Comments (2018 RM18–9) at 18; Duquesne Comments (2018 RM18–9) at 7; NYISO Indicated Transmission Owners Comments (2018 RM18–9) at 23; Pacific Gas & Electric Comments (2018 RM18–9) at 24; SunRun Comments (2018 RM18–9) at 5–6; TAPS Comments (2018 RM18–9) at 29.

[737] Lorenzo Kristov Comments (2018 RM18–9) at 17.

[738] NYISO Indicated Transmission Owners Comments (2018 RM18–9) at 23.

[739] Stem Comments (2018 RM18–9) at 17.

[740] Monitoring Analytics Comments (2018 RM18–9) at 13; NYISO Indicated Transmission Owners Comments (2018 RM18–9) at 23; PJM Comments (2018 RM18–9) at 27–28.

[741] Pacific Gas & Electric Comments (2018 RM18–9) at 24; PJM Comments (2018 RM18–9) at 27–28.

[742] Microgrid Resources Coalition Comments (2018 RM18–9) at 15; Stem Comments (2018 RM18–9) at 17; SunRun Comments (2018 RM18–9) at 6.

[743] Eversource Comments (2018 RM18–9) at 11; SoCal Edison Comments (2018 RM18–9) at 10; TAPS Comments (2018 RM18–9) at 29.

[744] *See, e.g.,* Eversource Comments (2018 RM18–9) at 11; SoCal Edison Comments (2018 RM18–9) at 10; TAPS Comments (2018 RM18–9) at 29.

[745] *See, e.g.,* Vice Chairman Place Comments (2018 RM18–9) at 8; Organization of MISO States Comments (2018 RM18–9) at 9–10.

Vice Chairman Place requests that the Commission require the role of relevant electric retail regulatory authorities be reflected in RTO/ISO rules, and that, if the Commission sets roles and responsibilities in RTO/ISO rules, relevant electric retail regulatory authorities should participate in setting these rules.[746] In addition, the Organization of MISO States contends that relevant electric retail regulatory authorities will need to be aware of coordination efforts and be able to participate in, and in some cases lead, these efforts based on jurisdictional scope, prevalence of distributed energy resource penetration, and state and local policy.[747] Vice Chairman Place requests that the relevant electric regulatory authority's ability to restrict distributed energy resource participation in the wholesale market be maintained.[748]

317. Distribution utilities generally agree with the comments from relevant electric retail regulatory authorities and support a central and key role for relevant electric retail regulatory authorities in coordinating the participation of aggregated distributed energy resource in RTO/ISO markets.[749] Specific roles and responsibilities for relevant electric retail regulatory authorities identified by distribution utility commenters include: Supervision of distribution utility review of distributed energy resource participation in aggregations; evaluation of distributed energy resources interconnection to distribution facilities; overseeing issues regarding distribution system operation and reliability; data sharing; and setting of metering requirements and related mechanisms to distinguish wholesale and retail transactions.[750] Moreover, APPA requests that the Commission be explicit that nothing in the final rule preempts or otherwise limits the ability of relevant electric retail regulatory authorities to adopt rules or tariffs, and to set rates to recover and allocate the costs associated with facilitating wholesale market participation by aggregated distributed energy resources.[751]

318. CAISO also comments in support of the role of relevant electric retail regulatory authorities in facilitating coordination. Based on its experience in California, CAISO identifies several possible coordination roles and responsibilities for relevant electric retail regulatory authorities, including: Establishing metering requirements for distributed energy resources; establishing rules for multi-use applications; providing oversight of distribution utility review of distributed energy resource participation in an aggregation; and resolving distributed energy resource aggregation controversies.[752] As an example of the importance of relevant electric retail regulatory authorities in distributed energy resource coordination, CAISO references its Commission-approved distributed energy resource process that requires that distributed energy resource providers comply with applicable utility distribution company tariffs, and operating procedures incorporated into those tariffs, as well as applicable requirements of the local regulatory authority.[753]

319. Conversely, other commenters argue for a somewhat more limited role for relevant electric retail regulatory authorities. Advanced Energy Management argues that the role of relevant electric retail regulatory authorities should be limited to defining non-discriminatory interconnection procedures that ensure the distribution grid can accommodate distributed energy resources, and ensuring that the distributed energy resource can safely deliver energy to the grid.[754] Icetec asserts that the coordination of distributed energy resource registrations should not become a vehicle for distribution utilities or relevant electric retail regulatory authorities to exercise improper authority over eligibility to participate in wholesale markets.[755] In order to forestall this possible intervention, Icetec recommends making distribution interconnection and registration for wholesale markets entirely separate processes.[756]

320. Some commenters urge the Commission to respect state and local concerns regarding distributed energy resource aggregations. APPA states that the Commission should afford distribution utilities and their relevant electric retail regulatory authorities a key role in coordinating the participation of aggregated distributed energy resources in RTO/ISO markets.[757] The Indiana Commission states that distributed energy resource wholesale participation must work in tandem with, and not in contravention of, Indiana's utility regulatory framework.[758] PJM Utilities Coalition urges the Commission to defer to relevant electric retail regulatory authorities in fashioning programs that integrate distributed energy resources into the distribution system, asserting that states are uniquely positioned to balance the benefits of distributed energy resource participation in wholesale markets with costs and other adverse impacts on distribution systems and retail load.[759]

321. The California Commission recommends that, given the complexity of ensuring just compensation for resources, it is most appropriate for local regulatory authorities to establish distinctly defined services and rules to govern coordination across wholesale and retail markets.[760]

c. Commission Determination

322. In consideration of the comments and to implement § 35.28(g)(12)(ii)(g) of the Commission's regulations, we require each RTO/ISO to specify in its tariff, as part of the market rules on coordination between the RTO/ISO, the distributed energy resource aggregator, and the distribution utility, how each RTO/ISO will accommodate and incorporate voluntary relevant electric retail regulatory authority involvement in coordinating the participation of aggregated distributed energy resources in RTO/ISO markets. We agree with commenters that relevant electric retail regulatory authorities have a role in coordination, *i.e.,* in setting rules at the distribution level and in RTO/ISO stakeholder discussions. Many relevant electric retail regulatory authorities indicate strong interest in participating in such coordination.

323. We note that the roles delineated in CAISO's Distributed Energy Resource Provider tariff provisions may provide an example of how relevant electric retail regulatory authorities could be involved in coordinating the participation of distributed energy resource aggregations in RTO/ISO

[746] Vice Chairman Place Comments (2018 RM18–9) at 8.

[747] Organization of MISO States Comments (2018 RM18–9) at 9.

[748] Vice Chairman Place Comments (2018 RM18–9) at 5.

[749] *See, e.g.,* APPA Comments (2018 RM18–9) at 2; New York Indicated Transmission Owners Comments (2018 RM18–9) at 17; Pacific Gas & Electric Comments (2018 RM18–9) at 16.

[750] *See, e.g.,* APPA Comments (2018 RM18–9) at 6; California Commission Comments (2018 RM18–9) at 1–3, 12; Organization of MISO States Comments (2018 RM18–9) at 9; Pacific Gas & Electric Comments (2018 RM18–9) at 16.

[751] APPA Comments (2018 RM18–9) at 4.

[752] CAISO Comments (2018 RM18–9) at 13–14.

[753] *Id.* at 14.

[754] Advanced Energy Management Comments (2018 RM18–9) at 18.

[755] Icetec Comments (2018 RM18–9) at 16.

[756] *Id.* at 18–19.

[757] APPA Comments (2018 RM18–9) at 2.

[758] Indiana Commission Comments (2018 RM18–9) at 2.

[759] PJM Utilities Coalition Comments (2018 RM18–9) at 10.

[760] California Commission Comments (2018 RM18–9) at 10–11.

markets. CAISO's Distributed Energy Resource Provider model requires that distributed energy resource providers comply with applicable utility distribution company tariffs and operating procedures incorporated into those tariffs, as well as applicable requirements of the local regulatory authority.[761]

324. We further note that possible roles and responsibilities of relevant electric retail regulatory authorities in coordinating the participation of distributed energy resource aggregations in RTO/ISO markets may include, but are not limited to: Developing interconnection agreements and rules; developing local rules to ensure distribution system safety and reliability, data sharing, and/or metering and telemetry requirements; overseeing distribution utility review of distributed energy resource participation in aggregations; establishing rules for multi-use applications; and resolving disputes between distributed energy resource aggregators and distribution utilities over issues such as access to individual distributed energy resource data. We require that any such role for relevant electric retail regulatory authorities in coordinating the participation of distributed energy resource aggregations in RTO/ISO markets be included in the RTO/ISO tariffs and developed in consultation with the relevant electric retail regulatory authorities. Further, as noted in Section IV.G, to the extent that metering and telemetry data comes from or flows through distribution utilities, we require that RTOs/ISOs coordinate with distribution utilities and the relevant electric retail regulatory authorities to establish protocols for sharing metering and telemetry data that minimize costs and other burdens and address concerns raised with respect to customer privacy and cybersecurity.

5. Coordination Frameworks

a. NOPR Proposal

325. As part of its proposal to require coordination in the NOPR, the Commission sought comment on the level of detail necessary in the RTO/ISO tariffs to establish a framework for ongoing coordination between the RTO/ISO, a distributed energy resource aggregator, and the relevant distribution utility or utilities.[762]

b. Comments

326. Several commenters propose that the Commission take a more proactive step and require RTOs/ISOs to establish a broader coordination structure, or ''coordination framework'' that addresses all aspects of coordination (planning, distributed energy resource registration, and operational coordination) between distributed energy resources, distributed energy resource aggregators, RTOs/ISOs, and distribution utilities. At the technical conference, panelist Jeffery Taft, Chief Architect at Pacific Northwest National Laboratory, described a coordination framework as a way to exchange information and control signals between the three levels of the U.S. electric system, namely the bulk power level, the distribution level, and the distributed energy resource/customer level.[763] R Street proposes two purposes for coordination frameworks, namely, to encourage technological innovation, and to coordinate policies between retail and wholesale markets.[764] Stem proposes three coordination frameworks (1) an operational framework; (2) a planning framework; and (3) a markets framework.[765] PJM suggests a framework that focuses on two components (1) reliability-related items; and (2) administrative items.[766] CAISO proposes an all-encompassing process that addresses each element of distributed energy resource aggregation.[767]

327. Several commenters express the belief that the development of a coordination framework will ensure that participation of distributed energy resource aggregations in RTO/ISO markets does not compromise the reliability or safety of the transmission and distribution systems.[768] For example, based on its experience with implementing CAISO's Distributed Energy Resource Provider framework, Pacific Gas & Electric states that it is important that RTOs/ISOs coordinate with distribution utilities.[769]

328. R Street Institute argues for a coordination framework that creates incentives for innovation and deployment of advanced active network management practices (*e.g.,* real-time operating procedures) and technologies (*e.g.,* software-enabled communications among control centers).[770] E4TheFuture notes that data creation, communications, and analytics are fundamental to successfully including distributed energy resources in the organized wholesale electric markets, and that the technologies and services surrounding these fundamentals and the standards that will support valuation and aggregation are evolving rapidly.[771] E4TheFuture asks the Commission to support the RTOs/ISOs in creating solutions to nimbly address the rapid development of these technologies over time.

329. Several commenters recommend that the Commission not require a specific coordination framework at this time. Public Interest Groups argue that the Commission should not specify a particular structure for coordination frameworks but instead allow the ''laboratories of innovation'' of state and distribution utilities to develop new practices and procedures.[772] Lorenzo Kristov emphasizes that these coordination efforts are at an early stage, noting that there are no best practices and no best coordination framework to adopt.[773] The California Commission asks that the Commission not establish specific requirements at this time, but instead to track the development of frameworks and architectures around the country and document best practices.[774]

c. Commission Determination

330. We believe that, among other benefits, a broader, holistic approach to coordination—referred to herein as a coordination framework—could help ensure that different elements of distributed energy resource aggregations do not work at cross-purposes. Because the topic of coordination frameworks is still developing and was not fully considered in this record, we encourage, but do not require, each RTO/ISO to develop a coordination framework that addresses the needs of its region.

331. We note that it may be beneficial for the RTOs/ISOs and their stakeholders to take into consideration in developing coordination frameworks the interoperability of new information technology and communications systems. Such systems will likely need to exchange mutually recognizable data, and will become more important as distributed energy resource penetration reaches higher levels. Early consideration of these issues could help prevent redundancy and unnecessary costs later.

[761] CAISO Comments (2018 RM18–9) at 14.

[762] NOPR, 157 FERC ¶ 61,121 at P 155.

[763] Technical Conference Transcript at 388.

[764] R Street Comments (RM16–23) at 10–11.

[765] Stem Comments (2018 RM18–9) at 7–8.

[766] PJM Comments (2018 RM18–9) at 19–21, 24.

[767] CAISO Comments (RM16–23) at 39–51.

[768] *See, e.g., id.* at 39; Institute for Policy Integrity Comments (RM16–23) at 9; NYISO Comments (RM16–23) at 19.

[769] Pacific Gas & Electric Comments (RM16–23) at 21.

[770] R Street Institute Comments (RM16–23) at 10.

[771] E4TheFuture Comments (RM16–23) at 2.

[772] Public Interest Organizations Comments (2018 RM18–9) at 11–12.

[773] Lorenzo Kristov Comments (2018 RM18–9) at 16–17.

[774] California Commission Comments (2018 RM18–9) at 12.

I. Modifications to List of Resources in Aggregation

a. NOPR Proposal

332. In the NOPR, the Commission proposed that each RTO/ISO revise its tariff to allow a distributed energy resource aggregator to modify the list of resources in its distributed energy resource aggregation without re-registering all of the resources if the modification will not result in any safety or reliability concerns.[775] The Commission emphasized, however, that, pursuant to other proposed requirements,[776] the relevant distribution utility or utilities must have the opportunity to review the list of individual resources that are located on their distribution system in a distributed energy resource aggregation before those resources may participate in RTO/ISO markets through the aggregation, so that they can assess whether the resources would be able to respond to RTO/ISO dispatch instructions without posing any significant risk to the distribution system.[777]

b. Comments

333. Many commenters support the Commission's proposal to allow a distributed energy resource aggregator to modify its list of resources without re-registering all of the resources in the distributed energy resource aggregation.[778] In support, University of Delaware's EV R&D Group states that within a substantial aggregation, small residential electric vehicle interconnection sites might enter and exit the aggregation even on a daily basis, as new participants and existing participants change vehicles, homes, or preferences.[779] However, NYISO asks the Commission to require the distributed energy resource aggregator to advise the RTOs/ISOs of any changes to the list of resources and changes in the aggregation's performance output or operating characteristics.[780]

334. Many commenters also generally support the proposal to allow distribution utilities to review the list of resources when it is revised.[781] Mensah states that any review should be streamlined as much as possible.[782] Stem stresses the importance of transparent standards of review and argues that opaque review methodologies create an unreasonable barrier to participation of distributed energy resources.[783] Additionally, many commenters emphasize the need to determine whether any changes in the list of resources affect safety and reliability at both the transmission and distribution levels.[784] Dominion adds that the review process to determine the impacts of a change in the list of resources on safety and reliability must be established in a final rule.[785]

c. Commission Determination

335. We adopt the NOPR proposal, as modified below, and add § 35.28(g)(12)(ii)(e) to the Commission's regulations to require each RTO/ISO to establish market rules that address modification to the list of resources in a distributed energy resource aggregation.

336. We require each RTO/ISO to revise its tariff to specify that distributed energy resource aggregators must update their lists of distributed energy resources in each aggregation (*i.e.,* reflect additions and subtractions from the list) and any associated information and data,[786] but that, when doing so, distributed energy resource aggregators will not be required to re-register or re-qualify the entire distributed energy resource aggregation. We note that any modification triggers the distribution utility review process (discussed in Section IV.H.2 above). This requirement is necessary to ensure that the RTOs/ISOs have accurate and current information about the individual distributed energy resources that make up a distributed energy resource aggregation and to allow distribution utilities the opportunity to review those modifications.[787] We find that this requirement will ensure minimal administrative burden, while protecting safety and reliability at both the transmission and distribution levels.

337. While any modification of a distributed energy resource aggregation will trigger distribution utility review, we clarify that it may be appropriate for each RTO/ISO to abbreviate the distribution utility's review of modifications to the distributed energy resource aggregations. As the Commission explained in the NOPR, the requirements for modifying the list of resources in a distributed energy resource aggregation can present a barrier to the participation of distributed energy resource aggregations in RTO/ISO markets.[788] We find that the incremental impacts on RTO/ISO markets and operations that would result from the addition or removal of individual distributed energy resources from a distributed energy resource aggregation, after the initial registration, are likely to be minimal and thus individual distributed energy resources should generally be able to enter and exit distributed energy resource aggregations participating in RTO/ISO markets without impairing safety and reliability. Because the impacts of modifications may often be minimal, an abbreviated review process should be sufficient for the distribution utility to identify the cases where an addition to the list of resources might pose a safety or reliability concern. As stated in Section IV.A.3, modifications to the list of resources in a distributed energy resource aggregation, and the resulting distribution utility and RTO/ISO review of those changes, could occasionally indicate changes to the electrical characteristics of the distributed energy resource aggregation that are significant enough to potentially adversely impact the reliability of the distribution or transmission systems and justify restudy of the full distributed energy resource aggregation.[789] However, even in such circumstances, we do not believe that participation of the distributed energy resource aggregation will need to be paused during the review of modifications or restudy. Aggregators should be able to continue to bid the unmodified portion of their aggregation into RTO/ISO markets. For example, in the event that a resource withdraws from an aggregation, the aggregator could continue to participate in the market by modifying its bidding parameters to reflect the aggregation's changed capability to perform.

338. Finally, to the extent that an RTO/ISO requires distributed energy resource aggregators to provide information on the physical or operational characteristics of its distributed energy resource aggregation (pursuant to Section IV.F), we require

[775] *Id.* P 149.

[776] *See supra* Section IV.H.2 (Role of Distribution Utilities).

[777] NOPR, 157 FERC ¶ 61,121 at P 154.

[778] *See, e.g.,* Advanced Microgrid Solutions Comments (RM16–23) at 8; Avangrid Comments (RM16–23) at 13; CAISO Comments (RM16–23) at 35–37; City of New York Comments (RM16–23) at 9–10; EEI Comments (RM16–23) at 32–33.

[779] University of Delaware's EV R&D Group Comments (2018 RM18–9) at 2.

[780] NYISO Comments (RM16–23) at 18.

[781] *See, e.g.,* APPA/NRECA Comments (RM16–23) at 45; EEI Comments (RM16–23) at 32–33; Mensah Comments (RM16–23) at 4; MISO Transmission Owners Comments (RM16–23) at 23; NYISO Comments (RM16–23) at 18.

[782] Mensah Comments (RM16–23) at 4.

[783] Stem Comments (RM16–23) at 15.

[784] Avangrid Comments (RM16–23) at 12–13; CAISO Comments (RM16–23) at 34–35; Dominion Comments (RM16–23) at 11; Mensah Comments (RM16–23) at 4; Pacific Gas & Electric Comments (RM16–23) at 20.

[785] Dominion Comments (RM16–23) at 11.

[786] *See supra* Section IV.F (Information and Data Requirements).

[787] *See supra* Section IV.H.2 (Role of Distribution Utilities).

[788] NOPR, 157 FERC ¶ 61,121 at P 148.

[789] *See supra* P 99.

each RTO/ISO to revise its tariff to ensure that distributed energy resource aggregators must update such information if any modification to the list of resources participating in the aggregation results in a change to the aggregation's performance. We find that this requirement will ensure that the RTOs/ISOs have accurate and current information about the physical and operational characteristics of the distributed energy resource aggregations that are participating in their markets, with minimal administrative burden.

J. Market Participation Agreements

1. NOPR Proposal

339. In the NOPR, the Commission stated that, in order to ensure that a distributed energy resource aggregator complies with all relevant provisions of the RTO/ISO tariffs, it must execute an agreement with the RTO/ISO that defines its roles and responsibilities and its relationship with the RTO/ISO before it can participate in RTO/ISO markets.[790] The Commission explained that, because the individual resources in these distributed energy resource aggregations will likely fall under the purview of multiple organizations (*e.g.,* the RTO/ISO, state regulatory commissions, relevant distribution utilities, and local regulatory authorities), these agreements must also require that the distributed energy resource aggregator attest that its distributed energy resource aggregation is compliant with the tariffs and operating procedures of the distribution utilities and the rules and regulations of any other relevant regulatory authority.[791] The Commission therefore proposed that each RTO/ISO revise its tariff to include a market participation agreement for distributed energy resource aggregators. The Commission did not propose specific requirements for such agreements in the NOPR; instead, the Commission sought comment on the information these agreements should contain.

340. The Commission also explained that, while these agreements will define the roles and responsibilities of the distributed energy resource aggregator, they should not limit the business models under which distributed energy resource aggregators can operate.[792] Therefore, the Commission proposed that the market participation agreement for distributed energy resource aggregators that each RTO/ISO must include in its tariff may not restrict the business models that distributed energy resource aggregators may adopt. The Commission stated that market participation agreements for distributed energy resource aggregators should not preclude distribution utilities, cooperatives, or municipalities from aggregating distributed energy resources on their systems or even microgrids from participating in the RTO/ISO markets as a distributed energy resource aggregation.

341. After the April 2018 technical conference, the Commission sought comment on whether the proposed use of market participation agreements addresses state and local regulator concerns about the role of distribution utilities in the coordination and registration of distributed energy resources in aggregations. The Commission further asked whether the proposed provisions in the market participation agreements that require that distributed energy resource aggregators attest that they are compliant with the tariffs and operation procedures of distribution utilities and state and local regulators are sufficient to address such concerns.[793]

2. Comments

342. All commenters that address this topic agree that market participation agreements between RTOs/ISOs and distributed energy resource aggregators are necessary. However, commenters disagree on the structure of these agreements.

343. Many commenters support the NOPR proposal to require a market participation agreement for distributed energy resource aggregators.[794] ISO–NE, however, urges the Commission to exclude from a final rule any specific directives regarding market participation agreements for aggregations of distributed energy resources, including requiring attestation from the aggregator.[795] ISO–NE states that such directives are not needed because its current generic market participant agreement is sufficient as a ''simple and proven'' approach to accommodate distributed energy resource aggregations and because other coordination processes, including the asset registration process, may be preferable mechanisms for gathering and verifying information related to a participant's assets.

344. Some commenters express concerns about the sufficiency of market participation agreements to address state and local regulatory concerns. The New York Commission, for example, cautions that a rule addressing the nature and use of market participation agreements should not create barriers that hinder a state regulator's ability to guide the ways that distributed energy resource aggregations can be formed, registered, managed, and operated, including the role of a distribution utility in the coordination and registration of distributed energy resource aggregations.[796] Organization of MISO States asserts that concerns remain about the ability to effectively police compliance with participation agreements, and that in order to comply, new lines of communication between distribution utilities, distributed energy resource aggregators, and the RTO/ISO will need to be developed.[797]

345. Organization of MISO States asserts that further participation agreements will need to be crafted to accommodate ever-evolving technology changes and to avoid such initial agreements becoming barriers to innovation. It asserts that the RTO/ISO stakeholder process is the appropriate place for these modifications to participation agreements to occur.[798]

346. Commenters express varying recommendations for the structure of an agreement or agreements and the parties required to enter them. AES Companies suggest a three-party agreement between the aggregator, distribution utility, and RTO/ISO is appropriate,[799] while Pacific Gas & Electric suggests two two-party agreements (one agreement between aggregator and RTO/ISO, and another between aggregator and distribution utility).[800] APPA/NRECA and MISO Transmission Owners favor the utilities being party to the agreements and argue that the agreement should demonstrate that the aggregation has been authorized by the utility or its relevant regulatory authority.[801] CAISO also suggests that

[790] NOPR, 157 FERC ¶ 61,121 at P 157.

[791] The Commission explained that this may include any laws or regulations of the relevant retail regulatory authority that do not permit demand response resources to participate in RTO/ISO markets as the Commission considered in Order No. 719. *Id.* n.238 (citing Order No. 719, 125 FERC ¶ 61,071 at P 154).

[792] *Id.* P 158.

[793] *See* Notice Inviting Post-Technical Conference Comments at 6.

[794] *See, e.g.,* APPA/NRECA Comments (RM16–23) at 46; California Commission Comments (2018 RM18–9) at 7; Mensah Comments (RM16–23) at 4; NYISO Comments (RM16–23) at 20; PJM Comments (RM16–23) at 28–29; SoCal Edison Comments (2018 RM18–9) at 2, 10–11.

[795] ISO–NE Comments (RM16–23) at 56–57.

[796] New York Commission Comments (2018 RM18–9) at 13.

[797] Organization of MISO States Comments (2018 RM18–9) at 4.

[798] *Id.* at 4–5.

[799] AES Companies Comments (RM16–23) at 12–13, 49.

[800] Pacific Gas & Electric Comments (RM16–23) at 24–26.

[801] APPA/NRECA Comments (RM16–23) at 46–47; MISO Transmission Owner Comments (RM16–23) at 26–27.

the Commission consider whether a separate Commission-jurisdictional agreement should apply between a distribution utility and a distributed energy resource aggregator.[802]

347. Some commenters request flexibility, further guidance from the Commission, and/or the participation of other parties in crafting market participation agreements. Most RTOs/ISOs suggest that some of their existing agreements may be applicable but argue for flexibility in establishing appropriate agreements.[803] Pacific Gas & Electric also argues that each RTO/ISO should be allowed to craft agreements appropriate for its markets.[804] NARUC requests that, for states that do allow third party aggregations, the Commission only provide broad policy direction in a final rule and allow the RTOs/ISOs to develop with state input the necessary details for implementation.[805] EEI similarly argues that RTOs/ISOs and distribution utilities should develop market participation agreements in conjunction with their stakeholders.[806] Xcel Energy Services goes further, stating that the details of market participation agreements will need to be addressed by states.[807] PJM asserts that further clarification as to the role of electric distribution companies and other relevant regulatory authorities is needed for PJM to finalize the appropriate market participant agreement design.[808] Massachusetts Municipal Electric requests sufficient flexibility for the agreement to accommodate different conditions at different distribution utilities.[809] Mensah, however, states that the participation agreement, and any necessary amendments, should be standardized, streamlined, and automated as much as possible to avoid unnecessary costs.[810]

348. Some commenters advocate for specific requirements in market participation agreements. EEI argues that the agreements should ensure that distributed energy resource aggregators are subject to comparable requirements as other resources.[811] AES Companies assert that an agreement should only obligate the aggregator to conform to the appropriate tariff rules and a proportionate share of essential reliability services as determined by each RTO/ISO and its stakeholders.[812] Pacific Gas & Electric states that an agreement between the aggregator and the distribution utility should include detailed requirements regarding operational coordination, mitigation of system impacts, cost allocation, and notification of changes to the aggregation.[813]

349. Avangrid emphasizes that the market participation agreement should be explicit that the aggregator is a wholesale market participant required to comply with the provisions in the tariff, including operational requirements.[814] MISO Transmission Owners and TAPS support requiring the distributed energy resource aggregator to attest to compliance with distribution utility tariffs and operating procedures and with the rules and regulations of any other relevant regulatory authority.[815] APPA/NRECA support requiring aggregators to demonstrate, rather than simply attest, that the relevant electric retail regulatory authority has authorized wholesale market participation by the resources in the aggregation, and to include in the market participation agreement requirements for notice to distribution utilities of any changes in resources and for compliance by the aggregator and its resources with the tariffs and operating procedures of the relevant distribution utilities.[816] MISO Transmission Owners make similar arguments in their comments.[817]

350. On the other hand, Tesla/SolarCity contend that, because many individual distributed energy resources may not be new nor installed by the aggregator, any attestation requirement should only require aggregators to state that, ''to the best of their knowledge,'' the distributed energy resources in the aggregation are compliant with distribution company tariffs and operating procedures and relevant regulatory authority rules and regulations.[818]

351. APPA/NRECA, Open Access Technology, MISO Transmission Owners, and NARUC support the NOPR proposal that market participation agreements should not restrict the business models for distributed energy resource aggregators, though the latter two commenters condition their support on the distributed energy resource aggregation having been permitted by the state regulatory body and, if applicable, the distribution utility.[819] NARUC supports the NOPR language that allows a scenario in which distribution utilities can act as aggregators so that the states can provide oversight of the terms and conditions of their relationship with distributed energy resources and customers, while allowing participation of the aggregator in RTO/ISO markets.[820] On the other hand, Xcel Energy Services asserts that the NOPR language may be too vague to protect yet-to-be-designed aggregator business models and also could inappropriately limit the ability of RTOs/ISOs to prevent business models that could threaten grid reliability.[821]

3. Commission Determination

352. We add § 35.28(g)(12)(ii)(h) to the Commission's regulations and adopt the NOPR proposal to require each RTO/ISO to establish market rules that address market participation agreements for distributed energy resource aggregators. Specifically, we require each RTO/ISO to revise its tariff to include a standard market participation agreement that defines the distributed energy resource aggregator's role and responsibilities and its relationship with the RTO/ISO and that an aggregator is required to execute before it can participate in the RTO/ISO markets. We also adopt the NOPR proposal that this market participation agreement must include an attestation that the distributed energy resource aggregator's aggregation is compliant with the tariffs and operating procedures of the distribution utilities and the rules and regulations of any relevant electric retail regulatory authority. As the Commission explained in the NOPR, these requirements are necessary to ensure that a distributed energy resource aggregator complies with all relevant

[802] CAISO Comments (RM16–23) at 51–52.

[803] *Id.;* ISO–NE Comments (RM16–23) at 56–57; MISO Comments (RM16–23) at 26–27; NYISO Comments (RM16–23) at 20; PJM Comments (RM16–23) at 28–29.

[804] *See* Pacific Gas & Electric Comments (RM16–23) at 24.

[805] NARUC Comments (RM16–23) at 5.

[806] EEI Comments (RM16–23) at 39.

[807] Xcel Energy Services Comments (RM16–23) at 29.

[808] PJM Comments (RM16–23) at 29.

[809] Massachusetts Municipal Electric Comments (RM16–23) at 5.

[810] Mensah Comments (RM16–23) at 4.

[811] EEI Comments (RM16–23) at 39.

[812] AES Companies Comments (RM16–23) at 12–13.

[813] Pacific Gas & Electric Comments (RM16–23) at 24–25.

[814] Avangrid Comments (RM16–23) at 18.

[815] MISO Transmission Owners Comments (RM16–23) at 19 (citing NOPR, 157 FERC ¶ 61,121 at P 157); TAPS Comments (RM16–23) at 13–14.

[816] APPA/NRECA Comments (RM16–23) at 47.

[817] MISO Transmission Owners Comments (RM16–23) at 19, 26–27.

[818] Tesla/SolarCity Comments (RM16–23) at 31.

[819] APPA/NRECA Comments (RM16–23) at 47–48; MISO Transmission Owners Comments (RM16–23) at 26 (citing NOPR, 157 FERC ¶ 61,121 at P 158); NARUC Comments (RM16–23) at 5 (citing NOPR, 157 FERC ¶ 61,121 at P 158); Open Access Technology Comments (RM16–23) at 4.

[820] NARUC Comments (RM16–23) at 5 (citing NOPR at P158).

[821] Xcel Energy Services Comments (RM16–23) at 29.

provisions of the RTO/ISO tariffs, the tariffs and operating procedures of the distribution utilities, and the rules and regulations of any other relevant electric retail regulatory authority.[822] These requirements are also supported by a general consensus among commenters that market participation agreements are necessary and, as expressed by some commenters, that the use of market participation agreements could help address state and local regulatory concerns.

353. Also, as proposed in the NOPR, we require that the market participation agreements that the RTOs/ISOs include in their tariffs not limit the business models under which distributed energy resource aggregators can operate. Allowing distributed energy resource aggregators with varying business models to be included in such agreements should increase the ability of the distributed energy resource aggregators, and resources within such aggregations, to participate in the RTO/ISO markets.

354. With the exception of the attestation requirement and prohibition of business model limitations described above, we will not specify the exact terms and conditions of the market participation agreements. This approach will give the RTOs/ISOs and stakeholders flexibility to develop appropriate agreements, and increase the ability of the distributed energy resource aggregators, and resources within such aggregations, to participate in RTO/ISO markets by better tailoring agreements to the operating conditions and needs of those markets, and thereby help to enhance competition in the markets. Commenters, including the RTOs/ISOs, express a variety of views about the specific requirements that should be included in such agreements and the potential need for additional agreements, and most commenters request flexibility in ability to design these agreements. We believe that this flexibility will provide RTOs/ISOs working with their stakeholders the ability to design the appropriate agreements for their regions and the reasonableness of such proposals will be evaluated in each RTO/ISO-specific compliance proceeding.

355. We also are not persuaded by the suggestion of some commenters that we require additional agreements to help facilitate participation by distributed energy resource aggregations in RTO/ISO markets, or that we require additional entities, such as distribution utilities, distribution system operators, or relevant regulatory authorities, to be parties to the market participation agreements that we are requiring. We believe that the attestation requirement that we adopt in this final rule will help ensure distributed energy resource aggregator compliance with the tariffs and operating procedures of distribution utilities and the rules and regulations of other relevant regulatory authorities. RTOs/ISOs and their stakeholders are best equipped to determine the nature and composition of, and counterparties to, additional agreements. We note that RTOs/ISOs and stakeholders may choose to include additional parties or incorporate related agreements in the proposed market participation agreements. Moreover, as discussed above in Sections IV.H.2 and IV.I, our directive to RTOs/ISOs to establish market rules on coordination will address coordination among any parties not included as parties to the market participation agreements (*i.e.,* the distribution utility and the relevant state and local regulators), including the ability of distribution utilities to review modifications.[823]

356. In response to Xcel Energy Services' assertion that the NOPR proposal to prohibit RTOs/ISOs from limiting the business models under which distributed energy resource aggregators can operate does not protect future business models and may allow other business models that threaten grid reliability, we disagree. Instead, it is responsive to many commenters' requests to avoid undue Commission specificity with respect to the required contents of market participation agreements to allow RTOs/ISOs sufficient regional flexibility in developing these agreements, including to address any business model challenges and any implications for grid reliability. Further, we note that Xcel Energy Services does not provide examples or support for its concerns that certain business models could threaten grid reliability or future business models. We think permitting RTO/ISO prohibitions against certain business models in their market participation agreements is not necessary given a distributed energy resource aggregator's duty to adhere to RTO/ISO market rules, the attestation requirement that we require to be included in the market participation agreements, as well as the ability of RTOs/ISO to craft any necessary safeguards short of business model prohibitions within these agreements. In response to PJM's assertion that further clarification about the role of distribution utilities and other relevant regulatory authorities is needed for PJM to finalize the appropriate market participant agreement design, we believe that we have provided such clarification to the extent possible, elsewhere within this final rule.[824]

K. Compliance

357. In the NOPR, the Commission proposed to require each RTO/ISO to submit a compliance filing within six months of the date the final rule in this proceeding is published in the **Federal Register**. The Commission stated that it believed that six months is sufficient for each RTO/ISO to develop and submit its compliance filing, but recognized that implementation of the reforms proposed in the NOPR could take more time due to the changes that may be necessary to each RTO's/ISO's modeling and dispatch software. Therefore, the Commission proposed to allow 12 months from the date of the compliance filing for implementation of the proposed reforms to become effective.

1. Comments

358. Most RTO/ISO commenters, with the exception of PJM, indicate that they would need to modify their existing rules to appropriately integrate distributed energy resource aggregations.[825] PJM states that it does not require significant modifications to dispatch software, communication platforms, or automation tools, as PJM already has developed many tools that can be adapted for distributed energy resource aggregations, but that improved coordination with electric distribution providers may be a challenge.[826]

359. Eversource recommends that the Commission provide sufficient time for proposals to be developed through the stakeholder process on this complex issue.[827] Dominion suggests a pilot project should be undertaken first.[828] Duquesne Light notes that distributed energy resource integration should proceed in a ''measured'' way to assess operational, reliability, safety and cost implications, noting that some new technologies may require observation and testing before being deemed capable of providing expanded services such as being deemed a capacity resource.[829] Distributed energy resource developers and their advocates, as well as some

[822] *See* NOPR, 157 FERC ¶ 61,121 at P 157.

[823] *See supra* Section IV.H.1 (Market Rules on Coordination).

[824] *See supra* Section IV.C.3 (Double Counting of Services).

[825] *See* CAISO Comments (2018 RM18–9) at 4; PJM Comments (2018 RM18–9) at 8–9.

[826] PJM Comments (2018 RM18–9) at 8–9.

[827] Eversource Comments (2018 RM18–9) at 11.

[828] Dominion Comments (RM16–23) at 9.

[829] Duquesne Light Company Comments (2018 RM18–9) at 3–4.

state commissions, believe that the proposal is timely and should not be delayed, especially given the rapid pace of technological advancement.[830]

2. Commission Determination

360. After consideration of the comments submitted, we find that it is reasonable to provide RTOs/ISOs with additional time to submit their proposed tariff revisions in response to the final rule, given that the changes could require significant work on the part of RTOs/ISOs. Consequently, after consideration of the comments submitted, we will require each RTO/ISO to file the tariff changes needed to implement the requirements of this final rule within 270 days of the publication date of this final rule in the **Federal Register**. To the extent that an RTO/ISO proposes to comply with any or all of the requirements in this final rule using its currently effective requirements for distributed energy resources, it must demonstrate on compliance that its existing approach meets the requirements in this final rule.

361. Based on comments submitted about the complexity of changes to RTO/ISO market rules and systems, we will not require the implementation of the tariff provisions within 12 months from the date of the compliance filing, as proposed in the NOPR. Instead, we will require each RTO/ISO to propose a reasonable implementation date, together with adequate support explaining how the proposal is appropriately tailored for its region and implements this final rule in a timely manner. The Commission will establish on compliance the effective date for each RTO's/ISO's compliance filing.

L. Issues Beyond the Scope of This Rulemaking

1. Comments

362. Some commenters raise issues that were not addressed in the NOPR. For instance, commenters raise issues regarding how the deduction of behind-the-meter resources from reserve margin requirements affects price formation; [831] impacts of subsidizing resources on functioning of RTO/ISO markets; [832] capacity market mitigation policies for distributed energy resources; [833] impacts on system variability and unpredictable operation due to RTO/ISO market participation of distributed energy resources; [834] impacts of distributed energy resource aggregations on distribution system operations and reliability, and necessary distribution system adjustments; [835] reflecting distribution system benefits associated with distributed energy resource aggregations into RTO/ISO market operation; [836] distribution system configuration issues; [837] need for modernizing distribution system equipment, such as the deployment of distributed energy resource management systems (DERMS); [838] privacy and cybersecurity concerns; [839] data collection practices during distributed energy resource registration focused on attributes available for essential grid services, but not necessarily in support of a market product; [840] differing compensation for short-duration resources to account for reduced run times in the capacity market; [841] and clarification that the term electric storage resource as defined in Order No. 841 may include an aggregation of distributed electric storage resources.[842]

2. Commission Determination

363. The NOPR did not propose reforms related to these issues raised by commenters. Therefore, these issues are outside the scope of this proceeding and will not be addressed here.

V. Information Collection Statement

364. The information collection (IC) contained in this final rule is being submitted to the Office of Management and Budget (OMB) for review under section 3507(d) of the Paperwork Reduction Act of 1995.[843] OMB's regulations,[844] in turn, require approval of certain information collection requirements imposed by agency rules. Respondents subject to the filing requirements of a rule will not be penalized for failing to respond to the collection of information unless the collection of information displays a valid OMB control number.

365. The Commission has submitted this IC to OMB as a revision of FERC–516H. OMB has assigned control number 1902–0303 to FERC–516H. The Commission is not asking OMB to change the expiration date of control number 1902–0303 (May 31, 2021).

A. Summary of This IC

Title: FERC–516H (Electric Rate Schedules and Tariff Filings, in Docket No. RM18–9–000).

OMB Control No. 1902–0303.

Type of Request: Revision of FERC–516H.

Abstract: This final rule, at 18 CFR 35.28(g)(12), includes two IC activities. Each RTO and ISO must have tariff provisions that allow DER aggregations to participate directly in the organized wholesale electric markets. In addition, each RTO and ISO must update the economic dispatch software accordingly.

Types of Respondent: RTOs and ISOs.

Frequency of Collection: One time.

Estimate of Annual Burden [845]: The Commission estimates the total annual burden and cost [846] for this IC in the following table:

In response to comments on the NOPR, we have increased the estimated burden and cost for the requirements of the final rule from those originally proposed in the NOPR. The estimated burden and cost for the requirements contained in this final rule follow.

[830] *See, e.g.,* AWEA Comments (RM16–23) at 4; Delaware Commission Comments (RM16–23) at 4; Fresh Energy/Sierra Club/Union of Concerned Scientists Comments (RM16–23) at 1.

[831] *See, e.g.,* NRG Comments (RM16–23) at 6.

[832] *See, e.g.,* PJM Market Monitor Comments (RM16–23) at 10.

[833] *See, e.g.,* NRG Comments (RM16–23) at 6.

[834] *See, e.g.,* Advanced Energy Economy Comments (2018 RM18–9) at 24; NYISO Indicated Transmission Owners Comments (2018 RM18–9) at 20; Organization of MISO States Comments (2018 RM18–9) at 10.

[835] *See, e.g.,* Advanced Energy Management Comments (2018 RM18–9) at 24; Vice Chairman Place Comments (2018 RM18–9) at 2–3; EEI Comments (2018 RM18–9) at 8–9, 19–21; Pacific Gas & Electric Comments (2018 RM18–9) at 20–21, 24–25; PJM Comments (2018 RM18–9) at 28; TAPS Comments (2018 RM18–9) at 7–11.

[836] *See, e.g.,* Stem Comments (2018 RM18–9) at 11.

[837] *See, e.g.,* NRECA Comments (2018 RM18–9) at 8.

[838] *See, e.g.,* CAISO Comments (2018 RM18–9) at 7; EPSA Comments (2018 RM18–9) at 9–13; Eversource Comments (2018 RM18–9) at 10–11.

[839] *See, e.g.,* California Commission Comments (2018 RM18–9) at 18; NRECA Comments (2018 RM18–9) at 11.

[840] *See, e.g.,* Union of Concerned Scientists Comments (RM16–23) at 10–11 (citing J. Nelson, Ph.D. and L.M. Wisland, *Achieving 50 Percent Renewable Electricity in California—The Role of Non-Fossil Flexibility in a Cleaner Electricity Grid* (2015), *http://www.ucsusa.org/sites/default/files/attach/2015/08/Achieving-50-Percent-Renewable-Electricity-In-California.pdf*).

[841] *See, e.g.,* Advanced Energy Economy Comments (RM16–23) at 42–43.

[842] *See, e.g.,* University of Delaware's EV R&D Group Comments (2018 RM18–9) at 1.

[843] *See* 44 U.S.C. 3507(d).

[844] 5 CFR pt. 1320 (2020).

[845] ''Burden'' is the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. For further explanation of what is included in the information collection burden, refer to Title 5 Code of Federal Regulations 1320.3.

[846] Commission staff believes that industry is similarly situated in terms of cost for wages and benefits. Therefore, we are using the FERC 2020 average cost (for wages plus benefits) for one FERC full-time equivalent (FTE) of $172,329 ($83.00 per hour).

ADDITIONS TO FERC–516H, AS IMPLEMENTED IN THE FINAL RULE IN DOCKET NO. RM18–9–000

A	B	C	D	E	F	G
Types of response	Number of respondents	Avg. number of responses per respondent	Total number of responses (col. B × col. C)	Average burden (hours) and cost per response	Total annual burden hours and total annual cost (col. D × col. E)	Cost per respondent (col. F ÷ col. B)
One-Time Tariff Filing Due to RM18–9 Final Rule.	6	1	6	1,529 hrs; $126,907	9,174 hrs; $761,442	$126,907
Software Update	6	1	6	1,500 hrs; $124,500	9,000 hrs; $747,000	124,500
Total Burden				3029 hrs; $251,407	18,174 hrs; $1,508,442	251,407

B. Discussion

366. The Commission implements this final rule and FERC–516H to remove barriers to the participation of distributed energy resource aggregations in the capacity, energy, and ancillary service markets operated by RTOs and ISOs. This IC in this final rule conforms to the Commission's need for efficient information collection, communication, and management within the energy industry.

367. In this final rule, we are requiring each RTO/ISO to propose revisions to its tariff that (1) allow distributed energy resource aggregations to participate directly in RTO/ISO markets and establish distributed energy resource aggregators as a type of market participant; (2) allow distributed energy resource aggregators to register distributed energy resource aggregations under one or more participation models that accommodate the physical and operational characteristics of the distributed energy resource aggregations; (3) establish a minimum size requirement for distributed energy resource aggregations that does not exceed 100 kW; (4) address locational requirements for distributed energy resource aggregations; (5) address distribution factors and bidding parameters for distributed energy resource aggregations; (6) address information and data requirements for distributed energy resource aggregations; (7) address metering and telemetry requirements for distributed energy resource aggregations; (8) address coordination between the RTO/ISO, the distributed energy resource aggregator, the distribution utility, and the relevant electric retail regulatory authorities; (9) address modification to the list of resources in a distributed energy resource aggregation; and (10) address market participation agreements for distributed energy resource aggregators.

368. Interested persons may obtain information on the reporting requirements by contacting Ellen Brown, Office of the Executive Director, Email: *DataClearance@ferc.gov;* Phone: (202) 502–8663.

VI. Environmental Analysis

369. The Commission is required to prepare an Environmental Assessment or an Environmental Impact Statement for any action that may have a significant adverse effect on the human environment.[847] We conclude that neither an Environmental Assessment nor an Environmental Impact Statement is required for this final rule under § 380.4(a)(15) of the Commission's regulations, which provides a categorical exemption for approval of actions under sections 205 and 206 of the FPA relating to the filing of schedules containing all rates and charges for the transmission or sale of electric energy subject to the Commission's jurisdiction, plus the classification, practices, contracts, and regulations that affect rates, charges, classifications, and services.[848]

VII. Regulatory Flexibility Act Certification

370. The Regulatory Flexibility Act of 1980 (RFA) [849] generally requires a description and analysis of rules that will have a significant economic impact on a substantial number of small entities. The RFA mandates consideration of regulatory alternatives that accomplish the stated objectives of a rule and that minimize any significant economic impact on a substantial number of small entities. The SBA Office of Size Standards develops the numerical definition of a small business.[850] The small business size standards are provided in 13 CFR 121.201.

371. Under the SBA classification, the six RTOs/ISOs would be considered electric bulk power transmission and control, for which the small business size threshold is 500 or fewer employees.[851] Because each RTO/ISO has more than 500 employees, none are considered small entities.

372. Furthermore, because of their pivotal roles in wholesale electric power markets in their regions, none of the RTOs/ISOs meet the last criterion of the two-part RFA definition of a small entity: ''not dominant in its field of operation.'' [852]

373. The estimated cost related to this final rule includes: (a) Preparing and making a one-time tariff filing ($126,907 per entity, as detailed in the Information Collection section above), and (b) updating the economic dispatch software. We estimate the one-time software work will take 1,500 hours with an approximate cost of $124,500 per entity. Therefore, the total estimated one-time cost for the tariff filing and software work is $251,407 per entity (or $126,907 + $124,500); the total estimated one-time industry cost is $1,508,442.

374. As a result, we certify that the reforms required by this final rule would not have a significant economic impact on a substantial number of small entities, and therefore no regulatory flexibility analysis is required.

VIII. Document Availability

375. In addition to publishing the full text of this document in the **Federal**

[847] *Regulations Implementing the Nat'l Envt'l Policy Act of 1969,* Order No. 486, 52 FR 47,897 (Dec. 17, 1987), FERC Stats. & Regs., ¶ 30,783 (1987) (cross-referenced at 41 FERC ¶ 61,284).

[848] 18 CFR 380.4(a)(15) (2020).

[849] 5 U.S.C. 601–12.

[850] 13 CFR 121.101 (2020).

[851] 13 CFR 121.201 (Sector 22, Utilities).

[852] The RFA definition of ''small entity'' refers to the definition provided in the Small Business Act, which defines a ''small business concern'' as a business that is independently owned and operated and that is not dominant in its field of operation. The SBA's regulations at 13 CFR 121.201 define the threshold for a small Electric Bulk Power Transmission and Control entity (NAICS code 221121) to be 500 employees. *See* 5 U.S.C. 601(3) (citing to section 3 of the Small Business Act, 15 U.S.C. 632).

Register, the Commission provides all interested persons an opportunity to view and/or print the contents of this document via the internet through the Commission's Home Page (*http://www.ferc.gov*). At this time, the Commission has suspended access to the Commission's Public Reference Room due to the President's March 13, 2020 proclamation declaring a National Emergency concerning the Novel Coronavirus Disease (COVID–19).

376. From FERC's Home Page on the internet, this information is available on eLibrary. The full text of this document is available on eLibrary in PDF and Microsoft Word format for viewing, printing, and/or downloading. To access this document in eLibrary, type the docket number excluding the last three digits of this document in the docket number field.

377. User assistance is available for eLibrary and the FERC's website during normal business hours from FERC Online Support at (202) 502–6652 (toll free at 1–866–208–3676) or email at *ferconlinesupport@ferc.gov,* or the Public Reference Room at (202) 502–8371, TTY (202) 502–8659. Email the Public Reference Room at *public.referenceroom@ferc.gov.*

IX. Effective Date and Congressional Notification

378. These regulations are effective December 21, 2020. The Commission has determined, with the concurrence of the Administrator of the Office of Information and Regulatory Affairs of OMB, that this rule is not a ''major rule'' as defined in section 351 of the Small Business Regulatory Enforcement Fairness Act of 1996.

List of Subjects in 18 CFR Part 35

Electric power rates, Electric utilities.

By the Commission. Commissioner Danly is dissenting with a separate statement attached.

Issued: September 17, 2020.

Nathaniel J. Davis, Sr.,

Deputy Secretary.

In consideration of the foregoing, the Commission amends part 35, chapter I, title 18, *Code of Federal Regulations,* as follows:

PART 35—FILING OF RATE SCHEDULES AND TARIFFS

■ 1. The authority citation for part 35 continues to read as follows:

Authority: 16 U.S.C. 791a–825r, 2601–2645; 31 U.S.C. 9701; 42 U.S.C. 7101–7352.

■ 2. Amend § 35.28 by adding paragraphs (b)(10) and (11) and (g)(12) as follows.

§ 35.28 Non-discriminatory open access transmission tariff.

* * * * *

(b) * * *

(10) *Distributed energy resource* as used in this section means any resource located on the distribution system, any subsystem thereof or behind a customer meter.

(11) *Distributed energy resource aggregator* as used in this section means the entity that aggregates one or more distributed energy resources for purposes of participation in the capacity, energy and/or ancillary service markets of the regional transmission organizations and/or independent system operators.

* * * * *

(g) * * *

(12) *Distributed energy resource aggregators.* (i) Each independent system operator and regional transmission organization must have tariff provisions that allow distributed energy resource aggregations to participate directly in the organized wholesale electric markets. Each regional transmission organization and independent system operator must establish distributed energy resource aggregators as a type of market participant. Additionally, each regional transmission organization and independent system operator must allow distributed energy resource aggregators to register distributed energy resource aggregations under one or more participation models in the regional transmission operator's or the independent system operator's tariff that accommodate the physical and operational characteristics of the distributed energy resource aggregation.

(ii) Each regional transmission organization and independent system operator, to accommodate the participation of distributed energy resource aggregations, must establish market rules that address:

(A) Eligibility to participate in the independent system operator or regional transmission organization markets through a distributed energy resource aggregation;

(B) Locational requirements for distributed energy resource aggregations;

(C) Distribution factors and bidding parameters for distributed energy resource aggregations;

(D) Information and data requirements for distributed energy resource aggregations;

(E) Modification to the list of resources in a distributed energy resource aggregation;

(F) Metering and telemetry system requirements for distributed energy resource aggregations;

(G) Coordination between the regional transmission organization or independent system operator, the distributed energy resource aggregator, the distribution utility, and the relevant electric retail regulatory authorities; and

(H) Market participation agreements for distributed energy resource aggregators.

(iii) Each regional transmission organization and independent system operator must establish a minimum size requirement for distributed energy resource aggregations that does not exceed 100 kW.

(iv) Each regional transmission organization and independent system operator must accept bids from a distributed energy resource aggregator if its aggregation includes distributed energy resources that are customers of utilities that distributed more than 4 million megawatt-hours in the previous fiscal year. An independent system operator or regional transmission organization must not accept bids from a distributed energy resource aggregator if its aggregation includes distributed energy resources that are customers of utilities that distributed 4 million megawatt-hours or less in the previous fiscal year, unless the relevant electric retail regulatory authority permits such customers to be bid into RTO/ISO markets by a distributed energy resource aggregator.

Note: The following appendix will not appear in the Code of Federal Regulations.

Appendix A: Abbreviated Names of Commenters

The following table contains the abbreviated names of all commenters in this docket.

Abbreviation	Commenter (full name)
Advanced Energy Buyers	Advanced Energy Buyers.
Advanced Energy Economy	Advanced Energy Economy.

Abbreviation	Commenter (full name)
Advanced Energy Management	Advanced Energy Management Alliance.
Advanced Microgrid Solutions	Advanced Microgrid Solutions, Inc.
Advanced Rail Energy Storage	Advanced Rail Energy Storage, LLC.
AES Companies	AES Companies.
Alevo	Alevo USA Inc.
Altametric	Altametric LLC.
Amanda Drabek	Amanda Drabek, Pantsuit Nation of East Texas.
American Petroleum Institute	American Petroleum Institute.
Vice Chairman Place	Vice Chairman Andrew Place of the Pennsylvania Public Utilities Commission.
APPA	American Public Power Association.
APPA/NRECA	American Public Power Association and National Rural Electric Cooperative Association.
Arkansas Commission	Arkansas Public Service Commission.
Avangrid	AVANGRID, Inc.
AWEA	American Wind Energy Association.
Beacon Power	Beacon Power, LLC.
Benjamin Kingston	Benjamin D. Kingston.
Bonneville	Bonneville Power Administration.
Brookfield Renewable	Brookfield Renewable.
CAISO	California Independent System Operator Corporation.
California Commission	Public Utilities Commission of the State of California.
California Energy Storage Alliance	California Energy Storage Alliance.
California Municipals	California Municipal Utilities Association.
Calpine	Calpine.
Center for Biological Diversity	Center for Biological Diversity.
City of New York	City of New York.
Connecticut Department of Energy	Connecticut Department of Energy and Environmental Protection.
Connecticut State Entities	Bureau of Energy and Technology Policy of the Connecticut Department of Energy and Environmental Protection and the Connecticut Public Utilities Regulatory Authority.
Delaware Commission	Delaware Public Service Commission.
DER/Storage Developers	DER and Storage Developers.
Direct Energy	Direct Energy.
Dominion	Dominion Resources Services, Inc.
DTE Electric/Consumers Energy	DTE Electric Company and Consumers Energy Company.
Duke Energy	Duke Energy Corporation.
E4TheFuture	E4TheFuture.
Eagle Crest	Eagle Crest Energy Company.
EEI	Edison Electric Institute.
Efficient Holdings	Efficient Holdings, LLC.
ELCON	Electricity Consumers Resource Council.
Energy Storage Association	Energy Storage Association.
EPRI	Electric Power Research Institute.
EPSA	Electric Power Supply Association.
EPSA/PJM Power Providers	Electric Power Supply Association and PJM Power Providers Group.
Eversource	Eversource Energy Service Company.
Exelon	Exelon Corporation.
FirstEnergy	FirstEnergy.
FirstLight	FirstLight Power Resources, Inc.
Fluidic	Fluidic Energy.
Fresh Energy/Sierra Club/Union of Concerned Scientists.	Fresh Energy, the Sierra Club, and the Union of Concerned Scientists.
Genbright	Genbright LLC.
Global Cold Chain Alliance	Global Cold Chain Alliance.
GridWise	GridWise Alliance.
Guannan He	Guannan He.
Harvard Environmental Policy Initiative	Harvard Environmental Policy Initiative.
Icetec	Icetec.
Imperial Irrigation District	Imperial Irrigation District.
Independent Energy Producers Association	Independent Energy Producers Association.
Indiana Commission	Indiana Utility Regulatory Commission.
Institute for Policy Integrity	Institute for Policy Integrity.
IPKeys/Motorola	IPKeys Technologies and Motorola Solutions.
IRC	ISO–RTO Council.
ISO–NE	ISO New England Inc.
Kansas Commission	Kansas Corporation Commission.
Kathy Seal	Kathy Seal.
Leadership Group	Leadership Group.
Liza White	Liza C. White.
Lorenzo Kristov	Lorenzo Kristov.
Lyla Fadali	Lyla Fadali.
Magnum	Magnum CAES, LLC.
Maryland and New Jersey Commissions	Maryland Public Service Commission and New Jersey Board of Public Utilities.
Massachusetts Commission	Massachusetts Department of Public Utilities.
Massachusetts State Entities	Massachusetts Department of Public Utilities and Massachusetts Department of Energy Resources.

Abbreviation	Commenter (full name)
Massachusetts Municipal Electric	Massachusetts Municipal Wholesale Electric Company.
Matthew d'Alessio	Matthew d'Alessio.
Mensah	AF Mensah Inc.
Microgrid Resources Coalition	Microgrid Resources Coalition.
Microsoft	Microsoft Corporation.
Minnesota Energy Storage Alliance	Minnesota Energy Storage Alliance.
MISO	Midcontinent Independent System Operator, Inc.
MISO Transmission Owners	MISO Transmission Owners.
Mosaic Power	Mosaic Power, LLC.
NARUC	National Association of Regulatory Utility Commissioners.
National Hydropower Association	National Hydropower Association.
NEPOOL	New England Power Pool.
NERC	North American Electric Reliability Corporation.
NESCOE	New England States Committee on Electricity.
New Jersey Board	New Jersey Board of Public Utilities.
New York Commission	New York Public Service Commission.
New York State Entities	New York Public Service Commission and New York State Energy Research and Development Authority.
New York Utility Intervention Unit	Utility Intervention Unit of the New York State Department of State.
NextEra	NextEra Energy Resources, LLC.
NRECA	National Rural Electric Cooperative Association.
NRG	NRG Energy, Inc.
NYISO	New York Independent System Operator, Inc.
NYISO Indicated Transmission Owners	Central Hudson Gas & Electric Corporation, Consolidated Edison Company of New York, Inc., National Grid, New York Power Authority, Orange and Rockland Utilities, Inc., and Power.
NYPA	New York Power Authority.
Ohio Commission	Public Utilities Commission of Ohio.
Open Access Technology	Open Access Technology International, Inc.
OpenADR	OpenADR Alliance.
Organization of MISO States	Organization of MISO States.
Pacific Gas & Electric	Pacific Gas and Electric Company.
PJM	PJM Interconnection, L.L.C.
PJM Market Monitor	Monitoring Analytics, LLC.
PJM Utilities Coalition	American Electric Power Service Corporation, East Kentucky Power Cooperative, Inc., and FirstEnergy Service Company, on behalf of its affiliates.
Power Applications	Power Applications and Research Systems, Inc.
Protect Sudbury	Protect Sudbury.
Public Interest Organizations	Clean Wisconsin, Environmental Defense Fund, Environmental Law & Policy Center, Fresh Energy, GridLab, Natural Resources Defense Council, Northwest Energy Coalition, Sierra Club, Southern Environmental Law Center, Union of Concerned Scientists, Vote Solar, Western Grid Group.
R Street Institute	R Street Institute.
RES Americas	Renewable Energy Systems Americas Inc.
Research Scientists	Drs. Audun Botterud, Apurba Sakti, and Francis O'Sullivan.
Robert Borlick	Robert L. Borlick.
San Diego Gas & Electric	San Diego Gas & Electric.
San Diego Water	San Diego County Water Authority.
Schulte Associates	Schulte Associates LLC.
SEIA	Solar Energy Industries Association.
Silicon Valley Leadership Group	Silicon Valley Leadership Group.
Six Cities	Cities of Anaheim, Azusa, Banning, Colton, Pasadena, and Riverside, California.
SoCal Edison	Southern California Edison Company.
Southern Companies	Southern Company Services, Inc.
SPP	Southwest Power Pool, Inc.
Starwood Energy	Starwood Energy Group Global, L.L.C.
Stem	Stem, Inc.
Sunrun	Sunrun Inc.
TAPS	Transmission Access Policy Study Group.
TechNet	TechNet.
TeMix	TeMix Inc.
Tesla	Tesla, Inc.
Tesla/SolarCity	Tesla, Inc. and SolarCity Corporation.
Trans Bay	Trans Bay Cable LLC.
Union of Concerned Scientists	Union of Concerned Scientists.
University of Delaware's EV R&D Group	EV R&D Group, University of Delaware.
UofD/Mensah	EV R&D Group, University of Delaware and AF Mensah Inc.
Viking Cold Solutions	Viking Cold Solutions.
Xcel Energy Services	Xcel Energy Services Inc.

UNITED STATES OF AMERICA—FEDERAL ENERGY REGULATORY COMMISSION

	Docket No.
Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators.	RM18–9–000.

(Issued September 17, 2020)

DANLY, Commissioner, *dissenting:*

1. The Commission today approves a rule requiring Regional Transmission Organizations (RTO) and Independent System Operators (ISO) to revise their tariffs to accommodate distributed energy resource (DER) aggregators. I dissent because, regardless of the benefits promised by DERs, the Commission goes too far in declaring the extent of its own jurisdiction and because the Commission should not encourage resource development by fiat.

2. The Federal Power Act (FPA) delineates the respective roles of the Commission and the States, assigning powers in accordance with each sovereigns' core interests.[853] The federal government is tasked with ensuring just and reasonable wholesale rates, prohibiting state action that would either encumber interstate commerce or harm other states. The States retain authority over the most local of concerns: Choice of generation, siting of transmission lines, and the entirety of retail sales and distribution. Each sovereign has a sphere of authority, and in each sphere, the relevant sovereign's powers are supreme.

3. Respect for the States' role in our federal system and under the FPA would counsel against even modest, non-essential declarations of our authority, if done at the States' expense. Why, when issuing a directive to the RTOs and ISOs (undoubtedly Commission-jurisdictional entities), must we also declare that ''retail regulatory authorit[ies] cannot broadly prohibit the participation in RTO/ISO markets of all distributed energy resources or of all distributed energy resource aggregators''? [854] Perhaps the States should not or cannot prohibit such participation.[855] But it is not for us to make sweeping declarations regarding the States' jurisdiction over distributed generation. Rather, the Commission's jurisdiction over wholesale rates would ideally be vindicated, were it to collide with a state prohibition, through a challenge to a specific enactment or regulation by making arguments ''armed with principles of federal preemption and the Supremacy Clause.'' [856]

4. Apart from the Commission's injudicious jurisdictional declarations, today's order stands as an imprudent exercise of the Commission's power. Why promulgate a rule at all? Reluctance to govern by fiat is counseled particularly in a case like this in which the generation resources the majority seeks to promote, by their very nature, inevitably will affect the distribution system, responsibility for which is assigned, with no ambiguity, to the States. We should allow the RTOs and ISOs (or the States or the utilities) to develop their own DER programs in the first instance. If the promises of DERs are what they purport to be, the markets will encourage their development. And if those programs result in wholesale sales in interstate commerce, then the question of the Commission's jurisdiction will be ripe. Commission directives are unnecessary to encourage the development of economically-viable resources. I have greater faith in the power of market forces and in the discernment of the utilities and the States.

For these reasons, I respectfully dissent.

James P. Danly,

Commissioner.

[FR Doc. 2020–20973 Filed 10–20–20; 8:45 am]

BILLING CODE 6717–01–P

[853] *See* 16 U.S.C. 824 (2018).

[854] *Final Rule,* Order No. 2222, 172 FERC ¶ 61,247, at P 58 (2020).

[855] I acknowledge the legal authority upon which the majority bases its exercise of jurisdiction. *Compare FERC* v. *Elec. Power Supply Ass'n,* 136 S. Ct. 760 (2016), *with Nat'l Ass'n of Regulatory Util. Comm'rs* v. *FERC,* 964 F.3d 1177 (D.C. Cir. 2020). The concern I express is prudential, not legal.

[856] *Midwest ISO Transmission Owners* v. *FERC,* 373 F.3d 1361, 1372 (D.C. Cir. 2004).