UNITED STATES OF AMERICA BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

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Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators Dockets No. RM16-23-000; AD16-20-000

COMMENTS OF THE ELECTRIC POWER SUPPLY ASSOCIATION AND THE PJM POWER PROVIDERS GROUP ON ELECTRIC STORAGE PARTICIPATION IN MARKETS OPERATED BY REGIONAL TRANSMISSION ORGANIZATIONS AND INDEPENDENT SYSTEM OPERATORS

The Electric Power Supply Association ("EPSA")¹ and the PJM Power

Providers Group ("P3")² (together, "Competitive Suppliers") respectfully provide

these comments on the Federal Energy Regulatory Commission's ("FERC" or

"Commission") Notice of Proposed Rulemaking ("NOPR") issued on November

17, 2016, in the above-referenced proceeding.³ In this NOPR, the Commission

proposes to amend its regulations under the Federal Power Act ("FPA") to

¹ Celebrating its 20th anniversary in 2017, EPSA is the national trade association representing leading independent power producers and marketers. EPSA members provide reliable and competitively priced electricity from environmentally responsible facilities using a diverse mix of fuels and technologies. Power supplied on a competitive basis collectively accounts for 40 percent of the U.S. installed generating capacity. EPSA seeks to bring the benefits of competition to all power customers. This pleading represents the position of EPSA as an organization, but not necessarily the views of any particular member with respect to any issue.

P3 is a non-profit organization dedicated to advancing federal, state and regional policies that promote properly designed and well-functioning electricity markets in the PJM Interconnection, L.L.C. ("PJM") region. Combined, P3 members own over 84,000 MWs of generation assets, produce enough power to supply over 20 million homes and employ over 40,000 people in the PJM region covering 13 states and the District of Columbia. The comments contained in this filing represent the position of P3 as an organization, but not necessarily the views of any particular member with respect to any issue. For more information on P3, visit www.p3powergroup.com.

³ Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators, Notice of Proposed Rulemaking, 157 FERC ¶ 61,121 (Nov. 17, 2016) ("NOPR").

remove barriers to the participation of electric storage resources and aggregated Distributed Energy Resources ("DER") in the capacity, energy, and ancillary service markets operated by Regional Transmission Organizations ("RTOs") and Independent System Operators ("ISOs") (collectively, organized wholesale electric markets).

EPSA previously commented⁴ on issues related to storage resources pursuant to reports submitted by all six organized wholesale electric market operators responding to the Commission's Office of Energy Policy and Innovation's ("OEPI") Requests issued to each market operator on April 11, 2016⁵ ("the Requests"). As demonstrated by these reports and a series of technical conferences, formal inquiries, and panels at public Commission meetings since 2015,⁶ storage is receiving considerable attention from FERC based on expectations for near and long-term technological advancements and growth. Currently, however, even when combined, storage and distributed energy resources provide a miniscule portion of the electricity delivered to consumers over the Bulk Power System ("BPS") through interstate wholesale

 ⁴ EPSA Comments on Storage Data Requests, *Electric Storage Participation in Regions with Organized Wholesale Electric Markets*, Docket No. AD16-20-000 (issued April 11, 2016).
⁵ *Electric Storage Participation in Regions with Organized Wholesale Electric Markets*, Docket No. AD16-20-000 (issued April 11, 2016) ("Storage Data Request").

⁶ FERC Sunshine Act Meeting (November 19, 2015), Item A-4 on Agenda, *Energy Storage Panel*, Docket No. AD16-12-000 (Sunshine Notice issued November 12, 2015); FERC Technical Conference, *Review of Generator Interconnection Agreements and Procedures*, Docket No. RM16-12-000 and American Wind Energy Association, Docket No. RM15-21-000 (Apr. 13, 2016) (Supplemental Notice of Technical Conference). *Utilization In the Organized Markets of Electric Storage Resources as Transmission Assets Compensated Through Transmission Rates, for Grid Support Services Compensated in Other Ways, and for Multiple Services*, Notice of Technical Conference, Docket No. AD16-25-000 (issued Sept. 30, 2016). The Commission issued supplemental notices on November 1, 2016, and November 7, 2016.

power markets.⁷ Competitive Suppliers agree that it is appropriate for the Commission to recognize that resources which provide value and service to the grid should have the opportunity to participate and compete. Notably storage resources currently represent .8 GW on a system comprised of 1,104 GW of total capacity in the U.S, with optimistic forecasts predicting the growth of storage resources, excluding pumped hydro resources, to reach between 1.3 and 1.7 GW by 2020.⁸ Any initiatives or rules to facilitate participation of these emerging resources must be compatible with, and support, the extensive system of conventional resources that make up the backbone of the BPS – today and for years to come -- particularly in light of changes created by the integration of new resources and technologies over time.⁹ While offering useful services and capabilities, storage resources are not identical in their reliability and service contributions to dispatchable electricity generation. Therefore, the most critical work of the Commission at this time is the continuation of its efforts on price formation in order to provide the right price signals for all resources, conventional and new, competing in markets. Consequently, EPSA encourages the

⁹ ISO New England President and CEO Gordon van Welie noted in remarks presenting the ISO-NE State of the Grid 2017, "The region's challenge is to find a way to maintain competitive markets that appropriately reward both clean-energy resources and *the conventional generators that will be needed for the foreseeable future*." (Emphasis added.) January 30, 2017, presentation and remarks - <u>https://www.iso-ne.com/static-</u> <u>assets/documents/2017/01/20170130_stateofgrid2017_remarks_pr.pdf?s_campaign=talkingpoint</u> <u>s:newsletter</u>

According to GTM Research Storage total (non-pump storage) U.S. storage capacity was
780 Megawatts (MW) compared to the U.S. grid capacity (EIA) of 1,104,000 MW.
⁸ EIA projection of 1.3 GW of storage by 2020,

<u>http://www.eia.gov/todayinenergy/detail.php?id=20652</u>. Green Tech Media projects up to 1.7 GW of storage by 2020, <u>https://www.greentechmedia.com/articles/read/us-energy-storage-market-grew-243-in-2015-largest-year-on-record</u>.

Commission to weigh the importance of potential rule changes in light of the needs and operation of the overall BPS.

That noted, EPSA stated in comments responding to the ISO/RTO requests that it was appropriate to survey organized wholesale electric markets operators on how storage resources may participate in their markets. While rule reforms may be required to assist in the development and participation of emerging storage technologies in wholesale markets, it is critical that any market rules in place now or to be developed preserve a level playing field, which critically includes adequate price formation for all suppliers of wholesale market products and services. While not all resources can be treated identically due to differing physical characteristics and capabilities, nonetheless rules, regulations and obligations should not create a preferred seat at the table for any particular resource to the detriment of others.

Energy storage – particularly as provided by battery technology – is very early in its development and deployment as a wholesale market resource. Therefore, Competitive Suppliers support development of participation models and criteria for electric storage resources to compete in wholesale electric markets such that doing so preserves efficient operational and investment signals for all resources. Likewise, the integration of DER aggregations into wholesale markets is a new frontier, and similarly efforts to enable their participation on the electric grid cannot interfere with the pricing and operational efficiencies that support the system's backbone conventional generation and demand response, as well as the new, aggregated resources.

I. BACKGROUND AND OVERVIEW

The Commission has long been investigating electric grid storage and the best methods for its integration into markets. In June of 2010, FERC staff issued a "Request for Comments Regarding Rates, Accounting and Financial Reporting for New Electric Technologies," recognizing changes in technology of electric storage resources and how ISOs/RTOs were dealing with this new category of resources at that time.¹⁰ Continuing from that work, the Commission examined, and in some cases set policies, to address other new technologies or resources that were seeking participation in wholesale electricity markets. These efforts included Order No. 745¹¹ on the treatment of Demand Response, and Order No. 755¹² to address changing needs for frequency regulation service in order to ensure reliability in light of new types of generation and technological resources providing power. More recently, the Commission has turned attention to the role of electric storage resources in participating to meet wholesale electricity needs,¹³ which was the precursor to the April 11, 2016 ISO/RTO data requests. Along with the data requests, the Commission Staff issued the aforementioned

¹⁰ Request for Comments Regarding Rates, Accounting and Financial for New Electric Storage Technologies, Docket No. AD10-13-000, June 11, 2010.

¹¹ Demand Response in Organized Wholesale Energy Markets, Order No. 745, FERC Stats. & Regs. ¶ 31,322 (2010), on reh'g and clarif., Order No. 745-A, 137 FERC ¶ 61,215 (2011).

Frequency Regulation Comp. in the Organized Wholesale Power Mkts., Order No. 755, 137 FERC ¶ 61,064 (2011).

FERC Sunshine Act Meeting (November 19, 2015), Item A-4 on Agenda, *Energy Storage Panel*, Docket No. AD16-12-000 (Sunshine Notice issued November 12, 2015); FERC Technical Conference, *Review of Generator Interconnection Agreements and Procedures*, Docket No. RM16-12-000 and American Wind Energy Association, Docket No. RM15-21-000 (Apr. 13, 2016) (Supplemental Notice of Technical Conference).

request for comments on whether barriers exist to the participation of electric storage resources in the ISO/RTO markets. This was followed by the Staff-led November 14, 2016 technical conference on utilization of electric storage resources as transmission assets compensated through transmission rates, for grid support services that are compensated in other ways, and for multiple services.¹⁴

EPSA has participated in the conferences and dockets associated with the integration and operation of electric storage in wholesale markets, and appreciates Commission Staff's continued attention on those developments and technological changes that may impact just and reasonable rates and a level playing field for all resources.

As Competitive Suppliers have noted in previous policy proceedings, the power sector is in the early stages of what will likely be a multi-year, even multidecade, series of profound changes to the provision and consumption of power as the resource mix includes greater deployment of many new resources, including non-hydro storage discussed above. One of the critical implications of these changes is the market impact of new resources with different or new cost structures and revenue requirements, as certain resources will have low to zero marginal costs while conventional resources with significant marginal costs will continue to be needed to meet operational and planning needs. While this poses

¹⁴ Utilization In the Organized Markets of Electric Storage Resources as Transmission Assets Compensated Through Transmission Rates, for Grid Support Services Compensated in Other Ways, and for Multiple Services, Notice of Technical Conference, Docket No. AD16-25-000 (issued Sept. 30, 2016). The Commission issued supplemental notices on November 1, 2016, and November 7, 2016.

challenges under the current competitive market structure, the best and most efficient way to deal with these changes remains reliance on well-designed, transparent, properly regulated competitive wholesale markets in which energy, ancillary services and operating reserve price formation policies and practices in both day-ahead and real-time energy markets result in price signals that reflect actual system conditions and support incentives for all resources to operate in support of system reliability, and to invest in additional resources that will be most valuable to the system. This market model best manages the challenges and risks presented by all resources including new technologies because markets are inherently more flexible and adaptable, and place risks primarily on investors rather than on consumers. Therefore, while it is beneficial to ensure that market rules allow for the integration of storage and aggregated DER resources, it is imperative that this work not undermine or take away from price formation efforts that have a much more material impact today and going forward on the wholesale electric grid.¹⁵ Because not all resources can be treated identically due to different physical characteristics and capabilities, it is essential that rules, regulations and obligations be as uniform as possible and not create or lead to inappropriate preferences for any particular resource. Any market rule or change contemplated to address storage and DER aggregation must be consistent with and support price formation and market rules which apply to all

¹⁵ Price Formation in Energy and Ancillary Services Markets Operated by Regional Transmission Organizations and Independent System Operators 153 FERC ¶ 61,221 ("Order Directing Reports") (2015).

other supply resources in order to sustain the Bulk Power System – both now and looking ahead years and decades.

Competitive Suppliers operate across all the ISO/RTO and non-ISO/RTO regions, and are owners, operators, and/or developers of every type of generation resource and associated technologies, including investments in renewable resources and energy storage technology projects. EPSA's foundational position is that all resources must be allowed to compete fairly to meet consumer needs, while meeting applicable environmental requirements. Doing so requires technology- and fuel-neutral rules and tariffs, thereby allowing the market to be the ultimate arbiter deciding which resources should be committed and dispatched.

Competitive suppliers have been active participants in ISO/RTO and other stakeholder initiatives to identify barriers and develop solutions to successfully integrate storage, renewable resources, demand response and energy efficiency resources, and associated technologies into the markets under just and reasonable terms and conditions. In those discussions, and as this effort moves forward, Competitive Supplier's primary concern is to ensure that no proposed reform or existing tariff provision potentially confers preferential treatment to storage or aggregated DER resources. Such treatment would undermine the efficiency of the wholesale markets that is based on technology-neutral valuation of capabilities and outcomes. While Competitive Suppliers recognize that such proposals can be associated with the challenges in integrating a new technology or resource type, or to achieve certain local policy goals, any changes or reforms

that institute preferential or special treatment *will* distort price signals and place uncompensated reliability burdens on other resources, thereby producing inefficient market outcomes. Therefore, Competitive Suppliers urge a measured approach by the Commission with respect to the storage portion of the NOPR, particularly in light of the many open ended questions posed to the ISOs/RTOs regarding electric storage in the proposed rule, despite the considerable attention this issue has received over the past year or more. This concern is even starker with regard to the DER aggregation portion of the NOPR; other than the substantial history of demand response, which typically participates through aggregation, there is little record or deliberation regarding the participation or aggregation of distributed resources on the Bulk Power System, leaving numerous considerations to be addressed by the ISOs/RTOs and their stakeholders with oversight from the Commission to ensure that wholesale markets are not detrimentally affected.

Certainly, as technologies for the delivery, storage and use of electricity evolves, there will be reforms or additional rules needed to facilitate the integration these resources. However, any such changes must be achieved without distorting or negatively impacting the market broadly, which sustains the full spectrum of resources and services relied upon to maintain reliability and deliver the most efficient and affordable energy to consumers.

II. COMMENTS

It is the Commission's responsibility to ensure non-discriminatory and fair treatment of all system resources as markets evolve to address the operational and technological changes necessary to meet ambitious national and state energy and environmental policy goals. Along with storage integration, continued investments in advanced and flexible conventional generation technologies and resources will be required to support these changing market dynamics. This will occur in markets with well-defined products and services, which are properly valued and compensated for the services provided and associated investments. To the extent storage resources were to gain preferential tariff rules, existing resources would be harmed, which would have consequences for system operability and reliability, and cost implications for consumers.¹⁶

A. Storage Defined, Participation Agreements and Criteria

In the NOPR the Commission defines electric storage resources as a "resource capable of receiving electric energy from the grid and storing it for later injection of electricity back to the grid, regardless of where the resource is located on the electrical system."¹⁷ "Location" is further defined as "whether located on the interstate grid or on the distribution system."¹⁸ In the Storage ISO/RTO Requests, FERC Staff set out a definition which provided a common framework for the ISO/RTO responses and evaluation of any proposed rule changes or reforms. This definition reflects the evolution of storage as

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¹⁶ https://www.caiso.com/Documents/Advancing-

MaximizingValueofEnergyStorageTechnology_CaliforniaRoadmap.pdf.

¹⁷ NOPR at p. 1, footnote 1.

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technology advancements have allowed for a greater number of resources that, regardless of source placement, can receive and inject electric energy to the wholesale grid. While several ISOs/RTOs have utilized pumped storage for decades, and many have made changes to accommodate flywheel and other rapid-response storage technologies in the 2008-2010 time frame, more recently several ISOs/RTOs have recognized that market rules require additional adjustment to accommodate newer technologies. The ISO/RTO Request responses often suggest that significant progress has been made by markets to integrate electric storage into wholesale markets.

The Commission proposes to ensure that ISO/RTO tariffs are just and reasonable and not unduly discriminatory or preferential by requiring each ISO/RTO to revise their tariff to create a specific participation model for electric storage to participate in the wholesale market. The model must consist of rules that recognize the physical and operational characteristics of storage resources as participants in ISO/RTO electric wholesale markets, and further must be based on five requirements set out in the NOPR. Competitive Suppliers support the five requirements as they set up a framework that will ensure consistency from region to region for electric storage participation. Beyond the five NOPR requirements, more detailed criteria need to be developed in stakeholder processes region by region. Deferring to ISOs/RTOs to specify criteria will ensure that existing tariff provisions can be preserved; it is critical that any new provisions not degrade or negatively impact the ISO/RTO's ability to accommodate both new and existing market participants. The regional

stakeholder process will also allow for the full consideration of retail and wholesale market considerations raised by efforts to develop participation criteria for new resource technologies. And importantly, the regional process should best ensure that existing market rules, processes and operations are not undermined by a rush to integrate new technologies prior to fully understanding their impact on reliability.

While Competitive Suppliers support the Commission's efforts to address the integration of storage resources, there remain many unanswered questions that should be answered before the Commission approves specific tariff provisions. The NOPR itself lays out numerous questions for the ISOs/RTOs that need to be considered as stakeholder processes address the tariff revisions. These questions include:

- Storage qualification criteria¹⁹
- ISO/RTO Software changes and costs
- Whether Energy schedule requirements should be eliminated²⁰
- NERC glossary and reliability impact²¹
- State of Charge²²
- Bidding parameter inclusion²³
- Make-whole payments for dispatched load²⁴

The software changes and associated costs alone are critical considerations and

it is likely that these criteria could vary from market to market, due to varying

topology and characteristics, which will require different resources and thereby

different system attributes. Competitive Suppliers would caution against the

¹⁹ NOPR at P. 29.

²⁰ NOPR at P. 51.

²¹ NOPR at P. 52.

²² NOPR at P. 70.

²³ NOPR at P. 71.

²⁴ NOPR at P. 85.

Commission developing generic criteria requirements for ISOs/RTOs in a final rule without a clear record that such specification will not constrain any particular region.

NERC is currently reviewing a draft report, "Distributed Energy Resources – Connection Modeling and Reliability Considerations,"²⁵ that sheds light on some of the Commission's questions. Once final, this report will be fundamental for ISOs/RTOs to understand the reliability impacts and support related to the integration of new storage technologies and distributed resources more broadly. EPSA participated in the task force that produced the report and can attest that the report provides insight on several operational aspects that the NOPR has not had the benefit of fully considering in its formulation. For example, the draft report suggests the need for close coordination among transmission operators (markets) and distribution entities for current and future reliable operation of the grid.

B. Storage Markets and Regulated and Unregulated Compensation

As the Commission has noted in its recent Policy Statement, "Utilization of Electric Storage Resources for Multiple Services When Receiving Cost-Based Recovery,"²⁶ storage resources have the potential for concurrent cost-based recovery and market-based recovery. While the Policy Statement guidance appears to be issued to help inform responses to the instant NOPR, it in fact opens up further questions that will need to be resolved so that market

²⁶ Utilization of Electric Storage Resources for Multiple Services When Receiving Cost-Based Rate Recovery, 153 FERC ¶ 61,221 ("Policy Statement") (January 19, 2017).

participants are clear on rules for cost recovery for those storage entities that are paid for certain services through cost-based rate recovery and may also wish to be paid for other services in competitive markets. The Policy Statement intones that the Commission will review storage resources that seek to recover both market revenues and cost-based rates concurrently, to ensure against the suppression of competitive market prices and examine the level of operational control. However, the impact of cost-based recovery on the suppression of market clearing prices or broader adverse impacts on wholesale electric markets cannot be fully clear at this stage of market integration. Therefore, the Policy Statement puts the cart before the horse by attempting to clarify the impacts of varied payment approaches as the rules on the competitive wholesale side are under development. The Policy Statement, in light of the instant NOPR, may in fact create considerable unanswered regulatory risk for wholesale market participants. As noted by now-Acting Chairman Cheryl LaFleur in a separate statement explaining her dissent to issuance of the Policy Statement,

I particularly disagree with the Policy Statement's sweeping conclusions about the potential impacts of multiple payment streams on pricing in wholesale electric markets. The Policy Statement summarily dismisses concerns regarding the impact of such arrangements on market competition, and leaves far more than just "implementation details" to be worked out.

I am concerned that the Policy Statement, while nominally limited to storage resources, could be read to reflect the Commission's views about the impact of multiple payment streams on market pricing more generally, thus implicating broader regional discussions on state policy initiatives and their interaction with competitive markets. These issues, which are currently being discussed by several RTO/ISOs and their stakeholders, will require careful and holistic consideration to ensure that policy advancements can be achieved while the benefits of competition are preserved for customers.²⁷

EPSA shares Acting Chairman LaFleur's concerns, and similarly urges that the Commission take a step back and consider the array of issues raised by the integration of storage and distributed energy resources holistically and fully within this NOPR proceeding.

Drawing the line between energy purchased or produced for resale and energy purchased or produced for consumption is complicated by two primary factors. First, due to jurisdictional divisions between retail and wholesale transactions, definitions and protocols are typically inconsistent. Second, the variety of technologies utilized for producing and storing energy and the potential for multi-use applications can create tremendous complexity and commercial uncertainty.

Additionally, the Policy Statement is rendered ineffectual to a degree as there is no corresponding guidance from retail regulators as to how their rules mesh with the stated Commission policy. Consequently, the current Policy Statement may be of little use in light of the properly directed development and implementation of regional participation agreements and corresponding tariff revisions

The jurisdictional divisions and technological complexities can be demonstrated by considering the example of California,²⁸ which is often viewed

²⁷ Id, La Fleur Statement.

²⁸ Order Instituting Rulemaking to consider policy and implementation refinements to the Energy Storage Procurement Framework and Design Program (D. 13-10-040, D. 14-10-045) and related Action Plan of the California Storage Roadmap.

as out in front on storage integration. California is in the process of trying to clearly distinguish the lines between wholesale and retail, and developing ways to measure each. An important result of this process has been to shine a bright light on the need for appropriate metering on both the wholesale and retail side to facilitate storage integration. Without proper sub-metering of retail (consumption) and wholesale (sale for resale), any service netting protocols become difficult if not impossible to distinguish, and there is insufficient transparency regarding the fundamental principle of comparable treatment of competitive wholesale resources. The experience in California shows that separate meters are essential to ensure comparable treatment of resources participating in wholesale markets; and, separate meters are vital to ensuring that the jurisdictional divide between retail (i.e. "consumption") and wholesale ("sale for resale") are clear and transparent to all market participants and regulators. Consequently, estimation, sampling, etc., do not provide the precision nor comparable treatment necessary in a competitive electric wholesale market. The need for appropriate metering for storage integration will require collaboration among the Commission, regional markets and states, and could require guidance in a future policy statement due to the complexity of the issue and reliance on experience to inform required technology and data.

C. Dispatch, Pricing and Bidding Parameters

Regarding dispatch and pricing of energy in order to offer to provide ancillary services, the NOPR asks if performance test information will suffice for start-up time and ramping capability to bid and guarantee the resource's ability to

provide services absent energy market participation. Competitive Suppliers believe that all resources should be required to *offer* into the energy markets as a means to price and provide operating reserves but it is *not* necessary for a resource to be scheduled on-line to be eligible for many forms of ancillary services/operating reserves, including battery and other fast-response storage technologies. Operating reserves are, effectively, the ability to convert unused capability into energy on short notice. If a resource has the response characteristics to meet the time requirements of the reserve product, it should be eligible to provide it. The ISO/RTO markets should provide incentives for performance and disincentives for failing to meet offered parameters.

III. CONCLUSION

WHEREFORE, Competitive Suppliers support the development of participation models by ISOs and RTOs, working with stakeholders, for storage and aggregated distributed energy resources so that they may appropriately participate in wholesale electric markets. In a final rule, the Commission should ensure that any initiatives or rules to facilitate participation of these emerging resources are compatible with, and support, the extensive system of conventional resources that make up the backbone of the BPS. In this vein, it is critical that the Commission continue its ongoing efforts to improve energy price formation in order to provide the right price signals for all resources, conventional and new, competing in markets and keeping our Nation's lights on.

Respectfully submitted,

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