

**PENNSYLVANIA  
PUBLIC UTILITY COMMISSION  
Harrisburg, PA 17105-3265**

Public Meeting held February 22, 2024

Commissioners Present:

Stephen M. DeFrank, Chairman, Joint Statement  
Kimberly Barrow, Vice Chairman, Joint Statement  
Ralph V. Yanora  
Kathryn L. Zerfuss  
John F. Coleman, Jr.

*Distributed Energy Resources  
Participation in Wholesale Markets*

L-2023-3044115

**ADVANCE NOTICE OF PROPOSED RULEMAKING ORDER**

Pursuant to the Joint Motion entered at the above-captioned docket, the Pennsylvania Public Utility Commission (PUC) issues this Advance Notice of Proposed Rulemaking Order (ANOPR) in order to investigate the PUC's role in the implementation of FERC Order 2222<sup>1</sup> and to determine whether any amendments or additions are needed to align existing Commission regulations or policy statements with the Federal Energy Regulatory Commission's (FERC) Order 2222.<sup>2</sup> The PUC seeks comments from interested stakeholders, including members of the regulated industry, statutory advocates, the public, and any other interested parties regarding the topics set forth in this ANOPR. The PUC notes that some of these topics may be appropriately resolved in regulations while others might be more appropriate for policy statements, contained in electric

---

<sup>1</sup> *Participation of Distributed Energy Res. Aggregations in Mkts. Operated by Reg'l Transmission Orgs. & Indep. Sys. Operators*, Order No. 2222, 172 FERC ¶ 61,247 (2020), *order on reh'g*, Order No. 2222-A, 174 FERC ¶ 61,197, *order on reh'g*, Order No. 2222-B, 175 FERC ¶ 61,227 (2021).

<sup>2</sup> Joint Motion of Chairman Stephen M. DeFrank and Vice Chair Kimberly Barrow, *Distributed Energy Resources Participation in Wholesale Markets*, Pa. PUC Docket No. L-2023-3044115, (Nov. 9, 2023), Ordering Paragraph 1, (Joint Motion).

distribution company (EDC) tariffs, or adjudicated on a case-by-case basis, and the PUC specifically seeks comment on how to best administer each topic.<sup>3</sup>

## BACKGROUND

### I. FERC Order 2222

On September 17, 2020, FERC issued Order 2222, which required regional transmission organizations (RTOs) including PJM Interconnection, L.L.C. (PJM) to allow aggregations of distributed energy resources to participate in PJM wholesale markets so that they may provide all services they are technically capable of providing. PJM is the RTO that coordinates the movement of wholesale electricity in all or parts of 13 states, including Pennsylvania, and the District of Columbia.<sup>4</sup> Among other duties, PJM is tasked with creating and operating robust, competitive and non-discriminatory electric power markets.<sup>5</sup> A distributed energy resource (DER) is any resource located on the electric distribution system, any subsystem thereof or behind a customer meter.<sup>6</sup> These resources may include, but are not limited to, electric storage resources, intermittent generation, distributed generation, demand response, energy efficiency, thermal storage, and electric vehicles and their supply equipment.<sup>7</sup>

Prior to Order 2222, DERs were prevented from participation in PJM markets by minimum size requirements and certain qualification and performance requirements.<sup>8</sup> DERs also faced commercial and transactional barriers such as costs associated with metering, telemetry and communications equipment.<sup>9</sup> In issuing Order 2222,

---

<sup>3</sup> Joint Motion at 2.

<sup>4</sup> <https://www.pjm.com/about-pjm>.

<sup>5</sup> *Id.*

<sup>6</sup> Order 2222 ¶ 114.

<sup>7</sup> Order 2222 ¶ 114.

<sup>8</sup> Order 2222 ¶ 2.

<sup>9</sup> Order 2222 ¶ 5.

FERC found that DER participation in PJM markets will provide a variety of benefits, including a better understanding of a DER's impact on installed capacity requirements and day-ahead energy demand, DERs' ability to locate in load pockets in response to price signals and DERs' ability to co-locate with load.<sup>10</sup> Therefore, the goal of Order 2222 is to remove barriers to DER participation in PJM markets, enhance competition and, in turn, help to ensure that PJM markets produce just and reasonable rates.<sup>11</sup>

Order 2222 facilitates DER participation in PJM markets in the form of DER aggregations.<sup>12</sup> In the order's parlance, a DER aggregator (DERA) is an entity that registers one or more DER aggregations (DER Aggregations) for purposes of participation in the PJM capacity, energy and/or ancillary service markets.<sup>13</sup> DERAs help DERs collectively meet the minimum size and operational requirements imposed by PJM, as well as share commercial and transactional costs which DERs could not bear individually.<sup>14</sup> Accordingly, Order 2222 requires PJM to revise its tariff to establish DERAs as a type of market participant that can register DER Aggregations under one or more participation models in the PJM tariff designed to accommodate the physical and operational characteristics of each DER Aggregation.<sup>15</sup>

## **II. Order 2222 On Role Of Relevant Electric Retail Regulatory Authorities**

FERC defines a "relevant electric retail regulatory authority" (RERRA) as "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

---

<sup>10</sup> Order 2222 ¶ 4.

<sup>11</sup> Order 2222 ¶ 3.

<sup>12</sup> Order 2222 ¶ 6.

<sup>13</sup> Order 2222 ¶¶ 6, 118.

<sup>14</sup> Order 2222 ¶ 5.

<sup>15</sup> Order 2222 ¶ 6.

cooperative utility, or the state public utility commission.”<sup>16</sup> In Order 2222, FERC recognized “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.”<sup>17</sup> FERC clarified that “nothing in [Order 2222] preempts the right of states and local authorities to regulate the safety and reliability of the distribution system and that all [DERs] must comply with any applicable interconnection and operating requirements.”<sup>18</sup> Specifically, FERC stated that Order 2222 does not “preclude or limit state or local regulation of: retail rates; distribution system planning, distribution system operations, or distribution system reliability; [DER] facility siting; and interconnection of resources to the distribution system that are not subject to Commission jurisdiction, as discussed further below.”<sup>19</sup> FERC recognized that “under a [RERRA’s] jurisdiction over its retail programs, such a [RERRA] is able to condition a [DER]’s participation in a retail distributed energy resource program on that resource not also participating in [PJM] markets.”<sup>20</sup>

Specifically with reference to smaller utilities, FERC determined “that customers of utilities that distributed 4 million MWh or less in the previous fiscal year may not participate in [DER Aggregations] unless the [RERRA] affirmatively allows such customers to participate in [DER Aggregations].”<sup>21</sup>

FERC ordered that “to the extent that [PJM] proposes that such information come from or flow through distribution utilities, we require that [PJM] 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

---

<sup>16</sup> Order 2222 ¶ 33, n. 65.

<sup>17</sup> Order 2222 ¶ 44.

<sup>18</sup> Order 2222 ¶ 44.

<sup>19</sup> Order 2222 ¶ 61.

<sup>20</sup> *Id.*

<sup>21</sup> Order 2222 ¶ 64.

and other burdens and address concerns raised with respect to privacy and cybersecurity.”<sup>22</sup> FERC “expect[s] that the state and local interconnection processes for [DERs] will provide the appropriate platform to address and study potential distribution system impacts and provide the necessary information to inform distribution utility review during [DER Aggregation] registration” and clarified that Order 2222 “in no way prevents state and local regulators from amending their interconnection processes to address potential distribution system impacts that the participation of [DERs] through [DER Aggregations] may cause.”<sup>23</sup>

Order 2222 “require[s] [PJM] to specify in its tariff, as part of the market rules on coordination between [PJM], the [DERA], and the distribution utility, how [PJM] will accommodate and incorporate voluntary [RERRA] involvement in coordinating the participation of aggregated distributed energy resources in [PJM] markets.”<sup>24</sup> FERC “agree[d] with commenters that [RERRA]s have a role in coordination, *i.e.*, in setting rules at the distribution level and in [PJM] stakeholder discussions.”<sup>25</sup> FERC noted with approval that the “[California Independent System Operator’s] Distributed Energy Resource Provider model requires that [DER] providers comply with applicable utility distribution company tariffs and operating procedures incorporated into those tariffs, as well as applicable requirements of the local [RERRA].”<sup>26</sup>

FERC further noted that:

[P]ossible roles and responsibilities of [RERRA]s in coordinating the participation of [DER Aggregations] in [PJM] markets may include, but are not limited to: developing interconnection agreements and rules; developing local rules to ensure distribution system safety and reliability,

---

<sup>22</sup> Order 2222 ¶ 270.

<sup>23</sup> Order 2222 ¶ 294.

<sup>24</sup> Order 2222 ¶ 322.

<sup>25</sup> Order 2222 ¶ 322.

<sup>26</sup> Order 2222 ¶ 323.

data sharing, and/or metering and telemetry requirements; overseeing distribution utility review of [DER] participation in aggregations; establishing rules for multi-use applications; and resolving disputes between [DERAs] and distribution utilities over issues such as access to individual [DER] data.

Order 2222 ¶ 323.

### **III. PJM Compliance Filings**

To comply with Order 2222, PJM submitted changes to its tariff, operating agreement, and reliability assurance agreement with FERC on February 1, 2022 (February 2022 Compliance Filing). In this filing, PJM defined several terms that are essential to understanding PJM’s implementation of Order 2222:

- “Component DER” shall mean any resource, within the PJM Region, that is located on a distribution system, any subsystem thereof, or behind a customer meter, and is used in a DER Aggregation Resource by a DER Aggregator to participate in the energy, capacity, and/or ancillary services markets of PJM through the DER Aggregator Participation Model. A Component DER may not exceed 5 MW.<sup>27</sup>
- “DER Aggregation Resource” shall be comprised of one or more Component DER. A DER Aggregation Resource is used by a [DERA] to participate in the energy, capacity, and/or ancillary services markets of PJM through the DER Aggregator Participation Model. A DER Aggregation Resource is capable of satisfying a minimum energy and/or ancillary services market offer of 100 kW.

---

<sup>27</sup> February 2022 Compliance Filing, Attachment D, Revisions to the PJM Open Access Transmission Tariff, Operating Agreement, and Reliability Assurance Agreement (Effective February 2, 2026) (Identified by Additional Cover Pages) (Clean Format).

The market participation eligibility of a DER Aggregation Resource shall be determined in accordance with the physical and operational characteristics of the underlying Component DER that comprise the DER Aggregation Resource.<sup>28</sup>

- “DER Aggregator” shall mean an entity that is a Market Participant that: (i) uses one or more DER Aggregation Resources to participate in the energy, capacity, and/or ancillary services markets of PJM through the DER Aggregator Participation Model; and (ii) has a fully-executed DER Aggregator Participation Service Agreement.<sup>29</sup>
- “DER Capacity Aggregation Resource” shall mean one or more DER Aggregation Resource[s] that participates in the Reliability Pricing Model, capable of satisfying a minimum capacity market offer of 100 kW, or is otherwise treated as capacity in PJM’s markets, such as through a Fixed Resource Requirement Capacity Plan, for the 2026/2027 Delivery Year and all subsequent Delivery Years.<sup>30</sup>

FERC accepted the February 2022 Compliance Filing, subject to further compliance filings, by Order dated March 1, 2023, (*March 2023 Compliance Order*).<sup>31</sup> The *March 2023 Compliance Order* directed PJM to submit a further compliance filing within 30 days, and an additional compliance filing within 60 days.<sup>32</sup> The 30-day compliance filing was to be limited to FERC’s directive that PJM remove its proposed tariff language that exempts DER Capacity Aggregation Resources containing

---

<sup>28</sup> *Id.* This term is synonymous with “DER Aggregation.”

<sup>29</sup> *Id.*

<sup>30</sup> *Id.*

<sup>31</sup> *PJM Interconnection, L.L.C.*, 182 FERC ¶ 61,143 (March 1, 2023) (*March 2023 Compliance Order*). On March 31, 2023, the Commission filed a protest jointly with the Public Utilities Commission of Ohio to the *March 2023 Compliance Order*. FERC issued an order denying the joint protest on July 11, 2023. *PJM Interconnection, L.L.C.*, 184 FERC ¶ 61,019 (2023).

<sup>32</sup> *March 2023 Compliance Order* ¶ 408.

Component DER directly connected to distribution facilities co-located with retail end-use load from capacity market power mitigation rules and to revise its tariff to apply its existing capacity market mitigation rules to DER Capacity Aggregation Resources based on the composition of the DER Capacity Aggregation Resource and consistent with such requirements applied to all resources in PJM.<sup>33</sup> The 60-day filing was to address all remaining FERC directives, of which there were many.

On March 31, 2023, PJM submitted the 30-day filing addressing FERC's directive regarding capacity market mitigation rules in the *March 2023 Compliance Order* (March 2023 Compliance Filing). On May 31, 2023, FERC issued an order accepting PJM's March 2023 Compliance Filing, subject to a further compliance filing (*May 2023 Compliance Order*).<sup>34</sup> On June 14, 2023, PJM submitted a further compliance filing in response to the *March 2023 Compliance Order* (June 2023 Compliance Filing). On November 13, 2023, FERC issued an order accepting PJM's June 2023 Compliance Filing, subject to a further compliance filing (*November 2023 Compliance Order*).<sup>35</sup> Therein, FERC ordered PJM to ensure that tariff provisions necessary for DERA participation in the 2026/2027 Delivery Year BRA for capacity are made effective in time for pre-auction activities.<sup>36</sup> On December 13, 2023, PJM filed redated capacity market mitigation tariff provisions with an effective date of July 1, 2024, while retaining the originally-filed effective date of February 2, 2026 for all other tariff changes implementing Order 2222.<sup>37</sup>

---

<sup>33</sup> March 2023 Compliance Order ¶ 87.

<sup>34</sup> *PJM Interconnection, L.L.C.*, 183 FERC ¶ 61,157 (May 30, 2023) (*May 2023 Compliance Order*).

<sup>35</sup> *PJM Interconnection, L.L.C.*, 185 FERC ¶ 61,112, ¶ 3 (November 13, 2023) (*November 2023 Compliance Order*).

<sup>36</sup> *Id.* ¶ 30.

<sup>37</sup> FERC Docket ER22-962, *Order No. 2222 Compliance Filing of PJM*, Letter transmittal from PJM to FERC, at 3-5 (December 13, 2023).



On April 11, 2023, FERC granted PJM an extension until September 1, 2023 to file its additional “60-day” compliance filing, to comply with the *March 2023 Compliance Order* directives on matters other than capacity market mitigation.<sup>38</sup> PJM filed its revised tariff and operating agreement, addressing these matters, on September 1, 2023 (September 2023 Compliance Filing).<sup>39</sup> Several parties, including the PUC, filed protests of the September 2023 Compliance Filing at FERC on or about September 22, 2023. These protests remain pending before FERC.

#### **IV. Role Of The PUC Under PJM’s Current DERA Participation Model**

PJM refers to its tariff revisions setting forth the rules for DERA participation in PJM wholesale markets as the DERA Participation Model (DAPM). Under the current version of the DAPM,<sup>40</sup> PJM, EDCs, DERAs and the PUC each play distinct and important roles to facilitate DERA participation in PJM wholesale markets. First, a DERA must enter into a service agreement and register each of its DER Aggregation Resources and DER Capacity Aggregation Resources with PJM. PJM then reviews the registrations to verify that the DERA meets PJM’s DAPM eligibility criteria, then notifies the appropriate EDC. The EDC then conducts a two-stage review of the DERA registration within 60 days. In the initial 15-day review, the EDC verifies, for each Component DER, location and data components, participation in an EDC retail program (*e.g.*, net energy metering) and compliance with PUC regulations. As part of this process, the EDC also assigns to each Component DER an electrical node on the PJM transmission system. With the remaining 45 days of the 60-day review, the EDC verifies that each DER Aggregation Resource’s participation in PJM markets does not

---

<sup>38</sup> *PJM Interconnection, L.L.C.*, Docket No. ER22-962-001, Notice of Extension of Time (Apr. 11, 2023).

<sup>39</sup> *PJM Interconnection, L.L.C.*, Docket No. ER22-962-001, Order No. 2222 Compliance Filing of PJM Interconnection, LLC. (September 1, 2023) (September 2023 Compliance Filing).

<sup>40</sup> September 2023 Compliance Filing, Attachment B, Revisions to the PJM Open Access Transmission Tariff and Operating Agreement (Identified by Additional Cover Pages) (Clean Format). Unless otherwise noted, all references to “DAPM” in this ANOPR shall be to the version of the DAPM set forth in the September 2023 Compliance Filing.

pose a threat to the reliable and safe operation of the distribution system. If an EDC identifies concerns and there is a dispute with the DERA, the dispute will be resolved by PJM or the PUC, depending on the jurisdictional nature of the dispute. Following EDC review, PJM will decide whether to approve the DERA's registration for participation in the DAPM.<sup>41</sup>

After approval for participation, a DERA dispatches its underlying Component DER in accordance with PJM dispatch instructions. A DERA must provide telemetry for each of its DER Aggregation Resources. A DERA may provide telemetry for each Component DER within a DER Aggregations Resource. A DERA must provide to PJM all individual Component DER meter data necessary to facilitate the settlement of each DER Aggregations Resource. Metering equipment must meet EDC requirements for accuracy.<sup>42</sup>

During the operating day, PJM dispatches each DER Aggregation Resource in accordance with the DERA's submitted bidding parameters. An EDC may override the physical operation of a DER Aggregation Resource, or individual Component DERs, for purposes of maintaining safe and reliable operation of distribution facilities. Disputes about an EDC override are resolved by the PUC in accordance with the EDC's tariffs and the PUC's regulations.<sup>43</sup>

---

<sup>41</sup> DAPM § 1.4B(b).

<sup>42</sup> DAPM § 1.4B(e).

<sup>43</sup> DAPM § 1.4B(f).

PJM does not permit a DERA to participate in the DAPM if its DER Aggregation includes Component DER that are end-use customers of an EDC that distributed 4 million MWh or less in the previous fiscal year, as identified by the EDC, unless the EDC determines, during the registration process, that the PUC permits such end-use customers to participate, as evidenced by an order, opinion or letter from the PUC. PJM permits a DERA to participate in the DAPM if the DER Aggregation includes Component DER that are end-use customers of an EDC that distributed more than 4 million MWh in the previous fiscal year, unless the DER Aggregation includes one or more Component DERs that are demand response and the PUC prohibits the participation of demand response in the DAPM.<sup>44</sup>

A DERA may participate in PJM markets through the DAPM using Component DERs that also participate in one or more retail programs. PJM only credits a DERA for the sale of energy, capacity, and/or ancillary services in PJM markets if one or more of those same services are not also provided as part of a retail program, including but not limited to a Component DER participating in a retail net energy metering program.

A DERA may participate in the PJM markets through DER Aggregation Resources that provide multiple services. A Component DER may not register with multiple DER Aggregation Resources or join another PJM market participant outside of the DAPM. PJM only credits a DERA for the sale of energy, capacity, and/or ancillary services if one or more of those same services are not also provided as part of another wholesale sale.<sup>45</sup> DERAs providing capacity are subject to PJM's must-offer requirement.<sup>46</sup> DER Aggregation Resources are subject to PJM's offer price cap and associated three pivotal supplier test provisions.<sup>47</sup> Capacity DER Aggregation Resources

---

<sup>44</sup> DAPM § 1.4B(g).

<sup>45</sup> DAPM § 1.4B(h).

<sup>46</sup> DAPM § 1.4B(i).

<sup>47</sup> DAPM § 1.4B(j).

are subject to PJM’s minimum offer price rule (MOPR).<sup>48</sup> A Component DER interconnecting to distribution facilities for purposes of participating in PJM markets exclusively through the DAPM are not subject to the parts of PJM’s tariff relating to interconnections with the transmission system and shall exclusively interconnect to distribution facilities pursuant to applicable state law and PUC regulations.<sup>49</sup>

## V. Pennsylvania Law And PUC Regulations

Several provisions of Pennsylvania law and the PUC’s existing regulations have potential relevance to the PUC’s implementation of Order 2222. While we will discuss the laws and regulations that have been identified to date, we also seek comment on whether any other law or regulation is implicated.

### **Electricity Generation Customer Choice And Competition Act**

Passage of the Electricity Generation Customer Choice and Competition Act (Choice Act)<sup>50</sup> in 1996 was “transformative.”<sup>51</sup> As described by the Pennsylvania Commonwealth Court:

The central objective of the legislation was to allow retail customers in the Commonwealth to purchase their electricity directly from an [electric generation supplier, or EGS], rather than rely on their local utility as the exclusive source for generation, transmission, and distribution. 66 Pa.C.S. § 2804(2). Under the Choice Act, public utilities are required to open their jurisdictional transmission and distribution facilities to EGSs chosen by the public utility's retail customers. *Id.* § 2804(6). Moreover, while the chosen EGS

---

<sup>48</sup> DAPM § 1.4B(k).

<sup>49</sup> DAPM § 1.4B(n).

<sup>50</sup> 66 Pa.C.S. §§ 2801–2815.

<sup>51</sup> *Coal. for Affordable Util. Servs. & Energy Efficiency in Pa. v. Pa. Pub. Util. Comm'n*, 120 A.3d 1087, 1100 (Pa. Cmwlth. 2015) (*CAUSE-PA v. PUC*).

is obligated to provide the contracted supply, the public utility, or EDC, remains the direct contact with the consumer on matters relating to billing and customer service. *Id.* § 2807(c), (d). If a customer contracts for electric supply and it is not delivered or if a customer does not choose an alternative EGS, in most cases the public utility is required to purchase electric energy at prevailing market prices to service that customer—*i.e.*, default service. *Id.* § 2807(e).

*CAUSE-PA v. PUC* at 1100-1101.

Under Section 2807 of the Choice Act, 66 Pa.C.S. § 2807 (relating to duties of electric distribution companies), Pennsylvania EDCs “shall maintain the integrity of the distribution system at least in conformity with the National Electric Safety Code and such other standards practiced by the industry in a manner sufficient to provide safe and reliable service to all customers[. . .]”<sup>52</sup> To that end, EDCs “shall implement procedures to require all [EGSs] to deliver energy to the [EDC] at locations and in amounts which are adequate to meet the [EGSs] obligations to its customers,”<sup>53</sup> and the EDC “may require that the customer install, at the customer’s expense, enhanced metering capability sufficient to match the energy delivered by the [EGSs] with consumption by the customer.”<sup>54</sup> Further, an EDC “shall not have an obligation to install nonstandard facilities, either as to type or location, for the purpose of receiving energy from the [EGS] unless the [EGS] or its customer pays the full cost of these facilities.”<sup>55</sup> The statute provides that “[d]isputes concerning facilities shall be subject to the jurisdiction of the [PUC] and may be initiated by the filing of a complaint... by the [EGS] or the customer.”<sup>56</sup>

---

<sup>52</sup> 66 Pa.C.S. § 2807(a).

<sup>53</sup> *Id.*

<sup>54</sup> *Id.*

<sup>55</sup> 66 Pa.C.S. § 2807(a).

<sup>56</sup> *Id.*

The statute further requires that EDCs deploy “smart meter technology” to their customers,<sup>57</sup> meaning “technology, including metering technology and network communications technology capable of bidirectional communication, that records electricity usage on at least an hourly basis, including related electric distribution system upgrades to enable the technology.”<sup>58</sup> Smart meter technology “provide[s] customers with direct access to and use of price and consumption information [and] information on their hourly consumption,” “[e]nable[s] time-of-use rates and real-time price programs” and “support[s] the automatic control of the customer’s electricity consumption” by the customer, the EDC or a third party engaged by the customer or the EDC.<sup>59</sup>

In 2008, Act 129 added subsection (f) to Section 2807 of the Public Utility Code, relating to smart meter technology and time-of-use rates.<sup>60</sup> Among Act 129’s objectives was “to expand the use of alternative energy and to explore the feasibility of new sources of alternative energy to provide electric generation in this Commonwealth.”<sup>61</sup> Act 129 directed all EDCs with greater than 100,000 customers to universally deploy advanced metering infrastructure (AMI), also known as “smart meter” technology, in order to provide efficiency gains in Pennsylvania’s electric grid.<sup>62</sup> Act 129 also required that EDCs, with customer consent, make available direct meter access and electronic access to customer meter data to third parties, including [EGSs] and providers of conservation and load management services.<sup>63</sup> Thereafter, in 2009 the PUC ordered EDCs to universally deploy smart meter technology within their respective service territories in the

---

<sup>57</sup> 66 Pa.C.S. § 2807(f).

<sup>58</sup> 66 Pa.C.S. § 2807(g).

<sup>59</sup> *Id.*

<sup>60</sup> Act 129 of 2008 (enacted October 15, 2008). Act 129 was codified at 66 Pa.C.S. § 2807(f) and became effective on November 14, 2008.

<sup>61</sup> Act 129, findings and objectives ¶ 3.

<sup>62</sup> 66 Pa.C.S. § 2807(f).

<sup>63</sup> *Id.*

Commonwealth in accordance with a depreciation schedule not to exceed 15 years and in accordance with other guidelines established therein.<sup>64</sup>

The Alternative Energy Portfolio Standards Act, 73 P.S. §§ 1648.1-1648.9 (AEPS Act), enacted in 2007, enables retail customers to sell excess energy generated by their renewable energy resources to their EDCs, a practice known as “net metering.” Under the AEPS Act, “[e]xcess generation from net-metered customer-generators shall receive full retail value for all energy produced on an annual basis.”<sup>65</sup> The AEPS Act tasks the PUC to “develop technical and net metering interconnection rules for customer-generators intending to operate renewable onsite generators in parallel with the electric utility grid, consistent with rules defined in other states within the service region of the regional transmission organization that manages the transmission system in any part of this Commonwealth.”<sup>66</sup>

The PUC has promulgated extensive net-metering regulations<sup>67</sup> pursuant to the AEPS Act.<sup>68</sup> Under the PUC’s regulations, each EDC “shall file a tariff... that provides for net metering” directly with customer-generators and “a tariff providing net metering protocols that enables EGSs to offer net metering to customer-generators taking service from EGSs.”<sup>69</sup> A customer-generator that net meters “must be equipped with a single bidirectional meter that can measure and record the flow of electricity in both directions at the same rate”<sup>70</sup> or “[i]f the customer-generator agrees, a dual meter arrangement may be substituted for a single bidirectional meter” and “[i]f the customer-generator’s existing electric metering equipment” cannot net meter, “the EDC shall install new metering

---

<sup>64</sup> See *Smart Meter Procurement and Installation*, Docket No. M-2009-2092655 (Order entered June 24, 2009).

<sup>65</sup> 73 P.S. § 1648.5 (relating to interconnection standards for customer-generator facilities).

<sup>66</sup> *Id.*

<sup>67</sup> 52 Pa. Code §§ 75.1—75.72. Alternative Energy Portfolio Standards.

<sup>68</sup> The Alternative Energy Portfolio Standards Act. 73 P.S. §§ 1648,1—1648.8.

<sup>69</sup> 52 Pa. Code § 75.13(c) (relating to general provisions).

<sup>70</sup> 52 Pa. Code § 75.14(a).

equipment for the customer-generator at the EDC's expense."<sup>71</sup> PUC regulations provide that a customer-generator may, at its own expense, physically or virtually aggregate meters located on properties owned or leased and operated by the same customer-generator.<sup>72</sup>

The PUC's regulations set forth a process for obtaining customer-generator status, whereby an EDC "obtain[s] [PUC] approval to net meter alternative energy systems with a nameplate capacity of 500 kW or greater."<sup>73</sup> Approved customer-generators must interconnect with EDCs according to processes established by the EDCs.<sup>74</sup> An EDC reviews interconnection requests using a tiered system of review, based on the size and complexity of the request.<sup>75</sup> In its review, an EDC follows technical standards set forth in IEEE 1547 and U.L. 1741, "as they may be amended and modified."<sup>76</sup> If an EDC identifies issues with a request, the customer-generator is responsible to pay for "additional review" and "modifications to the electric distribution system."<sup>77</sup>

Further, section 75.36(8) of the PUC's regulations provided that:

To minimize the costs to customer-generators, an EDC may propose to interconnect more than one small generator facility at a single point of interconnection when a customer-generator requests a single point of interconnection for multiple generation facilities, the EDC may not unreasonably refuse a request to do so. When an EDC proposes a single interconnection point for multiple generation facilities of a customer-generator, and the customer-generator elects not to accept and the EDC's proposal, the customer-generator shall

---

<sup>71</sup> *Id.*

<sup>72</sup> 52 Pa. Code § 75.14(e).

<sup>73</sup> 52 Pa. Code § 75.17(a).

<sup>74</sup> 52 Pa. Code § 75.32.

<sup>75</sup> 52 Pa. Code § 75.34.

<sup>76</sup> 52 Pa. Code § 75.35.

<sup>77</sup> 52 Pa. Code § 75.38(e); *see* 52 Pa. Code § 75.29(e)(4) (customer-generator must "pay for the interconnection facilities and distribution upgrades identified in the [EDC's] interconnection facilities study.")



pay the entire cost of a separate point of interconnection for each generation facility.

52 Pa. Code § 75.36(8).

Interconnection disputes are resolved through complaint or alternative dispute resolution procedures available at the PUC.<sup>78</sup>

## DISCUSSION

### I. Introduction

Under Section 501(b) (relating to general powers) of the Public Utility Code, the PUC has the general administrative power and authority to supervise and regulate all public utilities doing business within the Commonwealth and to make such regulations as may be necessary or proper in the exercise of its powers or for the performance of its duties.<sup>79</sup> Under Section 104 of the Public Utility Code (relating to interstate and foreign commerce), the PUC’s powers “shall not apply, or be construed to apply, to commerce with foreign nations, or among the several states, except insofar as the same may be permitted under the provisions of the Constitution of the United States and the acts of Congress.” This statutory authorization is pertinent because FERC, in exercising its Congressional mandate under the Federal Power Act, expressly reserved a substantial role for the PUC to implement Order 2222 in Pennsylvania.

---

<sup>78</sup> 52 Pa. Code § 75.51.

<sup>79</sup> 66 Pa.C.S. § 501(b).

## II. Stakeholder Meetings

To assist with the formulation of topics and gathering information relevant to this ANOPR, the PUC's Law Bureau and the PUC's Bureau of Technical Utility Services (TUS) staff held three virtual meetings with interested stakeholders:

- On December 11, 2023, a virtual stakeholder meeting was held with representatives of Pennsylvania EDCs, including Citizens Electric Company (Citizens Electric), Duquesne Light Company (DLC), FirstEnergy Pennsylvania Electric Company<sup>80</sup> (FirstEnergy PA), PPL Electric Utilities (PPL), UGI Electric Division (UGI Electric), Wellsboro Electric Company (Wellsboro Electric), and the Energy Association of Pennsylvania (EAP). Following this meeting, FirstEnergy PA, EAP and its other member companies forwarded a list of proposed additional ANOPR topics to staff.
- On February 1, 2024, a virtual stakeholder meeting was held with representatives of the DERA community, including Bluewave Solar, Cpower, DER Task Force, DLC, Electric Advisors Consulting, Engie, Evergy, Exelon, FirstEnergy PA, Goodleap, IGS Energy, Mainspring Energy, Microgrid Resources Coalition, Philadelphia Energy Authority, PPL, Reactivate, Solar Energy Industries Association, Sunnova, Tesla, TRC Companies, UGI and Voltus. Members of the Pennsylvania Office of Consumer Advocate (OCA) were also present.

---

<sup>80</sup> On January 1, 2024, the four FirstEnergy EDCs (Metropolitan Edison Company, Pennsylvania Electric Company, Pennsylvania Power Company, and West Penn Power Company) merged into FirstEnergy Pennsylvania Electric Company (FirstEnergy PA). FirstEnergy PA is the surviving entity. All references herein will be to FirstEnergy PA unless context indicates otherwise. *See Joint Application . . . .*, A-2023-3038771, *et al.*, (Order entered December 7, 2023). <https://www.puc.pa.gov/pcdocs/1808189.pdf>.

- On February 6, 2024, a virtual stakeholder meeting was held with representatives of Pennsylvania ratepayer advocates, including Community Legal Services of Philadelphia, OCA, Pennsylvania Office of Small Business Advocate (OSBA) and the Pennsylvania Utility Law Project (PULP).

### **III. Topics For ANOPR**

Pursuant to the Joint Motion adopted at the PUC’s November 9, 2023 Public Meeting, this ANOPR, investigation and rulemaking should address, at a minimum, changes to interconnection rules, changes to metering requirements, cost allocation issues, adjudication of DER registration disputes, EDC overrides of DER dispatch, consumer protection for DER owners, preventing double compensation and double counting of services and electronic data exchange. Both staff and stakeholders have suggested related and additional topics for discussion.

#### **A. Changes To Distribution DER Interconnection Rules**

The PUC maintains interconnection regulations that apply to customer-generators operating small generator facilities with a nameplate capacity not greater than 5 MW, that wish to net meter with an EDC pursuant to the AEPS Act.<sup>81</sup> FERC states that Order 2222 “in no way prevents state and local regulators from amending their interconnection processes to address potential distribution system impacts that the participation of [DERs] through [DER] aggregations may cause.”<sup>82</sup> PJM’s DAPM provides that Component DER interconnecting to distribution facilities for purposes of participating in PJM markets exclusively through the DAPM shall not be subject to the parts of PJM’s tariff relating to interconnections with the Transmission System, and shall exclusively

---

<sup>81</sup> 52 Pa. Code § 75.31.

<sup>82</sup> Order 2222 ¶ 294.

interconnect to distribution facilities pursuant to applicable state law and PUC regulations.<sup>83</sup>

At the EDC stakeholder meeting, it was noted that:

- PJM is still working on establishing requirements for verification of DER Aggregation Resource operations.
- Maryland and New Jersey are also having meetings to discuss these issues.<sup>84</sup>
- PJM intends to use verification rules similar to those used in the demand response context.
- Metering, submetering and telemetry issues are still being discussed at PJM.

At the DERA stakeholder meeting, it was noted that:

- PUC oversight of the EDC approval process is needed to ensure an efficient DER registration process and to avoid “over-registration.” PJM is using a pre-registration process that lacks definition, and for new DERs the PJM process is open-ended. Concern was expressed that EDCs have the ability and incentive to abuse a “black box” approval process. EDCs may have legitimate concerns, but PUC oversight is needed when requirements are onerous or unreasonable.
- PUC should aim to ensure that EDCs can process pre-registration and registrations within the 60-day period envisioned by FERC.

---

<sup>83</sup> DAPM § 1.4B(n).

<sup>84</sup> We also acknowledge the Michigan Public Service Commission’s DR/DER Aggregation Workshop and Stakeholder Meetings as well as the Indiana Utility Regulatory Commission’s Implementation of FERC Order 2222 Stakeholder Meetings.

- There is ambiguity in Order 2222 as to how a DER will interconnect and participate. Section 75 of the Pa. Code is clear about interconnection of small generation that is state jurisdictional. A problem arises when those resources want to sell into the wholesale market. Order 2222 cites existing PJM small generation interconnection procedures – which was recently replaced with a cluster-based approach. Thus, it may be that DERs will have to undergo both the PJM queue and the state interconnection procedures.

The PUC seeks comment on whether its existing interconnection regulations for customer-generators, 52 Pa. Code §§ 75.31—40, can be adapted to address interconnection of a Component DER participating in a DER Aggregation Resource with EDC distribution facilities, consistent with Order 2222 and PJM’s DAPM, and, if so, the specific changes to the PUC’s interconnection regulations that would facilitate this adaption.

The PUC also seeks comment on the following sub-topics raised by stakeholders:

- How will Component DERs previously not subjected to interconnection (energy efficiency and demand response resources) be integrated into an aggregation?
- In consideration of future technology advancement through distributed energy resource management systems (DERMS) and other technologies that may allow for utility direct control and overrides, should approval of interconnection requests extend to consideration of an option for firm and non-firm approval categories to reduce the need for system upgrades?

- Under what conditions will direct control vs. monitoring be required?
- How should the DER aggregation review process differ for different use cases, market services, DER compositions or grid conditions?
- How should load assumptions be adjusted to accommodate the use of load-modifying resources?
- What data will DERAs need to provide to EDCs and to what extent can this leverage existing PJM registration data requirements? How should these data be documented?
- Where should automation versus manual coordination and communication between EDCs, the DERA and PJM be required? How should the PUC ensure that the EDC DER registration approval process is efficient to consistently meet PJM’s 60-day timeline and avoid potential “over-registration”?
- How should the PUC clarify and harmonize the relationship between DER interconnection under PUC regulations with DER interconnection under PJM’s small generator interconnection rules, if needed?

## **B. Changes To Metering Requirements**

The PUC’s existing regulations provide that a customer-generator that net meters must be equipped with a single bidirectional meter that can measure and record the flow of electricity in both directions at the same rate, or, if the customer-generator agrees, a dual meter arrangement.<sup>85</sup> If the customer-generator’s existing electric metering equipment cannot net meter, the EDC shall install new metering equipment for the customer-generator at the EDC’s expense.<sup>86</sup> In Order 2222, FERC ordered that, to the

---

<sup>85</sup> 52 Pa. Code § 75.14(a).

<sup>86</sup> *Id.*

extent that PJM proposes that metering and telemetry data come from or flow through distribution utilities, PJM must coordinate with distribution utilities and the PUC to establish protocols for sharing this data, and that such protocols minimize costs and other burdens and address privacy and cybersecurity concerns.<sup>87</sup>

Under PJM's DAPM, a DERA *shall* provide telemetry for each of its DER Aggregation Resources and *may* provide telemetry for each of the Component DERs within a DER Aggregation Resource, and this telemetry must represent one or more values indicative of the total electrical output of the DER Aggregation Resource and inclusive of all underlying Component DERs.<sup>88</sup>

A DERA must provide to PJM all individual Component DER meter data necessary to facilitate the settlement of the DERA's DER Aggregation Resource.<sup>89</sup> A DERA must ensure that Component DERs within a DER Aggregation Resource have metering equipment that provides integrated hourly kWh values on an EDC account basis.<sup>90</sup> For non-interval metered residential DER Aggregation Resources, the DERA must ensure that a representative sample of Component DER have metering equipment that provides integrated hourly kWh values on an EDC account basis.<sup>91</sup> Metering equipment must meet EDC requirements for accuracy.<sup>92</sup>

---

<sup>87</sup> Order 2222 ¶ 270.

<sup>88</sup> DAPM § 1.4B(e).

<sup>89</sup> *Id.*

<sup>90</sup> *Id.*

<sup>91</sup> *Id.*

<sup>92</sup> *Id.*

At the EDC stakeholder meeting, it was noted that:

- PJM proposes the use of bidirectional interval meters that record at least hourly.
- Multiple Component DERs behind the point of interconnection may require submetering.
- Who owns and maintains the submeters is another issue.
- Telemetry provided by the EDC may also be required in some circumstances.
- PJM metering requirements may impact whether and how small utilities opt-in to the program.

At the DERA stakeholder meeting, it was noted that:

- The PUC should permit device-level metering.
- Device-level metering is a contested issue at FERC right now at PJM. PJM has said it will not require or allow device-level metering. FERC urges PJM to work with stakeholders to accept device-level metering. PJM says it puts an unreasonable burden on the EDCs because they generally use standard meters located on the side of the house.
- Certain DERs are not suited for device-level metering.

The PUC seeks comment on whether its existing metering regulations for customer-generators, 52 Pa. Code § 75.14 (relating to meters and metering), can be adapted to facilitate provision of metering and telemetry data by DERAs to public utilities, consistent with Order 2222 and PJM's DAPM, and if so, whether and what specific changes to the PUC's interconnection regulations that facilitate this adaption.



The PUC also seeks comment on the following sub-topics raised by stakeholders:

- How should interconnection regulations evolve to ensure alignment between EDC and PJM telemetry and metering to facilitate consistency and avoid extensive telemetry differences between DERA requirements and retail DERs?
- Should the PUC facilitate device-level metering and if so, how?

### **C. Cost Allocation Issues For Facilities Allowing The Interconnection Of DERs**

Under the Choice Act, an energy supplier “pays the full cost” of facilities to connect with an EDC.<sup>93</sup> The PUC’s net-metering regulations provide that a customer-generator is responsible to pay for interconnection reviews, modifications to the electric distribution system, interconnection facilities and distribution upgrades.<sup>94</sup> These regulations also provide that an EDC may propose to interconnect more than one small generator facility at a single point of interconnection, and if the customer-generator declines the proposal, the customer-generator pays the entire cost of a separate point of interconnection for each generation facility.<sup>95</sup>

FERC intends that DERAs help DERs share commercial and transactional costs which DERs could not bear individually.<sup>96</sup> Under PJM’s DAPM, a Component DER must interconnect to EDC distribution facilities pursuant to applicable state law and PUC regulations.<sup>97</sup>

---

<sup>93</sup> 66 Pa.C.S. § 2807(b).

<sup>94</sup> 52 Pa. Code § 75.38(e); 52 Pa. Code § 75.29(e)(4).

<sup>95</sup> 52 Pa. Code 75.36(8).

<sup>96</sup> Order 2222 ¶ 5.

<sup>97</sup> DAPM § 1.4B(n).

At the EDC stakeholder meeting, it was noted that interconnection and application costs, as well as information technology system upgrade costs and system operation costs are all issues, as well as who pays the costs: DERA, Component DER, or certain customer classes.

At the ratepayer advocates stakeholder meeting, it was noted that there may be an interplay between the direct procurements aspects of an EDC's default service plan and the EDC's costs to administer DERA participation in wholesale markets.

The PUC seeks comment on whether its existing interconnection cost allocation regulations for customer-generators, 52 Pa. Code § 75.36(8), 75.38(e) and 75.39(e)(4) (relating to additional general requirements, level 2 interconnection review, level 3 interconnection review), can be adapted to address interconnection cost allocation among Component DERs, DERAs and EDCs, consistent with Order 2222 and PJM's DAPM, and, if so, the specific changes to the PUC's interconnection regulations that would facilitate this adaptation.

The PUC also seeks comment on the following sub-topics raised by stakeholders:

- How will DERA market participation impact retail rates?
- What cost recovery guidance, if any, is needed by EDCs for investments that may support both transmission and distribution?
- How should EDCs distinguish cost allocation between grid modernization, general DER costs, and DERA-specific costs?
- What cost recovery mechanisms should be used (upfront charges, usage charges, rates)?

- What is the interplay between the direct procurements aspects of EDCs' default service plans and an EDC's costs to administer DERA participation in wholesale markets, if any?

#### **D. Adjudication Of Disputes Regarding The Registration Of DERs**

The PUC's regulations set forth a process whereby:

- (1) A prospective customer-generator submits a net-metering application to its EDC.
- (2) The EDC reviews the application for compliance with the PUC's net-metering regulations and the EDC's net-metering tariff (to include a safety and reliability review).
- (3) The EDC makes a recommendation to the PUC with respect to the application.
- (4) The PUC approves or rejects the application.<sup>98</sup>

FERC expects that PUC interconnection processes for DERs will provide the appropriate platform to address and study potential distribution system impacts and provide the necessary information to inform EDC review during DERA registration.<sup>99</sup>

---

<sup>98</sup> 52 Pa. Code § 75.17(a).

<sup>99</sup> Order 2222 ¶ 294.

Under PJM's DAPM:

- (1) A DERA registers its DER Aggregation Resources and DER Capacity Aggregation Resources with PJM.<sup>100</sup>
- (2) PJM reviews the registrations to verify that the DERA meets DAPM criteria.<sup>101</sup>
- (3) The EDC then conducts a two-stage, 60-day review of the DERA registration,<sup>102</sup> in which, during the initial 15-day review, the EDC verifies location and data components for each Component DER, participation in an EDC retail program (*e.g.*, net metering) and compliance with PUC regulations.<sup>103</sup>(4) Then, in the subsequent 45-day review period, the EDC verifies that the DERA's participation in PJM markets does not pose a threat to the reliable and safe operation of the distribution system.<sup>104</sup> Any dispute during the DERA registration process will be resolved by PJM or the PUC, depending on the jurisdictional nature of the dispute.<sup>105</sup> Following EDC review, PJM will decide whether to approve the DERA for participation in the DAPM.<sup>106</sup>

At the EDC stakeholder meeting, it was noted that PJM is proposing a 15-day period for EDCs to review applications for double counting issues and 45-days for EDCs to conduct system impact studies. EDC stakeholders suggested that the PUC look at its own dispute resolution processes regarding any issues relating to a DER's eligibility to

---

<sup>100</sup> DAPM § 1.4B(b).

<sup>101</sup> *Id.*

<sup>102</sup> *Id.*

<sup>103</sup> *Id.*

<sup>104</sup> *Id.*

<sup>105</sup> *Id.*

<sup>106</sup> *Id.*

participate in a DER Aggregation Resource, whether via a formal complaint proceeding or a more expedited review, similar to the review process in 52 Pa. Code § 75.17.

At the DERA stakeholder meeting it was noted that active PUC involvement, including both formal and informal dispute resolution, will be desirable. Although it is impossible to predict exactly what types of disputes may arise, there will likely be disputes based on unreasonable assertions of safety or engineering concerns raised by EDCs, which have a strategic advantage in their access to and control over technical information.

The PUC seeks comment on whether its existing application process for net metering customer-generators, 52 Pa. Code § 75.17, or its existing dispute resolution regulations, 52 Pa. Code Chapters 1 (relating to rules of administrative practice and procedure), 3 (relating to special provisions) and 5 (relating to formal proceedings), or both, can or should be adapted to facilitate adjudication of disputes about DERA registration of its Component DERs with PJM, consistent with Order 2222 and PJM's DAPM, and if so, the specific changes to the PUC's regulations that would facilitate this adaption.

**E. Management Of Distribution Utility Overrides Of DERs To Maintain Reliability, And Disputes Arising Therefrom**

While the PUC's net metering regulations do not provide for overrides, the interconnection regulations require that "generator facilities shall be capable of being isolated from the EDC by means of a lockable, visible-break isolation device accessible by the EDC." 52 Pa. Code § 75.36(9). EDC tariffs generally include provisions for EDCs to take any measures needed to avoid safety or reliability impacts to the

distribution system.<sup>107</sup> In Order 2222, FERC required PJM to provide coordination protocols and processes for the operating day that allow EDCs to override PJM dispatch of a DERA where needed to maintain the reliable and safe operation of the distribution system.<sup>108</sup> Under PJM's DAPM, PJM dispatches the DERA,<sup>109</sup> but an EDC may override the physical operation of a DER Aggregation Resource, or individual Component DERs, for purposes of maintaining safe and reliable operation of distribution facilities.<sup>110</sup> Under the DAPM, disputes about an EDC override are resolved by the PUC in accordance with the EDC's tariffs and the PUC's regulations.<sup>111</sup>

At the EDC stakeholder meeting, it was noted that:

- PJM is proposing a similar process as wholesale demand response.
- EDCs, LSEs, customers and DERAs all need access to the information.
- EDC reporting requirements may need to be established regarding planned and unplanned distribution system outages that impact DER wholesale market participation.
- Any reporting requirements would need to be automated, adding to information technology costs.
- Smaller utilities may have to do these reports on a manual basis.

---

<sup>107</sup> See, e.g., UGI Utilities, Inc. – Electric Division, Electric Service Tariff, Section 8 (Maintenance of Service by Company), Original Page 20.

<sup>108</sup> Order 2222 ¶ 310.

<sup>109</sup> DAPM § 1.4B(f).

<sup>110</sup> *Id.*

<sup>111</sup> *Id.*

The PUC seeks comment on whether and how its regulations can or should be augmented to address EDC overrides of DER Aggregation Resource or Component DER operation, consistent with Order 2222 and PJM’s DAPM, and, if so, the specific changes to the PUC’s regulations that would address overrides.

The PUC also seeks comment on the following sub-topics raised by EDC stakeholders:

- How should the distribution override process align with market bidding windows?
- What EDC “real-time” update and override requirements should be addressed in DERA agreements to ensure the reliability and safety of the grid?

**F. Protection Of DER Owners From Unfair Trade Practices Or Excessive Risk In The Wholesale Markets**

Order 2222 focuses on the relationships between and among DERAs, EDCs and RERRAs, but not as much on the relationship between DERAs and Component DERs. PJM’s DAPM indirectly addresses this relationship, for example, by specifying that DERAs must obtain “express written consent” of the Component DERs it intends to include in its DER Aggregation Resource, to access the Component DER’s account number and electrical location information from their EDC for purposes of registering Component DER with PJM.<sup>112</sup> The DAPM also requires DERAs to provide PJM with “evidence of [Component DER] approval to interconnect, including but not limited to a finalized interconnection agreement” between the EDC and the Component DER.<sup>113</sup>

---

<sup>112</sup> DAPM, § 1.4B(b)(i).

<sup>113</sup> *Id.*

The relationship between a DERA and its Component DERs will likely be one characterized by a large disparity in size, resources and bargaining power and governed by contracts of adhesion. In comments to FERC, Tesla describes its business case for running a DERA:

Tesla has pioneered in the market design and technical constructs needed to boost utilization of customer-owned and leased battery energy storage systems (Tesla Powerwalls) in such grid-integrated programs. The South Australia Virtual Power Plant (“SAVPP”), created first as a pilot and then integrated into a formal market design, leverages the capabilities of a network of distributed Powerwalls and other residential battery systems, mostly co-located with solar arrays, to work together as a single power plant, dispatched by the RTO through a load-serving entity working with Tesla or others as the device aggregator. Tesla has developed sophisticated software tools to orchestrate multiple value streams from these systems for the customers participating, and, for the electric grid: customers sell back to the grid during high energy price periods, import during periods of excess solar generation (“solar sponge” behavior), and provide system security services (fast contingency ancillary services) while charging, discharging, or providing autonomous services that based on programmed inverter settings cognizant of instantaneous changes in grid conditions. Since the program’s inception in 2017, the SAVPP is in the fourth phase of operations, enabling more low income customers to share in the personal resiliency benefits and the energy rate benefits of the program, while increasing participation in the ancillary services market from 4,100 households to over 7,000 households (each home has at least one Tesla Powerwall, a 5-kW system with a backup reserve quantity and solar-charged capacity available to export to the grid to fulfill grid services instructions from the grid operator).<sup>114</sup>

---

<sup>114</sup> Comments of Tesla, Inc., PJM Interconnection, L.L.C., FERC Docket No. ER22-962-005 (September 22, 2023).



Any agreement governing the Tesla Powerwall customers' participation in a Tesla-led DERA is likely to be highly technical, not subject to negotiation and well beyond the comprehension of a typical customer.

There are at least two existing legal and regulatory regimes that might be adapted to address potential exploitation or abuse arising from the DERA-Component DER relationship. First, under the Pennsylvania Unfair Trade Practices and Consumer Protection Law (UTPCPL),<sup>115</sup> “[u]nfair methods of competition and unfair or deceptive acts or practices in the conduct of any trade or commerce... are hereby declared unlawful.”<sup>116</sup> The key UTPCPL terms “trade” and “commerce” are limited to “the advertising, offering for sale, sale or distribution of any services and any property, tangible or intangible, real, personal or mixed, and any other article, commodity, or thing of value wherever situate, and includes any trade or commerce directly or indirectly affecting the people of this Commonwealth.”<sup>117</sup> The Pennsylvania Attorney General may promulgate regulations to implement the UTPCPL<sup>118</sup> and is authorized to bring an action against any person that uses any unlawful trade practice.<sup>119</sup> Based on UTPCPL’s definition of “trade” and “commerce,” it is not clear that a DERA, which simply aggregates Consumer DERs’ available energy for sale in PJM’s wholesale markets would be subject to UTPCPL’s prohibitions or enforcement provisions.<sup>120</sup> On the other hand, a DERA that sells equipment or services to a consumer to operate Component DER (as appears to be the case with Tesla’s Powerwall product line), is more likely to be covered by UTPCPL.

---

<sup>115</sup> 73 P.S. §§ 201-1—201-7.

<sup>116</sup> 73 P.S. § 201-3.

<sup>117</sup> 73 P.S. § 201-2(3).

<sup>118</sup> 73 P.S. § 201-3.1.

<sup>119</sup> 73 P.S. § 201-4.

<sup>120</sup> See *Commonwealth v. Chesapeake Energy Corp.*, 247 A.3d 934, 936 (Pa. 2021) (Commonwealth could not bring legally cognizable claims under the UTPCPL against natural gas exploration firm based on its allegedly unfair and deceptive conduct as a purchaser of mineral estates because the firm was in the position of the buyer, not regulated by the UTPCPL, as it was purchasing rights to landowners’ mineral estate.”)

Under the Choice Act, “[i]n regulating the service of [EGSs], the PUC shall impose requirements necessary to ensure that the present quality of service provided by electric utilities does not deteriorate, including assuring that adequate reserve margins of electric supply are maintained and assuring that 52 Pa. Code Ch. 56 (relating to standards and billing practices for residential utility service) are maintained.”<sup>121</sup> The Choice Act defines “electric generation supplier” as:

A person or corporation ... that sells to end-use customers electricity or related services utilizing the jurisdictional transmission or distribution facilities of an [EDC] or that purchases, brokers, arranges or markets electricity or related services for sale to end-use customers utilizing the jurisdictional transmission and distribution facilities of an [EDC].

66 Pa.C.S. § 2803.

Pursuant to the Choice Act, the PUC has promulgated regulations governing the relationship between an EGS and its retail customers. As with the UTPCPL, application of the Choice Act to DERAs is problematic since a DERA does not provide or supply electricity to its Component DERs; rather, a DERA aggregates Component DER energy for sale in PJM’s wholesale markets.

At the EDC stakeholder meeting, it was noted that an EDC should not be in the role of policing DERAs.

---

<sup>121</sup> 66 Pa.C.S. § 2809(e).

At the DERA stakeholder meeting, it was noted that PUC licensing or registration of DERAs is needed to ensure that the PUC has control over DERAs and can oversee how DERAs manage customer authorizations for data sharing and how DERAs obtain customer consent, verified by the utility.

At the ratepayer advocate stakeholder meeting, it was noted that some solar panel vendors lease, rather than sell, installations to homeowners, so that prospective DERA participants may not “own” the Component DERs, but only lease them.

The PUC seeks comment on whether the UTPCPL applies to the DERA-Component DER relationship and whether and how the PUC’s EGS regulations can or should be adapted to address consumer protection in the DERA-Component DER relationship, consistent with Order 2222 and PJM’s DAPM, and if so, what specific changes to the PUC’s regulations would address these matters.

**G. Prevention Of Double Compensation Or Double Counting Between Retail And Wholesale Market Participation, Including Rules Governing DER Owners’ Ability To Switch Between Retail And Wholesale Market Participation**

Under the AEPS Act, “[e]xcess generation from net-metered customer-generators shall receive full retail value for all energy produced on an annual basis.”<sup>122</sup> Under the PUC’s regulations, EDCs “shall file a tariff ... that provides for net metering” directly with customer-generators and “a tariff providing net metering protocols that enables EGSs to offer net metering to customer-generators taking service from EGSs.”<sup>123</sup> Further, “[a]n EDC ... shall credit a customer-generator at the full retail kilowatt-hour rate, which shall include generation, transmission and distribution charges, for each kilowatt-hour produced by [a] resource installed on the customer-generator’s side of the

---

<sup>122</sup> 73 Pa.P.S. § 1648.5.

<sup>123</sup> 52 Pa. Code § 75.13(c).

electric revenue meter, up to the total amount of electricity used by that customer during the billing period.”<sup>124</sup> Furthermore, “[a]t the end of each year, the [default service provider or DSP] shall compensate the customer-generator for any remaining excess kilowatt hours generated by the customer-generator that were not previously credited against the customer-generator’s usage in the prior billing periods at the [default service provider’s] price to compare rate.”<sup>125</sup> The price-to-compare (PTC) is defined as “[a] line item that appears on a retail customer’s monthly bill for default service. The PTC is equal to the sum of all unbundled generation and transmission related charges to a default service customer for that month of service.”<sup>126</sup>

Order 2222 permits PJM to limit the participation of Component DER in PJM wholesale markets that receive compensation for the same services as part of another program.<sup>127</sup> But rather than bar Component DER participation in both wholesale and retail programs, or multiple wholesale programs, Order 2222 requires PJM to permit participation in multiple programs, subject only to appropriate restrictions “narrowly designed to avoid counting more than once the services provided” by Component DERs in PJM markets.<sup>128</sup> Under PJM’s DAPM, an EDC has 60 days from notification by PJM to verify whether a Component DER registered in a DERA participates in the EDC’s retail program, and, if so, whether such participation precludes participation in PJM’s energy, capacity, or ancillary services markets.<sup>129</sup> Furthermore:

Component DER[s] that participate in a net energy metering retail program may only participate with grid injections in the PJM ancillary services markets, and may not participate in PJM energy or capacity markets, unless:

---

<sup>124</sup> 52 Pa. Code § 75.13(d).

<sup>125</sup> 52 Pa. Code § 75.13(e).

<sup>126</sup> 52 Pa. Code § 54.182 (relating to definitions).

<sup>127</sup> Order 2222 ¶ 159.

<sup>128</sup> Order 2222 ¶ 160.

<sup>129</sup> DAPM § 1.4B9B(iv)(a).

1. the EDC confirms to PJM that participation of the Component DER in a net energy metering retail program or tariff approved by the PUC will not violate the restrictions on duplicative compensation as described in the DAPM; and
2. PJM determines that the participation of the Component DER otherwise meets the applicable requirements for energy market or capacity market participation.

The DERA's participation in the PJM energy, capacity, and/or ancillary service markets complies with the rules and regulations of the PUC; and

The PUC allows the participation of any applicable Component DER that are also end-use customers of an EDC, in accordance with the provisions of the DAPM.

DAPM § 1.4B(b).

The DAPM also provides that any “issues within disputes” that PJM determines solely concern the application of EDC tariffs, agreements, and operating procedures and/or PUC regulations shall be addressed in accordance with applicable state or local law and shall not be arbitrated or in any way resolved by PJM.<sup>130</sup>

Finally, the DAPM provides that:

A DERA may participate in the PJM energy, capacity, and/or ancillary services markets... using DER Aggregation Resources containing one or more Component DER that also participate in one or more retail programs. PJM shall only credit a DERA for the sale of a product in the PJM energy, capacity, and/or ancillary services markets if that same product is not also credited as part of a retail program, including but not limited to a Component DER participating in a retail net energy metering program.

---

<sup>130</sup> DAPM § 1.4B(b).

A DERA may participate in the PJM energy, capacity, and/or ancillary services markets using DER Aggregation Resources that provide multiple services in the PJM energy, capacity, and/or ancillary services markets through the DAPM.

A Component DER shall not be registered with multiple DER Aggregation Resources, or participate as part of another Market Participant outside of the DAPM. PJM shall only credit a DERA for the sale of a product in the PJM energy, capacity, and/or ancillary services markets if that same product is not also credited as part of another wholesale sale.

DAPM § 1.4B(h).

At the EDC stakeholder meeting, it was noted that:

- The determination of whether net metering customers can participate in a DER Aggregation Resource should be left to the PUC, not PJM, as net metering rules vary by state and may change over time.
- The PUC should consider rules for when and how often a customer can switch between net metering and participation in a DER Aggregation Resource.

At the DERA stakeholder meeting, it was noted that the PUC should state how it intends to address resources participating in net metering programs at the retail level and to what extent the resources could participate as wholesale and retail simultaneously.

The PUC seeks comment on whether its existing regulations on compensation for net metering customer-generators, 52 Pa. Code § 75.13, could or should be adapted to incorporate appropriate restrictions on double counting of services provided by a Component DER in wholesale and retail markets, on duplicative compensation for the same service, consistent with Order 2222 and PJM's DAPM, or on both, and, if so, what specific changes to the PUC's regulations would or should facilitate this adaption.

Consistent with the concerns raised by EDCs, the PUC also seeks comments on the following sub-topics:

- Does the PUC have authority to decide whether to permit net metering customers to participate in DERAs, noting FERC’s statement that “under a [RERRA]’s jurisdiction over its retail programs, such a [RERRA] 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”?<sup>131</sup>
- Assuming the PUC does have requisite authority, should the PUC permit net metering customers to also participate in DERAs at the same time?
- Assuming the PUC does have requisite authority, should the PUC develop rules for when and how often a retail customer may switch between net metering and DERA participation?

#### **H. Any Necessary Electronic Data Exchange Revisions**

The PUC has an ongoing proceeding to review and revise standards for the exchange of electronic data between EDCs and EGSs to implement the Choice Act and to facilitate customer enrollment, billing, change of provider, termination of service when the customer selects an EGS to provide electricity supply through an EDC distribution system.<sup>132</sup> Among other things, EDC-EGS data exchange involves Electronic Data Interchange (EDI), which enables automated exchange of business documents in

---

<sup>131</sup> Order 2222 ¶ 61.

<sup>132</sup> See, e.g., *Standards for electronic Data Transfer and Exchange Between EDCs and EGSs*, Docket No. M-00960890 F0015, Electronic Data Exchange Standards for Electric Deregulation in the Commonwealth of Pennsylvania, Revised Plan v2.8, prepared by the Electronic Data Exchange Working Group (February 2, 2017). <https://www.puc.pa.gov/docket/M-00960890F0015>.

standard, machine-readable formats.<sup>133</sup> EDI benefits include uniform communications with trading partners, reduced errors and improved error detection and better auditability and control.<sup>134</sup>

At the EDC stakeholder meeting, it was noted that:

- Parties need to know what data are wanted or needed before it can be determined how data are to be provided.
- PJM's Distributed Resources Subcommittee (DISRS) working group is exploring this issue. Once the data requirements are known, it can then be determined whether it would be provided through EDI or an EDC web portal, similar to the EGS web portals.
- Cybersecurity issues also need to be considered.
- Small utilities may need to provide data manually as they do now for demand response.

At the DERA stakeholder meeting, it was noted that electronic data exchange will be a big issue for the PUC going forward. The PUC will need to ensure that processes are in place for efficient data exchange for customer authorizations in the DERA registration and EDC approval processes.

The PUC seeks comment on whether it should encourage or impose EDI and/or other data exchange protocols between and among EDCs, EGSs, DERAs and Component DERs to facilitate implementation of Order 2222, and, if so, what, if any, specific changes to the PUC's policies and regulations would or should facilitate this adaptation.

---

<sup>133</sup> *See, Id.*, at 10-11.

<sup>134</sup> *Id.*



The PUC also seeks comment on the following sub-topics raised by stakeholders:

- What DERA cybersecurity items require further evaluation?
- What role will advanced metering infrastructure (AMI) data play in operational coordination?
- How should the PUC ensure that processes are in place for efficient data exchange among and between Component DERs, DERAs and EDCs for customer authorizations?

### **I. Small Utility Opt-in Procedures**

Recognizing that Order 2222 places a disproportionate burden on smaller EDCs, FERC created an “opt-in mechanism” whereby “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 [RERRA] affirmatively allows such customers to participate in [DER Aggregations].”<sup>135</sup>

Under PJM’s DAPM:

[PJM] shall permit a [DERA] to participate in the PJM energy, capacity, and/or ancillary services markets through the [DAPM] with a DER Aggregation Resource including Component DER that are end-use customers of an electric distribution company that distributed 4 million MWh or less in the previous fiscal year, as identified by the [EDC], if, during the course of the registration process described above in [DAPM section 1.4B(b)], the [EDC] presents any of the following evidence to PJM:

---

<sup>135</sup> Order 2222 ¶ 64.

- i. an order, resolution or ordinance of the [PUC] permitting or conditionally permitting the end-use customer's participation;
- ii. an opinion of the [PUC]'s legal counsel attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation; or
- iii. an opinion of the state Attorney General, on behalf of the [PUC], attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation.

DAPM § 1.4B(g).

At the EDC stakeholder meeting, the issue arose concerning how a small utility would formally request the PUC for an affirmative declaration that the small public utility's customers are permitted to participate in a DERA.

The PUC seeks comment on procedures for small utilities to "opt-in" to Order 2222, and permit their retail customers to participate in DERAs, consistent with Order 2222 and PJM's DAPM, and any specific changes to the PUC's policies and regulations that would facilitate the opt-in process.

#### **J. Potential PUC Oversight Of DERAs**

Order 2222 and PJM's DAPM envision numerous roles for DERAs to fulfill, including pre-registration information gathering, registering with PJM, sharing metering data with PJM, coordinating registration and dispatch with EDCs, and entering into agreements with Component DERs and EDCs. While the PUC has no ready-made jurisdictional precedent relating to DERAs, asserting jurisdiction would greatly assist the

PUC in fulfilling the many roles with which it is tasked in the implementation of Order 2222.

At the EDC stakeholder meeting, the issue arose of whether the PUC may assert jurisdiction over DERAs and, if so, what requirements the PUC should impose on DERAs.

The PUC seeks comment on whether the PUC may assert jurisdiction to regulate DERAs, and, if so, what requirements should the PUC impose on DERAs, consistent with Order 2222 and PJM's DAPM, and what specific changes to the PUC's policies and regulations would facilitate the PUC's exercise of authority over DERAs.

#### **K. Cybersecurity Considerations**

Order 2222 notes cybersecurity considerations with respect to protocols for Component DERs, DERAs, EDCs and PJM sharing metering and telemetry data.<sup>136</sup>

The PUC seeks comments on whether it should impose cybersecurity standards or requirements on Component DERs, DERAs or EDCs, consistent with Order 2222 and PJM's DAPM, and any specific changes to the PUC's policies and regulations that would facilitate appropriate levels of cybersecurity in the implementation of Order 2222.

---

<sup>136</sup> Order 2222 ¶¶ 270, 324.

## **L. Distribution Level Benefits**

At the DERA stakeholder meeting, it was noted that Order 2222 and PJM's DAPM focus on DERA participation in PJM wholesale markets, and the attendant benefits for competition, efficiency and reliability at the wholesale level. However, to fully account for the impact of DERs and DERAs, their beneficial impact at the distribution level, including system planning and addressing contingencies, must be recognized.

The PUC seeks comment on whether and how it should account for the distribution level benefits of DERAs.

## **M. EDCs Acting As DERAs**

At the DERA stakeholder meeting, it was noted that that FERC and PJM permit EDCs to participate in wholesale markets in the form of DERAs. This raises potential conflict of interest concerns with respect to EDC interactions directly with customer DERs and with their own affiliated DERAs as opposed to unaffiliated DERAs. Failure to mitigate this conflict of interest could result in increased costs and delays for unaffiliated DERAs and restricted access to customer data.

The PUC seeks comment on whether and how it should mitigate conflicts of interest that may arise from an EDCs participating in wholesale markets as a DERA, consistent with Order 2222 and PJM's DAPM, and whether and what specific changes to the PUC's policies and regulations could facilitate such mitigation.

## **N. Billing Issues**

At the DERA stakeholder meeting, it was noted that billing should be added to the list of ANOPR topics. There will be a complex billing relationship between DERAs, customers owning DER and EDCs. Existing billing structures are not sufficient to deliver to a customer who owns a participating DER a synopsis of what happened in both the wholesale and retail markets. It was requested that the PUC should ensure that all facets of the DERA billing paradigm are made transparent to ensure customers understand it.

The PUC seeks comment on whether and how it could make the billing relationships between EDC customers, DERAs and EDCs transparent to the customer, consistent with Order 2222 and PJM's DAPM, and whether and what specific changes to the PUC's policies and regulations could facilitate such transparency.

## **O. Equity Concerns**

At the ratepayer advocates stakeholder meeting, it was noted that there may be equity concerns associated with DERAs, including allocation of DERA-related costs among EDC customer classes and the inability of low-income customers to participate in a DERA for affordability reasons. The PUC seeks comment on how to identify and address potential equity concerns associated with the expected proliferations of DERAs in Pennsylvania in the coming years.

## CONCLUSION

Due to the breadth of topics addressed in this ANOPR and the complexity of the topics which are open for comment, interested parties will have sixty (60) days from the date of publication of a notice of this ANOPR in the *Pennsylvania Bulletin* for the submission of comments. Comments should be clearly delineated as responding to one or more of the topics set forth in this ANOPR. Comments should include, where appropriate, a citation to statutory provisions and the existing regulation or regulations which the comments address, the proposed language for revision or amendments, and a clear explanation for the recommendation. Matters not responding to a topic listed herein or to an existing regulation should be clearly delineated as new subjects; **THEREFORE,**

### **IT IS ORDERED:**

1. That an Advance Notice of Proposed Rulemaking is hereby initiated at this docket to consider any changes or additions needed to Public Utility Commission regulations or policies to align with FERC Order 2222.
2. That this Advance Notice of Proposed Rulemaking will be served on all electric distribution companies, the Office of Consumer Advocate and the Office of Small Business Advocate.
3. That the Law Bureau will deliver this Advance Notice of Proposed Rulemaking Order, together with an appropriate regulatory analysis form, to the Governor's Office of the Budget for fiscal review.

4. That, after receipt of the fiscal note from the Governor's Office of the Budget, the Law Bureau will deliver a Notice of this Advance Notice of Proposed Rulemaking Order with the Legislative Reference Bureau to be published in the *Pennsylvania Bulletin*.

5. That, after the Notice of this Advance Notice of Proposed Rulemaking has been published in the *Pennsylvania Bulletin*, interested parties may submit written comments, referencing Docket No. L-2023-3044115, within 60 days from the date Notice is published in the *Pennsylvania Bulletin*. Comments may be filed either through the Public Utility Commission's e-Filing system or by mail.

6. Parties to proceedings pending before the Public Utility Commission may open and use an e-filing account through the Commission's website, or you may submit your filing by overnight delivery. If a filing contains confidential or proprietary material, the filing must be submitted by overnight delivery. Filing information can be found on the Commission's website at <https://www.puc.pa.gov/filing-resources/efiling/>.

7. The contact persons for this matter are Christopher F. Van de Verg, Assistant Counsel, 717-783-3459, [cvandeverg@pa.gov](mailto:cvandeverg@pa.gov); Tiffany L. Tran, Assistant Counsel, 717-783-5413, [tiftran@pa.gov](mailto:tiftran@pa.gov); Joseph P. Cardinale, Assistant Counsel, 717-787-5558, [jcardinale@pa.gov](mailto:jcardinale@pa.gov); and Karen Thorne, Regulatory Review Assistant, [kathorne@pa.gov](mailto:kathorne@pa.gov), in the Public Utility Commission's Law Bureau.

8. That copies in Word®-compatible format of all filings at this docket shall be provided by email to the contact persons for this matter.

**BY THE COMMISSION**

A handwritten signature in black ink, appearing to read "Rosemary Chiavetta". The signature is fluid and cursive, with the first name being more prominent.

Rosemary Chiavetta  
Secretary

(SEAL)

ORDER ADOPTED: February 22, 2024

ORDER ENTERED: February 22, 2024