City of Philadelphia

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May 29, 2024

Via Electronic Filing

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120

Re: Distributed Energy Resources
Participation in Wholesale Markets
Docket No. L-2023-3044115

Dear Secretary Chiavetta:

Attached for electronic filing please find the Comments of the City of Philadelphia and Philadelphia Energy Authority in the above-referenced proceeding. Copies have been served per the attached Certificate of Service.

Respectfully submitted,

/s/ Laura J. Antinucci

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Enclosures:
cc: Certificate of Service

BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

Distributed Energy Resources Participation in Wholesale Markets	: : : :	Docket No. L-2023-3044115

CERTIFICATE OF SERVICE

I hereby certify that I have this 29th day of May, 2024 served a true copy of the foregoing Comments of the City of Philadelphia and Philadelphia Energy Authority on the parties, listed below in accordance with the requirements of 52 Pa. Code §1.54 (relating to service by a party).

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May 29, 2024

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Distributed Energy Resources Participation in Wholesale Markets	: : :	Docket No.: L-2023-3044115

COMMENTS OF THE CITY OF PHILADELPHIA AND THE PHILADELPHIA ENERGY AUTHORITY IN RESPONSE TO THE COMMISSION'S ADVANCE NOTICE OF PROPOSED RULEMAKING

Pursuant to the Pennsylvania Public Utility Commission's ("Commission") February 22, 2024 Advance Notice of Proposed Rulemaking ("ANOPR")[1] regarding Distributed Energy Resources Participation in Wholesale Markets, the City of Philadelphia (the "City") and the Philadelphia Energy Authority ("PEA" and together with the City, the "City Parties") hereby file their opening comments. The Commission has issued the ANOPR to investigate the Commission's role in the implementation of Federal Energy Regulatory Commission ("FERC") Order 2222 ("Order 2222"),[2] which authorizes participation in wholesale energy markets by distributed energy resources ("DERs") through aggregation. The ANOPR seeks comments from interested stakeholders regarding a series of issues relating to DER participation in market aggregations. The City and PEA are grateful for this opportunity to provide their responses on the topics outlined by the Commission.

Summary

1. Speaking in connection with FERC's adoption of Order 2222, then FERC Chairman, Neil Chatterjee said:

> "This action, in my view, is revolutionary, and will help us pave the way for the grid of the future. It lets our markets be a catalyst for bringing new technologies and cleaner resources online. And, the big payoff here is really for consumers: This action will make our markets

[1] Advance Notice of Proposed Rulemaking Order, *Distributed Energy Resources Participation in Wholesale Markets*, Pa. PUC Docket No. L-203-3044115 (February 22, 2024).
[2] *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).

> more efficient, and it also promises to drive down costs for consumers. It also makes our grid more nimble, flexible and reliable. So this rule is just a very forward-leaning, technology-focused way to carry out our mandate to ensure consumers have access to reliable power at just and reasonable rates."[3]

The primary objective is to drive down costs for consumers, but as the Chairman pointed out, it also lets the markets be a catalyst to bring cleaner resources online.

2. The City Parties encourage the Commission to pursue both objectives; using this ANOPR to provide incentives to customers and communities to invest in resources that not only support the grid, but also advance the decarbonization of the grid. Pennsylvania's Climate Action Plan places grid decarbonization at the center of its recommendations, accounting for over one-third of the potential greenhouse gas ("GHG") reductions called for in the plan. The City Parties' comments are focused on behind-the-meter ("BTM") resources because (1) BTM resources are where customer and community investment will occur given a compatible regulatory structure and (2) Pennsylvania's current DER regulatory regime is less suited to BTM resources than to small merchant resources. BTM resources are typically not designed primarily for export but face regulations that assume that they are. They can be an important source of value to the grid, but as a policy matter, they should be treated as a customer service.

3. Assuring access to virtual power plants ("VPPs") and aggregations for all customers is a major concern to the City Parties. To the extent that participation in a VPP represents an opportunity to save on overall utility bills, exclusion from participation may discriminate against low- and moderate-income ("LMI") customers. This includes the need for internet or equivalent communication to allow for communication of price or dispatch signals (many solar installations use a dedicated cellular signal, and there are systems that use radio sideband communication), and for many types of VPPs, a home energy management system is required (these currently cost between $100 – $200, though the price can be expected to continue to

[3] FERC Open Access Podcast: *Chairman Chatterjee and Commissioner Glick talk FERC's new landmark DERs rule and carbon pricing,* (October 5, 2020), transcript at 1, *available at,* https://www.ferc.gov/news-events/news/open-access-order-no-2222.

decline).[4] More broadly, financial access to DERs (and smart appliances, smart thermostats, etc.) is critical. The proposed Philadelphia VPP, described below, is designed to address these issues.

Background

The City of Philadelphia

4. The City, a corporation and body politic formed and existing under the laws of the Commonwealth of Pennsylvania, has an estimated 1.55 million residents, with approximately 659,129 households and 30,007 businesses within its borders, according to the U.S. Census Bureau.[5] Within the City's Office of the Mayor, the Office of Sustainability works with partners around the city to improve quality of life in all of Philadelphia neighborhoods through advancing environmental justice, reducing the city's carbon emissions, and preparing Philadelphia for a hotter and wetter future. In addition, the City's Municipal Energy Office, under the Office of Sustainability, promotes municipal energy conservation, efficiency, and emissions reductions by procuring energy and managing utilities, promoting energy conservation and efficiency through the development and implementation of projects and programs, and manages municipal fleet electrification measures as outlined in the Municipal Energy Master Plan and Clean Fleet Plan.

Philadelphia Energy Authority

5. PEA is a body politic and corporate, created by the City of Philadelphia under the Pennsylvania Municipality Authorities Act, 53 Pa. C.S. § 5601 et. seq., established in 2010 with the purpose of building a robust, equitable clean energy economy in Philadelphia. PEA works to make Philadelphia a national model for implementing energy strategies that improve the health and well-being of the community and local economy, including the City's most vulnerable residents. PEA assists the City in the development of long-term energy related projects including energy efficiency projects for City facilities, such as efficiency retrofits of the Philadelphia

[4] See, Feasibility of low-cost energy management system using embedded optimization for PV and battery storage assisted residential buildings, https://www.sciencedirect.com/science/article/abs/pii/S036054422300316X#:~:text=Nowadays%2C%20the%20main%20obstacle%20to,from%20100%24%20to%20600%24 (Science Direct).

[5] U.S. Census Bureau QuickFacts: Philadelphia County, Pennsylvania (accessed May 2024), *https://www.census.gov/quickfacts/fact/table/philadelphiacitypennsylvania/PST045219*.

Museum of Art and the City's Municipal Office Building and the ongoing conversion of all City streetlights to LED fixtures, and renewable energy projects, such as the recently completed 70 MW Adams County Solar Project.

6. PEA also operates programs to install and/or finance the installation of energy efficiency improvements and renewable energy systems for residents and businesses in the City. These include its Built to Last program, which coordinates delivery of repairs and energy improvements for low-income single-family housing from multiple Philadelphia programs and funding sources, and its Solarize program which has installed a total of over 16 MW of residential solar in the City, with over 45 percent of installations made on individual low-income homes. PEA is preparing to issue an RFP for a VPP for the City, with the goal of using savings from demand management to reduce the cost of energy efficiency improvements and installation of solar and battery storage for residents and businesses in the City. PEA's affiliate, Philadelphia Green Capital Corp. ("PGCC"), is the successful co-applicant with the Pennsylvania Energy Development Authority for the U.S. Environmental Protection Agency's Solar for All program under the federal Inflation Reduction Act, and PEA will assist PGCC in implementing the program in Philadelphia and the four surrounding counties.

The Need for Climate Action

7. The City Parties are pursuing these efforts not only to improve the lives of the City's poorest citizens, but to meet the urgent need for climate action. Pennsylvania's 2021 Climate Action Plan ("2021 Plan") identifies the creation of a carbon-free grid as its single most effective strategy,[6] yet Pennsylvania ranks fifth from the bottom of all states in the adoption of renewable energy[7] and next to last in the growth of renewable energy generation in the last 10 years.[8] While Pennsylvania's record is particularly poor, the country as a whole is failing to meet its goals. The United States National Climate Assessment for 2023 warned:

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[6] 2021 Plan at 34-35, https://greenport.pa.gov/elibrary//GetDocument?docId=3925177&DocName=2021%20PENNSYLVANIA%20CLIMATE%20ACTION%20PLAN.PDF%20%20%3cspan%20style%3D%22color:green%3b%22%3e%3c/span%3e%20%3cspan%20style%3D%22color:blue%3b%22%3e%28NEW%29%3c/span%3e%209/21/2023.

[7] Wikipedia, *List of U.S. states by renewable electricity production* (based on US EIA data for 2022), https://en.wikipedia.org/wiki/List_of_U.S._states_by_renewable_electricity_production.

[8] Penn Environment, *Renewables on the Rise* (2023), https://publicinterestnetwork.org/wp-content/uploads/2023/10/RenewablesOnRise-Pennsylvania.pdf.

> "While US greenhouse gas emissions are falling, the current rate of decline is not sufficient to meet national and international climate commitments and goals. US net greenhouse gas emissions remain substantial and would have to decline by more than 6% per year on average, reaching net-zero emissions around midcentury, to meet current national mitigation targets and international temperature goals; by comparison, US greenhouse gas emissions decreased by less than 1% per year on average between 2005 and 2019."[9]

Meanwhile, studies agree that electrification of building thermal load and transportation (also called for by the 2021 Plan[10]) are likely to require 2 to 3 times as much electricity as the United States currently uses.[11] This creates a huge investment requirement in new renewable generation.

8. A study by Bloomberg New Energy concludes that the corresponding need for investment in renewable energy has also grown. [12] The study reports, "[t]o get on track for global net zero, . . . energy transition and grid investment need to average $4.55 trillion between 2023 and 2030. This is more than three times the total spent in 2022."[13] In addition, a study commissioned by the Department of Energy to assess the effectiveness of incentives in the Inflation Reduction Act ("IRA") concluded:

> "The biggest barriers to deployment between now and 2030 are non-cost in nature – like siting and permitting delays, backlogged grid interconnect queues, and supply chain challenges. Tackling these non-cost barriers will be critical for the IRA to achieve its full clean energy deployment and emissions reduction potential."[14]

This proceeding gives the Commission an opportunity to directly address many of those barriers.

Two Regulatory Paths

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[9] *National Climate Assessment 2023*, https://nca2023.globalchange.gov.
[10] *2021 Plan* at 33-34.
[11] *See, e.g.:* Murphy, Caitlin, Trieu Mai, Yinong Sun, Paige Jadun, Matteo Muratori, Brent Nelson, and Ryan Jones. 2021. *Electrification Futures Study: Scenarios of Power System Evolution and Infrastructure Development for the United States.* Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20-72330. https://www.nrel.gov/docs/fy21osti/72330.pdf.; International Renewable Energy Agency, *World Energy Transitions Outlook 2023, 1.5º C Pathway,* at 46, https://mc-cd8320d4-36a1-40ac-83cc-3389-cdn-endpoint.azureedge.net/-/media/Files/IRENA/Agency/Publication/2023/Jun/IRENA_World_energy_transitions_outlook_2023.pdf?rev=db3ca01ecb4a4ef8accb31d017934e97.
[12] Bloomberg New Energy, *Energy Transition Investment Trends 2023* (January 2023), https://assets.bbhub.io/professional/sites/24/energy-transition-investment-trends-2023.pdf
[13] *Id*.
[14] Energy Innovation, *Clean Energy Investment in 2023: Assessing Progress in Electricity and Transport* (February 21, 2024), https://energyinnovation.org/publication/clean-investment-in-2023-assessing-progress-in-electricity-and-transport/

9. The Federal Power Act[15] offers two regulatory paths to substantially increasing deployment of, and investment in, renewable energy resources. Bringing new utility scale resources to market is generally entirely within the jurisdiction of FERC for interconnection,[16] sale of power, and transmission capacity. For DERs, by contrast, the Commission has principal authority over interconnection[17] and distribution capacity. Small scale, behind-the-meter resources typically have little individual impact on the transmission system, but export sales by even the smallest generators are, with few exceptions,[18] subject to FERC jurisdiction. Order 2222 gives DERs broad access both to benefit from sales to the grid and to provide benefits to the larger grid. Access to an additional source of recurring revenue will support investment in DERs, while sophisticated demand response and exports from DERs can both reduce peak demand and supplement ramping capacity.

10. The City Parties are not suggesting favoring one path over another. Rather the City Parties strongly encourage the Commission to assure that the local path receives as much attention and encouragement as the utility scale path. Utility scale renewables are currently caught in a transition to a new interconnection process with a moratorium on new applications.[19] Transmission expansion is similarly stalled.[20] By contrast, distribution utilities can interconnect DERs more quickly, and upgrading the distribution system does not require major new rights-of-way. Moreover, the expansion of DERs unleashes investment by customers and communities, or third-party developers on their behalf, that can speed the renewable energy transition.

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[15] 16 U.S.C. § 824 *et seq.*

[16] Assuming interconnection is at the transmission level.

[17] Order No. 2222, 172 FERC ¶ 61,247 at P 90.

[18] One is through a combined retail tariff such as net metering. *See Sun Edison LLC*, 129 FERC ¶ 61,146 at P 1 (confirming that certain solar energy sales to net metered end-use customers do not constitute the sale of electric energy at wholesale in interstate commerce or the transmission of electric energy in interstate commerce for purposes of the FPA); *MidAmerican*, 94 FERC ¶ 61,340 at P 1 (objecting to the Iowa Utilities Board's implementation of final orders issued pursuant to Iowa's Alternate Energy Production Statute and § 199-15.11(5) of the regulations thereunder, directing MidAmerican to interconnect with three Alternate Energy facilities and to offer net billing arrangements to those facilities). The other is the Public Utility Regulatory Policy Act (16 U.S.C. 2601 *et. seq.*) provisions for sales to utilities by Qualified Facilities, which is not currently applicable for facilities over 5 MW in Pennsylvania as a part of the PJM market. (18 C.F.R. §292.309(e)).

[19] PJM News Release, *New Interconnection Process Reaches Next Milestone* (December 21, 2023), https://www.pjm.com/-/media/about-pjm/newsroom/2023-releases/20231221-new-interconnection-process-reaches-next-milestone.ashx.

[20] *Feds Issue Final Rules to Boost Transmission Project Expansion,* Engineering News Record (May 14, 2024) https://www.enr.com/articles/58641-feds-issue-final-rules-to-boost-transmission-project-expansion.

11. When compared to utility scale generating plants, local generation and load management resources provide numerous advantages:

- They avoid the need for investment in transmission and eliminate line losses.
- They diversify power supply and reduce the size of contingencies.
- They reduce the need for both peaking and ramping capacity.
- Local investment provides local employment and builds local wealth.
- Local clean energy reduces pollution levels.
- They may defer or eliminate the need for distribution upgrades.
- Through aggregation, DERs can provide the same services to the grid that wholesale generation provides, including frequency regulation, voltage and reactive power support.
- Local generation and storage deployed as microgrids provides resilience to customers, to critical facilities and to communities.
- If the distribution system is segmented to operate as local and regional islands in emergencies, DER exports can support continued operation of the islands, providing broader resilience.

The City Parties encourage the Commission to assure that the aggregation of DERs creates a level playing field for the deployment of local resources.

Business Models

12. In the past, traditional DER aggregations have tended to be technology agnostic; they have collected a variety of larger customers who could respond to specific demand response tariffs during comparatively rare events on a notification basis. As aggregation morphs into VPPs, it is moving to direct participation by aggregators in wholesale markets on a day-ahead or even real-time basis and to participation by smaller, more often residential, customers. In this evolution, a spectrum of business models is emerging. At one end of the spectrum are vendors who install a particular class of their own proprietary equipment, such as batteries or smart thermostats under contracts that allow the vendor to manage that equipment as a part of a VPP. At the other end is a VPP that operates as a platform, which allows multiple technologies, supplied through multiple installers, to participate in the same VPP.

13. The City Parties are seeking to create a VPP that leans toward the platform model for a variety of reasons. Technologies ranging from batteries (alone or coupled with solar), smart thermostats, smart water heaters, other smart appliances, and electric vehicle ("EV") chargers

(along with the EV batteries), can provide value to the grid in a VPP. If multiple separate assets participate in different aggregations, they may operate at cross purposes which is to the benefit of neither the customer nor the grid. Home controllers that can integrate a response from all resources in a residence now cost as little as $100 dollars,[21] and that price seems likely to continue to decline. If the final PJM rules prevent participation by a sub-metered resource, the approach of using a home controller will be necessary.

14. The City Parties generally prefer a platform approach that allows competition at several levels. First, the City Parties intend to set up a VPP in connection with a program that would assist residents and businesses with installing both VPP eligible resources and other energy efficiency measures, and also provide guidance, implementation, and financing for all customers, as well as subsidies for low-income customers. The City Parties also support appliances and technology choices for customers. The City Parties additionally seek (as it has done successfully with its solarize program) to expand business opportunities for smaller, diverse, Philadelphia-based businesses to participate in the energy efficiency space. The City Parties, however, are not advocating that the Commission require specific business models, but rather, the City Parties wish to assure that platform-based approaches are not precluded or disadvantaged.

Alternative Technologies

15. Multiple technologies are competing to implement VPPs. The City Parties wish to highlight the effects of different approaches on customer choice. Some VPPs rely on direct control of customer resources by the DERA. Some direct control programs give customers the ability to override DERA commands, while others do not. Other VPPs rely on price signals to drive customer behavior. A DERA that is, or is partnered with, a Commission-licensed energy generation supplier ("EGS") can directly include price signals in its regular rates. Alternatively, settlements for load modification can be conducted outside of the EDC settlement system. The City Parties have serious concerns about programs that do not allow customer overrides at the very least in emergencies. Operators will be obligated to make firm bids in PJM markets, and operators that do allow

[21] *See,* Science Direct, https://www.sciencedirect.com/science/article/abs/pii/S036054422300316X#:~:text=Nowadays%2C%20the%20main%20obstacle%20to,from%20100%24%20to%20600%24. *See also*, Reports Insights, *Home Energy Management Systems (HEMS)* (2023), https://www.reportsinsights.com/industry-forecast/global-home-energy-management-systems-hems-market-statistical-analysis-673908.

customer overrides, or that operate by price signals, will likely be compelled to have internal reserves or external hedges (or both) to manage their risks.

The New Grid

16. The City Parties encourage the Commission to move towards a new view of the role of the grid. The role of EDCs is not to just deliver power to passive consumers, but to collaborate with their customers to assure the collective adequacy of supply. EDCs should not simply plan its grid for the peak, but rather, plan with the understanding that the peak is within their control. Their job is to support customers whether the customer obtains power through the utility, from an electric generation supplier, from customer self-supply, through community supply, or some combination thereof. In turn, if the Commission and the EDCs make it possible to do so, the customers themselves will support the grid. This is not an abstract vision of the future; automatic demand response is currently in action in a diversity of places around the globe. In England, uptake of customers exceeded all expectations.[22] In California, Southern California Edison's pilot has been extremely successful.[23] The ability of motivated customers and communities to invest or mobilize third-party investment in renewable energy, in turn, will make a timely transition to a decarbonized grid possible.

Responses to Commission Questions

17. The following sections restate the Commission's major questions from the ANOPR followed by the City Parties responses, if any.

A. Changes To Distribution DER Interconnection Rules

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.

[22] Jemma Green, *Why No One Saw The Success of Demand Response Coming,* Forbes, January 27, 2023, https://www.forbes.com/sites/jemmagreen/2023/01/27/why-no-one-saw-the-success-of-demand-response-coming/?sh=498a8b8e3700.

[23] *Real-time pricing, new rates and enabling technologies target demand flexibility to ease California outages,* Utility Dive (September 13, 2022), https://www.utilitydive.com/news/real-time-pricing-new-rates-and-enabling-technologies-target-demand-flexib/631002/.

18. The Commission raises concerns that "DERs will have to undergo both the PJM queue and the state interconnection procedures."[24] As a first priority, the City Parties suggest that the Commission use this proceeding, in collaboration with PJM, to eliminate inconsistencies between the two regimes and streamline the collective PJM/EDC interconnection process for BTM resources. If interconnection becomes a roadblock, the benefits contemplated by Order 2222 for the grid and for the environment will not be achieved. The City Parties encourage the Commission to use the opportunity created by the ANOPR to reconsider its existing procedures to ensure that they are consistent not only with PJM procedures but also with the goals of Order 2222.

Treat customer DERs like customers.

19. Order 2222 is premised on FERC's conclusion that competition from customer-sited resources will benefit both the grid and ratepayers by providing essential services. The Commission's interconnection rules, by contrast, take the grid as a fixed resource and treat interconnection as a privilege that is accorded only to the fortunate for whom there is available space. The screens for levels 1 through 3 interconnections are all based on existing limitations of the distribution system, which was created for pushing centrally generated power out, not accepting power in, and is widely varied in its capacity. The cost allocation system was created for wholesale generators, not for retail customers. Cost allocation for grid upgrades will be discussed more specifically below, but the situation as it exists is neither equitable between customers nor based on any analysis of the benefits to the grid of reducing barriers to entry for retail customers. Moreover, the inequities of the legacy grid have been shown to fall disproportionately on disadvantaged communities.[25]

20. The City Parties recommend that Commission regulations be revised to reflect a alternative view of the grid. While EDCs remain the default providers, their role is evolving to one in which they support a diverse array of additional power sources for customers, including customers and community direct provision as well as Commission-licensed EGSs. While resources acquired by, or on behalf of, customers will primarily be sized to meet the needs of

[24] ANOPR at 21.
[25] Eric Niiler, *An Outdated Grid Has Created a Solar Power Economic Divide,* Science (September 18, 2021), https://www.wired.com/story/an-outdated-grid-has-created-a-solar-power-economic-divide/.

the customer or customers served by the resource,[26] they will frequently have some spare capability (or the customers' needs will be flexible) so that the resources can contribute through an aggregation. The EDCs' role of serving customers will evolve from assuring one-way delivery to assuring two-way delivery of power. Two considerations should drive this approach. First, we believe that the benefits of local resources described above justify a greater level of EDC support for interconnection capacity systemwide. Second, we suggest that the Commission consider whether interconnection for LMI customers should be included in its universal service and energy conservation plans[27] and, additionally, require EDC pursue efforts to remedy historic inadequacies in underserved areas. We understand that, in many cases, utilities can achieve significant improvements in export capacity simply by updating relay settings that assumed limited exports.

21. PEA has been working closely with PECO to speed interconnection processes for its Solarize customers. PECO has been making improvements in its process and proposes more, such as an online application fee payment system. Nevertheless, the time from customer payment to final permission to operate averages over 3.5 months. This average length of interconnection process results from significantly longer times for projects that are held over for further engineering study, not because of problems with the customer application, but because of limitations on PECO's system. We understand from PECO that only two percent of applications are delayed for further study, but in the experience of PEA's largest installer, eighteen percent of their applications are held over for study. The fees for further study more than double the interconnection application cost, with no assurance of eventual interconnection. This can serve as a substantial barrier, particularly to LMI customers.

Sophisticated controls allow reliance on DERs

22. The controls and connectivity currently available for DERs and collections of DERs behind a single meter are already more sophisticated than the communication and control

[26] The City Parties are aware that following the Hommrich decision (Hommrich v. Pa. Pub. Util. Comm'n., 231 A.3d 1027 (Pa. Cmwlth. 2020) there have been instances of virtual net metering installations used primarily for exports, but the Commission can limit eligibility to appropriately sized resources. This is, in any event, a problem only for export resources. No-one will buy a larger refrigerator to save more by shutting it off.

[27] 52 Pa. Code § 54.74.

technologies typically deployed by EDCs at the periphery of the grid. Controls that allow a residence to participate in an aggregation that responds to hour-by-hour (or more frequent) needs of the grid will need to be automated to be effective, and the City Parties suggest that manual coordination and communication is the equivalent of preparing to fight the last war. Automated controls can be programmed to reflect a customer's preferences and can be subject to override as needed. Manual coordination often worked poorly with relatively large and sophisticated customers and is completely unrealistic for a residential customer with limited time to devote to manually managing home resources. Managing a home controller, by contrast, can typically be accomplished through a simple screen interface, such as a cellphone.

23. The City Parties responses to many of the Commission's inquiries flow from our expectation that participation in an aggregation will rely on high-quality controls. PJMs rules currently do not permit metering devices as opposed to metering customers. While aggregators may need to know what sorts and capabilities of non-export devices are included in a building to evaluate their bid response capabilities, if all devices in a home operate through a controller, the customer's meter demonstrates aggregate performance and should be sufficient at least for all non-export resources. Aggregate resource data from a DERA may be helpful to EDCs in estimating load, but it is not clear why information about, for example, smart refrigerators should be provided to EDCs unless they are eligible for customer rebates.

24. The screens in the Commission's current regulations are designed for standalone front-of-the-meter generation. They assume that a customer building with multiple resources will deploy them to create maximum risks to the system. As an example, a home with a solar system and a battery will be discharging the battery in full while solar generation is at its peak. The typical planned use pattern is the opposite – the battery will charge at solar peak and discharge when the sun fades. The Commission raises a question about tailoring aggregation review to the use case, but the City Parties suggest that resource interconnection review should be tailored to the use case. FERC has accepted this view with respect to large battery installations,[28] but the City Parties believe that existing control technology will allow any DER to conform to agreed upon export limitations. Interconnection review should move to focus on adequacy of DER controls rather than either assuming that there are none or assuming that a

[28] 184 FERC ¶ 61,054, ¶ 1518 at 970 (July 28, 2023), https://www.ferc.gov/media/order-no-2023.

DER management system ("DERMS") must manage remotely.[29] The City Parties suggest that DERMS have an important role to play in providing grid resilience in a digitally controlled, segmented grid,[30] but micromanaging within customer homes is not one of them. The City Parties doubt that non-firm interconnections will allow customers to provide useful performance assurances to aggregators, but rather, suggest that agreed upon performance parameters in an interconnection agreement (and programmed into a building controller) may be a useful approach.

25. The City Parties raised in the Background (Paragraph 15) the problems that can arise from direct control of residential resources by an aggregator. Direct control by an EDC of home HVAC equipment and appliances is far more problematic. The aggregator has a direct agreement with the customer that, the City Parties would recommend, has protections from arbitrary cut-offs or provisions for customer override.[31] The EDC provides no protection. It should be sufficient for the EDC to have visibility and emergency cut-off control of resources that inject power to the grid (presumably to be rarely exercised). The City Parties suggest that, for most purposes, the EDCs, and the RTO's as well, should look to aggregators, not customers, for management of aggregated resources in accordance with distribution system limits.[32] This may require aggregators to carry reserves and/or balancing hedges to assure compliance with and reduce risks of firm bids to PJM. Aggregators in turn should have contractual boundaries on non-performance, and the Commission may well wish to provide limitations on risk-shifting to customers. Average households and small businesses are ill-equipped to take on these risks. Automation of customer response avoids unintended failure to respond, but we believe that customer ability to override, whether a dispatch signal or a preselected price response, is critical to customer wellbeing.

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[29] The City Parties are not objecting to emergency remote cutoff capability for export resources, but we suggest that total central dispatch control of household appliances is a poor way to run a VPP and an even poorer way to attempt to run a distribution system.

[30] *See,* T&D World, *Chattanooga EPB Microgrid Serves Emergency Response Center* (May 2, 2023) https://www.tdworld.com/microgrids/article/21262818/chattanooga-epb-microgrid-serves-emergency-response-center.

[31] We discuss consumer protections from aggregators below at ¶32.

[32] We discuss communication about distribution system limits below at ¶38.

B. Changes To Metering Requirements

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.

26. The City Parties generally have no comment at this time on the technical requirements of metering and have commented above on issues of direct control, submetering, and load assumptions.

27. The DERA review process should focus, in addition to the questions as to the grid effects of individual resources covered in interconnection review, on the effects on the distribution system of any groupings of individual resources within the aggregation on individual grid segment given the expected operation of the aggregation including the products to be offered and the type of resources involved. As with individual resources, the focus should be on the adequacy of aggregator controls to operate within grid safety requirements.

C. Cost Allocation Issues for Facilities Allowing the Interconnection of DERs

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 adaption.

28. DERA market participation can be expected to reduce rates for many reasons:

- Use of locally generated power reduces line losses;
- Demand management by DERA at times of peak demand reduces the wholesale price at the times it is the greatest and also reduces the system requirements for peak capacity;
- In a period where electrification of both transportation and HVAC are expected to grow dramatically (as well as demands of artificial intelligence applications)

customer and community investment in new capacity can substantially reduce the burden on ratepayers;

- If DERAs are providing the infrastructure to communicate with and elicit responses from customer DERs, the expense to EDCs of additional information management and transfer should be orders of magnitude less than the system benefits; and
- Enough pilot programs and full-scale deployments of VPPs and utility transactive energy pricing programs have been undertaken by now that data should be readily available, and the City Parties encourage the Commission to gather that data for itself.

29. The City parties suggest that EDC administrative costs of customer participation in DERAs be paid by all ratepayers. These costs are intended to make available energy choices and the benefits of increased competition to all customers and, therefore, should be funded by all classes of ratepayers. The costs of system upgrades to assure that customers have equal ability to interconnect DERs that are appropriately sized to the customer's load (and accordingly are not primarily intended for export) should generally be treated as grid modernization. This assumes the implementation of DER controls as discussed above to assure that DERs operate as planned. To the extent that charges are imposed on customers, upfront charges assessed with no assurance that interconnection is possible are a major barrier to customer adoption. When such charges are imposed to allow the EDC to, in effect, study its own system, there is no justification. The EDC should have an adequate model of its own system without creating the wheel for an individual residential customer. It should have such a model, in the first place, to allow it to prioritize upgrades in historically underinvested areas.

D. Adjudication of Disputes Regarding the Registration of DERs

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 a11d PJM's DAPM, a11d if so, the specific changes to the PUC's regulations that would facilitate this adaption.

30. The City Parties have no comment on this question at this time.

E. Management Of Distribution Utility Overrides of DERs to Maintain Reliability, and Disputes Arising Therefrom

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.

31. The City Parties suggest that EDC ability to override DERs should primarily be addressed to front-of-the-meter DERs and DERs that are substantially oversized for customer expected load. As a goal, the system should be prepared to include residential and small business solar sized to meet customer load without the requirement for customer-paid upgrades. Where upgrades are needed, the current system of charging the first customer to apply the full cost of the upgrade (or the first customer after hosting capacity is exhausted) is wildly unfair for residential and small business customers. As PJM moves to cluster studies that should be somewhat ameliorated, however we encourage the Commission to move toward a new grid model in which self-supply is intended to be an option for any customer.

F. Protection Of DER Owners from Unfair Trade Practices or Excessive Risk in the Wholesale Markets

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.

32. The City Parties believe it is appropriate for the Commission to regulate DERA's to assure customer protection. Consistent with other aspects of the Commission's regulatory authority, we believe that governmental entities operating within their own jurisdiction should be exempt from such regulation.[33] Unlike retail choice, implementation of

[33] The Public Utility Code generally excludes municipalities from the definition of public utility: a public utility is defined as person or corporation; and corporation in turn is defined to exclude municipal corporations "except as specifically provided;" Examples of "specifically provided" typically relate to a municipality providing service outside of its jurisdiction – e.g. 66 Pa. C. S. § 1301 and 66 Pa. C. S. § 1102(a)(5).

a DERA will typically involve installation of some new equipment at a customer's home or facility and may involve, for example, installation of batteries, EV chargers or major appliances. The Unfair Trade Practices and Consumer Protection Law may be more clearly applicable as a result. In any event, municipally operated or procured VPPs, can serve as an antidote to unscrupulous aggregators.

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

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.

33. FERC has determined that net metering customers who receive full retail rate compensation (as is true in Pennsylvania) can appropriately be excluded from participation in DERAs in PJM.[34] In general, customers registering for DERA participation should be required to disclose all retail programs in which they participate, and no customer should get credit for participation in two programs for the same product at the same time. Since any retail program will be under the jurisdiction of the Commission, we assume it would be appropriate for the Commission to make thoughtful decisions about what constitutes an overlapping product and regulate accordingly.

H. Any Necessary Electronic Data Exchange Revisions

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 adaption.

34. The City Parties have no comment on this question at this time.

[34] 182 FERC ¶ 61,143 (March 1, 2023) at 57-59.

I. Small Utility Opt-in Procedures

The PUC seeks comment on procedures for small utilities to "opt-in" toOrder 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.

35. The City Parties have no comment on this question at this time.

J. Potential PUC Oversight of 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.

36. If a DERA is implemented through EGS pricing, the Commission will have direct jurisdiction. The Commission also has jurisdiction, at a minimum, to avoid double counting with Commission jurisdictional retail programs. Given that the collective operation of a DERA can affect the operation of the distribution system, the Commission has another basis to assert jurisdiction. If the Commission treats customer-sized BTM interconnection as a system cost, that provides an additional direct regulatory connection to the aggregator. We expect that the collectivity of these relationships will allow the Commission to also address customer protection.

K. Cybersecurity Considerations

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.

37. The City Parties have no comment on this question at this time.

L. Distribution Level Benefits

The PUC seeks comment on whether and how it should account for the distribution

level benefits of DERAs.

38. DERAs and individual DERs can operate to protect the distribution system if there is adequate information about the needs of the distribution system and DER contributions are rewarded. In the discussion above, the City Parties have assumed that the only information the DERA has about distribution system needs is the operating parameters supplied in connection with DER interconnection and DERA registration. If the EDC can supply dynamic distribution system information in the form of supplemental congestion pricing, DERAs that operate through pricing can directly implement distribution system dynamic limits. The City Parties do not believe that any EDC in Pennsylvania currently has that capability. Implementation of dynamic limits through mandatory dispatch may interfere with DERA wholesale market obligations. Either a priced system or a non-mandatory dispatch system, as discussed above, requires DERAs to carry reserves or otherwise manage their performance risk. The City Parties support dynamic management of distribution system limits, in part because they are an alternative to more constraining fixed limits. The City Parties have no suggestions at this time for compensation of non-dynamic distribution system benefits.

M. EDCs Acting as DERAs

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.

39. We see no benefit in EDCs operating as DERAs. The possibilities of ratepayers subsidizing competition with independent DERAs are too many and too hard to police. There may well be a case for EDC dynamic pricing, but that is beyond the scope of this proceeding.

N. Billing Issues

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.

40. Unless a DERA is implemented through dynamic pricing by an EGS, there will be no direct interplay between billing by the EDCs and payments by DERAs to their customers based on wholesale market participation. The Commission generally does not regulate prices of EGSs, but it can, and does, mandate a level of transparency. Whether the Commission can impose a similar regime on non-EGS DERAs is the same issue raised by Question J.

O. Equity Concerns

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.

41. Assuring access to DERAs for all customers is a major concern. To the extent that participation in a DERA represents an opportunity to save on overall utility bills, exclusion from participation may discriminate against LMI customers. This includes the need for internet or equivalent communication to allow for communication of price or dispatch signals (many solar installations use a dedicated cellular signal, and there are systems that use radio sideband communication), and for many types of DERAs, a home energy management system will be required (although, an exception could be made to allow for device level metering for a single device such as a smart thermostat or water heater for an LMI residence.) More broadly, financial access to DERs (and smart appliances, smart thermostats, etc.) is critical. The proposed Philadelphia VPP is designed to address these issues by providing financing, lease options and LMI subsidies.

42. Multifamily and other rental properties raise more complex issues. Without individual metering, it is difficult to reward grid-benefitting behavior, and renters may be unable to install rooftop solar or even batteries. For purposes of a non-EGS DERA, installing submetering adequate to monitor and reward demand reduction that functions independently of the EDC billing system is probably feasible. Similarly, non-utility metering for individual apartment hot water consumption may be able to function as a proxy for common electric water heating usage to provide incentives (though it may be harder to relate directly to time of electricity use). In the experience of the City Parties, the Commission's metering rules, at least as applied by the EDCs, often make creative solutions difficult and the City Parties would welcome a further examination.

Conclusion

43. The City Parties encourage the Commission to move toward a future in which customer participation in generation and load management is the rule not the exception. We believe that customers and communities will take the lead in decarbonizing the grid and will provide the benefits of increased competition and increased load responsiveness to all ratepayers.

Respectfully submitted,

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