KATHAN ENERGY CONSULTING

Unleashing Virtual Power Plants in the District of Columbia:

Recommendations for a Regulatory Roadmap to Implement FERC Order 2222

1. Introduction and Summary[1]

The District of Columbia sits within the PJM Interconnection regional transmission operator (RTO) and imports approximately 96% of its power from outside DC. PJM is currently facing significant challenges driven by rapid load growth—particularly from data centers and artificial intelligence facilities—while simultaneously managing generator retirements, interconnection backlogs, and delays in bringing new resources online. These pressures have contributed to tightening reserve margins and rising capacity prices, which have led to dramatically rising regional electricity prices throughout the PJM region, underscoring the importance for the District in leveraging local technologies and resources to reduce energy costs.

Virtual power plants (VPPs) are emerging as a key tool to manage energy costs in a manner that does not require new expensive infrastructure. VPPs come in a variety of types, from strictly retail programs providing local distribution services to large aggregations of many different distributed energy resources (DERs) that participate directly in wholesale electricity markets.

The Federal Energy Regulatory Commission (FERC) issued Order No. 2222 in 2020 to enable VPPs to participate in wholesale markets.[2] PJM will be implementing FERC Order 2222 fully in February 2028. FERC Order 2222 creates an important new source of value and revenue for VPPs and additional flexibility and services within the District. PJM filed its compliance proposal and received final approval from FERC in July 2025.

This report focuses on how the District can support and enable VPPs that have the ability to directly participate in wholesale electricity markets administered by PJM and take advantage of the new market opportunities created by FERC Order 2222. If implemented

[1] See Attachment A for a list of key terms used in this report.

[2] Final Rule, Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators, Docket No. RM18-9-000, 172 FERC ¶ 61247 (September 17, 2020) (FERC Order 2222), https://www.ferc.gov/sites/default/files/2020-09/E-1_0.pdf

well, the District should view FERC Order 2222 as an opportunity to optimize existing and future infrastructure to access additional value from distribution, transmission, and PJM markets, and in a manner consistent with the District's climate commitments.

This report focuses on steps the District should take to support FERC Order 2222 implementation. The report is not an assessment of overall District VPP policy, nor does it delve deeply into the design of retail-level VPPs. However, many of the recommendations in this report would serve as valuable building blocks to support retail-level VPPs in the future.

This report urges action by District agencies to implement FERC Order 2222. The District has two key options or regulatory pathways to implement the order:

- Path A – Minimum Set of Policies Needed for Meaningful PJM market participation; and
- Path B – More Robust Set of Policies to Support Viable VPPs.

To provide additional markets for VPPs, facilitate greater DER deployment, and create additional sources of revenue and value, this report recommends Path B. This report also recommends a regulatory process to implement these pathways.

2. Objective & Process

The objective of this report is to advise the District of Columbia's Department of Energy and Environment (DOEE), and the District more generally, on the design of a regulatory framework to support DER aggregations (DERAs) and VPPs, with a focus on facilitating participation in PJM's electricity markets and providing flexibility and resource values to the District. This project is within the larger effort by the DOEE to research and gather information on VPPs.[3] To advance these goals, DOEE contracted with Kathan Energy Consulting, a leading expert on VPP policy and FERC Order 2222 implementation. DOEE also received input and advice from the Energy Policy Design Institute's VPP Convergence Project.

As part of the project, Kathan Energy Consulting reviewed actions taken by District of Columbia agencies, especially the Public Service Commission (DCPSC), examined VPP types and regulatory policies implemented in other states, and conducted two workshops to gather input

[3] The DOEE issued a Request for Information (RFI) on June 9 to gain input from stakeholders on VPPs, particularly feedback on priority actions and policies the District should undertake. Thirteen parties submitted feedback. A summary of this feedback is attached as Attachment A. The RFP can be found at https://doee.dc.gov/release/notice-request-information-advancing-der-aggregations-and-ferc-order-2222-implementation-dc.

from stakeholders. This draft report summarizes key findings and proposes a set of regulatory pathways.

3. Virtual Power Plants

The term VPP is a relatively new concept to describe aggregations of DERs that provide grid services. A good definition is included in the U.S. Department of Energy's Commercial Lift-Off Report on VPPs:

> Aggregations of distributed energy resources (DERs) such as smart appliances, rooftop solar with behind-the-meter batteries, electric vehicles and chargers, and commercial and industrial loads that can balance electricity demand and supply and provide grid services like a traditional power plant.[4]

For the purposes of this report, we primarily focus on VPPs that contain at least some DERs that inject power into the grid and are dispatchable. DER technologies capable of injecting power include behind-the-meter storage and electric vehicles (EVs). Programs and regulatory pathways already exist at PJM for VPPs that consist entirely of DERs that reduce customer demand (such as demand response resources) at a customer site.[5] Consequently, many of the policy topics and policies discussed below are not relevant to these types of VPPs.

The value of VPPs as a resource has been the subject of multiple reports. In general, deploying VPPs represents an opportunity to quickly and cost-effectively meet new infrastructure needs, and to operationalize the full capabilities of DERs. VPPs can provide significant value to the District. Benefits include managing electrification load growth, avoiding distribution-system upgrades, supporting renewable integration, resilience and energy security, and affordability and equity. These benefits are particularly important for the District, which currently imports approximately 96% of its power and has limited abilities to develop large scale generation or transmission.

Research underscores the value VPPs can provide. The Brattle Group published a study in 2023 that found that VPPs could provide the same resource adequacy at a significant cost discount relative to alternative options.[6] While VPP value depends on the conditions existing within a utility, state or region and by uses cases, Brattle found that the net cost to

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[4] U.S. Department of Energy. *Pathways to Commercial Liftoff: Virtual Power Plants*. Washington, DC: U.S. Department of Energy, September 2023, https://climateprogramportal.org/resource/pathways-to-commercial-liftoff-virtual-power-plants/

[5] See, for example, Pepco's Energy Wise program and PJM's Emergency Load Response Program.

[6] Ryan Hledik & Kate Peters, *Real Reliability: The Value of Virtual Power*, The Brattle Group (May 2023), https://www.brattle.com/wp-content/uploads/2023/04/Real-Reliability-The-Value-of-Virtual-Power_5.3.2023.pdf

the utility of providing resource adequacy from a VPP is roughly 40–60% of the cost of the alternative options, and that 60 GW of VPP deployment nationwide could meet future US resource adequacy needs at $15–$35 billion less than the cost of the alternative options over the ensuing decade.

4. Need for State Action to Implement FERC Order 2222

A major federal action that provides important new markets for VPPs is FERC Order 2222. FERC Order 2222 revised FERC's regulations to remove barriers to the participation of DER aggregations (and VPPs)[7] in the capacity, energy, and ancillary services markets operated by RTOs and Independent System Operators (ISOs).

FERC's Order 2222 addresses the key challenges PJM faces – increasing demand, power plant retirements, and long delays developing traditional sources of large-scale generation these challenges – head-on. FERC's rationale for issuing FERC Order 2222 was that "by removing barriers to the participation of distributed energy resource aggregations in the RTO/ISO markets, this final rule will enhance competition and, in turn, help to ensure that the RTO/ISO markets produce just and reasonable rates."[8] FERC further stated that the "final rule will help enable the participation of distributed energy resources in the RTO/ISO markets by providing a means for these resources to, in the aggregate, satisfy minimum size and performance requirements that they may not meet on a stand-alone basis."[9]

Order 2222 requires each RTO/ISO to (a) develop tariff provisions that ensure that its market rules facilitate the participation of DER aggregations, (b) allow DER aggregations to participate directly in RTO/ISO markets, and (c) establish DER aggregators as a type of market participant that can register DER aggregations. Compliance by all RTOs and ISOs is complete. PJM complied with FERC Order 2222 in July 2025, and PJM's implementation of the Order will start in February 2028.[10]

Due to the issuance of FERC Order 2222 and the obligations that the Order places on state agencies to change their rules to allow or support RTO/ISO market participation, several states, particularly in the PJM region, began proceedings on implementation of FERC Order

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[7] For the purpose of this report, the term DER aggregations will be used synonymously with VPPs.
[8] FERC Order 2222, P3
[9] FERC Order 2222, P5
[10] See https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/disrs/postings/ferc-order-no-2222-overview.pdf for a summary of PJM's model. DER aggregators will be able to directly participate in PJM energy and ancillary services markets on February 1, 2028. DER aggregators will be able register to participate in capacity markets on February 1, 2027. Consequently, DER aggregators will not be able to directly participate in the June 2026 Reliability Pricing Model auction for delivery year 2028/2029, and will need to wait until the next capacity auction or participate in incremental auctions for the 2029/2030 delivery year.

2222 in advance of PJM implementation of the Order in 2028. In order to meet the 2028 PJM implementation date, PJM states will need to complete any rule changes prior to February 2028, and by early 2027 to support DER aggregators who intend to register as PJM capacity resources in the 2028/2029 PJM Reliability Pricing Model capacity auction.

Maryland, Pennsylvania and New Jersey have initiated proceedings to implement Order 2222. Of these three states, Maryland and New Jersey are the furthest along (see the Maryland process callout box). The New Jersey Board of Public Utilities (NJBPU) recently issued a VPP Straw Proposal in July 2026. The NJBPU intends to issue an order directing VPP filings on VPPs by October 2026. Pennsylvania has not completed its proceeding. Maryland and New Jersey could serve as a possible model for District activity, with Maryland focusing on the development of policies at the work group level, with Commission approval and guidance on work group products, and New Jersey is more top-down, representing a Governor-directed and NJBPU-led proceeding.[11]

5. VPP Policy Framework

To help guide the development of a regulatory framework and pathways for the District of Columbia, Kathan Energy Consulting worked closely with Energy Policy Design Institute's (EPDI) VPP Convergence Project.[12] The VPP Convergence Project has created a VPP Policy Framework for organizing VPP knowledge and best practices and is currently researching and developing a comprehensive list of VPP Policy Topics to help state agencies understand what to consider when developing VPP policies within their own jurisdictions. According to EPDI, "the goal of the VPP Convergence Project isn't to push specific policies. It's to help public utility commissions cut through the noise and make informed, evidence-based decisions."

EPDI created an initial draft set of VPP Policy Topics that are designed to help regulators and stakeholders understand what regulatory policies and processes are needed to support VPPs. Furthermore, to help group the topics by similarity and policy area, the VPP Policy Topics established six categories of policy topics. A draft version of EPDI's VPP Policy Topics is included in Attachment C. Figure 1 displays how these policy topics can be grouped by policy category.

[11] New Jersey Board of Public Utility, Straw Proposal: Virtual Power Plant Program, July 16, 2026 (Docket Nos. QO26030099); Pennsylvania Public Utility Commission (PAPUC) Docket No. L-2023-3044115, In re: Distributed Energy Resources Participation in Wholesale Markets, Chapter 57: Notice of Proposed Rulemaking Order, December 18, 2025.

[12] https://www.epdiusa.org/projects/vpp-convergence-project.

Maryland VPP Activity

- Since 3Q 2023, the MDPSC's Interconnection work group has been developing a set of grid services regulations to
  - Implement FERC Order 2222
  - Harmonize retail and wholesale VPP policy.
- In 2024, Maryland enacted the Distributed Renewable Integration And Vehicle Electrification Act (DRIVE Act), which requires
  - Development of VPP pilots or temporary tariffs
  - Creation of time-of-use tariffs
  - Enablement of vehicle-to-grid (V2G) programs.
- The MDPSC implemented V2G regulations in December 2024, and required refiling of Maryland utility VPP proposals in October 2025.
- In March 2026, the MDPSC opened up a new proceeding (PC77) to consolidate policy development on the DRIVE Act, DER policy and demand response policy.
- In May 2026, the MDPSC issued Order No. 92398 that provided guidance on a number of DER and VPP issues, including access to customer data, DER management system (DERMS), DER registries, device-level metering, and communications protocols.
- In June 2026, the MDPSC approved, with revisions, the revised Maryland utility DRIVE Act proposals.
- The Interconnection Work Group plans to propose VPP regulations by 3Q 2026.

Since this paper is focused on how VPPs can participate in PJM's wholesale markets, Table 1 focuses on a subset of the broader policy topics with relevance to DER aggregation participation in PJM wholesale markets. Table 1 further separates these policy topics into (a) issues where state or local action is directly required, encouraged or considered essential by FERC to implement FERC Order 2222, and (b) areas where state or local action can support VPP participation in wholesale markets, but are not strictly necessary.

The second group, the remaining seven policy topics that are designated as supportive to the success of DER aggregation in PJM, are not directly addressed in FERC Order 2222. In many cases, implementation of policies in this second supportive group will be critical to the success of DER aggregation participation in PJM wholesale markets and VPPs. For example, access to metered customer data within one business day will be essential for DER aggregators to participate in PJM wholesale markets, even though FERC Order 2222 itself did not specify this capability as a requirement.

Figure 1 – VPP Policy Topics Categorized by Policy Category

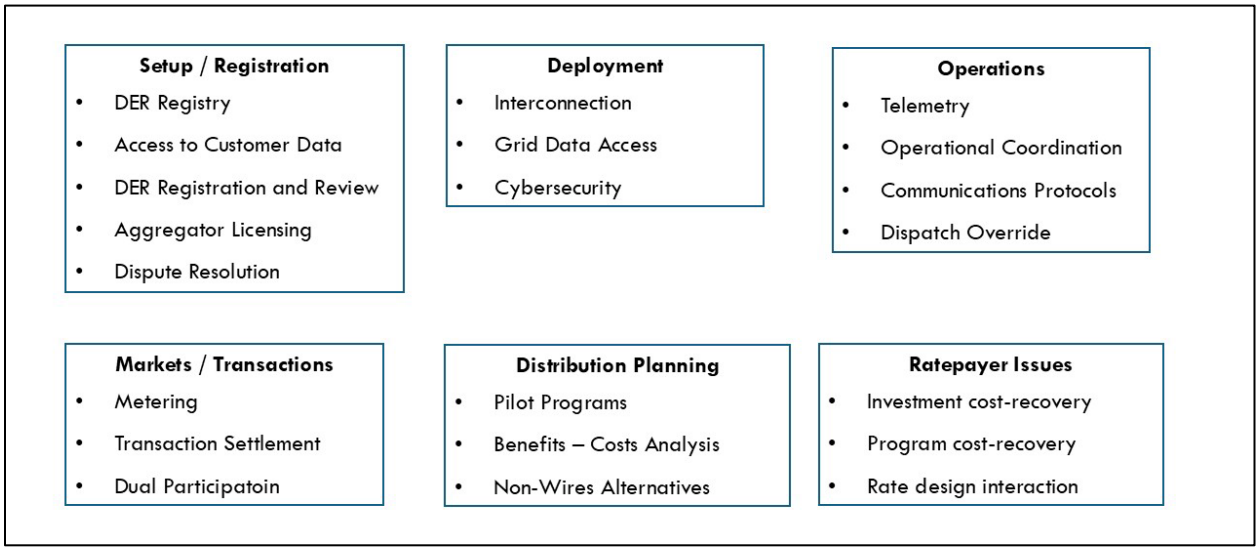


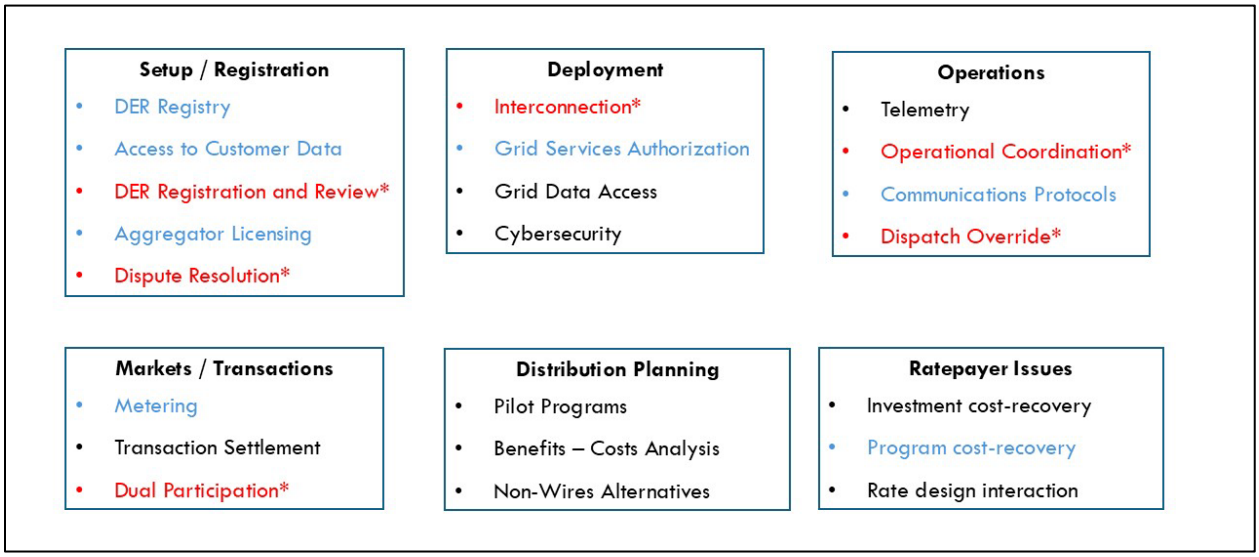
Table 1 - FERC Order 2222: PJM States VPP Policy Topics

Policy Topic	State and Local Action Necessitated by Order 2222	Additional State and Local Actions Supportive of Order 2222
DER Registry		✓
Access to Customer Data		✓
Aggregator registration / licensing		✓
Dispute Resolution	✓	
Interconnection	✓	
DERA Registration and Electric Distribution Company (EDC) review	✓	
EDC/DERA Operations Coordination	✓	
Communications Protocols		✓
Dispatch Override	✓	
Grid Services Authorization		✓
Metering		✓
Dual Participation	✓	
Program Cost Recovery		✓

Note that the other VPP policy topics listed in Attachment B are also important for the development of VPP policy within a jurisdiction, should not be ignored, and should be considered in broader VPP policy development.

Figure 2 applies the categorization of PJM-relevant policy topics from Table 1 onto the list of policy categories and topics shown in the VPP Convergence Projections' categorization of projects from Figure 1. In Figure 2, the necessary and supportive policy topics are color-coded.

Figure 2 – Core FERC Order 2222 Policy Topics



Key – **Red** and *= Necessary Policy, **Blue** = Supportive Policy, **Black** = General VPP Need

A description of each of these core FERC Order Topics follows. Policies that are necessary to implement FERC Order 2222 are highlighted with a red [Order 2222] indicator.

- **DER Registry.** A DER registry is a single point of truth for data on DERs, used by different stakeholders to more effectively and efficiently enable DER aggregations and VPPs to provide retail and wholesale services. A DER registry will contain information on DER characteristics, DER capabilities, location (electrical and geographic), ownership, and tariff/program participation. Tracking of EVs, managed charging systems, and vehicle-to-grid (V2G) systems is another layer of complexity that may need to be examined.
- **Access to Customer Data.** Access to customer usage and DER operational data will be needed by any VPP to register, operate, and settle transactions in PJM, and should be a priority issue for the District. DER aggregator access to customer usage is especially critical since PJM requires DER aggregators to submit detailed, metered DER data within one day.[13] Policies enabling third-party access to this data, subject

[13] For reference, please access PJM's presentation entitled "DER Aggregator Participation Model: Full Model Design," presented to the Distributed Resources Subcommittee on March 9, 2026, https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/disrs/2026/20260309/20260309-item-05---updated-der-aggregator-participation-model---full-model-design---informational-only.pdf.

to appropriate privacy and cybersecurity protections, will be essential for future VPP deployment.

- **Aggregator registration / licensing.** In order for VPPs to operate within a state or jurisdiction, registration or licensing of DERAs or VPPs may be needed to ensure compliance with state and local laws and regulations, and to provide important information about the VPPs.
- **Dispute Resolution.** Rules and procedures to address DERA and VPP dispute resolution are required at the state and local level. If a state or locality is in a wholesale market like PJM and wants to implement FERC Order 2222, it is important to differentiate between issues that will be deliberated at the RTO/ISO level versus district or state level. [Order 2222]
- **Interconnection.** FERC Order 2222 requires that a DER obtain an interconnection agreement prior to being aggregated. States and localities with retail and wholesale VPPs may determine that new interconnection rules are needed, especially to allow resources to inject power into the grid. Participation of DERs in DER aggregation and VPPs may require new interconnection rules, particularly to assess the adequacy of existing interconnection agreements, and the potential need for an interconnection review of a full DERA. In addition, rules for the interconnection of V2G will also need to be considered for development. [Order 2222]
- **DERA Registration and EDC review.** FERC Order 2222 requires extensive coordination between electric distribution companies (EDCs) and VPPs/DERAs (and RTOs/ISOs). Coordination is particularly key to the review of individual DERs for participation in a DERA or VPP. Rules and oversight of this coordination are needed. [Order 2222]
- **EDC/DERA Operations Coordination.** The implementation of FERC Order 2222 requires extensive coordination between EDCs and VPPs/DERAs (and RTOs/ISOs). State and local regulators need to develop clear roles, rules, and oversight to guide communications protocols between EDCs and DERAs. The possible inclusion of electric vehicles and vehicle-to-grid capabilities in DERAs increases the need for effective coordination. [Order 2222]
- **Communications Protocols.** Communications pathways will be needed for sharing information (e.g., DER dispatch overrides) between EDCs and DERAs/VPPs. In particular, communications with no significant time lag will be needed to support operational coordination, especially within the PJM operating day.
- **Dispatch Override.** Local conditions on the distribution system may necessitate EDC dispatch override of DER operation. This has important implications for VPP/DERA operations if they participate in wholesale markets. Key aspects of the

DER dispatch override should be examined: criteria used to override DER operation, including explanations of the override, and the communications of DER dispatch overrides to VPPs/DERAs. [Order 2222]

- **Grid Services Authorization.** Authorizing VPPs or DERAs is needed to provide specific grid services in states and localities. State and local rules and regulations would generically specify which grid services a VPP or DERA can provide at the distribution-level. For example, smart thermostats and EVs could be directly authorized to provide distribution support services to Pepco to assist in its distribution operation.[14]
- **Metering.** Metering technology measures and reports activities of DERs and VPPs to the markets and EDCs for transactions. For VPPs and DERAs, it may be beneficial to have direct metering of DERs (not whole-premise metering), which can include DER devices with sufficiently accurate internal measurement processes of DER operation. However, revenue-class metering is typically the only form of metering allowed or allowed for settlement.
- **Dual Participation.** Under Order 2222, DERs can participate in wholesale markets and retail programs. This leaves open the potential concern of double-counting. In addition, FERC Order 2222 allows state or local regulators to place restrictions on the ability of DERs to participate in DERAs at both the retail and wholesale level. Therefore, state or local regulators will need to determine if DERAs have ability to provide services to the distribution system and wholesale markets simultaneously, without double-counting. [Order 2222]
- **Program Cost Recovery.** EDC investment in the systems and programs that support VPP deployment will be needed. In addition, policies associated with any costs triggered by VPPs will be needed to ensure equitable allocation of costs. Clear state and regulatory support for and approval of prudent and cost-effective systems and programs that are consistent with the District's climate goals and commitments should be a priority of the DCPSC.

6. Status of VPP Policy in the District

The District of Columbia has adopted some of the most aggressive clean-energy and distributed energy resource policies in the United States, centered on statutory commitments to achieve carbon neutrality by 2045, 100% renewable electricity by 2032, and 15% local solar production by 2041. The District's policies strongly promote distributed solar, battery storage, demand response, electric vehicles, building

[14] Licensing procedures could also include the specific grid services a VPP or DERA is licensed to provide.

electrification, and DERs through a combination of renewable portfolio standards, community solar programs, net energy metering, beneficial electrification policies, energy-efficiency mandates, and grid modernization initiatives overseen by the PSC. Strategic plans such as Clean Energy DC frame DERs as essential tools for decarbonization, resilience, peak reduction, electrification management, and affordability, while the District's climate and building laws increasingly tie DER deployment to broader goals involving environmental justice, transportation electrification, and modernization of the electric distribution system.

The District does, however, lag other PJM jurisdictions like Maryland, New Jersey and Virginia on developing and deploying VPPs as a tool to meet the District's climate and clean energy goals. The implementation of important foundational systems and investments, such as initial pilot VPPs or a DERMS, is still at an early stage. Although the DCPSC is pursuing a VPP pilot project, with the support of the Pilot Projects Governance Board, no VPP program or pilot is currently operating in the District and District regulators have also not conducted any substantial proceedings focused on VPPs or FERC Order 2222, as states like Maryland have done.

Nevertheless, activity related to VPPs is starting to occur in the District. Several VPP pilots are under development, including a pilot planned to be funded by the PSC – the PSC recently issued an RFP for VPP or DERMS systems, which focused primarily on technology and capabilities.[15] DOEE issued a Request for Information on VPPs on June 9, 2025 to identify steps District agencies can take to support VPP deployment.[16] In addition, the PSC awarded a $3 million contract to Ecogy Energy and Ecosuite for a solar aggregation and advanced inverter project. This project will provide information and lessons learned about DER coordination technologies that can benefit future VPPs. The DC Sustainable Energy Utility (DCSEU) is preparing to launch its CarbonSmart Affordability Operations (CSAO) Pilot, which will evaluate emissions-aware operation of flexible DERs and examine how performance-based incentives can encourage operational behaviors that reduce greenhouse gas emissions while also supporting affordability and grid objectives. Pepco has also proposed VPP programs as part of past filings with the DCPSC, though none have yet been approved.[17] Pepco, in concert with its sister utilities in other states, is pursuing

[15] Public Service Commission of the District of Columbia, *Request for Proposals No. PSC-25-07: Virtual Power Plant or Distributed Energy Resource Management System Pilot Project* (issued July 9, 2025).
[16] See Attachment A for a summary of feedback received.
[17] Pepco proposed a VPP demonstration project to deploy BTM batteries in 2022 as part of its Climate Solutions Plan (CSP) Phase I Application. Pepco indicated that this VPP demonstration would receive revenues from the PJM wholesale market.[17] This project has not yet been approved or implemented.

development of a utility DERMS and DER-security infrastructure platform, which the Company anticipates having operational by late 2028.

Given the early-stage nature of VPP policy in the District, little attention has been given to the implementation of FERC Order 2222. A review of all the required and needed policies to support FERC Order 2222 (see Table 1) indicates that the District has not acted or considered most of the policies necessary to implement FERC Order 2222 or can support implementation. The only two policy areas that the District has actively worked on are Access to Customer Data and Interconnection, but this work is still ongoing and is not targeted on implementing FERC Order 2222. The Customer Impact Working Group actively worked on implementing Green Button Connect My Data and the DCPSC issued several orders on Green Button Connect My Data between 2020 and 2022.[18] The PSC has not yet set a clear path for Pepco to implement a data exchange platform using Green Button Connect My Data, especially for residential customers.[19] The District is further along on interconnection standards, and Small Generator Interconnection Rules are currently in place.[20] However, clean energy advocates, such as CHESSA, argue that the existing standards need to be updated. This creates a gap between existing processes and regulations and the set of actions that will be needed to support VPPs and implement FERC Order 2222.

7. Summary of Workshops and Feedback Received

To obtain feedback and information about VPPs and their possible participation in PJM markets, two workshops were conducted. The first occurred on March 26, 2026 and used a virtual format and a second workshop was conducted as a hybrid in-person/online workshop on June 24, 2026 at DOEE offices in Washington, DC.

[18] Formal Case 1130, Order No. 20364 (June 5, 2020) at paragraph 94 (directing Pepco to file a GBC feasibility report within 90 days); Order No. 21013 (September 9, 2021) (providing preliminary decisions on GBC platform design to enable cost estimates to be developed); and Order No. 21412 (July 29, 2022) at paragraphs 32-34 (adopting a definition for "best available data" and addressing data requirements and performance metrics).

[19] The DCPSC did issue an order on Green Button Connect My Data on July 15, 2026, directing Pepco to file updated cost information on the feasibility of adopting Green Button Connect My Data in the District. DCPSC. Formal Case No. 1130, In the matter of the investigation into modernizing the energy delivery system for increased sustainability, Order No. 22900, July 15, 2026, https://edocket.dcpsc.org/apis/api/Filing/download?attachId=247082&guidFileName=21bb3eca-4263-40da-bca5-5633fd506685.pdf.

[20] 15 D.C.M.R. Chapter 40. See also Formal Case No. 1050.

7.a Feedback Received During and After March 26, 2026 Workshop

The first workshop reviewed the purpose of this project, presented preliminary findings on the core state and local actions needed to implement FERC Order 2222, and received input from stakeholders.

Following the workshop, participants and workshop invitees were sent a questionnaire to elicit additional feedback.[21] Six responses were received. In addition, respondents were contacted to clarify and understand feedback provided. In summary, the respondents provided the following feedback.

- **Preferred VPP type.** In response to query about what kind of VPP is the best fit for the District, commenters expressed support for VPPs that provide a full set of benefits, with strong support of VPPs that provide grid services and locational services. Most commenters support aggregation of DERs to participate in PJM markets, especially due to the additional value wholesale participation unlocks. (i.e., access to the full value stack). In addition, the respondents all supported the design of a VPP in the District that is fully compatible with FERC Order 2222. One commenter argued that wholesale market participation or peak shaving should be the preferred VPP type since distribution services markets have not been established.
- **Preferred VPP Structure.** Most respondents expressed support for VPP programs owned and operated by a third-party aggregator, or to allow multiple VPP structures to exist. Pepco expressed a preference for third-party aggregations to receive a signal from a Pepco-owned DERMS in order to maintain grid conditions and visibility. Furthermore, Pepco stated that having to connect to individual DERs would be onerous to utility data flows, and preferred the third-party model.
- **Other States Role-Models.** When asked which state implementation model the District should consider in developing VPPs, most pointed to Maryland, but Massachusetts, New Jersey, and Virginia were also mentioned.
- **Regulatory Changes That the District of Columbia Should Consider.** A variety of answers were provided to this question, with support for a clear regulatory framework. A major theme expressed was the need for the District to focus initially on customer data access, and to complete earlier efforts to implement Green Button Connect My Data. Mission:Data emphasized that the lack of access to data is a fundamental barrier to DER aggregation and VPPs in the PJM region. It was recommended that the DCPSC finish its work on the subject. Other commenters

[21] Attachment B contains the set of follow-up questions.

recommended that net metering customers not be discriminated against when designing VPP rules.

- **Preferred Policies to Implement FERC Order 2222.** Respondents were asked to rank order a set of core policy topics required by or supportive of FERC Order 2222. While preferences differed significantly between respondents, the consensus top five policy topics were
    - Access to customer data
    - Interconnection
    - EDC/DERA coordination and review
    - Communications protocols
    - Dispatch override

- *7.b Feedback Received During and After June 25, 2026 Workshop*

A second in-person workshop occurred on June 24, 2026. During this workshop, Kathan Energy Consulting summarized the draft regulatory framework prepared for DOEE and stakeholders and received oral feedback on the regulatory framework. Following this workshop, stakeholders submitted their feedback on the draft regulatory framework.

The key feedback received included:

- A central theme across the comments was that VPPs should be treated as more than just a vehicle for distributed energy resources to participate in wholesale energy markets. Multiple stakeholders emphasized that the roadmap should explicitly align VPP operations with the District's broader, core policy objectives, such as meaningful greenhouse gas (GHG) reductions, system resilience, affordability, and energy equity.
- Another major focus of the feedback was the critical role of access to customer data, which was described as an essential, cross-cutting prerequisite for successful VPP implementation. Commenters argued that customer data access should be explicitly categorized in the roadmap as a legally and technically "necessary" component, rather than an optional one. This is because regional transmission organizations like PJM require interval data on rapid timelines for settlement, and aggregators face penalties or prohibition from participation if they cannot meet these reporting requirements. To resolve this, stakeholders strongly supported the full, uniform implementation of data exchange platforms—specifically utilizing the Green Button Connect My Data standard—to ensure secure, standardized, and user-friendly data sharing.

- Stakeholders urged the District to recognize and incentivize non-market benefits and carbon-aware dispatch protocols. DCSEU pointed out that optimizing VPPs solely for market revenues or system reliability does not inherently maximize emissions reductions. To address this, the feedback suggested incorporating performance-based incentives tied to verified GHG reductions and explicitly recognizing carbon optimization as a complementary component of VPP design. Furthermore, stakeholders recommended that VPP programs should be able to account for other valuable non-market services during cost-effectiveness screening, such as mitigating local distribution grid congestion, providing backup power for critical infrastructure, creating ratepayer savings via deferred grid investments, and supporting building electrification.
- Pepco provided detailed comments on the report. Pepco's feedback on the draft regulatory roadmap focuses on maintaining grid visibility, preferring contract-based coordination over new regulations, and supporting a specific structural model for VPPs.
    - *Preferred VPP Structure and DERMS*. Pepco reiterated its strong preference for a third-party aggregator model, noting that managing data flows by connecting directly to individual DERs would be "onerous". Instead, Pepco prefers that third-party aggregations receive signals from a utility-owned DERMS via an edge-DERMS provider. Pepco argued that developing a utility DERMS is critical for providing the necessary visibility into DER operations and supporting the utility's review of DER participation in aggregations. They anticipate having this DERMS platform operational by late 2028.
    - *Preference for Contracts over New Regulations*. When evaluating the proposed policy pathways, Pepco generally favored handling operational relationships through bilateral agreements rather than rigid new regulations. For instance, regarding the coordination of registrations, daily operations, and dispatch overrides, Pepco suggested these matters could be established within DERA-specific contracts or interconnection agreements rather than through new overarching District regulations. Similarly, Pepco argued that normal, existing dispute resolution processes are sufficient, questioning the need for specific rules targeted at FERC Order 2222 issues.
    - *Support for Developing Policies on FERC Order 2222 VPP topics*: Pepco expressed general support for the categorization and prioritization of core FERC Order 2222 policy topics, and agreed with the importance of District action on the required policy topics listed in Table 1.
    - *Technical and Operational Stances*. Pepco outlined a few specific technical preferences and concerns:

- Communications: Pepco plans to adopt IEEE 2030.5 as its primary communication and interoperability standard for VPPs.
- Dual Participation: While Pepco agreed that future tariffs must include rules to prevent double-counting across retail and wholesale programs, they raised significant concerns about the feasibility of "capacity-based" dual participation. Allowing a single DER to split its capacity between wholesale and retail markets (e.g., bidding part of a battery's capacity into wholesale while using the rest for retail grid services) would require advanced telemetry and create complex challenges for billing and dispatch coordination.

8. Recommended Regulatory Pathways

Two regulatory pathways are available to the District as it moves forward with the implementation of VPPs in the District that are also able to participate in PJM markets. As stated above, these alternative pathways start with the premise that the District is still in the beginning stages of developing VPP policy, and District action is needed. There are no VPPs operating in the District and key supporting policies and technologies have not been approved or implemented by the District. Due to the underlying need to address the District's exposure to high capacity costs and transmission costs driven by data centers in PJM, the implementation of a peak-shaving VPP should be pursued as the first priority. At the minimum, any regulatory pathway that supports FERC Order 2222 starts with the assumption that the District will adopt policies that support the development of a peak-saving VPP, such as interconnection rules that allow behind-the-meter (BTM) storage to export to the grid. In addition, the District may consider support for Pepco (and PHI's) investments in DERMS. Pepco argues that the existence of an edge DERMS will provide the needed visibility into DER operation and would support EDC review of DER participation in DERAs, and a utility DERMS would unlock a wide array of use cases.

Additional guiding principles include clearly delineating retail versus wholesale market use cases, and remaining flexible to allow for a wider set of services and use cases in the future, including but not limited to providing distribution grid services. Future District policies and regulations should be designed to maximize customers' ability to participate in VPP programs and to unlock their full value and environmental benefits. To facilitate this, the District should outline clear requirements of Pepco for its DERMS plans and VPP program(s) to inform future investment on the part of the EDC.

The District cannot choose to do nothing to facilitate VPP participation in PJM markets. First, as noted already, key VPP-supportive policies should be implemented irrespective of

FERC Order 2222 implementation. Without new regulations and rules, wholesale VPPs may be able to operate in the District without adherence to District-specific rules and oversight. Investments and policies planned for implementation must be factored into the baseline – e.g., Pepco's planned implementation of a utility DERMS by late 2028 for planned VPP pilots in other jurisdictions. Second, as discussed earlier, in several key areas (shown in Table 1 and Figure 2), state and local regulatory action is required or encouraged by the Order.

The District has two possible pathways to pursue to support the implementation of FERC Order 2222:

- Path A – Minimum Set of Policies Needed for Meaningful PJM Market Participation; and
- Path B – More Robust Set of Policies to Support Viable VPPs.

The core elements of each of pathway are listed below. The topics and recommended policies draw upon the VPP Policy Framework developed by the VPP Convergence Project.

- *8.a Path A* – Minimum Set of Policies Needed for Meaningful PJM market participation

Path A represents the minimum set of policies that can support FERC Order 2222 implementation in the District and provide a meaningful pathway for VPP participation. These policies are drawn from the Policy Readiness Levels included in EPDI's VPP Policy Framework. In general, the policies included in this minimum set are the first policy steps that will be necessary to facilitate VPP participation in PJM wholesale markets. Adoption of this set of policies will ensure that VPPs will have the ability to participate in PJM wholesale markets if they choose. Without regulatory action on these policies, barriers to participation will exist, and VPPs will find it difficult and burdensome to participate, or will participate without adherence to District rules or oversight.

Relative simplicity is the primary advantage of Path A; for many of the issues, the necessary policies are not significant departures from existing policies. The disadvantage of Path A is that it only unlocks a portion of the full value of allowing VPPs to participate in wholesale markets, especially if distribution services cannot be provided by VPPs in a timely manner.

Table 2 summarizes the recommended policies for each of the core FERC Order 2222 related policy topics, and highlights the topics considered necessary for FERC Order 2222 implementation. Note that several of the policies that represent minimum policies rely on PJM procedures or rules. In addition, several of these policies should be implemented

Table 2 – Path A – Minimum Set of Policies Needed for Meaningful PJM Market Participation

Policy Topic	Proposed Policy
DER Registry	Require Pepco and wholesale VPPs to use a manual registry for stationary DERs (e.g., solar), and this registry can interface with a wholesale market regional registry if one is published.
Access to Customer Data	Full and uniform implementation of Green Button Connect My Data in the District, ideally with the ability to obtain daily meter reads to comply with PJM DER aggregation settlement rules.
Aggregator registration / licensing	Aggregation registration/licensing rules promulgated by the DCPSC
Dispute Resolution (Necessary)	Normal dispute resolution procedures that exist in the District or the DCPSC
Interconnection (Necessary)	Interconnection rules that allow BTM batteries and electric vehicles to export to the grid
DERA Registration and EDC review (Necessary)	DCPSC sets clear coordination registration procedures/standards for Pepco's registration and review of DERs.
EDC/DERA Operations Coordination (Necessary)	Development of processes for ongoing coordination related to data flows and communication among PJM, DERAs/VPPs, and Pepco. At a minimum, follow PJM processes.
Communications Protocols	DERAs and VPPs use standard internet or communications protocols, such as IEEE 2030.5.
Dispatch Override (Necessary)	Pepco informs DERAs/VPPs of DER overrides based on PJM rules and criteria, not DCPSC-specific rules
Grid Services Authorization	No specific District rules. Use PJM's rules and registration requirements
Metering	Existing DCPSC metering and rules used for measurement and operations
Dual Participation (Necessary)	DERA/VPPs and DERs cannot participate in PJM's markets if they are also participating in specified retail programs/services (e.g. net metering)
Program Cost Recovery	Follow standard DCPSC rules and procedures to assess prudency, cost-effectiveness, and cost allocation of Pepco proposed VPP programs and infrastructure investments. Develop policies to address cost recovery of costs and investments created by DERAs.

regardless of whether VPPs will participate in PJM markets. For example, a registry of DERs within the District should be developed to provide Pepco with visibility into DERs on their system and to track which DERs are aggregated within any type of VPP, plus provide access to this information to aggregators. Other policies, such as completion of the implementation of Green Button Connect My Data and updating interconnection rules build on current efforts, and also provide significant value regardless of VPP type or participation model.

Six of these recommended policies relate to the necessary actions that the District must take to implement FERC Order 2222, and are described in greater detail below.

- **Dispute Resolution** – While most of the FERC Order 2222-related disputes will occur at PJM and address alleged violations of the PJM tariff or rules, disputes about DER participation in DERAs/VPPs can also occur at the retail level. For example, VPP providers may dispute Pepco's rejection of specific DERs from participating in their VPPs. Indeed, FERC Order 2222 clarified that states can play an active role in resolving disputes between DERAs and utilities in wholesale markets. At a minimum, normal dispute resolution procedures before the PSC should suffice to resolve these disputes. However, the development of VPP-specific processes may be worth considering.[22]
- **Interconnection –** FERC Order 2222 requires that any DER that will be aggregated into a DERA or VPP must have an interconnection agreement with their distribution utility. At the minimum, the DCPSC should ensure that all injecting DERs (e.g., batteries and electric vehicles) within these VPPs have interconnection agreements that allow export and support the grid services being offered to PJM markets. Additional updates to interconnection rules would be beneficial, but are not essential for FERC Order 2222 implementation.
- **Coordination.** Since DERs reside by definition on the distribution grid, the aggregation of these resources will need careful coordination between DERAs/VPPs, Pepco, and PJM. The DCPSC has a role in overseeing and ensuring that this coordination occurs, particularly Pepco's role. DCPSC could either set uniform rules guiding coordination, or potentially include these rules and expectations in a pro-forma EDC-DERA agreement. There are two coordination topics:
    - **DERA Registration and EDC review** – During registration of DERAs/VPPs at PJM, Pepco is required by FERC Order 2222 to inform VPPs of any concerns associated with the participation of individual DERs within 60 days. At a

[22] For example, the draft regulations under development in the Interconnection Work Group in Maryland contain a list of ten possible areas of VPP-related disputes that would be subject to Commission dispute resolution.

minimum, the DCPSC could set rules governing this coordination during registration based on PJM review guidelines.

  - **EDC/DERA Operations Coordination** – Coordination between Pepco and VPPs participating in PJM markets will be especially crucial during PJM's operating day. For example, if problems occur on the District's distribution system that limits the ability for a DER to operate or limit its output, Pepco will need to inform VPPs of these problems in a timely fashion so that the VPP can adjust their cleared schedules or access other DERs to meet their cleared schedules. The PSC should establish a process or expectation for how this ongoing coordination will occur, especially related to data flows and communication among itself, the DERA/VPP, and Pepco.

- **Dispatch Override** – Related to the need for specific rules or expectations on operational coordination, FERC Order 2222 explicitly allows distribution utilities to override the dispatch of DERs due to reliability and safety concerns. At a minimum, the DCPSC could allow dispatch overrides to occur based on PJM's rules and criteria, but it will need to be prepared to address conflicts over these overrides in dispute resolution. Similar to rules on coordination, DCPSC could either set uniform rules guiding this dispatch override, or potentially specify processes and expectations in a pro-forma EDC-DERA agreement.
- **Dual Participation** – The ability of DERs and VPPs to participate in both retail-only VPP programs and in wholesale markets and not be double counted or compensated was a key issue in FERC's deliberations about Order 2222. Ultimately, FERC deferred the development of dual participation policy to state regulators. A variety of options for how the DCPSC can address the issue of dual participation exist. At the minimum, it is recommended that the PSC set rules based on program participation, i.e., specify that VPPs and DERs cannot participate in wholesale markets if they are also participating in specified retail programs/services (e.g. net metering). Incorporation of these restrictions in existing retail programs such as net energy metering should be implemented at the same time as the PSC implements other FERC Order 2222 policies. This alignment will ensure that the restrictions are consistent with other PSC actions. Furthermore, any retail VPP program or pilot should be designed so that similar restrictions before or after the 2028 PJM implementation date can be accommodated.
- **Program Cost Recovery** - At the minimum, the DCPSC should follow standard DCPSC rules and procedures to assess prudency and cost-effectiveness of Pepco proposed programs and infrastructure investments to support VPPs and DER aggregation. In particular, DCPSC will need to develop policies to address cost recovery of costs and investments created by DERAs. Important questions include

whether to allocate system upgrades triggered from VPPs that do not burden ratepayers, and how (e.g., possible DERA administration fees or registration fees).

8.b Path B – More Robust Set of Policies to Support Viable VPPs

Path B represents a targeted set of policies that Kathan Energy Consulting recommends should be implemented by the District in order to create VPPs that are economically and technically viable. Like Path A, these policies are drawn from the Policy Readiness Levels included in EPDI's VPP Policy Framework. The difference between Path B and A is that the policies in Path B are just not the minimum actions needed, and are targeted to support VPPs that are economically viable, can participate in PJM markets, and can operate in a safe and reliable manner on the distribution system.

Adoption of these policies will provide the most robust set of policies to support VPP participation in PJM markets, and, if designed correctly, adds additional sources of value from the PJM wholesale markets to the VPP value stack. However, following this path requires a more comprehensive approach and detailed development of complex, technical issues. The DCPSC and its staff will be faced with difficult issues and may need to take more time to fully explore the costs and appropriateness of each policy.

Table 3 summarizes a list of the Path B recommended policies for each of the core FERC Order 2222 related policy topics identified in Section 5 above.

Detail on the recommended policies on the FERC Order 2222-related policies is described in greater detail below.

- **Dispute Resolution** – We recommend that the PSC do more than the minimum on dispute resolution, and develop rules specifically tailored to resolve possible disputes that associated with FERC Order 2222 implementation. While standard dispute mechanisms may suffice, FERC Order 2222 does create issues that must be addressed at the state or local level. These include disputes over double counting, dispatch override, and utility DER review. Since these issues are highly technical, clarity on what issues are within DCPSC review, along with clear procedures, would be beneficial.
- **Interconnection –** While interconnection agreements are a necessary condition specified by FERC, the interconnection of DERs to participate in PJM markets will benefit from additional PSC rules beyond just allowing DERs to export to the grid. For example, standard interconnection agreement forms could be revised to add an indication that a DER owner intends to participate in a VPP or a PJM DER aggregation, or EDC-DERA agreements can be developed to specify and include key obligations and requirements. In addition, flexible interconnection rules should be

Table 3 – Path B – More Robust Set of Policies to Support Viable VPPs

Policy Topic	Proposed Policy
DER Registry	Open-access District/regional registry with standard data fields for individual DERs
Access to Customer Data	Common data platform, with non-discriminatory access to third-parties, subject to privacy and cybersecurity measures
Aggregator registration / licensing	Aggregation registration/licensing set by the DCPSC, including additional VPP requirements, such as codes of conduct
Dispute Resolution (Necessary)	Specific DCPSC rules concerning dispute resolution targeted on FERC Order 2222 issues (e.g., double counting, dispatch override)
Interconnection (Necessary)	Incorporation of additional VPP-specific rules into interconnection agreements, such as communications protocols, dispatch override requirements, and adding intent to participate in DER aggregation
DERA Registration and EDC review (Necessary)	During registration, Pepco is required to inform DERAs of concerns with an individual DER by a standardized and dedicated file transfer protocol or communication protocols.
EDC/DERA Operations Coordination (Necessary)	Clear District rules and guidance on communications, operations, and data sharing between DERAs/VPPs and Pepco
Communications Protocols	Use of four interoperability communications protocols, such as IEEE 2030.5
Dispatch Override (Necessary)	DCPSC develops dispatch override procedures to support DERA/VPP wholesale participation, including specifying communications methods, etc.
Grid Services Authorization	DCPSC-specific rules that authorize DERAs to operate in the District and provide wholesale market services.
Metering	Support for DER submetering or the use of device-level meters
Dual Participation (Necessary)	Allow VPPs to use time-based dual participation rules. Time-based dual participation rules would allow VPPs and DERs to participate in wholesale and retail markets at different times.
Program Cost Recovery	DCPSC conducts a generic proceeding on the infrastructure and systems investments necessary to support DER Aggregation, including proper allocation and recovery of DERA-triggered upgrades and expenses.

considered to allow DERs to participate in VPPs and DERAs without necessitating distribution system upgrades. The need to also study the aggregated operation of a set of DERs within a VPP is an open question[23] and is likely premature given the nascent VPP deployment in the District.

- Coordination needs:
    - **DERA Registration and EDC review** – Coordination of DERA/VPP registration and Pepco's DER review necessitates specific rules and timelines from the PSC to guide EDC review. Reliance on PJM review guidelines may not be sufficient to facilitate VPP participation. District-specific rules could focus on the criteria that Pepco should use to review VPPs during registration and the 60-day review. For example, Maryland's draft regulations include additional timelines for VPPs to fix any deficiencies identified by utilities during their review. Specifications on how EDC review, especially concerns, will be communicated to DERAs, such as through a file transfer protocol, should also be specified in these rules.
    - **EDC/DERA Operations Coordination** – Using a similar logic, clear PSC rules and guidance on how operational coordination will occur will be beneficial, especially closer to real-time in the PJM market. In particular, the PSC could set expectations or rules about the latency (i.e., the length of time for the communication to be delivered) of communications about dispatch overrides. DCPSC could set uniform rules or incorporate operational coordination procedures and communications methods and timing in possible EDC-DERA agreements.
- **Dispatch Override** – While PJM's rules and criteria for dispatch override can serve as a minimum set of rules, the development of District-specific rules and criteria to guide how dispatch overrides occur would be beneficial. Standard EDC-DERA agreements may be a good option for setting these rules and criteria.
- **Dual Participation** – Instead of using program-based dual participation rules, we recommend that the PSC develop time-based dual participation rules. These time-based dual participation rules would allow VPPs and DERs to participate in wholesale and retail markets at different times (usually defined by months or seasons, but could be more granular). Similar time-based rules for demand response participation exist in New York retail programs and New York ISO capacity markets.[24]

[23] This issue was unresolved in FERC Order 2222, with positions supporting and opposing the need for additional study filed in comments. A definitive answer to whether this additional study is needed is not yet available.

[24] NYISO, Distributed Energy Resource (DER) and Aggregation Participation Model, 2026,

- **Program Cost Recovery** - DCPSC conducts a generic proceeding on the infrastructure and systems investments necessary to support DER Aggregation, and the proper allocation and recovery of DERA-triggered upgrades and expenses. Key issues that should be examined in this proceeding are what investments and upgrades are needed for broader grid modernization and are needed to better accommodate DERs, and which costs are specific to FERC Order 2222 DER aggregation. Development of proper cost-allocation rules for the recovery of these costs is needed.

9. Proposed Next Steps and Processes

Kathan Energy Consulting recommends the following next steps and processes to develop policies supportive of VPP participation in PJM markets per FERC Order 2222:

- **PSC support and approval of VPP-friendly policies.** The first priority for the PSC is to issue decisions in several proceedings and rate cases which contain policies and investments necessary for VPPs to operate and participate in PJM markets. This action needs to start immediately or ongoing proceedings need to be completed in order to support more generic VPP proceedings. Particular attention needs to be focused on updating small generator interconnection rules, especially rules concerning BTM storage, and implementing Green Button Connect My Data.
- **PSC commences new proceeding on VPPs and FERC Order 2222.** In order to implement the regulatory pathways advocated above, the PSC should initiate a proceeding to develop and approve VPP policies to implement FERC Order 2222. Drawing upon the history and experience of other PJM states, the District has several procedural options to conduct this proceeding. Note that it would be desirable that these final rules or policies be finalized to allow some types of VPPs and DER aggregations to participate in PJM's markets prior to PJM's February 2028 FERC Order 2222 implementation date. Several options are available to conduct this proceeding:
    - *RFI Option:* The DCPSC could initiate a proceeding with a Request for Information (RFI) targeted on FERC Order 2222 issues similar to the second RFI issued by the NJBPU. Like New Jersey, the DOEE has already released a more general RFI about VPPs, and a second RFI issued by DCPSC would build on the earlier RFI. This RFI would provide the broadest record and source of information. The disadvantage of this option is that it will likely

https://www.nyiso.com/documents/20142/49802416/DER-and-Aggregation-Participation-Model-FAQ.pdf/967117fb-8bbb-1916-651a-0f9dbe904780.

extend the date of completion of the proceeding to accommodate additional information-gathering activity. As an alternative, the DCPSC could coordinate with the NJBPU to try and learn more from its RFI and responses, rather than needing to issue its own RFI.

- *Rulemaking Option:* The DCPSC could move directly to propose new regulations and policies to support VPP participation in PJM markets. Embedded in this proposed rule could be a set of questions similar to the questions that could be covered in a RFI. This option would accelerate the timeline for implementation, but would require effort from the PSC and its staff to develop the regulations. The use of working groups to provide the PSC with recommendations for this proceeding could fill in information gaps and support DCPSC decisions. In order for these working groups to not unnecessarily delay implementation, these working groups would need to be given tight timetables and clear scope. In addition, it will be important to include the DCSEU in these discussions and possible development of regulations.
- *Leveraging Other States Option:* The DCPSC could explicitly leverage the knowledge and proposed policies being considered and implemented in other PJM states in the new VPP proceedings. By utilizing the information collected in other PJM states like Maryland, New Jersey and Pennsylvania, the DCPSC can potentially bypass much of the information-gathering typically required when starting from scratch. Maryland and New Jersey could serve as possible models for District activity, with Maryland focusing on the development of policies at the work group level, with Commission approval and guidance of work group products, and New Jersey representing a Governor-directed and NJBPU-led proceeding. The best strategy may be to propose a version of the Maryland or New Jersey VPP regulations and policies that are applicable to the District. [25] The DCPSC's proceeding will necessarily need to be District focused and require the development of a record, but leveraging other states' efforts could provide the DCPSC with valuable expertise and shorten the timeline of the proceeding.

  The advantage of this option is that the District would not need to recreate the wheel and can leverage other state actions and selected policies. Proceedings will still need to be conducted on the full set of policies, but

[25] See the Maryland VPP Activity call-out box, and the New Jersey Straw Proposal referenced earlier. Note that Maryland's draft process includes aspects of both the Minimum and Targeted pathways.

adopting regulations and policies developed by other PJM states will provide a roadmap and models to follow. Note that since Pepco serves both Maryland and District customers, using Maryland procedures and policies as the model will ensure that Pepco does not have to implement two different sets of policies. The disadvantage of this option is that DCPSC may not develop expertise in VPP policy or implement innovative or District-specific policies.

- **Implementation in phases.** Given the nascent VPP environment in the District, the PSC should not feel obligated to implement the full set of FERC Order 2222 recommended policies by February 2028. A two-phase implementation, similar to the strategy proposed by New Jersey in its VPP Straw Proposal, is a good model to follow. In the first phase, limited third-party, retail VPPs that are under the direction of Pepco can initiate VPP deployment and participate in PJM markets. However, it may take significant time to obtain full approval of this type of Pepco VPP program. Alternatively, allowing third-party, non-Pepco VPPs to participate on a more accelerated timeline without DCPSC approval may be more timely. To support these initial VPP deployments, Kathan Energy Consulting recommends implementing at the least the minimum set of policies in Path A. Later phases can fully implement the recommended Path B policies.

In conclusion, Kathan Energy Consulting recommends that the District take two broad actions. First, the DCPSC should issue decisions in several proceedings and rate cases which contain policies and investments necessary for VPPs to operate and participate in PJM markets, e.g., access to customer data through Green Button Connect My Data. Second, the DCPSC should initiate action or create proceedings to implement FERC Order 2222 in the near term to support DERA participation in PJM markets. Since PJM is fully implementing FERC Order 2222 in February 2028, time is of the essence. The exact form of action that the District should take, e.g., following the Leveraging Other States Option, is subject to DCPSC determination. As noted above, the District should not feel obligated to implement supportive VPP and DERA policies all at one time, and can implement policies in phases, similar to what New Jersey is proposing.

ATTACHMENT A – Terms Used in Report

TERM	DEFINITION
Behind-the-Meter ("BTM") Storage	A piece of equipment that exists behind the customer meter. The equipment captures energy produced at one time, stores that energy for a period of time, and delivers that energy as electricity at a future time.
Communications Protocols	A standardized set of rules, message formats, and procedures that enables interoperable communication between devices, software systems, and network operators by specifying how information is structured, transmitted, received, and interpreted.
Distributed Energy Resource ("DER")	Any geographically dispersed energy resource located on an electric distribution system that produces electricity or offsets electrical demand including small generator facilities, energy storage devices, energy efficiency devices, and demand response devices.
Distributed Energy Resource Aggregator ("DERA")	A market-facing entity that provides load shifting capabilities via a collection of distributed energy resources that can provide wholesale market value and/or other grid services.
Edge DERMS	A software platform that manages and can aggregate behind-the-meter assets or aggregations of assets—like home batteries or smart thermostats. A grid-edge DERMS can be operated by a third party.
Electric Distribution Company ("EDC")	A regulated electric utility that owns and operates the local electric distribution system and provides distribution service to retail customers within its service territory, including responsibility for distribution planning, reliability, interconnection of distributed energy resources,

	metering, and operation of the distribution network.
Peak Shaving	Load management strategy used to reduce electricity consumption during periods of high demand to improve grid stability and, in some cases, to reduce costs.
Utility DERMS	A visibility and control system that manages distributed energy resources—like batteries or solar fleets—to help address grid issues such as voltage fluctuation and capacity constraints. A Utility DERMS can be a component of ADMS.
Vehicle to Grid ("V2G")	The ability of a combination of hardware and software in or around electric vehicles to communicate with and program flow of energy into and out of the vehicle battery in support of electric loads or systems offboard the electric vehicle, including the electric grid.
Virtual Power Plant ("VPP")	Aggregations of distributed energy resources (DERs) such as smart appliances, rooftop solar with behind-the-meter batteries, electric vehicles and chargers, and commercial and industrial loads that can balance electricity demand and supply and provide grid services like a traditional power plant.

ATTACHMENT B – Feedback Received on DOEE June 9, 2025 VPP Request for Information

This attachment summarizes the responses received by the Department of Energy and Environment in response to its June 9, 2025 Request for Information on VPPs.

General themes expressed:

- **Prioritization of Retail VPP Programs Over Wholesale Execution**

  Stakeholders argue that D.C. should prioritize retail-level Virtual Power Plant (VPP) programs over PJM wholesale market integration. EnergyHub and the Joint Solar Parties point out that wholesale participation faces substantial administrative hurdles, restrictive capacity accreditation rules, and high metering costs for residential users. By contrast, retail programs can be deployed by local utilities in 3 to 6 months using a Bring Your Own Device (BYOD) framework. This allows the District to immediately unlock active, dormant customer resources like smart thermostats and batteries for localized grid benefits while wholesale rules finish evolving.

- **Distribution Grid Stability and Complex Systems Control**

  A primary technical concern is that wholesale transmission signals must not bypass or disrupt local distribution grid management. Ecosuite frames both networks as highly unpredictable "Complex Systems" and warns that treating Order 2222 strictly as a transmission-over-distribution tool will compromise grid reliability. Commenters agree that control signals must align with distribution constraints first, ensuring local requirements prevail over wholesale pricing in a conflict. To mitigate reliability risks, respondents recommend integrating cloud-based Edge DERMS platforms with utility-level grid systems to give operators the visibility needed to manage real-time power fluctuations.

- **Data Access, Communication, and Telemetry Infrastructure**

  Effective orchestration requires eliminating utility data silos and transitioning away from outdated billing infrastructure. The Joint Solar Parties report that aggregators struggle with manual, single-account data retrieval, and they urge the Public Service Commission to mandate central, online repositories for streamlined batch data access. While Pepco's current Advanced Metering Infrastructure (AMI) provides 15-minute interval data sufficient for wholesale energy markets, it lacks the sub-minute resolution

required for high-value ancillary services. Respondents advocate for incorporating highly accurate device-level and inverter-direct metering to enable low-latency measurement, grid verification, and billing.

- **Equity, Deployment Incentives, and Market Competition**

Stakeholders stress that D.C. must design aggregation frameworks that advance energy justice while maintaining healthy market competition. Organizations recommend utilizing the DCSEU to target affordable housing complexes and low-income neighborhoods to offset rising electricity rates and severe weather vulnerabilities. Regarding program execution, the Joint Solar Parties strongly oppose utility ownership of behind-the-meter assets. They argue that utility ownership places unfair capital installation costs onto captive ratepayers, whereas a third-party aggregator model lets private competitive forces drive down installation costs while utilities focus solely on distribution network safety.

- **Regulatory & Security Baselines**
    - *Cybersecurity Standards*: Commenters advise against inventing new local rules, suggesting instead a mandatory adherence to established global standards like ISO 27001, SOC 2 Type 2, and NIST Cybersecurity Frameworks.
    - *Consumer Privacy*: Privacy rules should mirror the European GDPR or California frameworks, giving customers granular, opt-in control over who accesses their time-series energy usage records.
    - *Regional Examples*: D.C. is encouraged to adapt the utility-facilitated ConnectedSolutions model used across New England, which pays robust seasonal incentives directly to home battery owners.

Summaries of feedback received from each of the commenters on the RFI is listed below.

Summary of DOEE RFI Commenters – Core Arguments

Commenter	Core arguments
CHESSA / SEIA / Solar United Neighbors	Advocates rapid deployment of retail VPPs alongside FERC Order 2222. Supports real-time utility data access, device-level metering, streamlined customer data sharing, competitive third-party aggregators rather than utility ownership, market-based compensation, and use of the DCSEU to promote equitable DER deployment. Cites Connected Solutions, Puerto Rico, Maryland, and Virginia as leading models.
DC Sustainable Energy Utility (DCSEU)	Argues DCSEU should serve as a neutral facilitator and program implementer. Recommends leveraging existing

	efficiency and DER programs, targeting constrained circuits with Pepco, expanding Solar for All into neighborhood VPPs, developing a DER workforce, and prioritizing affordability and equity.
Ecosuite	Argues distribution utilities—not wholesale markets—should remain the primary control authority because the distribution grid is a complex system. Promotes interoperable edge computing, open communications standards, advanced AMI/Green Button capabilities, flexible interconnection, and rigorous cybersecurity.
EnergyHub	Focuses on practical implementation using existing customer-owned technologies such as batteries, smart thermostats, EV chargers, and water heaters. Calls for standardized customer data access, streamlined enrollment, and clear market rules.
Energy Policy Design Institute	Urges DC to develop a comprehensive long-term VPP and DER aggregation strategy rather than focusing solely on FERC Order 2222 compliance. Supports integrating wholesale markets, retail programs, and distribution planning.
Exelevation Consulting	Emphasizes collaborative planning, regulatory clarity, and practical engineering. Supports use of existing technologies and standards while avoiding unnecessary regulatory complexity.
GRID 2.0	Views DER aggregation as a key tool for achieving DC's climate goals. Supports grid modernization, hosting capacity improvements, electrification, and long-term utility planning while maintaining equity and affordability.
Nuvve / Fermata Energy	Advocates making V2G a central DER resource. Recommends removing regulatory barriers, standardizing communications, and enabling EV fleets to participate in wholesale and distribution-level programs.
Olivine, Inc.	Focuses on operational readiness. Supports standardized registration, telemetry, metering, measurement and verification, settlement processes, and utility-PJM coordination while minimizing transaction costs.
Pepco	Supports careful, reliability-focused implementation. Emphasizes developing utility business processes, distribution review procedures, PJM coordination, and prudent cost recovery before large-scale DER aggregation.
Sierra Club	Advocates using DER aggregation to advance clean energy, resilience, equity, and consumer benefits. Supports rapid VPP deployment, strong consumer

	protections, broad low-income participation, and limiting utility ownership of DERs.
University of Delaware EV Research Group	Emphasizes standards, interoperability, accurate DER location data, transparent coordination, and lessons learned from V2G research and demonstration projects.

ATTACHMENT C – VPP Policy Framework – Policy Topics

Energy Policy Design Institute

- *(Policy Category)* **Setup and Registration**: The setup of Aggregators and the management of individual DER participation in VPPs
    - *(Topic)* **DER Eligibility**: What types of DERs are allowed to participate in VPPs
        - Technologies, interconnection point (mobile DERs), ownership models
        - *(Subtopic)* Utility approval rules and processes
    - (*Topic)*} **Coordination of DER Registration and EDC review**: Coordination between utilities and DER operators/aggregators as well as between utilities and ISO/RTOs for the registration of individual DERs to participate in VPPs
    - (*Topic*) **DER Registry**: A DER registry is a single point of truth for data on DERs, used by third party stakeholders to more effectively and efficiently enable DER registration and participation into the grid and market.
    - (*Topic*) **Access to Customer Data** : Access to customer usage and DER data by aggregators
        - *(Subtopic)* Customer Data - 3rd party eligibility and registration
        - *(Subtopic)* Customer Data - Access processes and standards
        - *(Subtopic)* Customer Data - Data quality / warranties
        - *(Subtopic)* Customer Data - Access related rules enforcement and dispute resolution
    - *(Topic*) **Customer Education & Engagement**
    - (*Topic*) **Customer Enrollment** (includes consumer protection)
        - *(Subtopic)* DER Permission - opt-in vs opt out approach
    - *(Topic)* **Aggregator registration / licensing**: Requirements and processes for Aggregators to officially register with a state agency
    - *(Topic)* **Registration Dispute resolution**: Commission processes for resolving registration related disputes between Aggregators and Utilities

- *(Policy Category)* **Deployment / Buildout**: The deployment of DERs and physical buildout of VPPs
    - *(Topic)* **Interconnection**: Rules, processes and agreements related to the physical interconnection of Component DERs and VPPs to distribution grids
        - *(Subtopic)* Adoption of Technical Standards (e.g. inverter standards)
        - *(Subtopic)* Mobile DERs (interconnection rules)
    - *(Topic)* **Access to Grid Data**: data on distribution grid operations related to interconnection capacity and potential value of DERs
        - *(Subtopic)* Grid Data - 3rd party eligibility and registration
        - *(Subtopic)* Grid Data - Access processes and standards
        - *(Subtopic)* Grid Data - Data quality / warranties
        - *(Subtopic)* Grid Data - Access related rules enforcement and dispute resolution

    - *(Topic)* **Cybersecurity**
        - *(Subtopic)* Grid operator to aggregator communications
        - *(Subtopic)* Aggregator to DERs communications and access
    - *(Topic)* **Permitting**

- *(Policy Category)* **Operational**: anything related to real-time operations of the distribution grid and the wholesale market
    - *(Topic)* **Telemetry**: Real-time measurement and communication of DER and VPP behavior
    - (Topic) **EDC - ISO/RTO Operations Coordination**
        - (Subtopic) Coordination Processes
        - (Subtopic) Communications Protocols
    - (Topic) **EDC - DERA Operations Coordination**
        - (Subtopic) Coordination Processes
        - (Subtopic) Communications Protocols
    - *(Topic)* **EDC - Individual DER Operations Coordination**
        - *(Subtopic)* Grid Operator systems for management and monitoring of individual DERs (i.e. DERMS)
    - *(Topic)* **Grid Operator systems for VPP communication and management**
    - *(Topic)* **Communications Protocols**
    - *(Topic)* **Dispatch Override**: Rules regarding the ability of a distribution utility to override a VPP dispatch from the wholesale market
        - (Subtopic) Override Criteria / Conditions
        - (Subtopic) Override Communications Protocols
    - *(Topic)* **Grid Operational Data**: data on distribution grid operations related to VPP impact on the grid

- *(Policy Category)* **Markets / Transactions**: anything related to *enabling* financial transactions between DERs, aggregators, utilities {all Business Models} and wholesale markets. This does not include how to structure those transactions
    - *(Topic)* **Grid Services Authorizations**: Permission for DERs to provide specific grid services
    - *(Topic)* **Grid Services Mechanisms**: Regulatory mechanisms needed to enable specific grid services / contracting structures
        - *(Subtopic)* Large load interconnection: Rules to allow large loads to contract with VPPs
    - *(Topic)* **Metering**: How the activities of DERs and VPPs are measured and reported to the markets and utilities for transactions
    - *(Topic)* **Transaction Settlement Processes**: Rules and processes for paying DER and VPP operators for delivered grid services
        - *(Subtopic)* Data access / quality for transaction settlement
        - *(Subtopic)* Mobile DERs (settlement processes)
    - *(Topic)* **Dispatch Override - Transactions**: Rules for penalties / compensation when a dispatch is overridden

    - *(Topic)* **Dual Participation**: Rules to prevent DERs from being compensated twice for providing the same grid service
    - *(Topic)* **Access to wholesale market products**
    - (Topic) **Forecasting market data**

- *(Policy Category)* **Distribution Grid Planning**
    - *(Topic)* **Utility pilot programs**: testing VPP use cases to understand how VPPs can be included in grid planning
    - (Topic) **Cost-Effectiveness or Benefits/Costs Analysis of VPP Programs**
        - *(Subtopic)* Valuation of VPP services in Distribution Plans

- *(Policy Category)* **Ratepayer / Financial Issues for Utilities**: anything related to costs to the utilities and ratepayers involved with enabling VPPs
    - *(Topic)* **Utility cost recovery for VPP investments/payments**: Establishing utility cost recovery methods for utility investments / payments to VPPs e.g. NWA type investments or cost recovery for the procurement of DERs
    - *(Topic)* **Cost recovery/allocation for supporting investments**: Rules for who pays for utility investments to enable VPPs and the associated financial processes
    - *(Topic)* **Retail rate design**: Issues with retail rates and VPP participation for BTM DERs

ATTACHMENT D – First Workshop Follow-Up Questionnaire

The following questions were sent to workshop participants and invitees on April 6, 2026.

1. What kind of VPP do you believe is the best fit for the District of Columbia?

2. Does your preferred VPP also have the capability to participate in PJM wholesale markets?

    a. Yes, fully compatible with FERC Order 2222
    b. Partially, requires additional tariff or regulatory modification
    c. No, primarily retail/distribution level
    d. Other/uncertain

3. Please select which VPP structure(s) the District should consider implementing? Please explain your selection.

    ☐ Utility program where an individual DER owner or operator controls the DER output in response to a utility signal
    ☐ Utility program where the DER is owned or directly controlled by the utility
    ☐ VPP program where a third-party aggregator provides retail services and/or wholesale services
    ☐ Other

4. What VPP models from other states (e.g., Maryland, Massachusetts, and California) should the District consider when developing VPPs, particularly with respect to facilitating participation in PJM wholesale markets?

5. What regulatory changes should the District of Columbia consider implementing to support VPPs? What specific regulatory changes should the District consider implementing to support VPP participation in PJM's implementation of FERC Order 2222?

6. Please rank the regulatory policy topics listed below by their importance and relevance to the District as it develops regulations and policies to support possible participation of VPPs and DER aggregations in PJM wholesale markets. Please consult the VPP Policy Map (attached) for an explanation of the topics, plus a full list of VPP policy topics. Are there additional policy topics that should also be included, and why?

    __ 1.b DER Registry
    __ 1.c Access to Customer Data
    __ 1.f Aggregator registration / licensing

__ 1.g Dispute Resolution
__ 2.a Interconnection
__ 3.a Telemetry
__ 3.c EDC/DERA coordination and review
__ 3.f Communications Protocols
__ 3.g and 4.e Dispatch Override
__ 4.a Grid Services Authorization
__ 4.c Metering
__ 4.f Dual Participation

7. For each of the five highest ranked items you identified in question #6, please answer the following questions:

    a. What is the minimum regulatory condition necessary for aggregators to deploy a VPP or DER aggregation in PJM markets?
    b. What is the ideal long-term regulatory condition for most effective performance of VPPs or DER aggregations in PJM markets?

    [For example, for a DER Registry, the minimum regulatory condition could be a manual utility-specific registries for static DERs (e.g., solar), and an ideal long-term regulatory condition could be an state-wide or region-wide integrated registry that supports automated-enrollment of all DERs via direct integrations.]

8. If you have any additional information or insights about VPPs, particularly with regards to participation in PJM wholesale markets, please provide them (i.e., implementation barriers, technology/DER mix or VPP readiness, implementation timeline and sequencing).