May 29th, 2024

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

Re: Distributed Energy Resource Participation in Wholesale Markets Investigation / Public Utility Commission Docket No. L-2023-3044115

Dear Secretary Chiavetta:

The Pennsylvania Public Utility Commission has issued an Advance Notice of Proposed Rulemaking Order in order to investigate the PUC's role in the implementation of FERC Order 2222 and to determine whether any amendments or additions are needed to align existing Commission regulations or policy statements with the Federal Energy Regulatory Commission's (FERC) Order 2222.

Recurve is an industry leader in meter-based demand flexibility. Recurve tracks changes in energy consumption resulting from program interventions for both individual buildings and in aggregate to support resource planning and facilitate performance-based transactions. We encourage and support market-based solutions for decarbonization.[1] Recurve's software platforms are grounded in open-source methods and code. Open-source methodologies, software, and collaboration are key to developing the foundational weights and measures required to scale demand flexibility as a reliable energy resource.

Recurve thanks the Commission for this opportunity to offer comments to help inform implementation in Pennsylvania of wholesale market rules related to FERC Order 2222. If you have any questions about these comments, please contact me with the information provided in my signature block.

[1] M. Golden, A. Scheer, C. Best. Decarbonization of electricity requires market-based demand flexibility, The Electricity Journal Volume 32, Issue 7, August–September 2019, 106621 *Available at:* https://www.recurve.com/blog/the-secret-plan-for-decarbonization-how-demand-flexibility-can-save-our-grid

Respectfully submitted,

Carmen Best

Chief Policy Officer
Recurve Analytics, Inc
Phone: 608-332-7992
email: carmen@recurve.com

I. Introduction.

Recurve thanks the Pennsylvania Public Utility Commission ("PUC") for its engagement on policy questions related to distributed energy resources. Recurve has specific expertise with respect to data access issues and the valuation of distribution-level benefits.

II. Responses to questions.

H. Any Necessary Electronic Data Exchange Revisions.

The PUC should permit the secure exchange and use of anonymized AMI data of non-participating customers in order to compare customers who participate in demand side programs while using non-participating customers as a baseline in order to more accurately measure the hourly quantity of grid services provided by the participating customers.

Recurve believes that the optimal way to measure and verify energy savings is to create a weather normalized control group of non-participants and then compare the energy savings of program participants with the energy usage of the non-participant control group. The hour in which energy is saved can be tracked when utilities have deployed advanced meter infrastructure ("AMI"), so that program compensation can be aligned with the value of energy on the grid at the time the savings were achieved. Most Pennsylvania utilities have AMI so hourly measurement and compensation can be implemented.

Each DER resource should be tracked individually and as part of an aggregated portfolio to assure program performance and enable data-driven program improvement. This also enables the program to pay for benefits only as they actually occur, rather than using a model to project benefits and committing to pay up-front for benefits that are projected.

Use of data-driven automated measurement and verification also provides other benefits to optimize the program. Data can be analyzed to determine what type of efficiency project in

what households would produce the highest energy savings program benefits. Hourly measurement can assist in reducing consumption at peak periods to drive program benefits. The ability to standardize and combine complex data sets will enable an automated methodology for determination of qualification for additional program benefits for projects in disadvantaged communities and low-income households.

L. Distribution Level Benefits

As is discussed in detail below, the PUC should first identify each category of grid benefits that DER can provide and define how to measure each of these services on an hourly basis. Next, the PUC should determine an hourly value for these grid services. The compensation for existing providers of these services should be referenced when establishing their value. Finally, the PUC should establish a market access program so that aggregations of DERs can provide those services for the established price.

Recurve submits that the most advanced thinking regarding tracking and reporting of DER performance is the total system benefits metric offered by Mohit Chhabra of the National Resources Defense Council in the Electricity Journal entitled *One metric to rule them all: A common metric to comprehensively value all distributed energy resources.*[2]

Chhabra observes that typically utility-funded DER programs are planned and implemented on a per-DER basis and are compensated for energy value only. Energy efficiency, demand response, and other greenhouse gas reduction programs and strategies are designed in separate proceedings and have separate metrics and budgets. This fragmented DER valuation and procurement creates inefficiencies by artificially siloing DERs, thereby prohibiting optimal deployment.

Also, fragmented DER procurement, each with its own methods of measurement and valuation, prevents multiple DERs from competing to provide value and ignores the interactive effects between multiple DERs. This is precisely the kind of "cross-section interaction, some competitive and some synergistic" identified by the Commission.

Finally, Chhabra observes that as renewable penetration on the grid increases, the value of DERs becomes increasingly time-dependent. To avoid energy, capacity, transmission & distribution investment, the time in which savings occur has a significant impact on the value of the savings achieved. "Traditional energy metrics, like annual savings for energy efficiency measures, don't capture this temporal variation."[3]

---

[2] The Electricity Journal, 35 (2022) 107192, Mohit Chhabra, *One metric to rule them all: A common metric to comprehensively value all distributed energy resources.* https://www.sciencedirect.com/science/article/abs/pii/S104061902200118X The Electricity Journal has a paywall. Permission to file a copy of the full article has been requested. With the Commission and Electricity Journal's permission a copy of the article will be filed as a supplement to these comments.

[3] Chhabra at page 1.

To solve both the problem of siloing and of time valuation, Chhabra offers the total system benefits (TSB) metric. "The TSB is calculated by multiplying the DER load-shape by the hourly avoided costs through the DER's effective life. For dispatchable demand response initiatives, the lifetime is equal to the number of demand response events being analyzed. To the extent that the avoided cost calculator accounts for the various benefits of energy savings and how they vary over time…the TSB will capture the complete value stack of DER."[4] The combined benefit of each DER should be aligned with rigorously measured changes in energy consumption patterns on an hourly basis.[5]

This policy option is readily available to implement in Pennsylvania because the state took the necessary step of deploying AMI. The use of the total system benefits metric and the market access program model described below will maximize the value of the AMI investment to Pennsylvania energy consumers and better align demand flexibility with integrated resource planning and clean energy investments.

The benefits, aligned with measured changes in energy consumption, are totaled for each hour and can be used to represent a technology and fuel-agnostic price through a market access program model. A market access program model is designed as an open solicitation for aggregators to identify and provide the designated benefits to customers and the grid in exchange for the Commission approved valuation.[6]

This innovation in program design provides several advantages. First, it is cost effective by design. Payments are capped at or just below the designated value of the benefits meaning that ratepayers would no longer take the risk of non-performance of programs, and aggregators would assume that risk. Second, it allows market actors to opt into the program with low barriers to entry to accelerate their existing business models and customer reach. As customer behavior changes load shapes and as avoided costs change, the Commission can adjust the compensation offered at regularly defined intervals, and market actors can respond with innovative customer solutions. Third, the market access model can synergize funding from multiple sources to drive investment. Public or private funds can be co-mingled to drive down overall costs on a project-by-project basis, and performance payments can drive overall shared outcomes and objectives like GHG and avoided costs.

---

[4] See illustration on page 3.

[5] A technical guide on implementing a Total System Benefit metric was developed by the California Public Utilities Commission: Total System Benefit Technical Guidance, Version 1.1, August 16, 2021; California Public Utilities Commission:
https://pda.energydataweb.com/api/view/2530/DRAFT%20TSB%20Tech%20Guidance%20081621.pdf

[6] Market Access Program model, regulatory background, program designs, and results. from the California Public Utilities Commission webpage
https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/demand-side-management/energy-efficiency/market-access-program
Creating a Market Access Model to Unleash Solutions Providers and Scale Demand Flexibility, C. Best, R. Boehnke, M. Keasey, ACEEE Summer Study Proceedings 2022