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May 27, 2021

Via Electronic Mail

Ms. Aida Camacho-Welch, Secretary
New Jersey Board of Public Utilities
44 South Clinton Avenue, 3rd Floor, Suite 314
P.O. Box 350
Trenton, New Jersey 08625-0350

Re: I/M/O NEW JERSEY 2019/2020 SOLAR TRANSITION SOLAR SUCCESSOR PROGRAM: STAFF STRAW PROPOSAL

BPU Docket No.: QO20020184

Dear Secretary Camacho-Welch:

On behalf of Utilidata, Inc. ("Utilidata"), we respectfully submit the following Comments in accordance with the Board of Public Utilities' ("BPU" or the "Board") Notice, as updated on May 5, 2021. We thank the Board for its attention to this matter.

Respectfully submitted,

DECOTIIS, FITZPATRICK, COLE & GIBLIN, LLP

By: *s/ Alice Bergen*
Alice M. Bergen

Encls.
AMB/ma

STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES

I/M/O NEW JERSEY 2019/2020 SOLAR TRANSITION SOLAR SUCCESSOR PROGRAM: STAFF STRAW PROPOSAL	**BPU Docket No. QO20020184**

COMMENTS OF UTILIDATA, INC.

Utilidata, Inc. ("Utilidata") is grateful for the opportunity to provide feedback to the New Jersey Board of Public Utilities' ("BPU" or the "Board") regarding the State's Solar Successor Program. As a leading energy software company that leverages grid-edge data to advance clean energy goals, we greatly appreciate the Board's comprehensive approach to developing a long-term, durable solar incentive program. For New Jersey to achieve its goal of 100% clean energy by 2050 while balancing ratepayer impacts and supporting a thriving and stable solar industry, the Board must look beyond just incentive programs.

New Jersey's electric distribution companies (EDCs) are making massive investments that could be leveraged to support solar energy and maximize benefits to ratepayers, if the Board sets the expectation that they be used in such a way. Specifically, the EDCs plan to spend nearly $2 billion over the next decade deploying advanced metering infrastructure (AMI) which could be used to improve solar interconnection, increase hosting capacity, and keep New Jersey at the forefront of solar innovation; however, none of the EDCs have clear plans to use AMI in this way, nor have AMI proceedings set requirements that they do so. We therefore urge the Board to use forthcoming solar proceedings to evaluate how the EDCs can and should leverage AMI to advance the State's clean energy goals and support a thriving and stable solar industry in the State.

A Thriving and Stable Solar Industry Will Require Real-Time Grid Visibility and Control

According to the latest Energy Master Plan (EMP), roughly one-third of New Jersey's electricity will need to be generated by solar to transition to 100% clean energy by 2050. This means that the State will need 32 gigawatts of solar generating capacity - roughly 10 times the current capacity. The rapid scaling of wholesale solar will require engaging flexible demand, starting with time-varying rates and quickly evolving to much more dynamic load control. This dynamism poses new challenges and opportunities for managing the electric distribution grid, much of which will need to be addressed at the edge of the system, where supply meets demand, and where the grid meets customers and their distributed energy resources (DERs).

The degree of operational complexity posed by massive increases in solar and other DERs will require that the distribution system leverage real-time data to make operational adjustments

to ensure continued safe, reliable and affordable service. The EDCs' current lack of grid-edge visibility and control is a driving factor for many existing solar challenges, including slow interconnection times and low hosting capacity, some of which the Board is working to address in Docket No. QO21010085. As solar capacity increases, those problems will become even more substantial, and could lead to reliability issues, moratoriums on solar, and drastic increases in grid costs.

AMI Plus Grid-Edge Software Can Provide Real-Time Visibility and Control

If implemented correctly, with the right combination of hardware, software, and communications networks, an AMI system can provide essential grid-edge visibility and control. Each smart meter can record about 25 million data points per month, including demand, voltage and power flow. With the right software, this data can be analyzed to determine grid-edge conditions at any customer location, operate the grid more efficiently, and deliver a host of benefits to the solar industry. These benefits start with increasing hosting capacity and streamlining interconnection, and they will soon evolve to include minimizing curtailment and enabling greater participation in energy markets.

However, none of the State's utilities have clear plans to use AMI in this way. For example, in their recently approved AMI filing, Public Service Electric & Gas (PSE&G) commits to only one vague use case for solar, stating they will "assist customers with DER installations and the management of any power quality issues that occur."[1] There is no timeframe or description of how the company plans to accomplish this, nor are there descriptions or timelines for other use cases that may benefit solar, such as voltage optimization in the presence of solar. Other AMI proposals, such as in Jersey Central Power & Light Company, do not commit to any solar use cases, highlighting the disparate approaches in how the various EDCs plan to leverage AMI. This lack of consistency risks creating an inequitable deployment of solar across service territories and highlights the need for statewide AMI standards that support statewide clean energy goals.

Without clear timelines, plans, or requirements from regulators, it is unlikely that AMI use cases that support solar will ever materialize, leaving significant AMI value untapped. The first wave of AMI deployments in the U.S. has proven that utilities will design and procure their AMI system based on the limited scope of their benefit-cost analysis and to meet minimum requirements set by regulators. This greatly increases the chance that the investment will not be future-proof or maximize ratepayer benefit. Given that the next decade is expected to be a period of unprecedented grid transformation, the risks of failing to plan for the future are greater than they've ever been. Rather than wait and see whether future use cases materialize, the Board should use forthcoming proceedings regarding the solar industry to evaluate the role of AMI and set clear expectations for the EDCs regarding how AMI should be used to advance clean energy goals and support solar growth.

[1] I/M/O the Petition of Public Service Electric and Gas Company for Approval of Its Clean Energy Future - Energy Cloud ("CEF-EC") Program On a Regulated Basis, Decision and Order Approving Stipulation, Docket No. EO18101115, Attachment 1 (P.2).

As an example of the kind of market input the Board could expect in a proceeding regarding AMI and solar, we are providing an overview of how Utilidata's grid-edge operating platform leverages AMI data to deliver benefits to the solar industry. Ours is just one potential solution that could deliver significant value to New Jersey ratepayers. We encourage the Board to solicit the market for additional input, as additional capabilities may be possible.

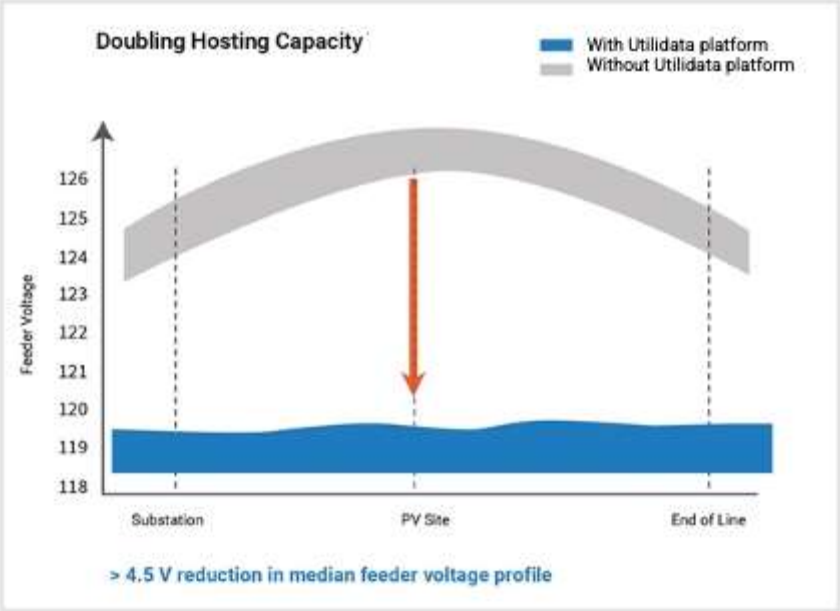
A Grid-Edge Operating Platform Can Leverage AMI to Deliver Benefits to the Solar Industry

Most existing utility operational systems are based on a physical model of the grid, i.e., a model that catalogs the physical characteristics of the system to gain visibility and enable more precise controls. These models are not designed for managing the complexity of a dynamic system with massive increases in distributed solar, nor can they accommodate the millions of data points from AMI. A real-time data-driven machine learning platform, like the one Utilidata has developed, can leverage AMI to deliver the following benefits:

1. **<u>Increasing hosting capacity using real-time voltage optimization</u>.**

For the past decade, Utilidata's software has been used to optimize voltage and deliver 3-5% energy savings. The same solution, which integrates real-time data from a wide range of distribution grid data sources including AMI, can also be used to optimize distribution grid operations in the presence of solar and increase hosting capacity. Solar generation raises the voltage on a circuit and if it exceeds 126 volts for 2 seconds, the solar inverter is required to disengage leading to curtailment of that installation. As solar penetration increases, the voltage on the circuit limits the hosting capacity. Inefficient voltage management can artificially limit the hosting capacity of a circuit, driving up costs for solar developers and contributing to frequent curtailment requests. By flattening and lowering voltage in real-time, a grid-edge operating platform can create headroom for additional solar capacity and increase hosting capacity by 50% or more. This increased capacity also decreases the costs associated with solar interconnection approvals.

This chart shows an example from one of Utilidata's existing utility customers' systems where a 5 MW solar farm is located mid-circuit. In this example, our platform could increase hosting capacity from 5 MW to 10 MW.



At least one of the EDCs has acknowledged the role voltage optimization could play in increasing hosting capacity. Atlantic City Electric's (ACE) study on optimal voltage in Docket No. EO19040499 states " VVO [volt/VAR optimization] technology can help EDCs increase the DER hosting capacity on their distribution grids, to the extent that the limiting factor is voltage, by mitigating voltage fluctuations and other challenges that arise as the density of DERs connected to the grid increases." However, the company does not appear to have any plans to use voltage optimization in this way. Without clear plans, timelines, or budgets, the Board cannot expect these benefits to materialize.

2. <u>Accelerating interconnection approval times with real-time grid-edge visibility</u>.

Many solar developers are plagued by slow interconnection approvals, due in large part to utilities' reliance on static models based on worst case grid conditions. Software solutions, like Utilidata's platform, can leverage artificial intelligence and machine learning to establish electrical relationships, build topology from the substation to the meter, and deliver real-time visibility and modeling. Utilities can leverage these insights to quickly understand whether the distribution grid can accommodate a solar installation or if additional system upgrades are needed. Given that interconnection costs are unpredictable and can exceed $1 million for larger projects, improvements to the interconnection process can save solar developers hundreds of thousands of dollars, helping the industry thrive and delivering maximum benefit to ratepayers.

3. <u>Maximizing operational value with smart inverter signaling</u>.

Utilities' lack of real-time visibility and control drives inefficient signaling with solar inverters, limiting the operational value of a solar installation. A grid-edge operating platform like Utilidata's can signal and control smart inverters using highly localized algorithms that leverage sub-second measurements to execute precise optimization. Signal integration and coordination on a circuit with solar reduces distribution grid device operations, which reduces wear and tear, extends the life of devices, and allows solar to stay online longer. Signal integration can also enable solar developers to go to market with new offerings that couple local demand management and grid services. This creates new opportunities to reduce the approximately $800 million in solar program costs[2] by increasing the value of solar installations not only for customers with solar, but all ratepayers. This capability will quickly become critical, as FERC Order 2222 requires that utilities be able to assess and resolve local grid conditions with DER wholesale market obligations.

Again, one EDC recognizes these benefits but has not funded, planned or committed to any results. ACE's study on optimal voltage in Docket No. EO19040499 states "at sufficiently high penetration levels, DERs may cause feeders to experience problematic increases in voltage instability due to rapid, intermittent cloud cover or wind speed. Several sources in the literature point to potential solutions that involve the integration of smart inverter technology with VO [voltage optimization] to overcome these concerns." To reach statewide clean energy goals and support statewide deployment of solar, all EDCs should have plans to integrate smart inverter technology into distribution grid operations.

[2] Solar Successor Program: Staff Straw Proposal, P.28

The benefit of investing in a grid-edge software platform is that the foundational capabilities will continue to evolve and deliver additional benefits over time. For example, if the EDCs were to use their AMI systems and a grid-edge operating platform to communicate and coordinate with solar inverters, they could eventually use the technology to transition to a dynamic hosting capacity methodology. Today, most utilities provide a static hosting capacity value based on a few snapshots in time, and often calculated based on the forecasted peak demand at the substation. Since peak demand is typically only reached a few days per year, these estimates significantly underestimate the typical hosting capacity. In contrast, dynamic hosting capacity considers the full solar capacity on any given circuit assuming that the solar installation is curtailed for a specific set of hours and days during peak demand conditions. This could further increase hosting capacity throughout the state.

Additionally, the benefit of a grid-edge operating platform is that it can be deployed immediately, before AMI is fully rolled out, and used to set benchmarks for AMI performance and solar benefits. For example, as described above, initial results indicated that the platform could increase hosting capacity by an average of 50% or more. If the EDCs procured and deployed the platform now, the core capabilities could be used to determine within 12 to 18 months what an appropriate hosting capacity target would be, based on actual system data and conditions.

Lastly, while we have emphasized the benefits of AMI plus a grid-edge operating platform for solar in these comments, the same capabilities can be used to accelerate the deployment of other DERs, such as storage, electric vehicle charging infrastructure, and electric vehicles. If the Board and EDCs are able to successfully leverage AMI to support a stable and thriving solar industry, it also opens the possibility of further leveraging the investment to support the State's broader clean energy goals. Given the magnitude of the investment New Jersey ratepayers are being asked to make in AMI, it would be in their best interest to fully explore how this investment could also accelerate the clean energy transition. We appreciate the opportunity to provide our perspective and look forward to the Board's continued efforts regarding the solar industry.

Dated: May 27, 2021