October 12, 2018

Mr. Kenneth Sheehan
Director, Division of Clean Energy
New Jersey Board of Public Utilities
44 S. Clinton Avenue
Trenton, NJ 08625

Dear Mr. Sheehan:

Enclosed please find Sunrun, Inc.'s supplemental comments regarding select grid modernization discussion questions as part of New Jersey's 2019 Energy Master Plan process. Additionally, we support the comments submitted by the Energy Storage Association today. Thank you.

Respectfully submitted,

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Sunrun, Inc.'s Supplemental Comments
New Jersey 2019 Energy Master Plan
Modern Grid

What does a modern grid look like? What is the most critical step to modernize the grid? What barriers exist to prevent state implementation of a modern grid?

In the future, a modern grid is an energy delivery system that is customer-centric, affordable, resilient and run by renewable energy. We believe that a fundamental element in grid modernization should be the decentralization of the energy delivery system whereby there is significantly reduced reliance on the transmission of energy across state lines and greater deployment of distributed energy resources ("DER") such as solar and battery storage. A modern grid will be one in which residential consumers are no longer categorized as solely end-users but are treated as partners with utilities and DER providers in the production and dispatch of renewable energy and energy management resources.

Customer-centric grid modernization should become a part of normal business practice for utilities and an integral part of policymaking for the New Jersey Board of Public Utilities. Investments in the electric grid and innovative solutions to infrastructure needs should be evaluated in rate case proceedings and held to the same standards as other capital investments – using a long-term cost-benefit analysis that takes into account long-term energy goals. For example, a modern grid enables Non-Wires Alternatives ("NWAs") to become standard solutions to utility infrastructure needs, reducing costs for ratepayers.

We believe that grid modernization should be anchored in the following guiding principles. The modern grid should be structured and operated such that it:

- Empowers and enables customer choice
- Ensures non-discriminatory access to facilitate and seamlessly integrate DER and other clean energy technologies to the grid
- Conducts open and transparent distribution system planning to allow competition between private market participants through non-discriminatory access to opportunities to provide grid solutions and other energy services.
- Seamlessly integrates increasingly higher penetrations of DER and other clean energy technologies.
- Empowers customers and other non-utility market participants to manage power consumption, contribute to system reliability through demand management and other system services, and reduce the carbon intensity of the electric system.

How does a modern grid address, adapt, or respond to climate change and its impacts on New Jersey?

Building a modern, customer-centric grid through distribution system planning and data transparency is truly the sleeping giant of addressing, adapting and responding to climate change. As experienced through the impacts of Superstorm Sandy, New Jersey is vulnerable to increasing severe weather events caused by climate change. A modern grid will be able to withstand severe weather events and "keeping the lights on" for New Jersey communities. Inherent in the transition to a modern grid is less reliance on carbon-emitting fossil fuels which has been a root cause of global warming but also greater visibility into the distribution network to identify points in the system that could benefit the most from DERs and energy management resources. Integrating these resources will reduce the need for continued build-out of traditional poles and wires in our energy delivery system that are routinely destroyed during severe weather events.

What integrated distribution planning is needed in a modern grid?

Integrated distribution planning ("ISP") or distribution system planning, in this era of climate change, should be a core function of utilities. ISPs offer a more holistic approach to energy delivery, rather than the piece-meal approach that has been in effect for decades. Through the ISP process, the utilities should provide DER providers and other market participants access to opportunities to provide alternative and less-costly grid solutions, including NWAs, such as distributed generation, energy efficiency, energy storage, and demand response. ISPs require utilities to perform functions that facilitate the integration of more DERs, to balance distributed resources, and to better incorporate the role of the customer in its operations and planning processes. The ISP design and decision-making process must be flexible and transparent to accommodate new technologies and solutions, as well as evolving goals and priorities.

Utilities must conduct the ISP process in a proactive manner and include distribution circuit studies to determine hosting capacity in advance, rather than the utility reacting to interconnection applications as they arrive. If anticipated growth in DERs exceeds a circuit's hosting capacity, the utility planning process should provide for identifying how additional DERs, NWAs, or other infrastructure necessary can accommodate that growth. This planning can reduce the inefficiencies that often arise when individual DG customers pay for system upgrades that can impede customer choice and DG growth, as discussed above. Aligning ISP with grid modernization efforts allows solutions such as advanced meter functionality and communications systems to inform the types of NWAs and other DER solutions that can be incorporated into the ISP and enhance customer energy choices.

With respect to NWAs, we support a greater focus on the potential for non-wires alternatives ("NWAs") in New Jersey. NWAs that incorporate solar energy and battery storage should be a primary component of any grid modernization initiative. NWAs provide significant benefits to distribution system planning, including the ability to defer and/or completely avoid the need for the ratepayer-funded utility capital expenditures on unnecessary distribution network poles and wires. NWAs further provide the benefit of peak demand reduction and reduce the need for expensive, dirty power plants.

As noted in the Solar Energy Industries Association's ("SEIA") recent whitepaper, "DER and the Non-Wires Solution Opportunity," NWAs produce tremendous ratepayer benefits, encourage customer adoption of clean energy, and improve grid resilience and reliability. SEIA states,

"[Non-Wires Solutions ("NWS")] will be a key part of holding down utility system costs in the future, which will lead to significant ratepayer savings. As utilities are required to make public more of their system planning and expected investments, in many instances, DER providers will be able to offer solutions to meet utility needs that may otherwise be met through additional distribution grid infrastructure investments at a fraction of the cost. This will ultimately result in savings for ratepayers as utilities are able to contract with DER providers for more cost-effective solutions, and policymakers can develop tariffs that support DER to offset or relieve grid needs."[1]

SEIA further adds,

NWS are an important tool in moving to a more customer-centric electric system. In many instances, NWS will be met by deploying technology that allows customers to reduce and manage their energy usage. For example, to defer the need to upgrade an overloaded substation or feeder, utilities may develop tariffs that incentivize customers to reduce their energy use and shift load away from peak hours by using distributed resources such as smart home technology, distributed solar, or storage."[2]

How can state policies support a modern grid to increase resiliency and reliability and fight climate change?

State policies that facilitate customer adoption of DERs will be essential to supporting a modernized grid to increase resiliency and fight climate change. For example, New Jersey can expand and revise its battery storage incentive program to enable more New Jersey consumers to adopt battery storage for backup power and greater home energy resiliency during severe weather events. Residential battery storage is the fastest deploying and most flexible segment of the storage industry. The more customers adopt battery storage, the better positioned energy stakeholders will be to aggregate these resources for grid infrastructure benefits.

Also, state and local agencies in New Jersey should consider streamlining and standardizing permitting, inspection and interconnection procedures for all customers – residential and otherwise – seeking to utilize solar and battery storage. These ongoing substantial soft costs of solar continue to be a barrier for many consumers. These costs – which are derived from delayed processes, manual application systems and time lost because of poor agency staffing -- add about $7,000 to the cost of an average residential solar energy system. We believe that these costs can be significantly reduced by making solar and storage installation a straight-forward, routine and electronic online process. In fact, the Solar Energy Industries Association and the Solar Foundation have launched a new initiative calls SolarAPP (Solar Automated Permit Processing) to cut over $2.2 billion, nationally, of red tape caused by these

[1] *See* Umoff, Rick, et al., Solar Energy Industries Association, *DER and the Non-Wires Solutions Opportunity*, May 2018, available at: https://www.seia.org/sites/default/files/2018-05/SEIA-GridMod-Series-5_2018-May-Final.pdf.

[2] *Id.*

soft costs[3]. We encourage New Jersey stakeholders to participate in this initiative and explore how the state might be able to implement its recommendations.

What regulations need to be updated with a modern grid? Should there be performance metrics tied to grid performance? Could regulated rate design and tariff structures be developed to implement the development of a modern grid? What are examples of these?

Ensuring that utilities are properly incentivized to operate in accordance with the principles identified above, relies upon a regulatory paradigm that ensures fair and open competition. Utility compensation should be aligned with the principle of empowering customers and non-utility market participants to manage power consumptions and deliver system solutions, and with the utility's role in achieving renewable energy procurement, energy efficiency and demand reduction, grid modernization, safety and reliability, customer service, emissions, cost and affordability goals, and other state energy policy priorities and customer service goals.

Sunrun supports performance-based incentives that provide financial rewards to utilities for meeting and exceeding the state's energy policy objectives, as well as expanding customer choice. We envision a future in which a majority of utility earnings are from performance-based incentives, with return-on-equity declining as a share of earnings. These incentives should be sufficient to overcome the bias toward capital investment while still providing utilities the opportunity to earn adequate revenues. The key is to design the compensation mechanisms to incentivize the right kinds of investment: those that advance the state's energy and other public policy goals.

Sunrun supports incentive mechanisms in the following categories:

- Increased reliance on DERs to reduce peak demand, ensure system reliability, reduce bulk power purchase, and lower electricity costs;
- Emissions reductions;
- System reliability and resilience improvement;
- Interconnection timeliness and reduced costs for behind-the-meter DER improvements
- Effective use of DER as a hedge against generation fuel price risk
- Effective and efficient implementation of grid modernization technologies and systems
- Electricity affordability
- Customer service

Stakeholder proceedings provide a transparent and effective process for establishing consensus on specific goals, metrics, and incentives. Once established, incentives may be awarded to utilities based on annual evaluations, and specific goals and metrics can be

[3] See generally, Pyper, Julia, Greentech Media, *Solar Industry to Slash Red Tape With New Automated Permitting Initiative,* Sept. 24, 2018, available at: https://www.greentechmedia.com/articles/read/solar-industry-to-slash-red-tape-new-automated-permitting-initiative#gs.N9F=rsg

reassessed, as needed, at the initiation of the BPU or the request of the utilities or stakeholders.

Additionally, Sunrun supports the development of tariff structures that will enable more customers to utilize battery storage and share the benefits of the technology with all ratepayers, such as the Bring-Your-Own-Device tariffs. Such tariffs are being implemented in New England and they enable customers to purchase batteries through any source and receive credits on their monthly bills. Customers can install battery storage at their residences and then share access to the storage with the utility to drive down costs for all ratepayers during peak hours. This approach makes customers true partners with the utility in the effort to reduce costs, shift peak consumption and facilitate greater grid resiliency.

What actions could the State take to manage energy costs while upgrading the grid? Within the regional transmission system, how does modernizing the grid have the potential to save ratepayers money?

As expressed above, a modern grid includes greater deployment of DERs like residential battery storage. Residential battery storage provides numerous benefits to the grid and all ratepayers like distribution and transmission deferral, distribution and transmission cost reductions, energy and wholesale market cost reductions, increased renewable integration, resource adequacy, peak reduction, and ancillary services.
Diversity of energy storage is important in achieving the greatest ratepayer benefit. Storage connected at the transmission and distribution (T&D) level serves different functions to the grid than storage connected behind the meter. Additionally, the size of T&D storage is commonly over 1 MW. In contrast, residential BTM systems are usually 5-15 kW. This makes residential BTM storage very fast to deploy – many systems can be installed in a single day.

Customer-sited, behind-the-meter energy storage can technically provide the largest number of services to the electricity grid. Residential battery storage can provide customer services (backup power, increased PV self-consumption, time-of-use bill management, etc.), utility services (distribution deferral, transmission deferral, transmission congestion relief, resource adequacy) and even ISO services (energy arbitrage, spin and non-spin reserves, frequency regulation, voltage support, and black start). All of these services save ratepayers money and enables a more resilient grid.

In a modernized grid, how should the interface between the energy distribution systems and the energy transmission systems work?

Sunrun has been engaged at the Federal Energy Regulatory Commission on this very issue for quite some time. In short, we believe that, in a modernized grid, it is critical to remove barriers to the participation of residential battery storage resources and DER aggregations in the organized wholesale electric markets. These resources are capable of participating in the organized wholesale markets and providing many grid services that will ultimately save ratepayers significant amounts of money. At the federal level, we must ensure open market participation for DERs and ensure that the full capabilities of these resources can be realized.

Indeed, residential battery storage systems may be capable of providing more services to the grid, utilities, and customers than other assets already accommodated by RTO/ISO tariffs. The further downstream energy storage is located on the electricity system (i.e., behind the meter), the more services it can offer to the system at large. Therefore, we believe that there are ways to integrate retail level resources into the wholesale markets in an equitable manner that would not result in double compensation but rather activate the multitude of services that can provide to the grid during times when they would otherwise be dormant. There are times during the day when customers' solar plus storage systems are not using those batteries in retail markets or otherwise.

As a recent Rocky Mountain Institute report noted, "[t]he behind-the-meter energy-storage business model creates value for customers and the grid, but leaves significant value on the table. Currently, most systems are deployed for one of three single applications: demand charge reduction, backup power, or increasing solar self-consumption. This results in batteries sitting unused or underutilized for well over half of the system's lifetime. For example, an energy storage system dispatched solely for demand charge reduction is utilized for only 5-50% of its useful life. Dispatching batteries for a primary application and then re-dispatching them to provide multiple, stacked services creates additional value for all electricity system stakeholders."[4]

[4] *The Economics of Battery Energy Storage: How Multi-Use, Customer-Sited Batteries Deliver the Most Services and Value to Customers and the Grid*, Rocky Mountain Institute at p. 7 (October 2015). Available at http://www.rmi.org/Content/Files/RMITheEconomicsOfBatteryEnergyStorage-FullReport-FINAL.pdf