STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION

IN RE: PETITION OF TESLA, INC. & SUNRUN, INC.
FOR DECLARATORY JUDGMENT **Docket No. 4743**
PURSUANT TO R.I. GEN. LAWS §39-26.4 et seq.,
THE NET METERING ACT

RESPONSE OF SUNRUN, INC. TO FIRST SET OF DATA REQUESTS DIRECTED TO TESLA, INC. AND SUNRUN, INC. BY THE STATE OF RHODE ISLAND DIVISION OF PUBLIC UTILITIES AND CARRIERS
(Issued: October 10, 2017)

1-1. Please list and describe in detail any legal, technical, or policy concerns that NGRID has expressed to Tesla and for Sunrun relative to allowing Solar+Storage systems to be related documents that discuss these concerns.

RESPONSE: NGRID has not expressed any legal, technical, or policy concerns to Sunrun relative to allowing Solar+Storage to be eligible for net metering status beyond that described in its petition. Please see NGRID response to Division Data Request 1-1. Sunrun has no analyses, reports, studies, or other related documents responsive to this request.

1-2. Please provide copies of manuals and technical specifications for any existing Storage.

RESPONSE: At this time, Sunrun does not have any existing storage installations in Rhode Island but does have solar + storage ("BrightBox") installations throughout its markets. Depending on the market, Sunrun's BrightBox solution offers residential customers the ability to store onsite photovoltaic generated energy for the purposes of self-consumption of photovoltaic power and/or to export that stored photovoltaic power to the grid at a later time if there is an economic incentive to do so and/or provide backup power when the utility grid fails. Sunrun's BrightBox product comes with some design variations depending on the level of grid support targeted and customer economics. For instance, a DC coupled BrightBox may use a 7.6 kW StorEdge inverter coupled with DC inputs for photovoltaic modules and LG Chem battery(s).

Below are a few referenced certification standards and specifications:

- The SolarEdge StorEdge specifications sheet (https://www.solaredge.com/sites/default/files/se_storedge_inverter_datasheet_na.pdf), UL 1741 (https://www.solaredge.com/sites/default/files/se-storedge-connection-unit-atm-na.pdf) and UL 9540 (https://www.solaredge.com/sites/default/files/se_storedge_atm_ul_na.pdf) certifications.
- The LG Chem battery is certified to UL 1642 for the Cell and UL 1973 for the Battery Pack.

1-3. Please provide a one-line diagram showing how the Solar Net Metered Resource, the Storage system, the premises / customer-host load, and the distribution grid are connected. Show all metering points, and inverters and other control systems that will ensure that the Storage system will only be ON charged by the Solar Net Metered Resource.

RESPONSE: Please refer to the diagram on page 2 in the SolarEdge manual located on this website - https://www.solaredge.com/sites/default/files/se_storedge_inverter_datasheet_na.pdf. Through a software setting, the inverter is configured to disable AC-charging of the battery from the grid, except in the event of inadvertent export, which is de minimis. Updating this setting is restricted and requires an installer password.

1-4. The petition states that the default setting for the Powerwall H6 Storage system disables battery charging from the grid. Please describe what other settings are available, how these settings can be changed, and who may be change them. Also describe in detail how NGRID will be able to monitor these settings and for battery charging from the grid.

RESPONSE: Sunrun is financially and legally responsible, due to claiming the Federal Investment Tax Credit, to ensure that the battery is charged only from onsite photovoltaic generation. Please also reference the setting configurations explained in answer to 1-3. Thus, there is no need to monitor settings for systems that have been approved by National Grid to operate, and we would argue that National Grid already has all the tools they need to enforce as their metering system data enables evaluation for operational abnormalities.

1-5. How will Tesla and for Sunrun determine the size and operating characteristics of the battery storage systems that will be installed with Solar Net Metered Resources in Rhode Island if the petition is granted? Please describe in as much detail as possible, and provide examples for several solar system sizes up to 25 KW AC.

RESPONSE: The size of the solar system does not change with the addition of energy storage and will not alter participation in net metering, except to perhaps lessen photovoltaic exports to the utility grid. Customer economics will drive the decision on how much storage is acceptable. A DC coupled BrightBox with a 7.6kW inverter would typically have approximately 10kWh of storage capacity as it is most economical for the customer. However, storage sizing could potentially increase, aligning with Rhode Island ratepayer needs, under appropriate market signals. A typical system may have islanding capabilities during a utility outage, as well as load following, scheduling and export capabilities, plus additional aggregation capabilities to leverage these resources more programmatically in the future. For a Rhode Island residential customer today, the primary operation of the battery is likely back up power for resiliency purposes, until such time that the battery finds additional opportunities to align DER operations with the grid needs.

1-6. Data Request withdrawn by Division of Public Utilities and Carriers

1-7. If the petition is granted, please describe how Tesla and Sunrun will operate the Storage system, including but not limited to when, how, and under what conditions the Storage system will be charged and discharged. Please answer this question with and without TOU rates.

RESPONSE: Not knowing what future residential time of use rate design may look like, it is impossible for us to comment on how we may optimize BrightBox for the benefit of the customers and grid. If there is no economic rate incentive, the primary selling feature for a Rhode Island residential customer would be resiliency through critical load power management during a utility outage. Thus, at this time, we do not anticipate other operations unless rate designs are modified. As other states have demonstrated, time of use (TOU) rates can enable the deployment of behind the meter storage to align with periods of grid needs. As indicated previously, the California TOU net metering program encourages energy management and enables battery exports when needed most by the grid. This has the potential to enable customers to make wise economic investments that align with grid needs.

Without TOU rates, BrightBox would be limited to backup only. The battery would charge from solar and maintain 100% state of charge (SOC) until an outage occurred. In the event of an outage, the battery would discharge to the islanded home to power backed-up loads. Additionally, the solar system would be able to produce energy that could charge the battery and/or power the backed-up loads.

With TOU rates generally, the battery would charge from solar produced during "off peak" hours and discharge during "peak" hours to maximize savings for the customer and for all ratepayers by reducing peak costs.

1-8. According to Rhode Island General Laws, Net Metered Resources are sized to annually produce electricity in an amount that is equal to or less than the Net Metering Customer's average annual usage. If the petition is granted, will the addition of a Storage System alter or change the size of the Solar Net Metered Resource to be installed? Please explain why or why not in as much detail as possible.

RESPONSE: No, the addition of storage for Rhode Island customers will not impact the way Sunrun will size solar systems in the state today.

1-9. through 1-13. Data Requests withdrawn by Division of Public Utilities and Carriers

Prepared by or under the supervision of
Becca Polishuk, Esq. and Steven Rymsha

CERTIFICATE OF SERVICE

I hereby certify that a copy of the cover letter and any materials accompanying this certificate was electronically transmitted to the individuals listed below.

The paper copies of this filing are being delivered by first class mail to the Rhode Island Public Utilities Commission and to the Rhode Island Division of Public Utilities and Carriers.

Seth H. Handy, Counsel for Sunrun, Inc.

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