July 16, 2021

Jeffrey R. Gaudiosi, Executive Secretary
Public Utilities Regulatory Authority (PURPA)
10 Franklin Square
New Britain, CT 06051

Re: Docket No. 17-12-03RE03, PURA Investigation into Distribution System Planning of the Electric Distribution Companies – Electric Storage

Dear Mr. Gaudiosi:

The Northeast Clean Energy Council (“NECEC” or “the Council”) and the U.S. Energy Storage Association (“ESA”) appreciate the opportunity to provide a written brief in response to the Proposed Final Decision in the above-referenced docket. NECEC and ESA, with contributions from our respective members, would also like to request the opportunity to provide oral arguments on July 19th.

NECEC is a clean energy business, policy, and innovation organization whose mission is to create a world-class clean energy hub in the Northeast, delivering global impact with economic, energy, and environmental solutions. NECEC is the only organization in the Northeast that covers all of the clean energy market segments, representing the business perspectives of investors and clean energy companies across every stage of development. NECEC members span the broad spectrum of the clean energy industry, including energy efficiency, wind, solar, energy storage, microgrids, fuel cells, electric vehicles, and advanced and “smart” technologies.

ESA is the national trade association dedicated to energy storage, working toward a more resilient, efficient, sustainable and affordable electricity grid – as is uniquely enabled by energy storage. With more than 230 members, ESA represents a diverse group of companies, including independent power producers, electric utilities, energy service companies, financiers, insurers, law firms, installers, manufacturers, component suppliers, and integrators involved in deploying energy storage systems around the globe. Further, our members work with all types of energy storage technologies and chemistries, including lithium-ion, advanced lead-acid, flow batteries, zinc-air, compressed air, liquid air, and pumped hydro among others.

NECEC and ESA commend the Public Utilities Regulatory Authority (“PURPA” or “the Authority”) for its recognition of the importance of deploying energy storage systems at the distribution level and for exploring with stakeholders the programmatic designs that will overcome the barriers to energy storage deployment in Connecticut.
In the comments below, NECEC and ESA suggest modifications and clarifications that are critical for enabling the new customer-sited storage program to meet its objectives. While the Proposed Final Decision contains the foundational potential for a successful program, additional modifications and clarifications are necessary to reduce complexity and confusion and maximize the potential to achieve program objectives. In general, our requests are made in the recognition that the market for this program is end-use customers who often do not specialize in energy. Simple and easily understandable program rules are necessary for success.

The following recommendations offer a path to an administratively straightforward program for all stakeholders. The sequence of the recommendations follows the order in which the issues appear in the Proposed Order and are not in order of priority.

Requests for Clarification and Modification

III.C.1. Residential Incentive Formula

PURA Proposal #1: “Accordingly, the Authority authorizes the declining capacity blocks for residential customers as shown in Table 2 (i.e., capacity blocks of 2.0, 3.5, 6.5, 13.0, and 25.0). Additionally, the Authority authorizes the upfront incentive to be capped at $7,500 as recommended by the CGB.” (p. 10)

NECEC/ESA Recommendation #1: The following formulas were proposed by the Connecticut Green Bank (“CGB”) and result in the incentive values listed in Table 2 which the Draft Decision adopts.

1. BESS usable energy capacity (kWh) * $/kWh
2. BESS maximum power output rating (kW) * 2 hrs * $/kWh
3. Solar PV system nameplate rating (kW) * 2 hrs * $/kWh
4. 50% of BESS total installed cost
5. Maximum per project incentive of $7,500

We recommend that formulas #2 and #3 be removed from the incentive value calculation. Without the removal of those formulas, the calculation structure will favor smaller capacity energy storage systems, which would not further the program objectives. The energy storage market is trending towards higher capacity residential batteries which can provide improved back-up value for customers and greater ratepayer benefit through the passive and active dispatch models. For formula #2, it is unclear what the rationale behind applying a 2 hour discharge duration for all ESS systems even if a system is capable of exporting at its maximum output rating for greater than 2 hours. On the opposite end, systems that do not have the usable capacity to export at the maximum output rating for at least 2 hours would benefit in this calculation. This arbitrary formula essentially penalizes larger - and more expensive - capacity systems, such as Tesla Powerwalls.
Formula #3 utilizes the solar kW capacity multiplied by 2 hours and then by the incentive level. Given that this Program allows for the participation of standalone residential storage, inclusion of formula #3 would mean that many eligible projects would receive an upfront incentive of $0 because they are not paired with a solar resource. This outcome would hamper the development of the standalone residential storage industry in Connecticut and formula #3 should be removed.

To illustrate the issues above, below is a comparison of these calculations for a Tesla Powerwall 2 and a LG Chem RESU10H with the minimum value in bold and underlined. As demonstrated, the Tesla Powerwall 2 would receive only a slightly higher incentive value despite having a significantly higher capacity and cost. The “effective incentive value” for the Tesla Powerwall 2 is $278/kWh whereas for an LG Chem RESU10H it is potentially $375/kWh (assuming the calculated incentive value in #1 does not exceed 50% of installed cost). To avoid these unintended disparities between energy storage technologies, we recommend calculating the incentive based on the lower of usable energy capacity, 50% of BESS total installed cost, and the maximum per project incentive of $7,500.

**Tesla Powerwall 2 (13.5 kWh usable power, 5 kW max output, 8 kW solar estimate)**
1. BESS usable energy capacity (kWh) * $375/kWh = 13.5 * $375 = $5,062
2. BESS maximum power output rating (kW) * 2 hrs * $375/kWh = 5 * 2 * $375 = $3,750
3. Solar PV system nameplate rating (kW) * 2 hrs * $375 = 8 * 2 * $375 = $6,000
4. 50% of BESS total installed cost = Likely higher than other values
5. Maximum per project inventive of $7,500

**LG Chem RESU10H (9.3 kWh usable power, 5 kW max output, 8 kW solar estimate)**
1. BESS usable energy capacity (kWh) * $375/kWh = 9.3 * $375 = $3,487
2. BESS maximum power output rating (kW) * 2 hrs * $375/kWh = 5 * 2 * $375 = $3,750
3. Solar PV system nameplate rating (kW) * 2 hrs * $375 = 8 * 2 * $375 = $6,000
4. 50% of BESS total installed cost = Likely higher than other values
5. Maximum per project inventive of $7,500

**III.C.3. Performance Incentive**

**PURA Proposal #2:** The proposed C&I Performance Incentive states that “… electric storage systems participating in the Program will be eligible for a performance incentive paid to the storage system on a per event basis for each event the storage system is dispatched.” (p. 13)

**NECEC/ESA Recommendation #2:** While we believe this to be the intent, PURA should clarify that the Performance Incentive payment is determined based on the average performance across all seasonal event hours, regardless of the number of events. Therefore, the compensation for the summer would be “(average performance on a percentage basis across all event hours) * ($225/kW-yr)”. Without such clarification, one might conclude that the number of events will determine the performance incentive, and not the performance across
these events. Page 7 of the Connected Solutions materials explains this calculation: https://www.nationalgridus.com/media/pdfs/bus-ways-to-save/connectedsolutions-ciprogrammaterials.pdf.

This approach has been a success in the Massachusetts Connected Solutions program as it fairly balances rewarding resources that actually perform, while providing appropriate financial certainty to energy storage system developers.

III.C.4. Front-of-the-Meter Considerations

PURA Proposal #3: “The CGB shall provide the results of the above ordered actions, including a recommended path forward on or before August 1, 2022 in the appropriate annual Program review proceeding.” (p. 17)

NECEC/ESA Recommendation #3: NECEC and ESA appreciate the Authority’s recognition of the significant barriers that currently limit front-of-the-meter (“FTM”) storage deployment. Particularly, the development of a revenue-neutral tariff that does not contain a demand charge will be instrumental in unlocking this category of energy storage and we applaud PURA for taking immediate action to remove the demand charge barrier. Coupled with the directives to the CGB to evaluate additional barriers and opportunities and then to report on a recommended path forward for standalone FTM systems, PURA is making immediate progress toward on the development distribution-connected energy storage at each level of interconnection, as directed by Public Act 21-53. NECEC and ESA request that the deadline for the CGB to conduct an analysis and a recommended path forward by August 1, 2022 be expedited to June 1, 2022. We have consulted with the CGB on this request and they agree that a June deadline is reasonable and achievable. This will allow standalone FTM energy storage systems to deliver benefits to Connecticut ratepayers and residents sooner, and help achieve the interim target of Public Act 21-53 to achieve 300 MW of energy storage by December 31, 2024.

III.D Program Eligibility

PURA Proposal #4: “The electric storage system must be new to the customer residence or C&I building/facility.” (p. 17)

NECEC/ESA Recommendation #4: PURA should clarify that the electric storage must be new in order to qualify for the Upfront Incentive, but this should not apply to the Performance Incentive.¹ The benefits to ratepayers from dispatching the battery and the Performance Incentive are the same regardless of whether the storage is new or existing. If only new storage is eligible, it would underutilize existing storage during peak periods. We recognize the

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¹ This clarification should also apply to any future FTM program.
rationale behind limiting the Upfront Incentive to only new customers, and take no issue with it.

III.D.1. ISO-New England Market Participation

PURA Proposal #5: “The Authority will require residential and C&I Program participants to transfer the capacity rights to the appropriate EDC as the default arrangement.” (p. 18)

NECEC/ESA Recommendation #5: NECEC and ESA continue to believe that system-owner retention of capacity rights will result in the most successful program. Some Program participants who retain capacity rights may participate in the Forward Capacity Market (“FCM”) and provide long-term ratepayer benefit, in the form of clean, firm contributions to the Installed Capacity Requirement. These benefits will only grow with the ongoing deployment of intermittent renewable resources. Other system owners may have systems that would be uneconomic to participate in the capacity market - for either the EDCs or system owners. In this case, transfer of capacity rights would only inject risk without delivering ratepayer benefit. To avoid any potential conflicts with split ownership of capacity rights and ancillary service rights, capacity rights should remain with the system owner, even if the program does not allow the system owner to utilize those capacity rights.

If the capacity rights are to transfer to the EDCs, **it is critical that PURA clarify that the EDCs are prohibited from enrolling the storage into the FCM.** If the EDCs were to enroll the storage in the FCM, it would hinder the ability for new projects to get financed and built. As NECEC and ESA have previously noted, developers will struggle to finance new storage projects if another entity has potential operational control of the battery. If the EDCs enrolled the storage in the FCM, they would be offering into the ISO-NE market and receiving dispatch instructions from ISO-NE. This would create a conflict with the storage project’s other use cases (e.g. demand charge management), and negate the value proposition.

If the EDCs acquired a Capacity Supply Obligation for the storage, it also introduces serious questions of risk, especially with penalties exceeding $9,000 MWh and when the owner/operator of the asset is not the same entity as the Market Participant with the capacity obligation. PURA has not named a responsible party for paying the penalties (the EDCs, ratepayers, or TPOs). **PURA should therefore clarify that the EDCs are prohibited from enrolling the storage into the FCM.**

PURA Proposal #6: “However, in the select cases described below, TPOs and residential and C&I customers will be permitted to request capacity rights for projects that support public policy goals outlined in the Program Objectives, namely regarding the objective to increase local and community resilience and prioritize delivering increased resilience to customers in underserved communities, critical facilities, and customers on the grid edge who consistently experience more and/or longer than average outages during major storms. See, Section III.A. Additionally, **the Authority will allow C&I participants to request capacity rights for projects to enable such projects to more actively optimize electric grid benefits.** Electric storage system
operators with capacity rights shall be required to adopt the passive dispatch settings established pursuant to this Decision, but may operate outside the passive dispatch parameters to meet ISO-NE market obligations.” (p. 18-19)

**NECEC/ESA Recommendation #6**: PURA should clarify whether any type of facility or location may request capacity rights to enable a more active optimization of electric grid benefits, or if eligibility is limited to one of the four sub-categories outlined in Section III.D.1. a-d. To avoid a burdensome administrative process, PURA should forgo a project-by-project eligibility evaluation and instead simply offer a reduced upfront incentive for projects that wish to request and utilize capacity rights during their registration.

PURA should also clarify that a TPO may enroll a project in the ISO-NE energy and ancillary services market, even if it does not own the capacity rights. PURA specifies the ancillary services market (p.23), but the ISO-NE reserves market (the main form of ancillary services) is co-optimized with the energy market, and the two cannot be separated.

### III.D.3. Passive Dispatch

**PURA Proposal #7**: “Specifically, participants would be required to “set the electric storage system to automatically store and dispatch ... energy through the battery to reduce demand during ISO-NE summer peak periods which currently includes June through August weekdays from 1:00 to 5:00 p.m. using no more than 80% of the battery storage capability (i.e., at least 20% will be reserved for back-up power).” (p. 22)

**NECEC/ESA Recommendation #7**: NECEC and ESA remain unclear on what exactly the passive dispatch requirement means operationally for projects, and how it will interact with the Performance Incentive.

Importantly, because of the passive dispatch requirement, it is imperative that PURA specify that the performance measurement for the active dispatch “Performance Incentive“ be done by metering the actual output of the storage during an event, and not use a baseline methodology (e.g. a 10 of 10 that looks at the output of the storage over the last 10 days). Our understanding of the passive dispatch requirement is that it will result in storage dispatching every weekday summer afternoon when there is not an active dispatch event. If there was a traditional baseline methodology that considered what the storage was doing on non-active event dispatch days, then the storage would not receive compensation for active dispatch. For example, assume a 1 MW battery that receives the upfront incentive and has the passive dispatch settings. If that storage device were to discharge for passive dispatch every weekday from June 1-June 15, the baseline would be 1 MW of output. Therefore, in order for the storage to perform at 1 MW for an active dispatch event, it would have to deliver 2 MW (2 MW of performance – 1 MW of baseline). Clearly, a 1 MW battery would be unable to dispatch for 2 MW, and it would therefore would earn no performance incentive dollars.
As long as there is no baseline, and the storage’s performance is based off the actual output during a specific window, the storage would only need to deliver 1 MW and the passive dispatch would not have a negative impact on the Active Dispatch performance.

Additional areas of confusion could create challenges for TPOs, customers, and the Program Administrators. We request that PURA clarify the following:

- TPOs/customers can charge the battery at any period outside 1:00-PM-5:00 PM on summer weekday afternoons, or the passive dispatch hours;
- Even under passive dispatch, it will be the TPO that physically dispatches the battery even if there is no actual event, as long as they discharge at least 80% of the total energy in the battery during these hours;
- Whether the battery needs to be charged at or near 100% by 1 PM on summer weekdays. This may be more appropriate for CGB to seek stakeholder feedback on;
- How passive dispatch settings interact with active dispatch, and specifically whether, on days for which an active dispatch event is called, the passive dispatch settings are overridden.

We further request clarification on how the passive dispatch requirement would work for residential customers on time-of-use (“TOU”) rates, or commercial and industrial (“C&I”) rate classes that use time-varying rates. For instance, Eversource’s residential Rate 7 has an on-peak period of weekdays from noon-8:00 pm, which does not align with the passive dispatch period of weekdays from 1:00-5:00 pm. This creates a potential situation in which the storage system is charging during the customer’s peak hours in accordance with the passive dispatch settings. This outcome would not benefit the customer or the grid. While there may not be many residential customers on TOU rates today, some solar and storage companies have begun defaulting all residential customers to TOU rates where available, and nearly all C&I customers are on a time-varying rate. One potential solution to the aforementioned conflict between TOU or time-varying rate customers and passive dispatch is to allow TOU or time-varying rate customers to opt-out of the passive dispatch requirement in recognition of the charging/dispatch price signals being provided through their delivery rates.

Finally, it is also unclear why the passive dispatch and active dispatch windows are different. In the absence of a compelling rationale, we recommend making them both 2:00 to 7:00 pm to avoid confusion.

PURA Proposal #8: “The Authority adopts the CGB’s proposed passive dispatch settings described above as the default arrangement for participating residential electric storage systems.” (p. 23).

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2 Summary of Connecticut Electric Rate. See Rate 7.
NECEC/ESA Recommendation #8: Here PURA discusses residential participants. PURA should clarify whether the passive dispatch settings are to be the default arrangement for C&I participants.

PURA Proposal #9: “...The CGB shall develop a passive dispatch waiver to include in the project application. The CGB shall also develop a process to verify participation in the ISO-NE markets or other approved program to ensure the expected benefits are realized.” (p. 23)

NECEC/ESA Recommendation #9: PURA should clarify whether projects can override the passive dispatch settings with participation in other programs, not just ISO-NE dispatch signals. CGB should be tasked with establishing the list of qualifying programs and rate classes and updating that list as new programs are created and approved.

III.D.4. Technology Eligibility

PURA Proposal #10: “Storage technologies shall be considered (and approved or not approved) for inclusion as eligible based on their ability to satisfy program requirements and objectives, including, but not limited to, the following: ... Safety considerations, and other characteristics including: a. 80% roundtrip efficiency or greater...” (p. 25)

NECEC and ESA Recommendation #10: NECEC and ESA continue to believe that a minimum round-trip efficiency (“RTE”) is unnecessary. If PURA requires a minimum RTE, we recommend that the threshold should be lowered to at least 70% to ensure that diverse storage technologies that may provide unique benefits to customers – including but not limited to, cycle-life, durability, total cost of storage over the lifetime of the asset – are not unnecessarily excluded from the program. As a point of comparison, the NYSERDA retail incentive program requires a 70% minimum RTE.³ PURA should also detail a roundtrip efficiency measurement methodology (including who will measure it, how will it be measured, during what operating conditions and duty cycles, when and how often should be measured) to enable fair and relevant comparison across technologies and systems.

IV. Benefit-Cost Analysis

PURA Proposal #11: “the Authority directs the CGB to design upfront incentives, using the 2021 AESC, designed to deliver a RIM of 1.5 over the first three-year Program cycle.” (p. 31)

NECEC/ESA Recommendation #11: NECEC and ESA are concerned that this proposal will result in upfront incentives being reduced to a level that may potentially limit the ability for the market to meet the Program deployment targets. While we appreciate the desire to design cost-effective programs, requiring a RIM of 1.5 is arbitrary and the revised upfront incentive

levels will not have the benefit of industry review, opening the door to the possibility that incentive levels will not drive the desired level of deployment. As described in NECEC’s response to CAE-4, there is a significant revenue gap for energy storage projects in Connecticut that may not be addressed if upfront incentive levels are reduced.\textsuperscript{4} As such, NECEC and ESA urge PURA to direct the CGB to proceed with the levels proposed in the Straw Proposal as long as the RIM is above 1, and re-evaluate and adjust, if necessary, after program review.

\textbf{V. Data Collection, Sharing, and Reporting Requirements}

\textbf{PURA Proposal #12:} The Draft Decision orders the EDCs and CGB to create a publicly available online portal with real-time, anonymized, aggregate program data. (p. 38).

\textbf{NECEC/ESA Recommendation #12:} We recommend that this requirement be clarified that the aggregate program data should be provided but not specify that such data must be “real-time.” The use of “real-time” suggests a down to the second reporting from participating systems which is likely not technically feasible on both the participant and EDC/CGB ends. While ESS systems will be providing granular data in increments, such as 15 minutes, which would achieve the purposes of the online portal, it is not technically real-time.

\textbf{VI. Conclusion}

NECEC and ESA applaud PURA for its recognition of the value of energy storage and the thoughtful approach taken in the framework of the Electric Storage Program. We strongly support the Program Objectives, and our recommendations are designed to help ensure the program’s success.

Sincerely,

\begin{center}
Sean Burke  
Policy Associate  
Northeast Clean Energy Council
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Julian Boggs  
State Policy Director  
U.S. Energy Storage Association
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\textsuperscript{4} \textit{NECEC Response to CAE-4}. Note that this response assumed participants would retain capacity rights, which is not the case in the Proposed Final Decision.