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January 14, 2016

Rob Klee, Commissioner
Connecticut Department of Energy & Environmental Protection
10 Franklin Square
New Britain, CT 06051

RE: Energy Storage Association's Comments on Draft Request for Proposals Pursuant to P.A. 15-107 Section 1(b) – 2-20 MW Renewable, Passive Demand Response, and Energy Storage Procurement

Dear Commissioner Klee:

On behalf of the Energy Storage Association ("ESA"), please accept these Comments in response to the Connecticut Department of Energy & Environmental Protection's ("DEEP") request for comments in the above-referenced matter.[1] As detailed herein, for energy storage to operate competitively in Connecticut, ESA respectfully recommends several modifications to the draft RFP. With these modifications, energy storage will more cost-effectively reduce electric demand and improve resiliency and grid reliability in Connecticut.

ESA appreciates DEEP's recognition that energy storage should be an important part of a clean energy program. As is currently drafted, however, the RFP unnecessarily limits the load reduction and reliability contributions that energy storage is capable of providing to the Connecticut electric grid. Additionally, the draft RFP requires clarifications to ensure energy storage operators understand and can adequately meet the terms of the RFP. By addressing these issues, DEEP will ensure Connecticut ratepayers realize fuller benefits of having storage entities on the electric system. Finally, the draft RFP establishes rules for pricing energy storage bids that create a structural bias in cross-technology comparisons with other resource categories.

Moreover, given the substantial value of energy storage in deferring the replacement of aging distribution infrastructure while providing load reductions, ESA submits that the rules should allow non-exporting, behind the meter battery storage systems to bid as Passive Demand Response resources as part of the DEEP's RFP. Similarly, energy storage resources should be allowed to demonstrate alternative means of effective site control, which will enable pursuit of the highest-value locations for energy storage. Such a change is necessary if Connecticut seeks to take full advantage of the benefits that energy storage technologies can provide to distribution systems.

[1] ESA members include public utilities, independent power producers and operators/developers of batteries, flywheels, thermal energy and compressed air technologies that have deployed over 800 MW of non-hydro energy storage on the nation's electric grids. A number of ESA members companies maintain operations and offices in Connecticut.

I. COMMUNICATIONS

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II. ABOUT THE ENERGY STORAGE ASSOCIATION

Since its inception 26 years ago, ESA has promoted the development and commercialization of competitive and reliable energy storage delivery systems for use by electricity suppliers and their customers. ESA represents electric utilities that actively seek to incorporate energy storage into their asset portfolio. In addition to electric utilities, ESA's membership comprises a diverse group of electric sector stakeholders, including energy service companies, independent power producers, technology developers—of advanced batteries, flywheels, thermal energy storage, compressed air energy storage, supercapacitors, and other technologies—component suppliers, and system integrators.

ESA's nearly 200 member companies have expertise in transmission- and distribution-level grid operations relevant to energy storage, as well as firsthand knowledge of the regulatory challenges to financing and operating commercial energy storage facilities to realize full system benefits. ESA looks forward to working with the DEEP and other interested participants in this and related proceedings to ensure that Connecticut continues to enhance electric reliability and promote energy system sustainability while ensuring least cost to ratepayers.

III. COMMENTS

ESA is pleased that the DEEP has recognized the importance of energy storage and incorporated it into the draft RFP as part of the resource procurement required pursuant to Public Act 15-107. Energy storage entities are incorporated onto the grid throughout the world in order to, among other things, reduce electric system demand and improve resiliency and grid reliability. However, to ensure that energy storage can compete fairly in the RFP process, several modifications should be made to the RFP.

ESA requests DEEP's confirmation that the RFP seeks Energy Storage that can deliver its bid energy quantities for any four hours during Performance Hours.

In section 1.2.3, the draft RFP states:

> "Minimum discharge time at bid quantity must be greater than or equal to four hours per day, during Performance Hours."

While ESA is satisfied with this requirement as written, nevertheless we request DEEP make explicit that an Energy Storage system is eligible as long as its total discharge time at bid quantity during Performance Hours equals four hours, and that such discharge need not occur in a single 4-hour interval. Grid operators and owners of Energy Storage systems may prefer to discharge it in several, separate intervals,

particularly if system contingencies make energy delivery more important at certain times or other demands on the resource must be accommodated.

ESA recommends that this text be altered to say:

> "The total duration of discharge at bid quantity must be greater than or equal to four hours per day and must occur during Performance Hours."

DEEP should ensure that Energy Storage used to store and release system power is directed to conduct charging and discharging in the ISO-NE energy market or with third-party contracts.

In section 2.2.3.3.B, the draft RFP states:

> "The EDCs will not provide energy for storage and will not take delivery or title to any energy discharged from storage from distribution or transmission projects that are not Paired and Co-located with Class I or Class III Qualified Clean Energy sources."

ESA understands this statement to mean that EDCs are prohibited from bilateral arrangements for storage operations unless paired with a Class I or Class III Qualified Energy source. We request DEEP make explicit (1) that such bilateral arrangements are allowed for Energy Storage paired with a Class I or Class III Qualified Energy source, and (2) that Incremental Energy Storage used to store and release system power is expected to conduct its operations either in the ISO-NE energy market or by third-party contract only.

ESA respectfully requests that Energy Storage systems be allowed to charge during Performance Hours under certain conditions.

In section 1.2.2, the draft RFP states that, for Energy Storage:

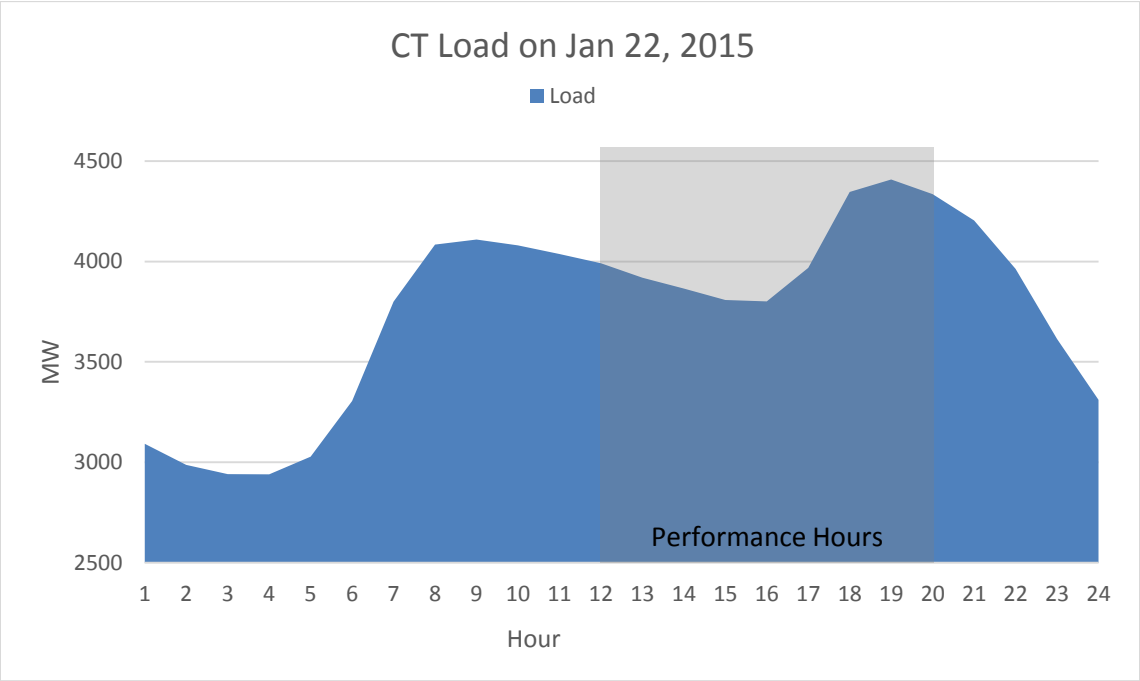
> "Delivery must be during Performance Hours, and charging must be during hours other than Performance Hours."

ESA respectfully requests that Energy Storage systems be allowed to charge during Performance Hours under limited conditions. Specifically, ESA recommends allowing Energy Storage to charge during Performance Hours if doing so will enable the Energy Storage to meet other significant system demands during Peak Hours, such as winter morning ramp periods and winter morning peaks.

ESA agrees that the procurement of Energy Storage in this RFP should be premised on reducing peak energy demand and improving the resiliency and reliability of the Connecticut electric grid. ESA recognizes the intent of P.A. 15-107 and DEEP to meet winter peak demand as a key motivation in issuing this draft RFP. During winter peak demand days, however, not all hours are of equal peak, and days with both local morning and evening peaks are not uncommon.

As an example, Connecticut's system demand on January 22, 2015, included both morning and evening peaks.[2] The load profile of that day is presented in Figure 1, with performance hours overlaid.

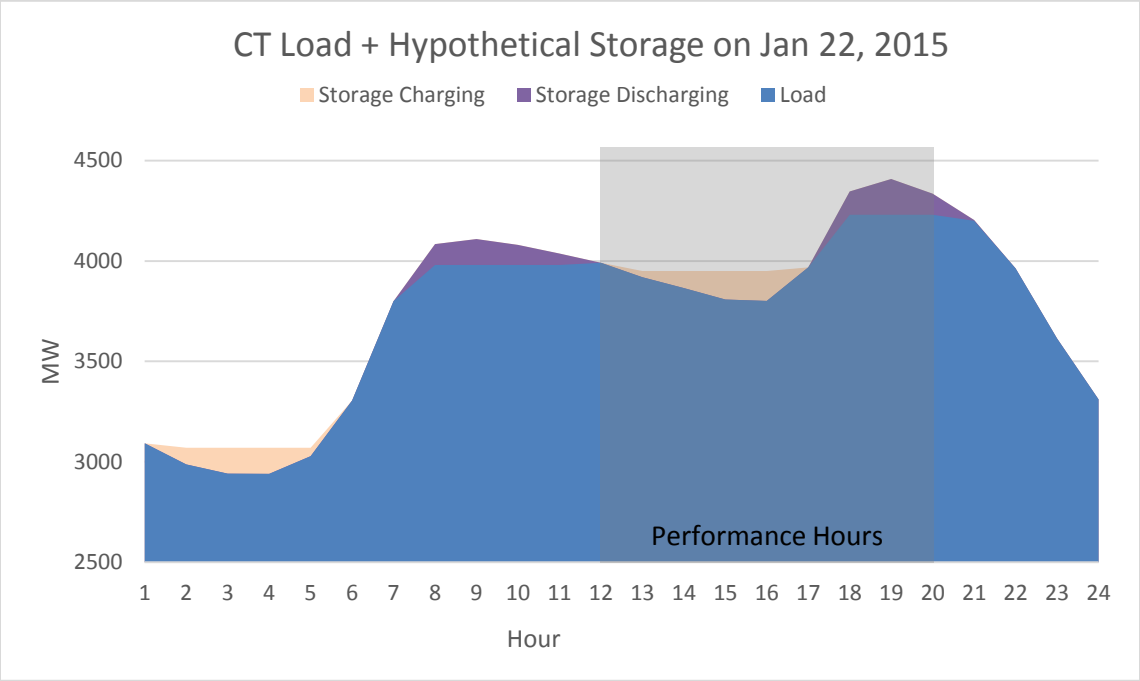
Figure 1



In Figure 2, a hypothetical 400 MW of energy storage resources are deployed to reduce both morning and evening peak periods. Energy storage is capable of reducing peak demands at the highest periods of the day if it charges between morning and evening peaks, including during Performance Hours. Doing so does not increase peak demand during Performance Hours.

[2] See *2015 SMD Hourly Data* in "Energy, Load, and Demand Reports." ISO-NE Website. Accessed 12 Jan 2016. Available at http://www.iso-ne.com/isoexpress/web/reports/load-and-demand/-/tree/zone-info

Figure 2



Moreover, ISO-NE has identified winter morning ramp periods as particularly taxing on the New England electric grid. Presently, ISO-NE will sometimes dispatch larger, slow-moving coal- or gas-fired generators out-of-merit in advance of long, steep load increases common to winter mornings.[3] ISO-NE has discussed plans to alter its market to incent flexible resources like Energy Storage to be able to avoid using slower-moving conventional generation in this non-market manner.[4] ESA believes that DEEP should procure Energy Storage resources in a manner that enables them to best contribute to regional grid reliability and substitute for higher-emissions generation sources.

ESA requests that DEEP allow Energy Storage resources to be able to charge during Performance Hours if those resources are dispatched to meet morning ramp or morning peak load. Doing so would enable greater efficiency and overall load reductions on the Connecticut electric grid than a prohibition on Energy Storage charging during Performance Hours, as well as ensure Connecticut ratepayers get the most value out of procured Energy Storage resources. Failing to do so will adversely impact the evaluation of Energy Storage bids by reducing their possible contributions of improvements to system reliability and reducing greenhouse gas emissions.

ESA respectfully requests that DEEP's RFP include a capacity structure for evaluation of Incremental Energy Storage offers.

In our previous comments on *Proceedings for Procurement of Resources to Provide Affordable & Reliable Electricity Pursuant to P.A. 15-107*, ESA detailed the reasons why a $/MWh compensation

[3] See p. 36 of "Post-Technical Workshop Comments of ISO-NE, Inc." Federal Energy Regulatory Commission Docket No. AD14-14-000. 6 Mar 2015. Available at http://iso-ne.com/static-assets/documents/2015/03/ad14-14-000_3-6-15_price_formation_post_tech_comments.pdf

[4] See p. 4 of "Energy Pricing Enhancements: A Roadmap." NEPOOL Participants Committee Correspondence. 19 Dec 2014. Available at http://iso-ne.com/static-assets/documents/2014/12/ISO-NE_EPE_Roadmap-Dec_2014.pdf

mechanism used for other technologies is inappropriate to apply for storage. Energy storage shares characteristics of generation, infrastructure, and load. As such, it can provide multiple benefits—such as peak-shifting during summer and winter peak periods while simultaneously relieving grid congestion or contributing frequency regulation services. In this manner, Energy Storage is valuable for the capacity it provides to the system, not simply the electricity that it can discharge. The $/MWh approach to compensation, while more appropriate for generation or load resources, would make energy storage uneconomical by restricting consideration of the multiple benefits it provides, thus structurally disadvantaging energy storage in a cross-technology comparison required by P.A. 15-107.

In the interest of a timely issuance of this RFP and enabling better technology value comparisons, ESA requests that DEEP solicit Incremental Energy Storage offers that bid a capacity value in addition to an energy value in $/MWh. Since Class I resources like wind and solar deliver MWh on a non-dispatchable basis, their energy is accepted on a "must-take" basis and their costs are recovered primarily through the value of that energy. In contrast, Energy Storage is dispatchable and is thus capable of delivering energy when most valuable for the overall electric system; this flexibility is, however, not sufficiently captured in a $/MWh construct. Moreover, Energy Storage can provide system value as a load, absorbing over-generation locally or system-wide to help integrate higher penetrations of non-dispatchable, variable generation from wind and solar; as such, the $/MWh energy value does not sufficiently capture the value of Energy Storage acting as a load. For these reasons, a $/MWh criteria creates a systematic bias against Energy Storage, which will appear more expensive than non-dispatchable resources despite offering other flexibility and reliability values.

ESA requests that DEEP solicit Incremental Energy Storage offers that bid a $/MW-month value in addition to $/MWh. Doing so will remedy the structural disadvantage otherwise placed Energy Storage while simultaneously enabling DEEP to use $/MWh to make an appropriate cross-technology comparison as contemplated in P.A. 15-107.

ESA respectfully requests that DEEP's RFP include non-exporting behind-the-meter battery storage as an eligible Passive Demand Response resource.

As currently written, the draft RFP does not contemplate a role for battery energy storage located behind a customer revenue meter. Yet, the draft RFP does specifically identify thermal energy storage located behind a customer revenue meter as an eligible passive demand response resource. A non-exporting battery system and a thermal storage device, such as a "smart" water heater, carry out the same operations—namely, converting electricity into a storable form that can then be utilized at a subsequent period to reduce customer demand for electricity. So long as such batteries are not exporting discharged electricity to the grid, then the demand reduction is identical from the standpoint of an electric distribution company or other grid operator.

Moreover, incorporating battery storage into Passive Demand Response resources will better meet the clean energy goals of P.A. 15-107. The greenhouse gas intensity of thermal storage and battery storage is identical if charged from the grid. Yet, given the recent 5-year extension of the federal investment tax credit for customer-sited solar power and the eligibility of solar-paired battery energy storage for that credit, behind-the-meter battery energy storage is increasingly likely to be paired with solar power, making it more likely to be charged entirely from zero-carbon sources than equivalent thermal storage. Capturing that clean energy value is directly aligned with P.A. 15-107's goals.

ESA recognizes that DEEP's draft RFP explicitly states that Passive Demand Response "does not include ISO-NE or utility dispatched load control, or active demand response." We suggest that eligible non-exporting behind-the-meter battery storage would not follow ISO-NE or utility dispatched load control.

Moreover, whereas active demand response can bid into ISO-NE markets and follow ISO-NE dispatch, we suggest that eligible non-exporting behind-the-meter battery storage differs from active demand response by not being allowed to bid into ISO-NE markets nor follow ISO-NE dispatch.

P.A. 15-107 clearly aims to increase Connecticut's procurement and use of energy storage, and the statutory language does not prohibit battery energy storage as a Passive Demand Response resource. The RFP should seek to exploit all opportunities for cost-effective demand reductions in a technology-neutral manner by counting non-exporting battery storage as an option. Doing so will ensure the best value and cleanest energy at lowest cost to Connecticut ratepayers.

ESA respectfully requests that DEEP's RFP allows Energy Storage offers to present alternative qualifications for demonstrating effective site control.

The draft RFP requires Energy Storage offers to include an unconditional lease or ownership of property to demonstrate site control. ESA recommends that a letter of intent or development of a facility be a reasonable qualification for Energy Storage offers to demonstrate effective site control. A letter of intent can reasonably accomplish the same objective as an unconditional lease at lower burden to bidders, and doing so will make a wider range of locations available for Energy Storage to provide value. That greater range of locations will ultimately ensure that Energy Storage bids can seek the highest locational value on the transmission or distribution system, which in turn will ensure that Connecticut ratepayers receive the highest value from procured Energy Storage resources.

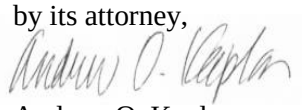
IV. CONCLUSION

ESA commends the DEEP for explicitly including energy storage in its draft clean energy RFP, acknowledging both the value of energy storage in meeting energy system reliability and sustainability goals. ESA appreciates the opportunity to provide these Comments and looks forward to working with DEEP and other interested parties to design an RFP that will provide the greatest value to ratepayers for energy storage.

Respectfully submitted,

ENERGY STORAGE ASSOCIATION

by its attorney,



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