BLUEWAVE

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March 9, 2023

By Electronic Mail

Karen Apuzzo Langton, Chair
Holliston Planning Board
703 Washington Street
Holliston, Mass. 01746

Re: Holliston Planning Board | 600 Central Street - Additional Information and Responses

Dear Ms. Apuzzo Langton and Members of the Board:

BWC Bogastow Brook, LLC ("BlueWave") submits the following responses to comments and questions raised during the Planning Board's January 26, 2023 meeting regarding the Special Permit application for the proposed Battery Energy Storage System at 600 Central St. BlueWave is of course pleased to address any additional concerns or questions the Board or public may have at the continued public hearing on March 16, 2023.

I. THE ENERGY STORAGE FACILITY IS A PERMITTED "OUTDOOR STORAGE" USE

As explained in BlueWave's application and January 13, 2023 letter, the "outdoor storage of building or other materials or equipment not covered elsewhere in this by-law" is a use allowed by special permit under Section II.G.6 of the applicable version of the Town of Holliston Zoning By-Law ("Zoning By-Law") (emphasis supplied). This definition is broad, and nothing in it is inconsistent or incompatible with an energy storage use. Indeed, energy storage falls well within the scope of this category, as the sole purpose of these outdoor batteries is for the storage of energy. And as the Massachusetts Appeals Court held in *Commonwealth v. Catalano*, 74 Mass. App. Ct. 580, 584 (2009), "[e]lectricity, the same as gas, is a valuable article of merchandise, bought and sold like other personal property and is capable of appropriation by another. We refuse to depart from this long-standing principle." *Id*. (internal citation omitted).

Nor is energy storage more properly classified under another category in the Zoning By-Law. Some public comments contended that energy storage is a "general industrial use" under Section II.G.2 of the Zoning By-Law. Yet while that classification mentions storage, it does so in the context of uses involving manufacturing, processing, fabrication, packaging, and assembly — none of which apply here. The *only* activity occurring here is storage of a non-industrial nature, making Section II.G.6 the most applicable category available.

II. THE ENERGY STORAGE FACILITY "FACILITATES THE COLLECTION OF SOLAR ENERGY" AND IS PROTECTED UNDER G.L. C. 40A, § 3

Regardless, if the energy storage facility here is a "structure[s] facilitating the collection of solar energy," it cannot be prohibited or unreasonably regulated under the Zoning By-Law given the express protection of state statute, G.L. c. 40A, § 3.

The Board's main question was whether BlueWave could explain how a standalone energy storage "facilitates the collection of solar energy" (and therefore be entitled to the Section 3 exemption), particularly where — as here — the energy storage facility is not directly connected to a solar array.[1] We can.

A. Energy Storage *Exists* to Facilitate Collection of Solar Energy, and is Essential to Meeting the Commonwealth's Renewable Energy Goals

The first thing to understand is that traditional fossil fuel generators *do not require energy storage*, since fossil fuel plants can be turned on (and off) to reflect the peaks and valleys of energy demand throughout the day. There is no significant need to store fossil fuel energy, as it is generated essentially "on demand" — also called "just-in-time" generation — simply by burning more gas or coal.

In sharp contrast, the need for energy storage is a direct consequence of the intermittency of *renewable* energy generation. Unlike fossil fuel generators, solar energy *cannot* be turned on or off to meet demand: it can only be generated when the sun is shining. And if more solar energy is generated than is needed on the grid at a given time — a particularly sunny day with low demand — that energy must either be stored or it is wasted and lost. Energy storage takes excess solar energy produced during the day when demand is lower, and stores that solar energy for use during evening peak demand periods. Indeed, the state Department of Energy Resources ("DOER") expressly confirmed in its comprehensive *State of Charge* report that "[i]nstead of generating electricity with natural gas 'peaker' plants during times of high electric and fuel

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[1] As a tangential matter, some public commenters unfamiliar with the statute suggested incorrectly that the Section 3 exemption was broad enough to allow any *activity* to be a protected facilitation of collection of solar energy (one hypothetical offered was a "snowplow being used to clear a solar facility"). However, the plain language of the statute protects only "structures" that facilitate the collection of solar energy.

Other commenters unfamiliar with the statute suggested that the energy storage facility must be connected to a solar array to benefit from the Section 3 exemption. Again, this is incorrect – the plain language of the statute protects "solar energy systems ***or*** the building of structures facilitating the collection of solar energy" (emphasis supplied). The use of the word "or" means an energy storage facility is entitled to Section 3 protection so long as it "facilitate[s] the collection of solar energy," *regardless* of whether that energy storage facility is also a component of a "solar energy system," or in proximity to a "solar energy system."

prices, storage can be used to 'peak shift' by using lower cost energy [e.g., solar] stored during off-peak periods to meet this demand." [2]

The Commonwealth's position on the inherent and essential connection between solar and storage — and the critical importance of storage in facilitating the collection of solar energy — has been repeatedly made clear by both DOER and the state Executive Office of Energy and Environmental Protection ("EOEEA").

1. DOER *State of Charge* Report

For instance, DOER's *State of Charge* report confirmed not just the importance of storage in increasing the amount of solar energy available to displace fossil fuel energy. The report also highlighted the critical importance of storage in alleviating the reliability issues that can be created as more solar arrays connect to the regional power grid. The combination of lower energy demand but higher solar generation (known as a "reverse power flow") can overload the grid and damage its protective systems. However, as DOER observed:

> Using energy storage on the distribution side of the system **will eliminate reverse power flow concerns by charging with the solar surplus** (emphasis supplied) (seen in the green portion of Figure 10) and discharging during times of high demand (seen in the red portion of Figure 10). Eliminating the reverse power flow concerns **will provide reliability benefits and lower the interconnection cost of integrating distributed solar resources** (emphasis supplied).

Figure 10: Storage Can Avoid Reverse Power Flows with Solar PV

2. EOEEA *2050 Decarbonization Roadmap*

Similarly, the EOEEA *2050 Decarbonization Roadmap* expressly affirms in no uncertain terms in order to meet the Commonwealth's aggressive decarbonization goals, the Commonwealth will require not only a significant increase in solar energy generation, but a

[2] Department of Energy Resources, *State of Charge* (2016) at vii (available at https://www.mass.gov/media/6441/download).

significant increase in energy storage: "**Higher amounts of solar require deployment of more storage to better utilize those resources**" (emphasis supplied).[3]

Constructing the amount of solar required to meet the Commonwealth's aggressive 2050 goals will inherently require more energy storage capacity than can be built on-site with solar arrays. This is primarily due to a combination of siting constraints and the importance of siting energy storage closer to the location where the solar energy is ultimately *needed*, rather than closer to the location where the solar energy is *generated*.

3. DOER Clean Peak Regulations (225 CMR § 21.00)

Finally, DOER's Clean Peak Standard ("CPS"), while undeniably a financial incentive program, is designed specifically to incentivize "*displacing nonrenewable generating resources during Seasonal Peak Periods*" (225 CMR § 21.01). This means charging energy storage systems during prime solar-based charging (daylight) hours, so the grid has available to it clean solar energy at peak-use hours when solar energy would otherwise be unavailable (for instance, on cloudy days or after dark). Indeed, the regulations specifically contemplate that energy storage projects that charge during hours of high solar generation are systems that "operate primarily to store and discharge renewable energy" (225 CMR § 21.05(2)):

	Energy Storage Charging Windows	
Clean Peak Season	Solar-Based Charging Hours	Wind-Based Charging Hours
Winter	10am - 3pm	12am - 6am
Spring	8am - 4pm	12am - 6am
Summer	7am - 2pm	12am - 6am
Fall	9am - 3pm	12am - 6am

Hours when renewables are at their highest percent of the generation mix.
If storage is charging during these hours and discharging during peak, they are shifting renewable energy

[4]

When a standalone energy storage projects agrees to charge during these windows, it generates Clean Peak Credits (CPECs). Under DOER regulations, utilities have an increasing annual obligation to solicit a minimum number of CPECs to progress towards the Commonwealth's 2050 decarbonization goals. As most standalone storage projects are not economically viable *without* CPECs, this requirement provides *extremely* strong incentives to charge during these times. The below diagram illustrates the disparity between renewable generation periods and energy demand periods, establishing the empirical basis for the Clean Peak Standard charging windows:

[3] Executive Office of Energy and Environmental Affairs, Massachusetts 2050 Decarbonization Roadmap (2020) at 59 (available at https://www.mass.gov/doc/ma-2050-decarbonization-roadmap/download).

[4] https://www.mass.gov/doc/drafts-cps-reg-summary-presentation/download, page 13

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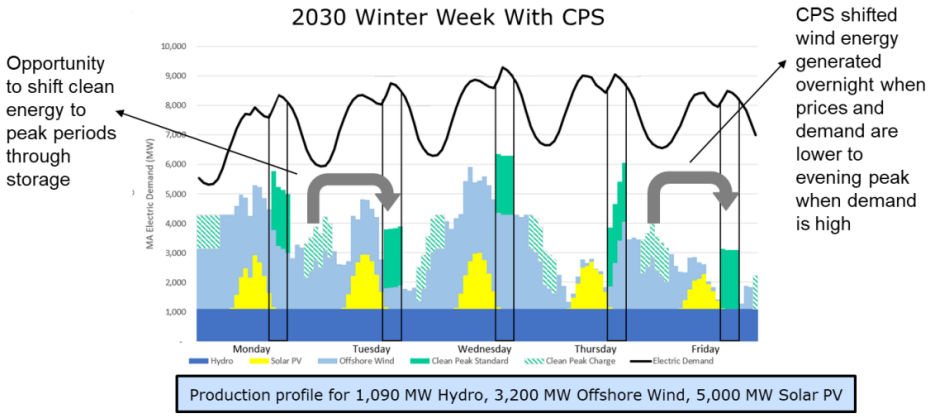
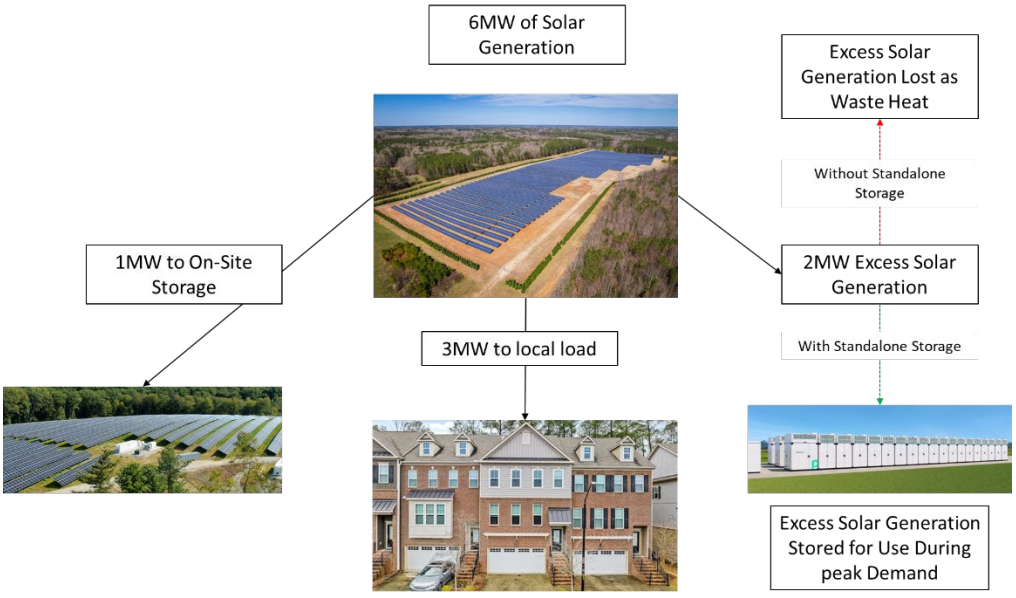


In short, the availability of energy storage on the grid — even if not directly connected to a solar array — "facilitates the collection of solar energy" because it enables solar energy that would otherwise be lost to be collected, reserved, and then utilized.

B. Without Energy Storage to Facilitate the Collection of Excess Solar Energy, That Energy is Wasted and Lost, Contravening the Express Purpose of § 3.

To illustrate why standalone energy storage nonetheless "facilitates the collection of solar energy," consider a 6 MW solar array (with a 1MW on-site DC-coupled energy storage system) that is connected to the distribution grid (as shown in the schematic below).



During the middle of the day, when the solar array is generating at its full capacity, the solar array may export 5MW of solar energy to the grid, and store 1MW in its on-site battery for later use. However, of the 5MW exported to the grid, there may not be immediate localized demand for any more than 3MW. In this scenario, without additional storage capacity somewhere on the distribution circuit, the remaining 2MW of solar energy will go to waste as heat if it cannot be utilized when generated.

However, if there is a standalone energy storage project on the distribution circuit, those remaining 2MWs *can* be stored for later use, after the sun sets and the solar array cannot generate energy. The closer the energy storage is to areas of high demand, the more grid resiliency is improved. And when that evening demand for additional energy occurs, instead of running a gas-fired or coal-fired power plant to generate those 2MW, the 2MW can be drawn from the energy storage instead. *In short, when standalone storage is on a distribution circuit with solar generating assets, that storage facility operates to facilitate the collection of solar energy.*

C. There is Direct Data Supporting that the 600 Central Street Project Will Facilitate the Collection of Solar Energy in This Way.

In the case of the 600 Central Street project, there is direct data supporting the presence of solar energy available to be shifted into battery storage. Based Eversource's required *2021 Grid Modernization Report* filings with the Department of Public Utilities, the specific "distribution feeder" to which the 600 Central Street storage facility would interconnect — Feeder 130-H1 — ranks at *79.9%* across all Eversource distribution feeders with respect to solar saturation. A distribution feeder is the section of the power line that transmits electricity from a substation to an electric customer.

In plain English, this means there is more solar saturation on this feeder (relative to its capacity) than approximately *80% of all Eversource distribution feeder lines (of approximately 2,300 lines)*. This makes Feeder 130-H1 a particularly strong candidate for standalone energy storage, and one where excess solar energy can and should be captured during times of excess solar energy generation.

III. CONCLUSION

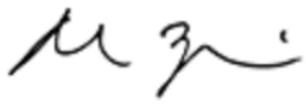
As the Supreme Judicial Court recently held in *Tracer Lane II Realty, LLC v. Waltham*, 489 Mass. 775 (2022), a by-law contravenes the protections of Section 3 — which was "enacted to help promote solar energy generation throughout the Commonwealth" — if it "restricts rather than promotes the legislative goal of promoting solar energy." *Id.* at 778, 782. Here, the DOER *State of Charge* report, the DOER Clean Peak regulations (225 CMR § 21.00), and the EOEEA *2050 Decarbonization Roadmap* all confirm that energy storage is an integral and essential

component of the legislative goal of promoting and expanding solar energy generation throughout the Commonwealth.

When combined with the specific facts about the Eversource distribution infrastructure at this particular location, and the levels of solar present in the Holliston area, as evidenced by the solar projects on Chestnut St and Hopping Brook Rd that are not coupled with energy storage, both the law and the facts reinforce the conclusion that this standalone energy storage project indisputably "facilitates the collection of solar energy." As a result, to the extent the Zoning By-Law were construed as *not* allowing a battery energy storage system at this location, the result would be the prohibition of battery storage facilitating the collection of solar energy, in contravention of G.L. c. 40A, § 3.

For the above reasons, BlueWave's proposed project at 600 Central Street complies with the applicable zoning for the locus and is eligible for a Planning Board special permit as a matter of law. Please do not hesitate to contact me with any questions or for further information.

Sincerely,



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Mike Zimmer
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Cc: Brian Winner, Esq., Town Counsel
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