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September 13, 2024

Via Electronic Mail and Hand Delivery

Melanie Bachman  
Executive Director / Staff Attorney  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

**Re: Petition No. 1623 - HQCA Energy Solutions, LLC petition for a declaratory ruling, pursuant to Connecticut General Statutes § 4-176 and § 16-50k, for the proposed construction, maintenance and operation of a 3.92-megawatt AC battery energy storage facility located at 40 Norwich Road, Waterford, Connecticut and associated interconnection**

Dear Ms. Bachman:

I am writing on behalf of my client HQCA Energy Solutions, LLC ("HQCA") in connection with the above-captioned Petition. Enclosed please find the answers and supporting Attachment Exhibits provided by HQCA in response to the Interrogatories posed by the Connecticut Siting Council on June 4, 2024. Also included herewith is a supplement to the initial Petition No. 1623 memorandum.

The electronic version of the above described documents have been sent via email to your attention.

Please do not hesitate to contact me with any questions or concerns regarding this submission.

Sincerely,

A handwritten signature in blue ink that reads "Mark J. Cook".

Mark J. Cook, Esq.

Enclosures

**Petition No. 1623**  
**HQCA Energy Solutions, LLC**  
**40 Norwich Road, Waterford**

**HQCA Energy Solutions, LLC**  
**Responses to Interrogatory Nos. 1-65**  
**September 13, 2024**

Responses by HQCA Energy Solutions, LLC to Interrogatory Nos. 1-65 issued by the Connecticut Siting Council on June 5, 2024 are respectfully submitted herewith.

1. Has Hanwha Qcells America, Inc. (Qcells) directly received any comments since the Petition was submitted to the Council? If yes, summarize the comments and how they were addressed.

HQCA Energy Solutions, LLC (“HQCA” or “Petitioner”) received a carbon copy of a letter by Ms. Jennifer Keatley, Executive Director, United Cerebral Palsy of Eastern Connecticut (“UCP”) dated April 22, 2024 and addressed to the Connecticut Siting Council. The letter expressed concern regarding the safety of the proposed battery energy storage facility (“BESF” or “Project”) in this instant Petition. The letter also expressed concern regarding noise and the visual impact of the proposed BESF. The letter also expressed concern regarding health and electromagnetic fields.

Petitioner also received a carbon copy of a letter by Mr. Robert J. Brule, Town of Waterford First Selectman dated July 17, 2024 and addressed to Ms. Melanie A. Bachman, Executive Director, Connecticut Siting Council. The letter described that one of the abutters to HQCA’s proposed BESF is United Cerebral Palsy of Eastern, CT. The letter expressed concern regarding noise and vibration and possible impacts to the UCP’s clients. The letter stated that the Town opposes the project moving forward at this particular location unless the new equipment and noise and vibration mitigation results in no increase to the ambient existing noise and vibration at the proposed site post-construction and satisfies all other Council on Environmental Quality’s noise requirements.

The Petitioner has addressed each of these expressed concerns as follows:

I. Safety: The Tesla Megapack 2XL (“MP2XL”) battery energy storage units proposed by Petitioner include several layers of safety protection:

A. Code Compliant

The MP2XL units will comply with all applicable building, electrical, and fire codes as well as the 2022 Connecticut State Fire Code Chapter 52 – Energy Storage Systems.

B. Electrical Fault Protection

The MP2XL battery modules contain DC single-use fusible links mounted directly on the battery modules. These fuses can interrupt the flow of an overcurrent in the battery module during an off-normal electrical event. Inverter modules can quickly isolate the battery module passively or actively during an off-normal event. Each inverter module is equipped with its own AC contactor and AC fuses. Each MP2XL is also provided with a DC ground fault detection system. The MP2XL also contains an AC circuit breaker, with ground-fault trip settings.

### C. Thermal Management System

The MP2XL equipment also meets UL 9540A performance criteria, which requires that no propagation may occur between a battery cell that has been ignited and the other system unit cells.

The MP2XL Thermal Management System (“TMS”) provides a suitable operating temperature for optimal operation and helps to avoid thermal runaway by utilizing a closed-loop liquid cooling system that circulates a 50/50 mixture of ethylene glycol and water throughout the battery modules and power electronics to maintain optimum battery operating temperature. The TMS works autonomously and does not require user feedback or controls to turn the cooling system on when needed.

Each MP2XL has a thermal roof located at the top of each MP2XL unit. The thermal roof contains fans and radiators that cool the 50/50 ethylene glycol-water solution. The liquid cooling system utilizes approximately 400 liters of the ethylene glycol-water solution. Refrigerant is stored separately in a sealed system. Each MP2XL has an integrated 900 liter gravity-fed secondary coolant containment basin in its enclosure in accordance with Title 40 C.F.R. 264.174. In addition, each MP2XL has a coolant reservoir level indicator that will alert qualified personnel to be dispatched for investigation.

The HQCA BESF TMS can direct the HQCA BESF Tesla Site Controller (“TSC”) to immediately isolate and shutdown individual HQCA BESF battery units or the entire HQCA BESF. The HQCA BESF TSC and the HQCA Growing Energy Labs, Inc. (“GELI”) Emergency Management System (“EMS,” and together with GELI, the “GELI EMS Platform”) Platform can also disconnect a battery or the entire HQCA BESF from the electric grid.

While the MP2XL does not have smoke detectors, each MP2XL unit has the ability to remove and ventilate errant gas very early in a thermal runaway event. When this protocol is activated, overpressure vents open automatically into each MP2XL’s thermal roof, permitting gases to safely exhaust through the roof of the MP2XL during a thermal event. This engineered approach is permitted by NFPA 855 §9.6.5.6.4.

When this protocol is activated, the HQCA BESF Fire Control Panel would signal the Town of Waterford Fire Department of a possible emergency event. At that time, the Town of Waterford Fire Marshal has the discretion to issue a remain in place order and/or to order an evacuation of nearby structures. The Waterford Fire Department would implement those orders via its emergency text message system and/or via door-to-door.

Consistent with the findings of the *American Clean Power Battery Energy Storage Safety FAQs* (please see [Supplement Attachment F](#)), gases released in fire events are similar to fires involving materials such as sofas, mattresses, or office furniture.

The HQCA BESF can also be remotely shut down and disconnected from the grid by HQCA and can be manually shut down via an external emergency stop (E-Stop) button noted as “(N) Pad Mounted ‘SWBD1’ with ‘DISC1’” located within the HQCA BESF. Please see [Supplement Attachment B, Sheet E100](#).

HQCA first met with the Waterford Fire Marshal on February 28, 2024. Since then, HQCA has provided the Waterford Fire Marshal with information regarding the change in equipment and the MP2XL’s electrical fault protections, its Thermal Management System, and its other fire protection design features along with the MP2XL Emergency Response Guide. HQCA has also discussed the MP2XL’s safety and fire protection features as well as emergency response with the Waterford Fire Marshal. HQCA will provide training to the Waterford Fire Department prior to commencing

operations. HQCA will also provide a plan depicting the HQCA BESF layout and a map depicting areas of seventy-five feet (75') and three hundred thirty feet (330') from the HQCA BESF to the Waterford Fire Department.

II. Noise: Petitioner has taken several steps to not only meet Regulations of Connecticut State Agencies ("Regs. Conn. Agencies") § 22a-69-1 *et seq.*, but to come well under such thresholds for every receptor property but one where the BESF meets the State threshold for Class A receptors.

A. Petitioner Utilized the Stricter Standards in Completing Its Sound Analysis Report

Although the host parcel is zoned commercial, the proposed land will be utilized for utility purposes which falls under Regs. Conn. Agencies. § 22a-69-3.5 – Class C standards. However, to be conservative, the more strict Class B emitter standards were applied to Petitioner's proposed BESF in Petitioner's sound analysis report (please see Supplement Attachment H).

Additionally, while the UCP property to the immediate north is also zoned commercial, the property also functions as a daytime health services facility. Pursuant to Regs. Conn. Agencies. § 22a-69-2.3, the daytime Class A standards under Regs. Conn. Agencies. § 22a-69-3.5 were utilized for the UCP property.

B. BESF Relocated Further Away From Residential Properties

Petitioner relocated its proposed BESF further east from its originally proposed location in order to increase the distance between the BESF and the residential properties to the west and northwest.

C. Mitigation Barrier on All Four Sides of BESF Fence

Petitioner proposes installing twelve (12') feet high mitigation barrier on the interior of all four sides of the twelve (12') feet high BESF chain link and green-slatted fence. This action not only allows compliance with Regs. Conn. Agencies § 22a-69-1 *et seq.* but resulting sound produced from the HQCA BESF will be well under such thresholds for several receptor properties except one where it meets State Class A thresholds.

Petitioner is proposing mitigation barrier on the east, north, and south sides of the BESF fence even though those receptor measurements meet State requirements with no mitigation. This action results in measurements well under State requirements for those sides.

III. Visual Impact: Petitioner has taken multiple steps to screen the proposed BESF from view:

A. Mitigation Barrier on All Four Sides of BESF Fence

Petitioner proposes installing twelve (12') feet high mitigation barrier on the interior of all four sides of the twelve (12') feet high BESF chain link and green-slatted fence. This effectively screens any view of the BESF equipment located within the BESF fenced area.

B. Petitioner Will Install Giant Green Arbor Vitae Plantings Around All Four Sides of BESF

Petitioner will install minimum thirteen (13') feet tall Giant Green Arbor Vitae plantings around the perimeter of the BESF fence. This will add to the screening the mitigation barrier provides.

IV. Vibration: HQCA's proposed BESF equipment will not vibrate.

## V. Health and Electromagnetic Fields

### A. The Proposed BESF Is Compliant With All Building, Electrical, Fire, and Energy Storage Codes

The MP2XL units will comply with all applicable building, electrical, and fire codes as well as the 2022 Connecticut State Fire Code Chapter 52 – Energy Storage Systems.

BESS EMF emissions are expected to be similar to those of transmission substations with respect to 60-Hz magnetic fields, whereas the sources inside the facility are not generally substantial sources of 60-Hz magnetic fields outside the facility. The transmission and distribution lines entering and exiting the facility are the dominant sources of EMF at the property line and beyond.

Further, industry best management practices have yet to be established for EMF due to the lack of evidence that exposure to minimal EMF, as will be the case at this site, is a significant issue according to studies performed by the World Health Organization.

2. If the project is approved, identify all permits necessary for construction and operation and which entity will hold the permit(s)?

The Petitioner anticipates that the following permits will be necessary for the construction and/or operation of the Project: Building Permit from the Town of Waterford; Electrical Permit from the Town of Waterford; and Council approval.

### **Project Development**

3. What is the estimated cost of the project? How are costs recovered?

The Petitioner objects to this interrogatory to the extent it seeks information beyond the scope of a petition for declaratory ruling as provided pursuant to the Public Utility Environmental Standards Act (“PUESA”), General Statutes § 16-50 et seq. Further, the Petitioner asserts that its cost information is a trade secret that is protected from disclosure pursuant to General Statutes § 1-200 et seq. Without waiving the foregoing objection, the Petitioner will provide the Council with a Motion for Protective Order supported by an Affidavit of Daehyun Kim, in a separate filing which contains information responsive to this interrogatory.

4. Does Qcells intend to enter the Project into the Energy Storage Solutions Program?

The Project is a proposed stand-alone energy storage system that will participate in wholesale energy, capacity, and frequency regulation markets. HQCA intends to assess the front-of-the-meter (“FTM”) Energy Storage Solutions Program framework.

5. Referencing Petition p. 3, who determined this portion of Waterford was a load pocket?

HQCA personnel determined that a battery facility in this general area could be used to enhance community energy.

6. If Qcells transfers the facility to another entity, would Qcells provide the Council with a written agreement as to the entity responsible for any outstanding conditions of the Declaratory Ruling and quarterly assessment charges under CGS §16-50v(b)(2) that may be associated with this facility, including contact information for the individual acting on behalf of the transferee?

If the Petitioner transfers ownership of the facility to another entity, the Petitioner will provide notice to the Council of the entity responsible for the management and operations of the Project, and any outstanding conditions of the Declaratory Ruling, as well as the transferee entity's contact information.

7. Referencing Petition Figure 1, two types of property lines are shown - solid thick gray line and dashed red line. What does the thick gray line represent? What is the reason the red dashed line on the north side does not follow existing plot lines?

The base map used for Petition Figure 1 does not depict the location of the property boundary lines correctly (please see Petition Figure 4 for a correct depiction of the host property's boundary lines). The red dashed lines provide a more accurate depiction of the host property's boundaries.

8. Referencing Petition Figure 4, what does the gray box represent in the northwest corner of the parcel?

The interior of the gray box represents the 'array limit' of the survey, meaning the survey did not capture measurements within the confines of the gray box.

9. Referencing Petition Figure 4, what is the reason the Project Limit line extends beyond the property boundaries?

The Project Limit lines reference the limit of what the surveyors surveyed. Construction work will not exceed the property boundaries depicted on Petition Figure 4.

### **Proposed Site**

10. Submit a map clearly depicting the boundaries of the battery energy storage facility (BESF) site and the boundaries of the host parcel(s). Under Regulations of Connecticut State Agencies (RCSA) §16-50j-2a(29), "**Site**" means a contiguous parcel of property with specified boundaries, including, but not limited to, the leased area, right-of-way, access and easements on which a facility and associated equipment is located, shall be located or is proposed to be located.

Please see Supplement Attachment B – Site Plan, Sheet E120. Petitioner notes that the interconnection route description must be updated to "Overhead". Petitioner will provide the Council this updated sheet immediately upon receipt of same.

11. Referencing Petition p. 12, a portion of the host parcel within which the BESF will be located is leased by the property owner. What uses are permitted under the existing lease? How could these uses conflict with the construction, maintenance and operation of the proposed BESF?

Reference on Petition p. 12 to a lease agreement is the lease agreement between HQCA and the property owner. HQCA is not aware of any other leases on the host parcel that would conflict with the construction, maintenance and operation of the proposed BESF.

12. Referencing Petition p. 15, does the 4,437 square foot area represent the size of the fenced compound?

The relocated and reconfigured BESF fenced compound measures 4,356 square feet.

13. Provide the distance, direction and address of the nearest residential property line to the proposed facility.

The nearest residential property line is approximately sixty (60') feet west from the west face of the proposed BESF fence and is located at 17 Maple Road, Waterford, CT.

14. Provide the distance, direction and address of the nearest residential structure to the proposed facility.

The nearest residential structure is approximately one hundred forty-five (145') feet west from the west face of the proposed BESF fence and is located at 17 Maple Road, Waterford, CT.

15. Can the BESF be moved to the east, increasing the distance to the residences on Maple Avenue?

Petitioner has relocated the proposed BESF to the east, increasing the distance to the residences on Maple Avenue.

### **Proposed Facility and Associated Equipment**

16. Referencing Petition Exhibit B, the specification sheet for the ST2752UX-US unit includes a 2-hour unit and a 4-hour unit. What type of unit will be installed? Does the timeframe reference the maximum hours of output?

The MP2XL battery units will be 4-hour units, which refers to the maximum number of hours of output before needing to recharge.

### **Energy Output**

17. What distribution system benefits (ex. resiliency of critical infrastructure, reliability of the electric system, etc.) would be provided by the facility? How does the facility meet the objectives of the state Energy Storage Solutions program?

The Petitioner objects to this interrogatory to the extent it seeks information beyond the scope of a petition for declaratory ruling, as opposed to an application for a Certificate of Environmental Compatibility and Public Need, as provided for under PUESA. Without waiving the foregoing objection, the Project provides benefits at the electricity market wholesale-level, as envisioned by Public Act 21-53, which incentivizes front-of-the-meter ("FTM") projects on the distribution network that can help improve grid constituency and resilience by supplying saved electricity during high peak demand times, helping to avoid numerous brownouts or power failures. The facility will also provide grid resilience by making saved electricity available during an outage or supplementing the supply of electricity when that supply is temporarily interrupted due to large introductions, or removals, of electricity from high-volume users.

18. When would the facility recharge? What factors are considered for the recharge interval?

The facility will recharge at optimal market periods when the cost of electricity is at its lowest because of low demand and high supply periods. These are typically off-peak periods. Further, the Project's charge periods may be limited so as not to coincide with periods when the infrastructure used by the Project is under high stress. If Eversource concludes that this is required, such time-of-day limitation factors will be included in the interconnection agreement. These periods for allowed charging will likely coincide with off-peak periods.

19. Is the 4 MW AC output based on the point of electrical interconnection?

Due to the new equipment, the proposed BESF will have 3.92 MW AC output. Yes, the Project's location has been selected due to system capacity availability data from Eversource, and further consultation and study performed in cooperation with Eversource to identify the capacity of the system at this location. The Petitioner determined that 3.92 MW was the appropriate size for the Project at this location.

20. What is the cumulative efficiency of the discharge output (e.g.- the BESF can only discharge 90% of its stored capacity)? What is the depth of discharge for the Sungrow batteries?

The GELI EMS Platform will manage the discharge of the BESF from 100% to 10% of its storage capacity. The MP2XL batteries can provide 3.92MW on demand power, and will discharge up to 10% of its stored capacity.

21. If the BESF is contracted to discharge its full charge, would any of the battery export capacity be held in reserve to prolong battery life?

The utility mandates a charge and discharge schedule that the Petitioner must follow, dictating the regular cycle the battery experiences. This cycle significantly impacts the battery's lifespan, and adhering to these standard charge and discharge rates is essential for maximizing battery life. A full depletion of the batteries would cause batteries to degrade faster and would cause voltage regulation issues on the MV bus, and therefore also on the HV bus, causing setpoint deviation issues. Additionally, batteries degrade over time.

22. What storage capacity losses are anticipated for ambient temperatures below freezing?

The BESF's GELI EMS Platform will manage and maintain appropriate temperature. As a result, no losses are anticipated due to ambient temperatures below freezing.

23. Would the BESF utilize power for cooling and heating of the battery packs? If yes, would this power source be from stored energy or from the local distribution system?

Yes, the BESF will utilize power for cooling and heating of the battery packs from the local distribution system.

### **Electrical Interconnection**

24. Referencing Petition p. 15, is Eversource's local electrical distribution system three-phase, or would it have to be upgraded to three-phase to accommodate energy output from the BESF? If yes, for what circuit length and to what location?

The existing local electrical distribution system is a three-phase system.

25. Referencing Petition p. 15, what is the status of the system impact study with Eversource? Is it anticipated the battery manufacturer/model will change based on the interconnection agreement?

The system impact study has concluded. No further changes to the battery manufacturer/model are anticipated.

26. Would the facility be able to automatically disconnect from the grid in the event of a fault or other electrical disturbance? Explain.



The MP2XL battery modules contain DC single-use fusible links mounted directly on the battery modules. These fuses can interrupt the flow of an overcurrent in the battery module during an off-normal electrical event. Inverter modules can quickly isolate the battery module passively or actively during an off-normal event. Each inverter module is equipped with its own AC contactor and AC fuses. Each MP2XL is also provided with a DC ground fault detection system. The MP2XL also contains an AC circuit breaker, with ground-fault trip settings.

The HQCA BESF TSC and the HQCA GELI EMS Platform can disconnect a battery or the entire HQCA BESF from the electric grid.

### **Public Health and Safety**

27. Is a gap proposed between the bottom of the fence and grade? What animal deterrents are in place for small animals, such as nesting birds, chewing rodents, etc.?

The fence is proposed to be secured to the ground to deter any animals or rodents from entering. Additionally, the BESS containers/enclosures are designed to prevent small animals or birds from entering the containers where they may chew or cause damage.

28. Referencing Petition p. 22, if the site is monitored and can be dispatched 24/7 by an Energy Management System, what additional tasks does the Qcells Operations Center perform from 12:00 p.m. to 8:00 p.m.?

The Qcells Operations Center does not perform any additional tasks than the tasks performed by the HQCA BESF TSC and HQCA GELI EMS Platform.

29. Referencing Petition p. 21, the battery units would have fused sprinkler heads for fire safety.  
a. Where will the connection for the water supply be located?

Pursuant to current guidance regarding the use of water to extinguish a battery fire, the MP2XL battery units do not have a sprinkler system. The emergency response guidance for this equipment continues to evolve as advances in safety testing and practices are made. Current guidance instructs that a sprinkler system should not be used, and any fire event should be allowed to burn out in a controlled manner while nearby resources are monitored and protected using water as a proactive cooling agent on the exterior of the battery unit.

Caution should be exercised if water is applied directly to the exterior of an affected Battery Energy Storage System (“BESS”) enclosure, as this will not stop a thermal runaway event and may potentially delay eventual combustion of the entire ESS product. Defensive firefighting tactics are generally recommended, with water being applied to nearby exposures for cooling, as necessary. Any hoseline operations should be limited to hose and master stream application from the outside of the construction perimeter as far back as hose and stream ranges allow. The decision to provide thermal cooling via hoselines should be made in coordination with the BESF owner / operator, local emergency responders, and any other required Subject Matter Experts (“SMEs”). A hydrant is located at the front portion of the host property abutting Route 32.

A fog pattern from a handline or monitor nozzle may potentially be utilized to control smoke and gases from the affected enclosure and to prevent them from migrating to unwanted areas. The use of water as the primary agent removes the concerns with run off from fire chemical agents. Use of water on the exterior only prevents the contaminated runoff from any chemicals associated with the BESF and cooling system.

In all instances, power shut down and isolation involving any high voltage feeder lines must be confirmed before any defensive measures are taken involving application of water to the site.

The Petitioner will continue to coordinate with the Waterford Fire Marshal and Waterford Fire Department to refine the emergency response plan and to provide training to local responders prior to construction with the best available procedures and recommendations at that time.

- b. Under what conditions might the sprinkler heads be activated, and how long would they continue to jettison water?

Pursuant to current guidance regarding emergency response for battery facilities, there are no sprinkler heads included in the design of the MP2XL.

- c. In the event that such sprinkler heads are activated, would the ground surrounding the proposed facility be graded to direct sprinkler water to a certain location or area? If yes, identify such location.

As discussed in Petitioner's response above, sprinkler heads are not present in the MP2XL design.

- d. If the sprinkler heads will not be activated under any fire scenario, was this issue discussed with the Town Fire Marshall? If yes, on what date?

Petitioner has provided the Waterford Fire Marshal with information regarding the change in equipment and the MP2XL's electrical fault protections, its Thermal Management System, and its other fire protection design features along with the MP2XL Emergency Response Guide, including the fact that the MP2XL battery units do not have a sprinkler system. HQCA has also discussed the MP2XL's safety and fire protection features as well as emergency response with the Waterford Fire Marshal.

- 30. Is the use of water applied directly to a battery fire currently a best management practice for fire control and extinguishment? If no, why are fused sprinkler heads proposed?

As discussed in Petitioner's response to interrogatory number 29 above, current guidance instructs that a sprinkler system should not be used, and any fire event should be allowed to burn out in a controlled manner while nearby resources are monitored and protected using water as a proactive cooling agent on the exterior of the battery units.

Please refer to the International Association of Fire Chiefs ("IAFC") Recommended Fire Department Response to Energy Storage Systems ("ESS") (please see Supplement Attachment D). HQCA follows the guidance from the IAFC for defensive fire-fighting which includes the best practices of containment strategy for any fire until it is exhausted and use water on surrounding structures to prevent any spread of fire.

Please also refer to the American Clean Power's First Responders Guide to Lithium-Ion Battery Energy Storage System Incidents (the "ACP Guide") (please see Supplement Attachment E). The ACP Guide provides more context related to the current industry guidance for incident response that minimizes life safety and environmental impact issues.

Consistent with the IAFC guidelines, section 4.3 of the ACP Guide notes that “application of water should be limited to cooling and protecting nearby exposures.” Per section 4.6, introduction of water within the BESS units can create potential for problematic run off. Per section 5.1, the uncertainties, risks, and complications of introducing water or other fire control substances lead to the same conclusion provided by the IAFC, namely to respond to fire with a defensive containment strategy.

31. Referencing Petition p. 21, what BESF design features are included to prevent Thermal Runaway besides the notification system.

The MP2XL battery unit has multiple layers of protections against Thermal Runaway:

A. Electrical Fault Protection

The MP2XL battery modules contain DC single-use fusible links mounted directly on the battery modules. These fuses can interrupt the flow of an overcurrent in the battery module during an off-normal electrical event. Inverter modules can quickly isolate the battery module passively or actively during an off-normal event. Each inverter module is equipped with its own AC contactor and AC fuses. Each MP2XL is also provided with a DC ground fault detection system. The MP2XL also contains an AC circuit breaker, with ground-fault trip settings.

B. Thermal Management System

The MP2XL equipment meets UL 9540A performance criteria, which requires that no propagation may occur between a battery cell that has been ignited and the other system unit cells. The HQCA BESF will comply with the 2022 Connecticut State Fire Code Chapter 52 – Energy Storage Systems.

The MP2XL TMS provides a suitable operating temperature for optimal operation and helps to avoid thermal runaway by utilizing a closed-loop liquid cooling system that circulates a 50/50 mixture of ethylene glycol and water throughout the battery modules and power electronics to maintain optimum battery operating temperature. As a result, no storage capacity losses are anticipated due to ambient temperatures below freezing. The TMS can also warm the HQCA BESF equipment if ambient temperatures drop. The HQCA BESF will utilize power from the local distribution system for said heating and cooling. The TMS works autonomously and does not require user feedback or controls to turn the cooling system on when needed.

Each MP2XL has a thermal roof located at the top of each MP2XL unit. The thermal roof contains fans and radiators that cool the 50/50 ethylene glycol-water solution. The liquid cooling system utilizes approximately 400 liters of the ethylene glycol-water solution. Refrigerant is stored separately in a sealed system. Each MP2XL has an integrated 900 liter gravity-fed secondary coolant containment basin in its enclosure in accordance with Title 40 C.F.R. 264.174. In addition, each MP2XL has a coolant reservoir level indicator that will alert qualified personnel to be dispatched for investigation.

The HQCA BESF TMS can direct the HQCA BESF TSC to immediately isolate and shutdown individual HQCA BESF battery units or the entire HQCA BESF. The HQCA BESF TSC and the HQCA GELI EMS Platform can also disconnect a battery or the entire HQCA BESF from the electric grid.

While the MP2XL does not have smoke detectors, each MP2XL unit has the ability to remove and ventilate errant gas very early in a thermal runaway event. When this protocol is activated, overpressure vents open automatically into each MP2XL’s thermal roof, permitting gases to safely exhaust through the roof of the MP2XL during a thermal event. This engineered approach is permitted by NFPA 855 §9.6.5.6.4.

When this protocol is activated, the HQCAs BESF Fire Control Panel would signal the Town of Waterford Fire Department of a possible emergency event.

The HQCA BESF can also be remotely shut down and disconnected from the grid by Qcells and can be manually shut down via an external emergency stop (E-Stop) button noted as “(N) Pad Mounted ‘SWBD1’ with ‘DISC1’” located within the HQCA BESF. Please see Supplement Attachment B, Sheet E100.

Consistent with the guidance provided by the International Association of Fire Chiefs and American Clean Power First Responders Guide (please see Supplement Attachment D and Supplement Attachment E) the MP2XL units do not require an internal or external fire suppression system, or manual fire suppression (hose lines) as the use of water can cause a battery fire to appear extinguished when it is not. Similar to most lithium-ion batteries on a commercial scale, a fire in an MP2XL battery could last for approximately forty-eight hours.

Consistent with the findings of the *American Clean Power Battery Energy Storage Safety FAQs* (Supplement Attachment Exhibit F), gases released in fire events are similar to fires involving materials such as sofas, mattresses, or office furniture.

HQCA first met with the Waterford Fire Marshal on February 28, 2024. Since then, HQCA has provided the Waterford Fire Marshal with information regarding the change in equipment and the MP2XL’s electrical fault protections, its Thermal Management System, and its other fire protection design features along with the MP2XL Emergency Response Guide. HQCA has also discussed the MP2XL’s safety and fire protection features as well as emergency response with the Waterford Fire Marshal. HQCA will provide training to the Waterford Fire Department prior to commencing operations. HQCA will also provide a plan depicting the HQCA BESF layout and a map depicting areas of seventy-five feet (75’) and three hundred thirty feet (330’) from the HQCA BESF to the Waterford Fire Department.

During construction, a site-specific health and safety plan will be developed and implemented to protect the safety of construction personnel and Project staff.

32. What is the typical duration of a battery fire before it self-extinguishes?

A BESS fire could last for approximately forty-eight (48) hours, provided that the containment strategy is applied as prescribed.

33. If one battery unit caught fire, can it easily spread to adjacent batteries? What mechanisms are in place to reduce the possibility of a fire from spreading to an adjacent battery unit?

The MP2XL battery units proposed by the Petitioner passes UL 9540A, which requires that no propagation may occur between a cell that has been ignited and the other system unit cells.

34. What are the typical causes of a battery fire?

Thermal Runaway is a main cause of battery fires.

35. Referencing Petition pp. 20-21, when and what type of testing would be conducted on the BESF fire extinguishing agent and venting actuators, and smoke, thermal and gas detectors prior to installation at the site?

Pursuant to current guidance, the MP2XL design does not include a fire extinguishing agent. The MP2XL design also does not include smoke detectors. Before activation and when required by all building, electrical, and fire code inspection requirements, the Petitioner will engage a third-party vendor to conduct any required testing.

36. Would runoff from fire suppression water applied directly to a battery fire be considered hazardous and require cleanup by a hazardous materials response contractor?

The direct application of water to the exterior of an affected BESS enclosure should be avoided, as the use of water can cause a battery fire to appear extinguished when it is not and cause complications with runoff. This is consistent with the attached guidance from the International Association of Fire Chiefs and American Clean Power First Responders Guide (please see Supplement Attachment D and Supplement Attachment E).

The use of water as the primary agent removes concerns with run off from fire chemical agents. Use of water on the surrounding structures and environment only prevents the contaminated runoff from any chemicals associated with the BESF and cooling system.

37. What type of fire suppression media can be applied to directly to a battery fire?

The use of water as an agent removes concerns with run off from fire chemical agents. Use of water on the surrounding structures and environment only prevents the contaminated runoff from any chemicals associated with the BESF and cooling system.

38. Referencing Petition Exhibit J pp. 16-17,

- a. Would smoke from the fire be considered hazardous and require notification to state and local authorities?

The Petitioner will notify and cooperate with local emergency responders and fire safety authorities in the event of a fire. In recent BESS fire incidents, monitored results concluded that gases released are similar to “fires involving materials such as sofas, mattresses, or office furniture.” (please see p. 4 of the Supplement Attachment Exhibit F – American Clean Power – Battery Energy Storage Safety – Frequently Asked Questions).

- b. Would smoke require area residences to stay in place or evacuate? If yes, who would determine if these actions are necessary and who ensures notifications have been made?

Ultimate decision-making authority rests with the Town of Waterford Fire Marshal concerning any orders to remain in place or evacuate. Per the IAFC guidance on fire response, persons should maintain a safe distance from the unit involved. Typically, for large commercial systems, this distance is at least three hundred (300) feet (please see Supplement Attachment D).

- c. If the Fire Marshal is the emergency decision authority, how and when would the Fire Marshal notify all property owners within 330 feet that evacuation or shelter in place orders may be imposed if there was an emergency at the BESF?

The Waterford Fire Marshal would implement those orders via its emergency text message system and/or via door-to-door.

- d. What type of emergency would require the evacuation of all persons 330 feet downwind of the BESF?

While an emergency event causing the release of smoke or gas might require the evacuation of all persons 330 feet downwind of the BESS, the Town of Waterford Fire Marshal will have the ultimate decision-making authority concerning any orders to remain in place or evacuate. Per the IAFC guidance on fire response, for large commercial systems, this distance is at least three hundred (300) feet (please see Supplement Attachment D).

e. To what distance from the BESF would evacuation take place in the event of a fire?

Per the IAFC guidance on fire response, persons should maintain a safe distance from the unit involved. Typically, for large commercial systems, this distance is at least three hundred (300) feet (please see Supplement Attachment D).

f. Provide an aerial image showing all properties within a radius of 75 feet and 330 feet from the proposed BESF.

Please see Supplement Attachment I.

g. Would the final Emergency Response Guide contain a map with addresses of all properties requiring evacuation and/or isolation for certain types of emergencies?

The Waterford Fire Marshal's Office will be provided with a final Emergency Response Guide listing all properties within radiuses of 75 feet and 330 feet. The Fire Marshal can utilize this information in considering any orders to evacuate or remain in place. A copy of the final Emergency Response Guide will be kept at the BESS Facility.

h. What methodology was used to determine the size of the evacuation and isolation zones?

The IAFC Recommended Fire Department Response to Energy Storage Systems recommends a distance of at least three hundred (300') feet. Additionally, the Town of Waterford Fire Marshal will have the ultimate decision-making authority concerning any orders to remain in place, evacuate, and/or establish an area of isolation.

39. Referencing Petition Exhibit J p. 18, the diagram shows response actions to protect the transformer from becoming involved in a fire. What materials/fluids within the transformer are combustible?

Ester oil will be used inside the transformer. Ester oil is flammable but has a higher flash point, typically above 300°C.

40. Would Qcells dispatch personnel to the BESF in the event of a fire? Where would Qcells personnel be located that can respond to on-site emergencies? Do first responders have to wait for Qcells personnel to arrive before beginning emergency response measures?

The GELI EMS Platform will notify HQCA personnel to be dispatched from New York and/or New Jersey. Local first responders, however, do not have to wait for HQCA personnel to arrive on-site before beginning emergency response measures.

41. Would placards be installed at the facility to alert emergency responders as to how to extinguish a fire, the fire media to be used, and contact numbers for BESF operations personnel? If yes, provide detail. If no, explain why such measures are not necessary.

A standard UN placard will be affixed to the BESS units. Telephone and emergency contact numbers will be provided on the project fence and gate. The Project's BESS units will have the placard of UN3536, 9. This is for lithium batteries installed in a cargo transport unit.

The Petitioner will provide local emergency responders with training in fires involving lithium-ion batteries. Emergency response instruction will be directly provided and documented in a handbook provided to emergency responders. The Petitioner will provide training to local emergency responders prior to commencement of operations. Such training and documentation will be updated when appropriate.

42. Referencing Petition Exhibit J p. 15, what role does the battery supplier have in fire emergency response? What procedures would be followed if the battery supplier is not available?

The Petitioner, as well as the battery supplier, will provide guidance remotely initially regarding the incident as it develops. The Petitioner will work with the battery supplier to review alarms and other available data to evaluate the current conditions within the battery enclosures, take appropriate operation actions (if not already completed by the GELI EMS Platform), and will determine when it is considered safe to access a battery enclosure after a fire event is reported. The Petitioner will provide training to local first responders, and instruct them to take up defensive firefighting positions outside of the BESS fence perimeter and should not enter the facility, or open an enclosure, without guidance from the Petitioner or the battery supplier.

43. Referencing Petition Exhibit J p. 5, can the refrigerant storage container within the cooling units potentially explode in the event of a fire?

Each liquid cooling unit utilizes 50-50 ethylene glycol and water for coolant, and possesses a low risk of explosion in the event of a fire.

44. Referencing Petition Exhibit J p. 1, it states the Emergency Response Guide should be placed in the "FACP". Define FACP.

FACP stands for Fire Action Control Panel.

45. What are the industry Best Management Practices for Electric and Magnetic Fields at battery storage facilities?

BESS EMF emissions are expected to be similar to those of transmission substations with respect to 60-Hz magnetic fields, whereas the sources inside the facility are not generally substantial sources of 60-Hz magnetic fields outside the facility. The transmission and distribution lines entering and exiting the facility are the dominant sources of EMF at the property line and beyond.

Further, industry best management practices have yet to be established for EMF due to the lack of evidence that exposure to minimal EMF, as will be the case at this site, is a significant issue according to studies performed by the World Health Organization.

46. Would the proposed facility have on-site night security and/or maintenance lighting? If yes, identify the type, location and potential visual impacts.

No, the Petitioner is not proposing the BESF have any on-site night security, or maintenance lighting.

47. Is there a standard or recommended minimum distance of a BESF to a publicly accessible area?

Section 1207.8.3 of the 2021 International Fire Code lists a minimum of ten (10) foot clearance from any public way or lot line. The location of the BESF equipment complies with this section.

48. Referencing Petition p. 14, the transformers would contain a “degradable ester oil.” Does the transformer have a containment system in the event of an insulating mineral oil leak? Are there alarms (such as low-level oil alarms) to alert monitors of a leak? If there is a leak, what mitigation measures would be employed?

While there is no containment system for degradable ester oil in the transformer, a low-pressure oil alarm will monitor the level of oil within the transformer and automatically alert the appropriate personnel of an indication of low ester oil level.

49. Referencing Petition Exhibit E – Acoustic Analysis,
- a. Will the system generate noise during charging of the facility, discharge of the facility, neutral conditions (i.e. neither charging nor discharging), or all three?

The system will generate sound during charge, discharge, and in a steady maintenance state at varying levels.

- b. Was the modeling performed for the worst-case scenario with all equipment operating simultaneously, including, but not limited to, fans for the cooling/heating system? Explain.

The sound level modeling represents the worst-case scenario, which would involve the transformer and all four MP2XL battery units operating at full load with the liquid-cooling system including fans also running at their full capacity. The MP2XL fans are programmed to run at no more than a 40% duty cycle and this represents worst-case conditions and was used in the sound analysis report (please see [Supplement Attachment H](#)).

- c. Would rotating the BESF alignment from north-south to east-west reduce noise at the west and/or/north property line?

Rotating the alignment of the BESF to east-west would not materially reduce sound at the west and/or north property lines.

- d. Referencing Table 2, what are the distances of the BESF noise emitters to the model receiver points?

Figure 5-3, Sound Analysis Report, Sep. 12, 2024:

PL1: Approximately 115 feet  
PL2: Approximately 150 feet  
PL3: Approximately 40 feet  
PL4: Approximately 185 feet  
PL5: Approximately 35 feet

- e. Why was PL-1 used as a model receiver point if the southeast corner of 17 Maple Road is closest to the BESF?

Please see [Supplement Attachment H](#). Receptor PL1 has been placed as the appropriate receptor measurement location for 17 Maple Road.



50. What material will the sound barrier be composed of? Submit a specification sheet for the sound barrier.

The sound mitigation barrier is manufactured by Acoustifence. The barrier is a heavy-mineral filled, barium free viscoelastic acoustic material. Please see Supplement Attachment G for the Acoustifence data sheet.

51. Can the portion of the sound barrier on the north side of the BESF be extended an additional 10-12 feet to account for noise from the northeastern battery unit?

Petitioner proposes installing twelve (12') feet high mitigation barrier on the interior of all four sides of the twelve (12') feet high BESF chain link and green-slatted fence. This action not only allows compliance with Regs. Conn. Agencies § 22a-69-1 *et seq.* but resulting sound produced from the HQCA BESF will be well under such thresholds for several receptor properties. PL1 meets the State Class A Night standards.

Petitioner is proposing mitigation barrier on the east, north, and south sides of the BESF fence even though those receptor measurements meet State requirements with no mitigation. This action results in measurements well under State requirements.

52. Can a sound barrier also be installed on the south side of the BESF to reduce noise at the 30 Norwich Road property line? What would be the modeled noise level at this property line if a sound barrier was installed?

Please see Petitioner's response to Interrogatory No. 51.

### **Environmental Effects and Mitigation Measures**

53. Referencing Petition p. 20, what is the status of the State Historic Preservation Office review of the Phase 1A cultural resources survey?

The Connecticut State Historic Preservation Office completed a review of this site's cultural resources survey and concluded that no historic properties will be affected by the proposed BESS project and no additional archaeological investigations are warranted. Please see Supplement Attachment J.

54. Referencing Petition Exhibit I, manholes that could be associated with underground storage tanks and pits are within the site development area. Has the site been investigated to determine if underground tanks, pits utilities and other structures are present? If yes, when was the investigation conducted and what were the findings?

A Phase I Site Assessment ("Phase I") was completed on 40 Norwich Road, Waterford (the "Property") by Paul Burgess, LLC in May, 2014. A Phase II Site Investigation ("Phase II") was completed on the Property by Paul Burgess, LLC in November, 2014. These investigations did not indicate the existence of any underground storage tanks within the site development area. The Phase II indicated a formerly utilized septic system and associated leaching field is located underground within a portion of the site development area. The Phase II did not detect any releases in the area of the septic leaching field. The Phase II also reported no indications of any significant buried objects within the site development area.

55. Has a subsurface investigation been conducted to determine if soils within the construction area have been impacted by contaminants from previous use of the host parcel? If not, when would such a survey be conducted?

As discussed in Interrogatory 54 above, the May, 2014 Phase I and November, 2014 Phase II did not detect any releases within the site development area, including in the reported area of the septic system and associated leaching field. During construction, Petitioner will monitor subsurface conditions and properly dispose of any unsuitable materials located within the site development area.

56. Submit photographic site documentation with notations linked to the site plans or a detailed aerial image that identify locations of site-specific and representative site features. The submission should include photographs of the site from public road(s) or publicly accessible area(s) as well as Site-specific locations depicting site features including, but not necessarily limited to, the following locations as applicable:

For each photo, please indicate the photo viewpoint direction and stake or flag the locations of site-specific and representative site features. Site-specific and representative site features include, but are not limited to, **as applicable**:

1. wetlands, watercourses and vernal pools;
2. forest/forest edge areas;
3. agricultural soil areas;
4. sloping terrain;
5. proposed stormwater control features;
6. nearest residences;
7. Site access and interior access road(s);
8. utility pads/electrical interconnection(s);
9. clearing limits/property lines;
10. mitigation areas; and
11. any other noteworthy features relative to the Project.

A photolog graphic must accompany the submission, using a site plan or a detailed aerial image, depicting each numbered photograph for reference. For each photo, indicate the photo location number and viewpoint direction, and clearly identify the locations of site-specific and representative site features show (e.g., physical staking/flagging or other means of marking the subject area).

The submission shall be delivered electronically in a legible portable document format (PDF) with a maximum file size of <20MB. If necessary, multiple files may be submitted and clearly marked in terms of sequence.

Please see [Interrogatories Attachment 2](#).

### **Facility Construction**

57. Referring to Petition Exhibit G – Geotechnical Report, p. 6 recommends a geotechnical engineer be on-site to observe excavation and site preparation. Does Qcells intend to retain a geotechnical engineer to oversee these activities?

Yes, the Petitioner intends on having a geotechnical engineer on-site during excavation and site preparation.

58. Have drainage characteristics of the proposed site been evaluated to ensure water will not pool around the BESF? Where would stormwater be directed to?

The drainage characteristics of the proposed site have been evaluated by the Petitioner's civil engineer to ensure water will not pool around the BESF. Please see the civil plan sets included in Interrogatories Attachment 1 for further details.

59. Where will runoff from the equipment compound be directed? What feature would collect and divert water?

Runoff from the equipment compound will be directed along the existing flow path southwesterly. No new features are proposed to collect and divert water. Surface water is allowed to flow across existing flow paths.

60. Submit a revised site plan that includes the site layout with site grading, sediment controls, sound barrier and proposed landscape plantings with installation detail.

Please see the Supplement Attachment B as well as Interrogatories Attachment 1 for details regarding site grading, sediment controls, and sound barrier. Proposed landscape plantings are noted but an installation detail has not been provided with this response. Petitioner will supply a landscape planting installation detail if required.

61. Submit a side elevation drawing for the facility that shows required side slopes, retaining wall (if any), and BESF units and associated electrical components.

No side slopes beyond a 3:1 ratio are required for this site development. Similarly, no retaining walls are required are required for this site development.

#### **Facility Maintenance/Decommissioning**

62. Referencing Petition p. 5,

- a. What is the anticipated life of a battery before replacement/replenishment is required?

The anticipated life of a battery before replacement or replenishment is required is approximately fifteen years.

- b. What is anticipated annual degradation of battery storage capacity?

Battery storage capacity degrades roughly 2% annually.

- c. At what remaining battery capacity is replacement/replenishment recommended?

Upon fifteen years of use.

- d. What is the estimated cost of replacement/replenishment?

The Petitioner objects to this interrogatory to the extent it seeks information that is beyond the scope of a petition for declaratory ruling pursuant to PUESA. Further, the costs information sought is a trade secret pursuant to General Statutes § 1-210 et seq., and is therefore protected from disclosure. Without waiving the foregoing objection, the Petitioner will provide the Council with a Motion for Protective Order supported by an Affidavit of Daehyun Kim under separate filing which contains information responsive to this interrogatory.

63. At what time intervals would the transformers, inverters and switchgear need replacement?

Transformers, inverters, and switchgear typically start to need replacement after fifteen years.

64. At what intervals would vegetation management occur?

Vegetation management will occur on an as-needed basis to ensure clear, safe ingress and egress to the BESF equipment, to ensure the clear intake of the vents for the cooling and electronic equipment and to ensure that there are no tree limbs or vegetation within ten feet of the BESF equipment.

65. Referencing Petition p. 23, what minimum snow depth would require removal within the BESF compound? At what height could snow block the airflow to the chiller and/or electronic compartments?

As a result of the change in equipment, snow accumulation potentially blocking airflow is no longer an issue. Air flow for the MP2XL Thermal Management System is achieved via vents located near the very top of each 9' 2" MP2XL unit.