

# DRAFT

**Petition No. 1630**  
**VFS, LLC**  
**University of Connecticut**  
**2358 Alumni Drive, Storrs (Mansfield), Connecticut**

**Staff Report**  
**July 12, 2024**

## Notice

On May 15, 2024, the Connecticut Siting Council (Council) received a petition from VFS, LLC (VFS), for a declaratory ruling, pursuant to Connecticut General Statutes (CGS) §4-176 and §16-50k, for the installation of a customer-side 920-kilowatt combined heat and power fuel cell facility and associated equipment at University of Connecticut (UCONN) located at 2358 Alumni Drive, Mansfield, Connecticut (Petition or Project).

Prior to filing the Petition, VFS and UCONN collaborated on the development of the Project.

On May 14 and May 21, 2024, VFS provided notice of the Project to the Town of Mansfield (Town), required state officials and agencies, and abutting property owners. No comments were received.

On May 16, 2024, the Council sent correspondence to the Town stating that the Council has received the Petition and invited the municipality to contact the Council with any questions or comments by June 14, 2024. No comments were received.

Also, on May 16, 2024, pursuant to Regulations of Connecticut State Agencies (RCSA) §16-50j-40, the Council notified all state agencies listed therein, requesting comments regarding the proposed Project be submitted to the Council by June 14, 2024. On May 22, 2024, the Council on Environmental Quality provided comments regarding noise mitigation and compliance with state standards.<sup>1</sup>

While the Council is obligated to consult with and solicit comments from state agencies by statute, the Council is not required to abide by the comments from state agencies.<sup>2</sup>

On May 21, 2024, the Council sent correspondence to VFS noting a deficiency in the completeness of the Petition. Specifically, proof of service of the Petition to state officials and agencies was not provided to the Council. On May 21, 2024, VFS submitted proof of service of the Petition on the required officials and agencies. On May 22, 2024, the Council rendered the Petition complete.

The Council issued interrogatories to VFS on June 28, 2024. VFS provided responses to Council interrogatories on July 8, 2024.

Pursuant to CGS §4-176(e) of the Uniform Administrative Procedure Act, an administrative agency is required to take action on a petition for a declaratory ruling within 60 days of receipt. At a public meeting held on June 20, 2024, pursuant to CGS §4-176(e), the Council voted to set the date by which to render a

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<sup>1</sup> [https://portal.ct.gov/-/media/csc/3\\_petitions-medialibrary/petitions\\_medialibrary/mediapetitionnos1601-1700/pe1630/proceduralcorrespondence/pe1630\\_ceq-commentsrecd\\_a.pdf](https://portal.ct.gov/-/media/csc/3_petitions-medialibrary/petitions_medialibrary/mediapetitionnos1601-1700/pe1630/proceduralcorrespondence/pe1630_ceq-commentsrecd_a.pdf)

<sup>2</sup> *Corcoran v. Conn. Siting Council*, 284 Conn. 455 (2007).

decision on the Petition as no later than November 11, 2024, which is the 180-day statutory deadline for a final decision under CGS §4-176(i).

### **Public Benefit**

The Project would be a “customer-side distributed resources” facility, as defined in CGS § 16-1(a)(49). CGS § 16a-35k establishes the State’s energy policy, including the goal to “develop and utilize renewable energy resources...to the maximum practicable extent.” The proposed facility is a distributed generation resource and will contribute to fulfilling the State’s Renewable Portfolio Standard as a low emission Class I renewable energy source.

The Project is part of a larger campus-wide plan to deploy fuel cell technology at UCONN while utilizing combined heat and power to increase grid resiliency and provide clean, low cost and reliable energy to UCONN. The Project would be constructed by VFS, and the energy would be sold to UCONN under an Energy Services Agreement. UCONN would also purchase the capacity. UCONN has designated VFS to be its agent for purchasing renewable energy certificates (RECs).

No state funds would be used to construct the facility. VFS is a private entity.

### **Proposed Site**

Pursuant to CGS §16-50x, the Council has exclusive jurisdiction over the proposed fuel cell facility “site.” Under 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. The Council does not have jurisdiction or authority over any portion of the host parcel beyond the boundaries of the Project “site.” This includes portions of the host parcel retained by the landowner and portions of the host parcel the landowner may lease to third parties. Once a facility is decommissioned, the Council no longer has jurisdiction or authority over the Project “site.”

The proposed facility would be located within an approximately 5,672 square foot site at the UCONN campus in Mansfield.

The parcel is zoned Institutional (I) and is developed with UCONN campus buildings. The proposed facility would be located in a paved area extending partially onto a lawn area immediately west of Alumni Drive, an on-campus road. Israel Putnam Refectory (Putnam Dining Hall) is located on the opposite or east side of Alumni Drive. Nathan Hale Hall, the nearest on-campus residential building, is also located on the east side of Alumni Drive and to the north of the Putnam Dining Hall approximately 115 feet from the proposed facility.

The surrounding area consists of UCONN-owned property to the north, south and east and an associated off-campus residential area to the west. The nearest off-campus residential structure is located 80 feet to the west, at 83 Cheney Drive. A pedestrian path leads from the off-campus residential development to a crosswalk at Alumni Drive. The proposed facility is approximately 30 feet south of the pedestrian path.

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

The facility would consist of two 460-kW HyAxiom PureCell Model 400 fuel cell power modules that utilize a non-combustion phosphoric acid technology that interacts with natural gas to generate electrical power. The amount of phosphoric acid within the fuel cell complies with applicable state and federal regulations.

The proposed facility would be a customer-side combined heat and power distributed resources project, designed to provide electricity and thermal energy to the Putnam Dining Hall and Hilltop Dormitory. The facility would have an overall annual electrical efficiency of approximately 94 percent with utilization of waste heat. Waste heat would be used at the Putnam Dining Hall. The facility would provide approximately 15 percent of the associated energy load. All power from the facility would be utilized at UCONN. The facility was not designed to operate as a backup power source. The facility was designed to operate in parallel with the grid.

The facility is designed to accommodate a future Battery Energy Storage System (BESS) to ensure uninterrupted power and thermal energy to the host buildings. The BESS would be commissioned approximately second quarter of 2025. A step-up transformer and associated disconnect switch would be installed at that time to accommodate the BESS.

The facility would be installed on a 135.3-foot by 26.7-foot concrete pad. Steel guardrail would be installed on the eastern side of the concrete pad along Alumni Drive and also along portions of the northern and southern sides of the pad. The future BESS would be installed on the southern portion of the concrete pad.

The fuel cell power modules are each approximately 27.3 feet long by 8.3 feet wide by 10 feet tall. Two cooling modules, measuring 16 feet long by 7.9 feet wide by 6 feet tall, would be installed to the west, adjacent to the fuel cell units and next to the concrete pad. The cooling modules would be protected by bollards. One transformer, switchgear and other associated electrical equipment would also be installed on the concrete pad. The proposed facility would be enclosed by a 12-foot high chain link fence with privacy slats.

A 24-square foot pad for natural gas service and meter equipment would be installed adjacent to the northern side of the concrete pad. The gas/meter pad would be protected by bollards.

A 13.8-kV electrical interconnection would run underground to an existing duct bank at manhole #20 in front of Nathan Hale Hall. Eversource is currently reviewing a Project interconnection application.

The facility's water connection would extend underground and connect to the Putnam Dining Hall. The natural gas connection would be installed underground to the meter pad.

The facility would be accessed directly from Alumni Drive. Site access would be controlled by two locked fenced gates.

Project construction is expected to begin by September 2024 and continue over a four-month period. Construction hours would be from 8:00 a.m. to 5:00 p.m. Monday through Friday.

The fuel cell has an operational service life of 20 years; however, the solid oxide media in the fuel cell unit would be replaced every 5-7 years. At the end of the 20-year operational life, the fuel cell unit and associated equipment would be dismantled and removed.

The estimated cost of the facility is \$6.9M.

### **Public Health and Safety**

Before commissioning the proposed facility, VFS would use nitrogen or atmospheric air under pressure as pipe cleaning media in accordance with Public Act 11-101, An Act Adopting Certain Safety Recommendations of the Thomas Commission. Nitrogen would be stored on site and would be remotely monitored to detect leaks and provide prompt response.

The fuel cell facility has internal and remote 24/7 operational monitoring. Abnormal operation would cause the facility to automatically shut down and service technicians dispatched to site if necessary. The facility can also be shut down through a remote operations center as well as manually. The fuel cell stack is wrapped in a fire-retardant blanket. The fuel cell facility is designed in accordance with American National Standards Institute and Canadian Standards Association (ANSI/CSA) America FC 1-2004 and the National Fire Protection Association, Inc. Standard 853 for stationary fuel cell power systems and includes extensive safety control systems, including both automatic and manual shutdown mechanisms that comply with pertinent engineering standards.

A sample emergency response plan (ERP) for the facility is included within the Petition. VFS would develop a formal, site-specific ERP once the final design is complete. Emergency responders would have the ability to shut down the fuel cells and shut off natural gas flow to the facility. HyAxiom service personnel would be dispatched in the event of any emergency. HyAxiom would offer site safety training to emergency responders once construction of the facility is completed.

LED lighting would be installed at the site and controlled by a switch.

The fuel cell system is controlled electronically and has internal sensors that continuously measure system operation. If safety circuits detect a condition outside normal operating parameters, the fuel supply is stopped, and individual system components are automatically shut down. In addition, manual emergency shut down push buttons would be located at the site. When the fuel cells go into emergency shutdown mode, nitrogen would be used to purge hydrogen remaining in the fuel processing equipment to safe levels.

The construction or operation of the proposed facility will not impact or interfere with any existing utilities or infrastructure within the surrounding area. A crane with a boom reaching a height of approximately 130 feet would be utilized for construction of the proposed facility.

The nearest airport (Windham Airport) is located over 5.5 miles southeast of the proposed facility. Notification to the Federal Aviation Administration is not required.

The proposed facility would be in compliance with Department of Energy and Environmental Protection (DEEP) Noise Control Standards. Noise modeling indicates noise from operation of the facility would be less than 45 dBA at the nearest off-campus residential receptor at Cheney Drive and at the nearest on-campus residential receptor at Nathan Hale Hall subject to the installation of 12-foot tall acoustical barrier on the western and eastern sides of the facility. VFS would install the acoustical barriers on the proposed 12-foot fence.

Noise associated with Project construction would be temporary and exempt per DEEP Noise Control Regulations.

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

The fuel cell facility would comply with all applicable DEEP water quality standards as no water would be consumed or discharged once the facility is operational. The proposed facility would be connected to UCONN's water system from the Putnam Dining Hall and water consumption would only occur at system fill, requiring approximately 350 gallons for each fuel cell. Minimal discharge of de-ionized water would occur in rare instances and directed to a drywell.

Air emissions produced during fuel cell operation would be below DEEP applicable limits for a new distributed generator, as shown below, and thus, no DEEP air permit is required.

Fuel Cell Facility	
Compound	Fuel Cell Facility (lbs/MWh)
NO <sub>x</sub>	0.02
CO <sub>2</sub>	496 With waste heat recovery
CO <sub>2</sub> *	1,006 Without waste heat recovery

\*DEEP amended its regulations in 2016 to eliminate the CO<sub>2</sub> permit requirements from the New Source Review and Title V Programs as a result of a United States Supreme Court decision that overturned states' regulatory CO<sub>2</sub> permit requirements (*Utility Air Regulatory Group v. U.S. Environmental Protection Agency*, 573 U.S. 302 (2014))

The proposed facility would emit no methane (CH<sub>4</sub>), sulfur hexafluoride (SF<sub>6</sub>), hydrofluorocarbons (HFCs) or perfluorocarbons (PFCs), which are greenhouse gases defined in RCSA §22a-174-1(49), and would emit negligible amounts of sulfur oxides, volatile organic compounds and particulate matter.

The fuel cell desulfurization system would remove sulfur that is used as an odorant in natural gas because it is a fuel cell system contaminant. Desulfurization creates zinc-sulfide, a non-hazardous waste that would be contained within the fuel cell unit until facility refurbishment is required, usually after 10 years of operation. The desulfurization vessel is sealed and then removed from the fuel cell for recycling and disposal. The vessel is recyclable as scrap metal.

The Project is located entirely within a previously disturbed area on a developed property. No wetlands, trees, or prime farmland soils would be impacted by site construction. The nearest waterbody is East Brook, located approximately 1,500 feet west of the facility site.

Erosion and sedimentation controls for the proposed facility would comply with the *Connecticut Guidelines for Soil Erosion and Sediment Control*, effective March 30, 2024. No permanent stormwater management features are proposed.

The site is not located within a DEEP Natural Diversity Database buffered area.

The site is not within a DEEP-designated Aquifer Protection Area.

The site is not within a Federal Emergency Management Agency-designated flood zone.

By letter dated May 31, 2024, the State Historic Preservation Office (SHPO) determined that the proposed facility would not affect historic properties.

Visual impact is not expected to be significant because the proposed facility would be installed on a developed campus and would only be visible from Alumni Drive.

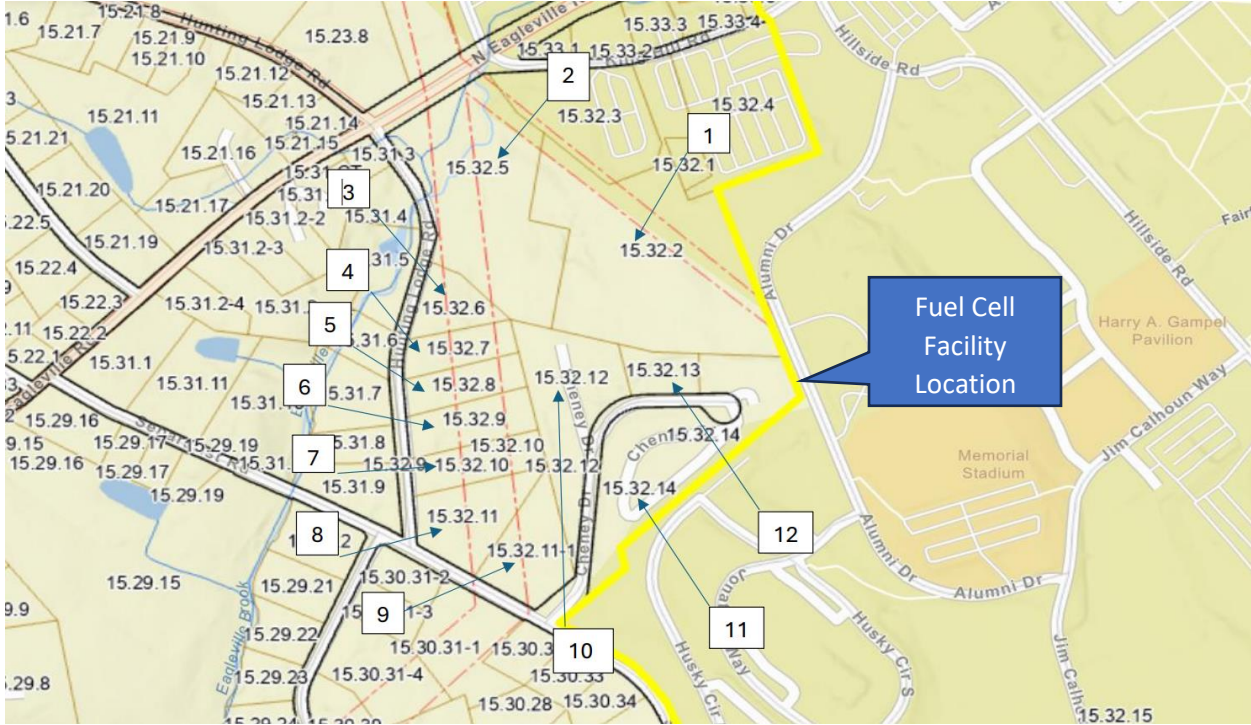
### Conclusion

The Project is a distributed energy resource with a capacity of not more than sixty-five megawatts, meets air and water quality standards of the DEEP, and would not have a substantial adverse environmental effect. It would reduce the emission of air pollutants that contribute to smog and acid rain, and to a lesser extent, global climate change, and furthers the State's energy policy by developing and utilizing renewable energy resources and distributed energy resources. Furthermore, the facility will advance UCONN's 2030 green energy goals and is part of UCONN's plan to deploy fuel cell technology.

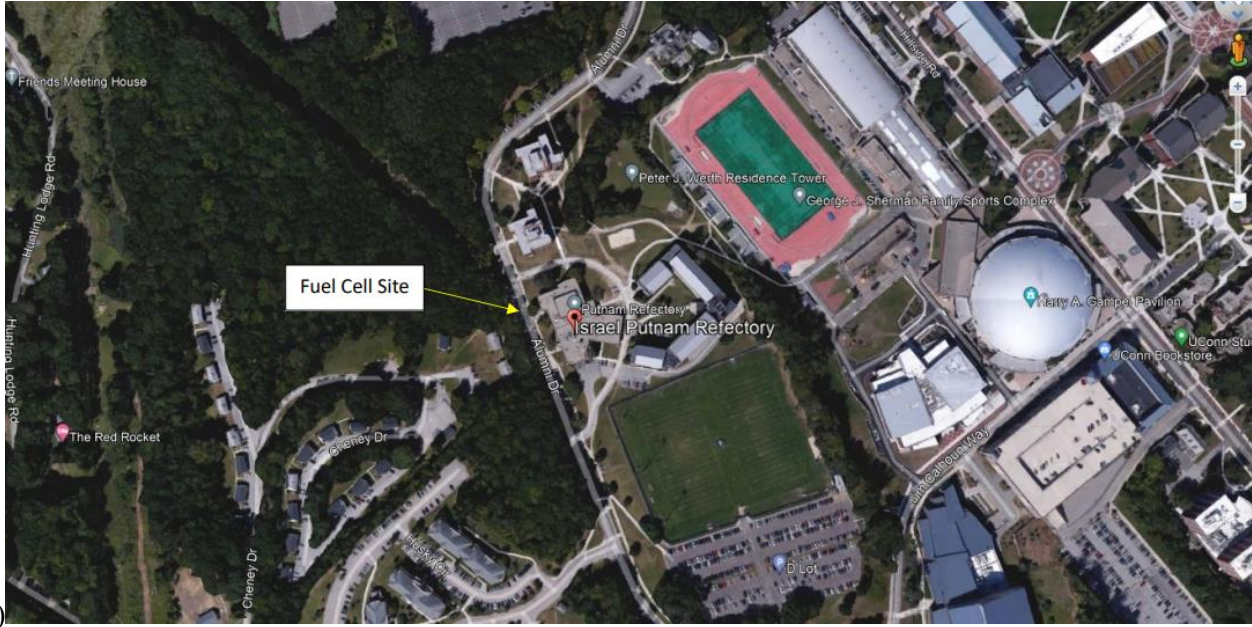
If approved, staff recommends the following conditions:

1. Approval of any Project changes be delegated to Council staff;
2. Provide the final facility fence layout in compliance with the National Electrical Code and with privacy slats and acoustical barriers prior to the commencement of construction;
3. Provide a copy of the Fuel Cell Emergency Response Plan to local emergency responders prior to facility operation and provide emergency response training that includes an itemized list of necessary fire suppression equipment;
4. Provide a Construction Spill Prevention Control and Countermeasure Plan with contractor information and appropriate reporting forms; and
5. Submit an amendment to the Petition for the associated BESS proposed to be installed at the site, when applicable.

Site Location



**Site Location – West of Alumni Drive (opposite of Israel Putnam Refectory)**





### Site Plan

