DRAFT

Petition No. 1564
Bloom Energy Corporation
Central Connecticut State University
1615 Stanley Street
New Britain, Connecticut
Staff Report
May 19, 2023

Introduction

On March 22, 2023, the Connecticut Siting Council (Council) received a petition from Bloom Energy Corporation (Bloom) for a declaratory ruling, pursuant to Connecticut General Statutes (CGS) §4-176 and §16-50k, for the installation of a 2.0 megawatt (MW) fuel cell facility and associated equipment to be located at Central Connecticut State University (CCSU), 1615 Stanley Street, New Britain, Connecticut (Petition or Project).

Bloom provided Project plans to the City of New Britain's (City) Planning Department on March 2, 2023.

On March 8, 2023, Bloom provided notice of the Project to abutting property owners, City and Town of Newington[1] (Town) officials and required state agencies and officials. No comments were received.

On March 23, 2023, the Council sent correspondence to the City and the Town stating that the Council has received the Petition and invited the municipalities to contact the Council with any questions or comments by April 21, 2023. No comments were received.

Also, on March 23, 2023, 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 April 21, 2023. No comments were received.

The Council issued interrogatories to Bloom on April 24, 2023. Bloom provided responses to the Council's interrogatories on April 27, 2023.

Pursuant to CGS §4-176(e) of the Uniform Administrative Procedure Act, an administrative agency is required to take action on a petition within 60 days of receipt. On April 27, 2023, pursuant to CGS §4- 176(e), the Council voted to set the date by which to render a decision on the Petition as no later than September 18, 2023, 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 was selected as part of the Non-Residential Renewable Energy Solutions (NRES) Program, the successor to the low and zero emissions (LREC/ZREC) renewable energy credit program. The facility would be installed,

[1] The Town of Newington is located within 2,500 feet of the proposed facility.

maintained and operated by Bloom under a 20-year power purchase agreement with Connecticut State Colleges and Universities (CSCU).

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 4,300-square foot site on a 119-acre parcel owned by the State of Connecticut. The host parcel is zoned Office and Public (OP) and is developed with multiple buildings, recreational facilities, parking garages, roadways and parking lots associated with CCSU. The facility would be located in the eastern portion of the host parcel, within an existing lawn area 20 feet north of the Copernicus Parking Garage and west of CCSU's Energy Center[2].

The surrounding area consists of residential development to the north, west and south, Stanley Street and a City recreational property to the west and Route 9 to the east. The nearest residential property line from the proposed facility is approximately 375 feet to the south at 230 Hillcrest Avenue.

An existing 1.4 MW fuel cell facility approved by the Council in Petition No. 1005 is located 900 feet east of the proposed facility and provides about 60-70% of CCSU's electricity needs.

Proposed Facility

The facility would consist of one Bloom Energy 250-kW ES-5, four 275-kW ES-5 and two 325-kW ES-5 solid oxide fuel cell Energy Servers and associated equipment, including water deionizers, telemetry cabinets, disconnect switches, a transformer and utility cabinets. The fuel facility would consist of seven energy servers installed on concrete pads. See Attached Site Plan for detail.

The fuel cell facility would be installed within a 4,300 square foot paved equipment area. The fuel cells are tamper proof and can only be accessed by essential personnel with a unique access key. The fuel cell facility would be located outside of a designated vehicle travel path in accordance with applicable safety codes.

The natural gas point of connection will be determined by Connecticut Natural Gas. Other utilities (water and data) would extend underground east to existing utility infrastructure located within the Energy Center. Electrical interconnection would extend to an existing electrical switch, located at the southwest corner of Copernicus Parking Garage. New meters and other electrical equipment would be installed adjacent to the proposed facility.

[2] CCSU's Energy Center hosts two water cooling towers, an energy stack, three boilers and two 1.25MW gas generators within a 20,000 square foot building.

The proposed facility would be a customer-side, distributed resources project, designed only to provide electricity. The proposed facility would operate in parallel with the utility grid and provide a portion of the electrical needs of the campus. The proposed facility is sized to provide at least 42% of the average annual baseload of the campus. Any excess electricity created during periods of low energy usage, would be exported to the grid under the net metering tariff. The interconnection application has been submitted to Eversource and is under review.

The proposed Bloom fuel cell units are designed to optimize the electrical efficiency alone rather than operate as combined heat and power units. Heat generated by the proposed facilities is used internally to increase the electrical efficiency of the fuel cells, and consequently there is no useful waste heat generated.

The fuel cell facility has an operational life of 20 years. The solid oxide fuel cell media would be changed at five-year intervals. At the end of the 20-year contract, CSCU may renew the contract, return the facility at no cost, or buy the facility at fair market value. If the facility is to be removed at the end of the contract, the fuel cell units and associated equipment and components would be dismantled and removed.

Bloom anticipates construction to start in the second quarter of 2024 with approximately 12 - 18 weeks of total construction time, i.e. 4 to 6 weeks for site prep, 4 to 6 weeks for installation and 4 to 6 weeks for commissioning. Construction days/hours would be Monday-Friday, 7AM – 5 PM.

The estimated cost of the facility is $3,306,470.

Environmental Effects and Mitigation Measures

The fuel cell facility would comply with all applicable Department of Energy and Environmental Protection (DEEP) water quality standards as no water would be consumed or discharged once the facility is operational. The proposed fuel cell facility would operate without water discharge under normal operating conditions. Water consumption would only occur at system fill and during restart operations and would require about 672 gallons of water.

Air emissions produced during fuel cell operation would not trigger any regulatory thresholds and are shown below.

Fuel Cell Facility	
Compound	lbs/MWh
NOx	0.01
CO_2*	679-833

* DEEP amended its regulations in 2016 to eliminate the CO2 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 CO2 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_4), sulfur hexafluoride (SF_6), 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. Sulfur compounds would be collected within a desulfurization unit (desulf unit) using a filter media – a composite copper catalyst. The U.S. Department of Transportation has certified the desulf unit as an acceptable form of transport for the desulfurization material that meets hazardous waste shipment standards. When a desulf unit is taken out of service, it is transported by a Bloom contractor to an out of state facility where the composite copper catalyst within the unit is removed, and the copper is used for other products. The empty desulf units are then refurbished for reuse at other Bloom fuel cell locations.

Three existing trees would be removed to provide the required minimum clearance for the fuel cell. Visual impact from the proposed Project would be minimal as it is located on the CCSU campus among existing buildings, parking garages and parking lots. The Copernicus Parking Garage would block views from the south. Views of the facility would be obstructed by the surrounding buildings and vegetation. The facility would be visible within the immediate vicinity from nearby campus roads and pedestrian walkways.

No wetlands, forest or prime farmland soils would be disturbed by the proposed Project as it is located entirely within paved/previously disturbed areas on a developed property. The nearest wetland is located 0.25 miles east of the proposed facility site. Erosion and sedimentation controls for the proposed facility would comply with the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*.

The site is not within a Federal Emergency Management Agency-designated flood zone nor within an Aquifer Protection Area (APA). The nearest APA is 2.75 miles to the northeast. The site is not located within a DEEP Natural Diversity Database buffered area.

The site is previously disturbed and would not impact historic or cultural resources.

Public Safety

Before commissioning the proposed facility, Bloom would use nitrogen as pipe cleaning media, in accordance with Public Act 11-101, An Act Adopting Certain Safety Recommendations of the Thomas Commission.

The fuel cell facility has internal and remote 24/7 operational monitoring. Abnormal operation would cause the facility to automatically shut down. The facility can also be shut down through a remote operations center as well as manually. The fuel cell facility is designed in accordance with current 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.

An emergency response plan (ERP) for the facility is included within the Petition. Bloom would submit the ERP to the New Britain Fire Marshal and would provide training and useful information to emergency responders related to fire safety at the site.

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.

Noise associated with the construction of this Project would be temporary and exempt from DEEP Noise Control Regulations. Operation of the facility is expected to produce noise emissions no greater than 26 dBA at the nearest residential receptor located approximately 375 feet to the south of the site and would comply with DEEP Noise Control Regulations. The fuel cell would have a noise dampening foam material at the doors and exhaust of the fuel cell to lower its noise emissions by up to 5 dBA.

The proposed facility would not be enclosed by a fence or bollards because it would operate below 1000 volts and it is not located proximate to vehicular use areas.[3] Lighting would not be installed at the proposed facility site due to existing campus lighting.

Conclusion

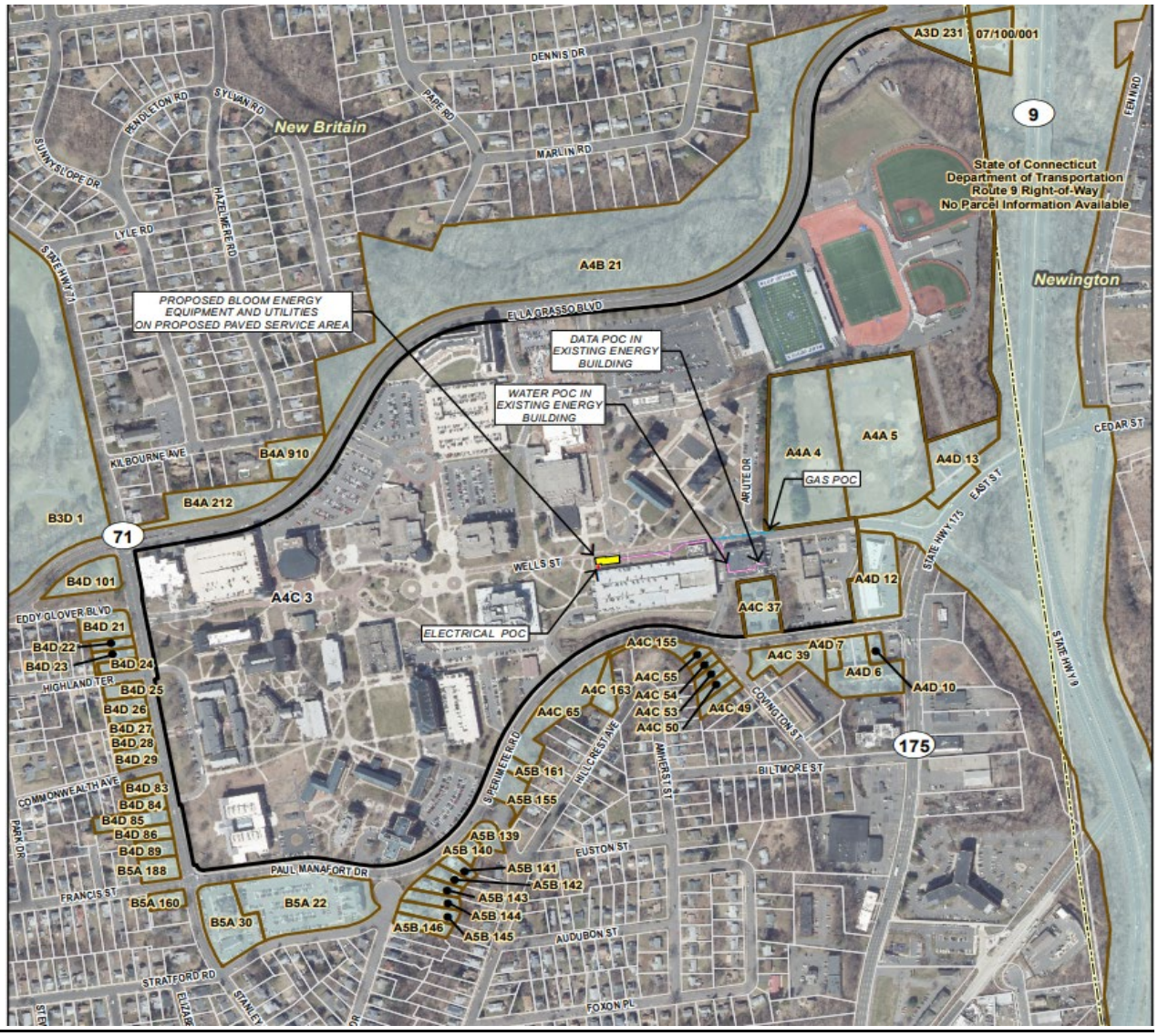
The Project is a distributed energy resource with a capacity of not more than sixty-five megawatts, meets air and water quality standards of the DEEP, and would not have a substantial adverse environmental effect. It would reduce the emission of air pollutants that contribute to smog and acid rain, and 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 Project was selected under the state's NRES Program.

If approved, staff recommends the following conditions:

1. Approval of any Project changes be delegated to Council staff; and
2. 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.

[3] Section 110.31 of the 2023 National Electrical Code notes that for facilities that operate over 1,000 Volts, "…a wall, screen, or fence shall be used…." and "…where exposed to physical damage from vehicular traffic, suitable guards shall be provided…"

Fuel Cell Site Location



Legend

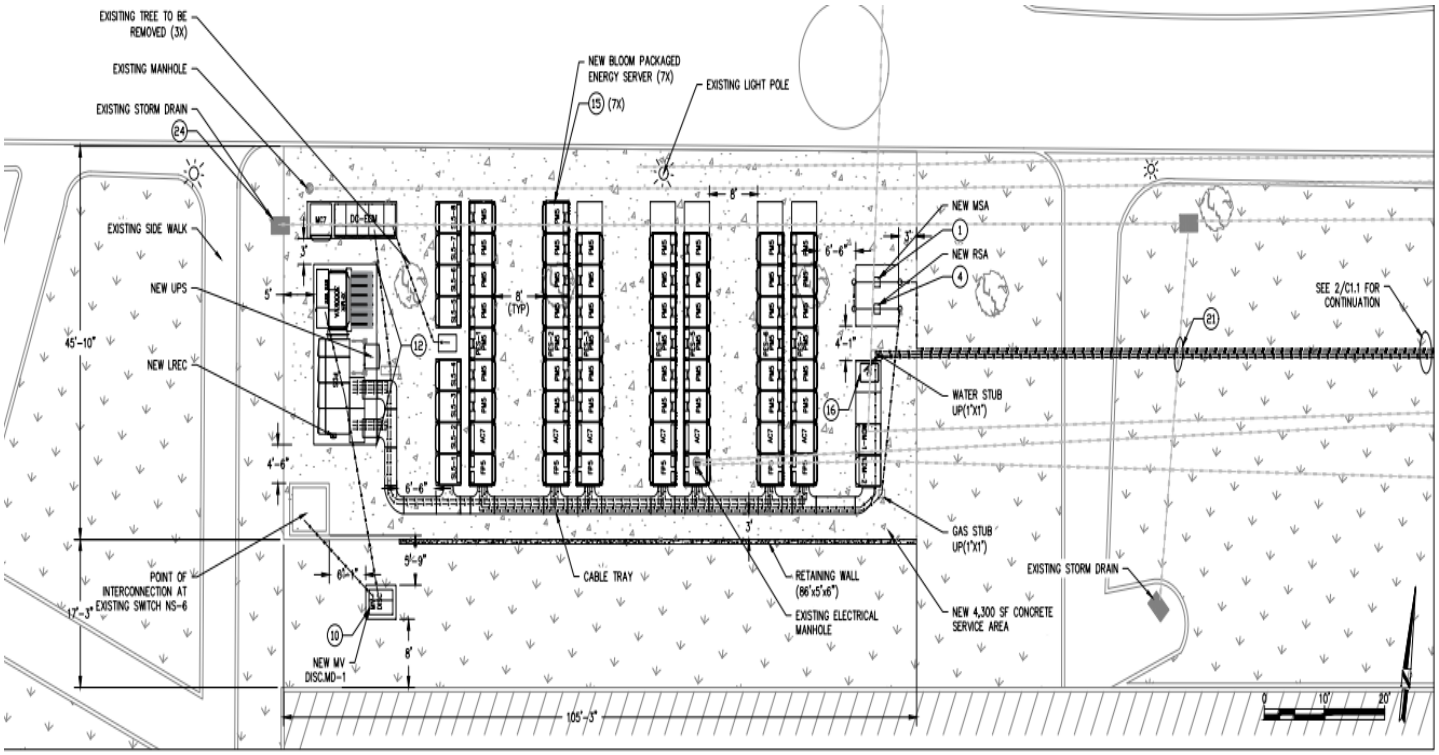
- Proposed Bloom Energy Equipment
- Proposed Service area
- Site
- Abutting Property
- Approximate Parcel Boundary
- Municipal Boundary
- Proposed Electrical Service
- Proposed Gas Service
- Proposed Water Service
- Proposed Data Service

Map Notes:
Base Map Source: 2019 CTECO Aerial Imagery
Map Scale: 1 inch = 600 feet
Map Date: March 2023

N

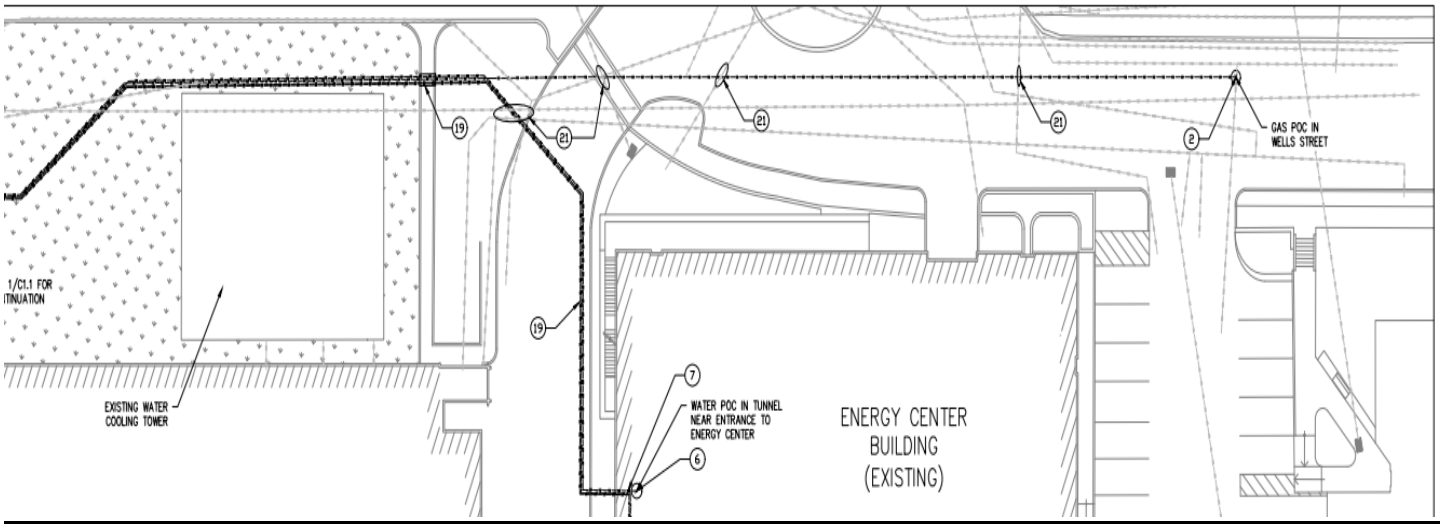
600 300 0 600
Feet

Site Plan



UTILITY SITE PLAN
SCALE: 1" = 10'

1
C1.1



Site Location Photograph 1

Looking southwest toward Facility location

Site Location Photograph 2

Looking east from Facility location;
water cooling tower and Energy Center stack in background