DRAFT

Petition No. 923A
Fuel Cell Energy, Inc.
539 Technology Park Drive, Torrington, Connecticut

Staff Report
January 31, 2025

Notice

On December 9, 2009, the Connecticut Siting Council (Council) issued a Declaratory Ruling pursuant to Connecticut General Statutes (CGS) §4-176 and §16-50k, approving a proposal from FuelCell Energy, Inc. (FCE) to conduct new fuel cell testing at its manufacturing facility located at 539 Technology Park Drive, Torrington, Connecticut (Petition No. 923) with a condition that if any testing of fuel cells with an output larger than 5 megawatts (MW) occurs at the site, the Council shall be notified in writing at least two weeks prior to the testing operation.

On October 8, 2024, FCE submitted a request to amend the Council's fuel cell testing facility Declaratory Ruling to accommodate its new SureSource fuel cells and associated Carbon Separation Plant and Nitrogen Generation Plant, along with a Motion for Protective Order (MPO) related to the disclosure of FCE's Site Infrastructure Location Plan, a trade secret, pursuant to CGS §1-210(b) and Regulations of Connecticut State Agencies (RCSA) §16-50j-22a(d).

On October 11, 2024, the Council sent correspondence to the City of Torrington (City) stating that the Council has received the request to amend the Declaratory Ruling and invited the City to contact the Council with any questions or comments by November 7, 2024. No comments were received.

Also, on October 11, 2024, pursuant to RCSA §16-50j-40, the Council sent correspondence requesting comments on the request to amend the Declaratory Ruling from the following state agencies by November 7, 2024: Department of Energy and Environmental Protection (DEEP); Department of Agriculture (DOAg); Department of Public Health (DPH); Council on Environmental Quality (CEQ); Public Utilities Regulatory Authority (PURA); Office of Policy and Management (OPM); Department of Economic and Community Development (DECD); Department of Emergency Services and Public Protection (DESPP); Department of Labor (DOL); Department of Administrative Services (DAS); Department of Transportation (DOT); the Connecticut Airport Authority (CAA); the State Historic Preservation Office (SHPO); and Office of Consumer Council (OCC). No comments were received.

On October 24, 2024, the Council granted FCE's MPO related to the Site Infrastructure Plan.

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 November 21, 2024, 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 April 6, 2025, which is the 180-day statutory deadline for a final decision under CGS §4-176(i).

The Council issued interrogatories to FCE on December 16, 2024. FCE provided responses to the Council's interrogatories on January 21, 2025.

Approved Testing Facility

The approved fuel cell testing facility is located within an approximately 2,800 square foot site on an approximately 31-acre host parcel owned by FCE. The host parcel is zoned Industrial Park and is developed with FCE buildings, equipment and parking areas. The site is located in the north-central portion of the host parcel, north of FCE's buildings.

The surrounding area consists of industrial property to the north and residential areas to the south. Areas to the east and west are residential and largely undeveloped.

The nearest residential property line from the testing facility is located approximately 792 feet to the south at 37 Pepper Drive. Gregor Technologies is the nearest industrial property located approximately 65 feet to the north at 529 Technology Park Drive.

The approved fuel cell testing facility accommodates three different size fuel cells manufactured by FCE: 300 kilowatt (kW) unit known as DFC300; 1.4 MW unit known as DFC1500; and 2.8 MW unit known as DFC3000. The installation included the fuel modules, associated electrical equipment, main process skid, desulfurization skid, and water treatment skid surrounded by a six-foot high chain link fence that is compliant with the National Electrical Code. Consistent with the Council's Declaratory Ruling, FCE tests one fuel cell system at a time that does not exceed 5 MW of output.

Proposed Amendment

FCE will test customer-side combined heat and power distributed resources units, designed to provide electricity and thermal energy. FCE proposes to test its SureSource 1500 fuel cell and associated equipment within the approved testing facility site. The fuel cell units utilize non-combustion carbonate fuel cell technology that consumes natural gas as fuel to generate electrical power. The SureSource 1500 has an efficiency of about 47 percent without the use of waste heat. The waste heat will not be utilized during the testing process.

FCE only has plans to test 1.4 MW SureSource 1500 fuel cells at the testing facility at this time. Thus, the unit will not exceed 5 MW. Consistent with the Council's Declaratory Ruling, FCE will operate one fuel cell system at a time that does not exceed 5 MW of output. Testing of the fuel cell unit would continue until the end of 2025. The testing facility has a useful life of 20 years.

Each fuel cell unit being tested at the site would consist of three main sections:

a) The mechanical section includes desulfurization system, the main process skid and water treatment system, providing system control, ventilation, fuel and water processing;
b) The carbonate power modules which convert the fuel supply into direct current (DC) power; and
c) The electrical portion of the fuel cell unit which converts DC power into AC power.

The SureSource 1500 has nominal dimensions of approximately 56 feet long by 39 feet wide by 20 feet high. Testing would utilize existing on-site water, natural gas and electrical connections. No changes to the existing electrical interconnection agreement are necessary. The drainage (sewer) connection has been modified in compliance with local requirements.

FCE utilizes air as pipe cleaning media, in accordance with Public Act 11-01, An Act Adopting Certain Safety Recommendations of the Thomas Commission. Nitrogen would be piped in from onsite storage tanks located on the eastern corner of the host parcel. It is used in both the manufacturing and operating processes for FCE's fuel cells.

The SureSource 1500 has internal and remote 24/7 operational monitoring. Abnormal operation would cause the facility to automatically shut down. It can also be shut down manually. The fuel cell unit 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.

Detection of a potential combustible gas mixture or a fire will result in an emergency facility shutdown and alarm notification to service personnel. The natural gas supply valves would close and nitrogen (an inert gas) from the on-site storage tanks would purge the fuel cell stack and fuel processing system. Also, manual emergency shut down push buttons will be included.

The nearest fire department is the Torrington Volunteer Fire Department approximately 2.8 miles from the testing facility site. A fire hydrant is located on the host parcel. FCE developed an emergency response plan (ERP) for the fuel cell testing facility.

The nearest airport, Green Acres Private Airport, is located approximately 17 miles southeast of the testing facility. Notification to the Federal Aviation Administration (FAA) is not required. A crane would be used to installed to install and remove fuel cells. However, the existing gantry crane does not require notice to FAA.

The fuel cell testing facility is an industrial (Class C) emitter under DEEP Noise Control Regulations. For residential (Class A) and industrial (Class C) receptors, the noise limits are 61/51 dBA (daytime/nighttime) and 70 dBA (daytime or nighttime), respectively. Noise from operation of the facility would be approximately 46 dBA at the nearest residential receptor at 37 Pepper Drive to the south and approximately 61 dBA at the nearest industrial receptor at 539 Technology Drive to the north. Thus, the fuel cell unit testing would comply with DEEP Noise Control Regulations.

Testing of the SureSource 1500 will comply with all applicable DEEP water quality standards. During operation, the fuel cell would consume an average of approximately 4.5 gallons per minute (gpm) of water and discharge approximately an average of 2.25 gpm of water into the drainage system. FCE has an existing DEEP General Permit for Discharges from Miscellaneous Industrial Users.

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.

SureSource 1500	
Compound	SureSource 1500 (lbs/MWh)
NOx	0.01
CO_2	520-680** With waste heat recovery
CO_2 *	980** Without waste heat recovery

* DEEP amended its regulations in 2016 to eliminate the CO_2 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_2 permit requirements (*Utility Air Regulatory Group v. U.S. Environmental Protection Agency*, 573 U.S. 302 (2014))

** In addition, FCE has a carbon separation plant that can reduce these carbon dioxide emissions by up to 10 tons per day.

Fuel cell testing will 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.

Testing of the fuel cell will produce renewable energy certificates (RECs) and FCE is evaluating potential options for an agreement with Eversource to sell the electricity and/or the RECs associated with fuel cell testing at their manufacturing facility.

Conclusion

If approved, staff recommends the following conditions:

1. Approval of any testing facility 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.

Site Location – SS1500

Figure 1: **Aerial Overview of the Area Showing the Key Equipment Areas, Measurement Locations and Receptors**