DRAFT

Petition No. 1506
SCEF 1 Fuel Cell, LLC, 49 Coon Hollow Road
Derby, Connecticut
Staff Report
June 17, 2022

Introduction

On April 14, 2022, the Connecticut Siting Council (Council) received a petition from SCEF1 Fuel Cell, LLC (SCEF1), a wholly owned subsidiary of Fuel Cell Energy Inc. (FCE), for a declaratory ruling, pursuant to Connecticut General Statutes (CGS) §4-176 and §16-50k, for the installation of a grid-side 2.8-megawatt fuel cell facility and associated equipment at 49 Coon Hollow Road, Derby, Connecticut (Petition or Project).

FCE contacted the City of Derby (City) about the availability of sites that would be suitable for the Shared Clean Energy Facility Program on May 8, 2020. In response, the City referred FCE to the proposed site on May 21, 2020.

On April 14, 2022, SCEF1 provided notice of the Project to abutting property owners, City officials, required state agencies and officials, and the City of Ansonia, which has boundaries within 2,500 feet of the proposed site. No comments were received.

C.G.S. §22a-20a requires applicants seeking a permit from the Department of Energy and Environmental Protection (DEEP) or the Council for a new or expanded facility defined as an "affecting facility" that is proposed to be located in an environmental justice community to file an Environmental Justice Public Participation Plan (EJPPP). Derby is an environmental justice community. However, the proposed facility is not an "affecting facility" under C.G.S. §22a-20a because it is a Class I renewable resource under 10 MW. Thus, C.G.S. §22a-20a does not apply to the facility, and an EJPPP is not required.

On April 19, 2022, the Council sent correspondence to the Cities of Derby and Ansonia stating that the Council has received the Petition and invited the municipalities to contact the Council with any questions or comments by May 14, 2022. No comments were received.

Also, on April 19, 2022, 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 May 14, 2022. No comments were received.

The Council issued interrogatories to SCEF1 on May 20, 2022. On June 1, 2022, SCEF1 requested an extension of time until June 10, 2022 to respond to the interrogatories. On June 2, 2022, the Council granted such extension of time. SCEF1 submitted responses to Council interrogatories on June 10, 2022.

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 June 9, 2022, 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 October 11, 2022, which is the 180-day statutory deadline for a final decision under CGS §4-176(i).

Public Benefit

The Project would be a "grid-side distributed resources" facility, as defined CGS § 16-1(a)(37). 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. On April 30, 2020, The Connecticut Light and Power Company d/b/a Eversource Energy (Eversource) and The United Illuminating Company (UI) issued a joint Request for Proposals (RFP) for the Shared Clean Energy Facility Program (SCEF RFP). On September 28, 2020, SCEF1 was selected under the SCEF RFP, and SCEF1's bid received final approval from the Public Utilities Regulatory Authority (PURA) on January 22, 2021. Operation of the fuel cell facility would reduce electric load and stress on the system.

100 percent of the electricity and renewable energy credits (RECs) produced by the facility would be sold to UI in accordance with a Tariff Terms Agreement (TTA). The TTA is for 2.8 MW. The TTA also has a 20-year term and there are no provisions for extension or renewal.

SCEF1 does not have plans to utilize the waste heat from the facility; however, the waste heat from the facility would be available to potential future off-takers.

The TTA includes the transfer of capacity to UI. Thus, SCEF1 would not participate in the ISO-New England, Inc. Forward Capacity Auction.

Project Site

The proposed site[1] is located on an approximately 0.30-acre portion of an 8.84 acre parcel east of Coon Hollow Road. The host parcel is owned by the City, zoned Public and Semi-Public (P) and was formerly used as a dog pound. The City Department of Public Works (DPW) currently uses the site for storage of seasonal equipment. The facility would be located in a paved area in the southwestern corner of the host parcel south of the DPW garage. Development of the site would require demolition of a shed that was used as the dog pound office.

The surrounding area contains a dog walking park to the south, Coon Hollow Road to the west and a wooded area to the east. The nearest residential property line is located at 6 Indian Avenue about 660 feet to the east of the site.

Proposed Project

The proposed facility would consist of one natural gas fueled SureSource 3000 fuel cell unit and associated equipment installed on a concrete foundation approximately one-foot above grade. The fuel cell unit will be manufactured in Connecticut and installed and operated by FCE on behalf of SCEF1. The fuel cell units would be delivered to the site by truck.

The unit would be about 69-feet 11-inches long and about 43-feet 2-inches wide and have a footprint of about 3,018 square feet. The fuel cell unit would have a vertical exhaust stack that would reach a height of about 33-feet above ground level (agl) including the concrete pad. The exhaust stacks would be the tallest

[1] 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.

features of the proposed facility. See attached Site Plan. The unit would generate about 2.8 MW of power and would have an operational service life of 20 years.

The fuel cell unit would consist of three main sections:

a) The mechanical portion of the fuel cell unit which is comprised of the desulfurization system, the main process skid and the water treatment system that provides ventilation, cleans and heats fuel and water and includes the control system for the unit;
b) Two 1.4 MW fuel cell power modules which convert the fuel supply into direct current (DC) power; and
c) The electrical portion of the fuel cell unit which comprises two power conditioning units, two transformers, and one switchgear for grid connection that converts DC power from the fuel cell into AC power.

The fuel cell unit utilizes non-combustion carbonate fuel cell technology that consumes natural gas as fuel to generate electrical power. The fuel cell unit would be replaced every 5-7 years.

The facility would be grid-interconnected to UI's Ansonia Substation at 13.8-kV. The proposed connection path would be via an underground connection from the proposed facility to the existing 13.8-kV distribution system that is located next to the proposed fuel cell facility and leads to the substation. No upgrades to the Ansonia Substation are necessary to accommodate the generation of the fuel cell facility.

UI electrical impact studies are currently pending. The proposed project would also require an ISO-NE interconnection study.

The existing Yankee Gas pipeline on Coon Hollow Road is adequate to serve the fuel cell facility and would not require upgrades.

The fuel cell is microgrid-capable; however, the proposed facility will not operate as part of a microgrid at this time.

FCE would construct the facility and maintain the fuel cell unit. SCEF1 would own the facility.

Construction of the project is expected to begin in early 2023 and would take approximately 12 months. Construction hours would be from 7:00 am to 5:00 p.m. Monday through Friday. If Saturday and Sunday work is required, the construction hours would be between 9:00 a.m. and 5:00 p.m.

Once operational, the facility would be unstaffed, requiring only occasional visits by technicians for maintenance activities.

At the end of the 20-year TTA, all fuel cell components would be removed and the utility connections properly isolated. The on-site concrete pads and associated structures would remain in place.

The estimated cost of the facility is $10.5M.

Environmental Effects and Mitigation

Air Emissions

Air emissions produced during the operation of the facility would not trigger any regulatory thresholds and would not require a DEEP Air Permit. The proposed facility would emit 12,000 tons per year (tpy) of CO_2 without waste heat recovery.

The proposed facility would emit 215 tpy CO_2e of methane (CH_4), 0.2 tpy of oxides of nitrogen (NO_x), no sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs) or perfluorocarbons (PFCs), which are greenhouse gases defined in RCSA Section 22a-174-1(49). The Project would also emit negligible amounts of sulfur oxides (0.001 tpy), volatile organic compounds (0.2 tpy) and particulate matter (0.0002 tpy).

Water Resources

The facility would require about 13,000 gallons per day (gpd) of raw water and will discharge about 6,500 gpd of wastewater to Derby's Water Pollution Control Authority. A new water line would also be installed.

The DEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (General Permit) requires implementation of a Stormwater Pollution Control Plan to prevent the movement of sediments off construction sites into nearby bodies of water and to address the impacts of stormwater discharges from a project after construction is completed. The General Permit authorizes the discharge of stormwater at a site with a total disturbance of one acre or more of land area. The Project entails site disturbance of less than one acre. A DEEP issued General Permit for Stormwater Management is not required.

The site is not within a Federal Emergency Management Agency-designated flood zone. There are no wetlands or watercourses near the site. The site is not within a DEEP-designated Aquifer Protection Area. The nearest wetland is located off-site about 900 feet to the west. The proposed project would be constructed consistent with the *2002 Connecticut Guidelines for Soil Erosion and Sedimentation Control*.

Soil

The project site is not located on any prime farmland soils. Soil profiles of the area are udorthents and urban land, characterized by periods of cutting, filling, grading and disturbance.

Wildlife

The project area is not located within a DEEP Natural Diversity Database (NDDB) buffer area. No trees six inches diameter or greater would be removed to construct the proposed Project.

Historic and Recreational Resources

By letter dated October 4, 2021, SHPO determined that no historic properties would be affected by the proposed project. Although SHPO refers to the removal of "several non-historic sheds within the project area" in its correspondence, only the shed that was formerly used as the dog pound office would be demolished for development of the proposed facility site.

Visibility

The site is within an area developed with a mix of commercial and municipal uses. The proposed project would have a low visual profile as compared to the municipal buildings adjacent to the site and the existing electric transmission structures immediately to the east.

Views of the proposed facility from the east and south of the site and from the west of Coon Hollow Road would be obstructed by the existing trees. Views of the proposed facility from the north would be obscured by the existing municipal buildings.

Public Safety

Natural Gas Safety

Natural gas would not be stored at the site. It will be delivered through a connection to an existing underground pipeline from the Yankee Gas main on Coon Hollow Road.

Odorized natural gas would be supplied to the fuel cell facility site at a nominal pressure of 15 psig[2].

The natural gas supply contains sulfur which is a fuel cell system contaminant. Each fuel cell has a desulfurization system that would remove sulfur. The desulfurization process would not result in sulfur being released into the air. The sulfur and other byproducts would be stored/contained within the sealed desulfurizer vessel.

Maintenance of the desulfurizer vessel and replacement of the desulfurizer media is anticipated to be done every one to two years. The vessels would be removed from the fuel cell units and transported by a licensed hazardous waste transporter to an approved disposal facility. Hazardous materials would not accumulate within the fuel cell stacks.

In the event of a fire, system malfunction or emergency the plant control system would initiate an emergency shut down sequence which isolates the fuel cell units from the external fuel source and disconnects the fuel cell inverters from the grid.

Before commissioning the proposed facility, SCEF1 would use compressed air as pipe cleaning media, in accordance with Public Act 11-01, An Act Adopting Certain Safety Recommendations of the Thomas Commission.

Approximately 400 gallons of liquid nitrogen will be stored on site. The liquid nitrogen is used in gaseous form to purge the fuel cell modules of all humidified natural gas and prevent ambient air intrusion during an emergency shut down event or when the facility is not in operation. SCEF1 will update its Emergency Response Plan (ERP) to include a nitrogen gas response contact in the event of a tank leak or rupture. SCEF1 will submit its ERP to the City Fire Marshal and provide on-site training to local emergency responders.

Noise

The primary sources of equipment noise for the proposed project are the air blower (to supply the main process skid); the fans for the supplemental chiller for the inverter cabinet; a cooling unit on the Water Processing Skid; and electrical equipment, e.g. transformers and inverters. While these cooling/chiller units will cycle on and off as necessary, they were conservatively modeled as continuous full-time sources.

Sound modeling techniques were used to estimate the potential noise impacts to commercial and residential receptors in the project area.

[2] **psig** (pound-force per square inch gauge) is a unit of pressure relative to the surrounding atmosphere.

RCSA §22a-69-2.2 notes that, "Where multiple uses exist within a given Noise Zone, the least restrictive land use category for Emitter and Receptor shall apply…" Given the zoning classification of the subject property and its past and current use, the proposed facility would be considered a Class C (Industrial) emitter. Please see Table 1 below.

Emitter Class	**RECEPTOR ZONE**		
	Industrial	***Commercial***	***Residential (day/night)***
Industrial	70	66	61/51
Commercial	62	62	55/45
Residential	62	55	55/45

Table 1. DEEP Noise Control Regulations.

Results indicate that projected sound levels are not expected to exceed 45 dBA at residential property boundaries and 41 dBA at commercial property boundaries. Thus, the operation of the proposed fuel cell facility would meet DEEP Noise Control Regulations.

The facility layout incorporates engineering design considerations that act as sound mitigation measures. For example, the largest sound-generating associated equipment is located in the central portion of the facility layout and is shielded by other associated equipment. SCEF1 incorporated vibration isolation of rotating equipment and a partial sound enclosure of the main process air blower.

Any noise associated with the construction of this project would be temporary in nature and exempt per DEEP Noise Control Regulations.

Security

The facility would be remotely monitored by FCE's Global Monitoring and Control Center personnel on a 24/7 basis to detect abnormalities in operation. The fuel cell facility would be designed in accordance with American National Standards Institute and Canadian Standards Association (ANSI/CSA) America FC 1-2004 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. If operational abnormalities occur, the fuel cell can be remotely shut down and personnel dispatched to service the facility.

The project area would be enclosed within a 9-foot tall chain link fence that complies with the requirements of the National Electrical Code (NEC)[3].

The fence would be about 21 feet from Coon Hollow Road to the west, about 487 feet from the abutting property to the north, about 361 feet from the abutting property to the east, and the abutting property to the south is about 216 feet from the southern fence line.

The site will have a locked gate and limited access for authorized personnel only.

Site lighting will be turned on at night time for security purposes, and lighting fixtures will be selected and installed in accordance with the International Dark Sky Association (IDA) Guidelines.

[3] Section 110.31 of the National Electrical Code (NEC), 2020 Edition notes that, for over 1,000 Volts, "…a wall, screen, or fence shall be used…A fence shall not be less than 7 feet in height or a combination of 6 feet or more of fence fabric and a 1 foot or more…utilizing barbed wire or equivalent."

Fire Protection

In accordance with the National Fire Protection Association, Standard for the Installation of Stationary Fuel Power Systems (NFPA 853) FCE has provided a Fire Prevention and Emergency Plan for this fuel cell installation. FCE's Fire Prevention and Emergency Plan provides guidance on fire prevention procedures, inspections, housekeeping practices, flammable material storage, control of ignition sources, procedures for fire protection equipment impairment, fire emergency plans and other information.

The proposed transformers would be filled with 100% biodegradable oil and would not have secondary containment.

The closest facility associated equipment to Coon Hollow Road is the natural gas meter pad at about 20 feet away. The gas meter pad would be surrounded by bollards. Bollards would also be installed around southern, eastern and western sides of the electrical switchgear area.

The detection of a potential combustible gas mixture or a fire will result in an emergency facility shutdown and an alarm notification to service personnel. The natural gas supply valves would close and nitrogen (an inert gas) from the on-site storage tank would purge the fuel cell stack and fuel processing system.

Also, Emergency Shut Down push buttons will be located throughout the site and can be used by site personnel or emergency responders.

FCE would provide on-site training to local emergency responders.

Aviation Safety

The fuel cell's exhaust stack would reach a maximum height of approximately 33 feet above ground level. The nearest airports to the proposed facility are the Flying Ridge Airstrip-CT52, Waterbury-Oxford Airport, Sikorsky Memorial Airport, and Tweed New Haven Airport, located at approximately 10 miles, 10.4 miles, 11.54 miles, and 12 miles from the facility site, respectively.

Notice to the Federal Aviation Administration (FAA) is not required for the use of a crane during construction because the crane's height will not exceed 200 feet.

The fuel cell exhaust stream does not produce any appreciable vapor plumes in the exhaust, and thus, it would not interfere with air navigation.

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. As a low-emission Class I renewable energy source, 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.
If approved, staff recommends the following conditions:

1. Approval of any Project changes be delegated to Council staff;
2. Provide a copy of the Emergency Response Plan to local emergency responders prior to facility operation, and provide emergency response training;
3. Provide the nitrogen gas response contact information; and

4. The Council shall be notified in writing at least two weeks prior to the commencement of construction activities.

Figure 1. Aerial view of the project area and surrounding development

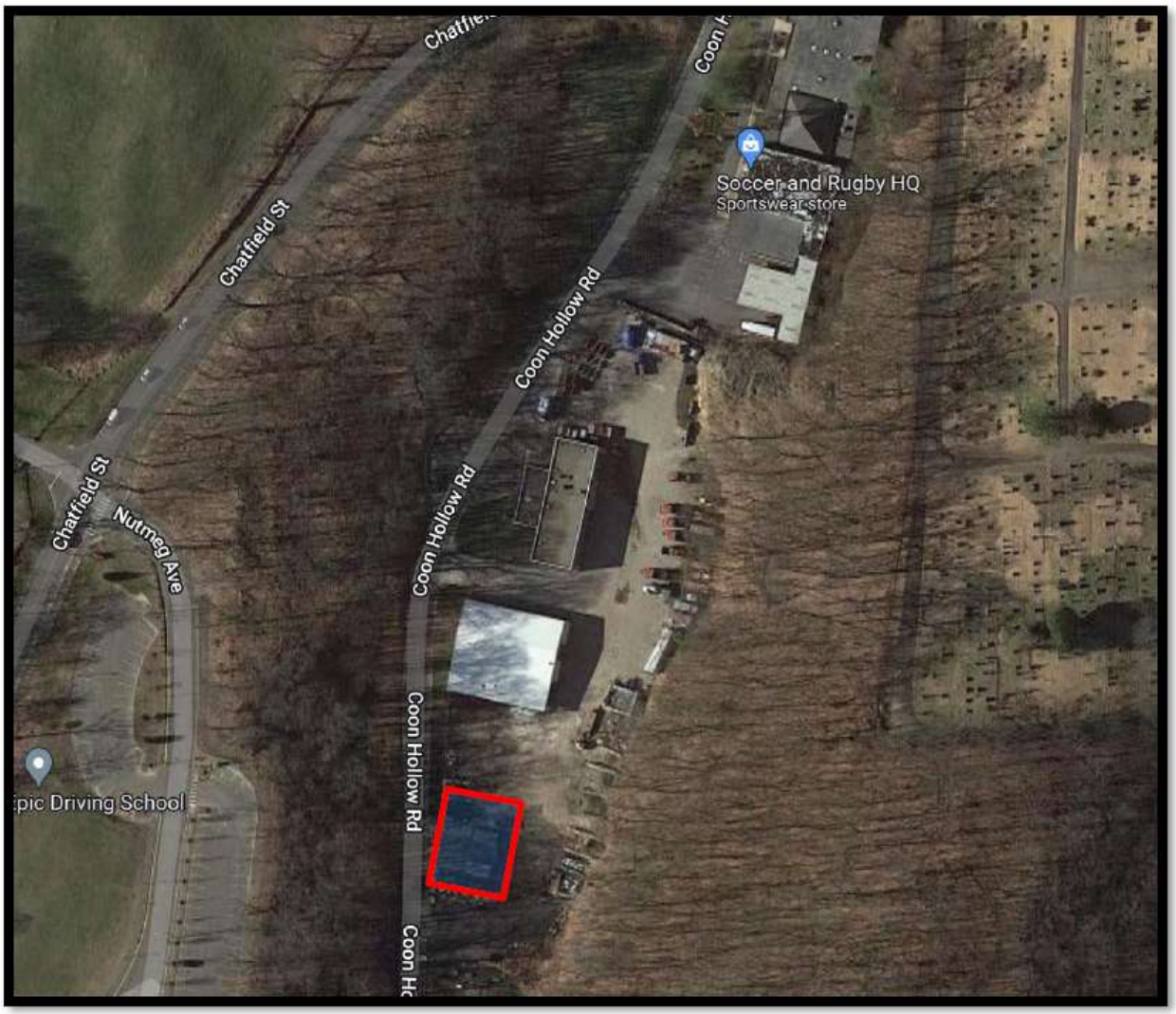

Figure 2. Site Plan

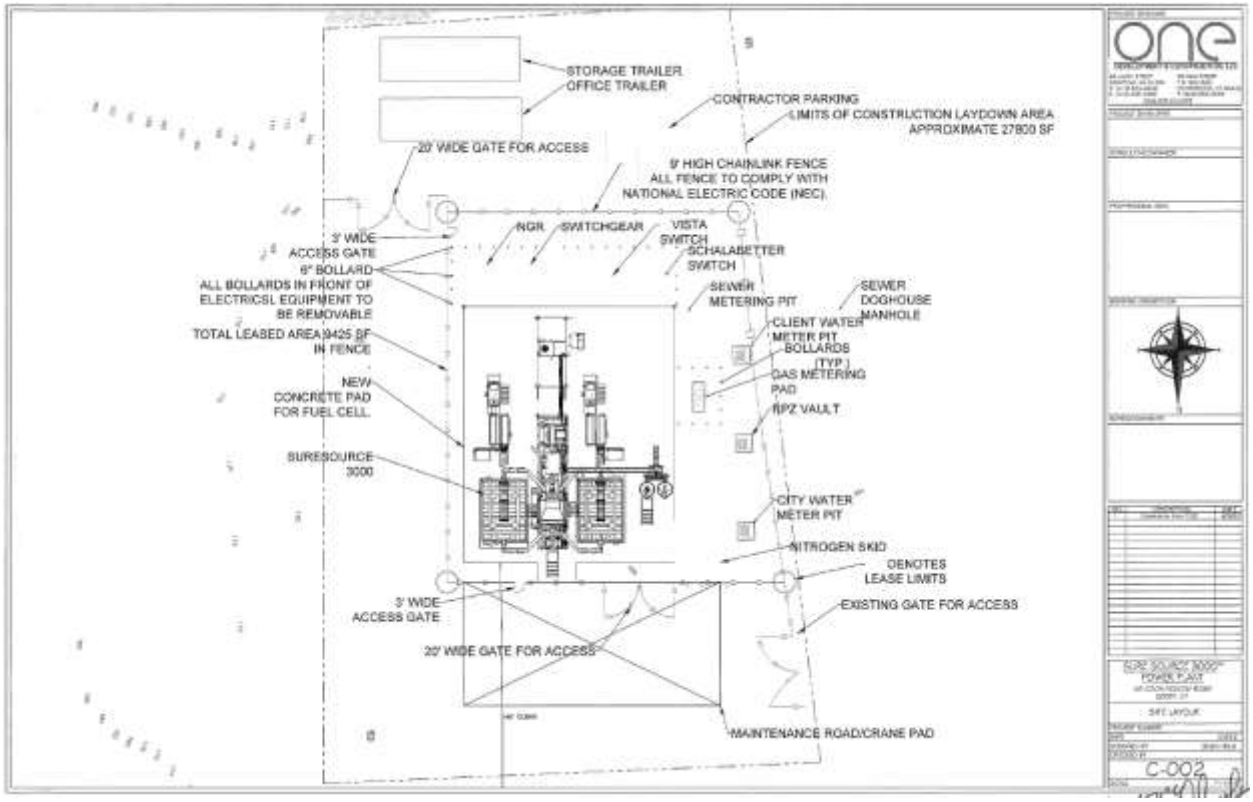

Figure 3. Typical equipment component layout of the SureSource 3000 Fuel cell power plant

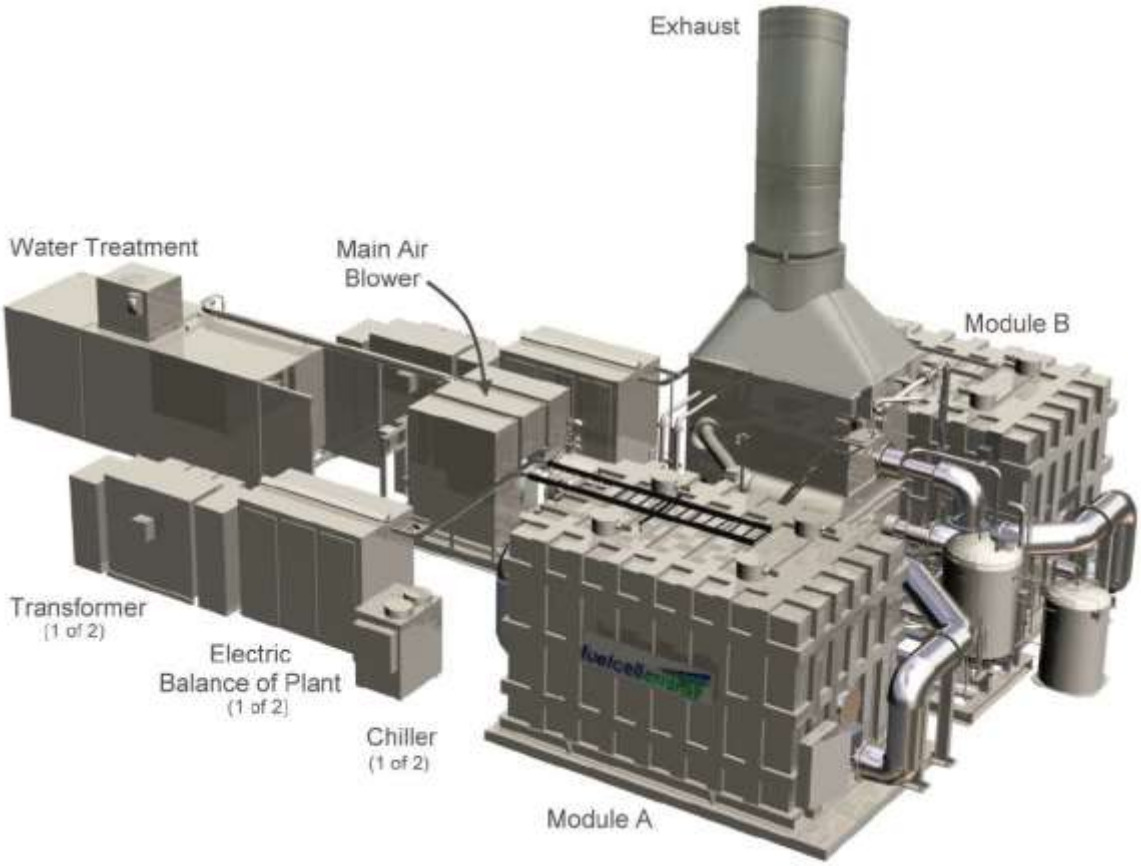

Figure 4. Existing Site conditions

Figure 5. Simulation of proposed facility

Figure 6. View from Coon Hollow Road (facing southeast)