

**Petition No. 957**  
**Bridgeport Fuel Cell Park, LLC**  
**Bridgeport, Connecticut**  
**September 23, 2010**  
**Staff Report**

**Background**

On October 31, 2006, the Connecticut Siting Council (Council) issued a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for the installation of a 14.4-megawatt (MW) fuel cell facility on Hancock Street in Bridgeport, Connecticut (Petition 785). The project was proposed by Bridgeport Fuel Cell Park, LLC (Bridgeport Fuel) with construction partially contingent on being selected for funding by the Connecticut Clean Energy Fund's (CCEF) renewable energy development Project 150, Round 2. Although the project is in an area identified by the Department of Public Utility Control and ISO-New England as having electrical reliability problems, the project was not selected due to its low efficiency rating.

**Proposed Project**

On July 13, 2010, Bridgeport Fuel submitted a Petition for a declaratory ruling that no Certificate would be required for a redesigned fuel cell facility at the site. The redesign increased the projects efficiency and was submitted to and selected by the CCEF Round 3 RFP process. Bridgeport Fuel obtained an Electric Purchase Agreement with United Illuminating (UI). On August 6, 2010, Council member Dr. Barbara Bell and Council staff member Robert Mercier met Bridgeport Fuel representatives Kenneth Baldwin, Richard Shaw and Kirk Arenson at the site to review the Petition.

Bridgeport Fuel proposes to install a 14 MW fuel cell facility on a vacant, two-acre parcel zoned for Light Industry. The parcel, owned by the City of Bridgeport, would be leased to Bridgeport Fuel. Located in an industrial area undergoing redevelopment, it is a brownfield site that contains on-site monitoring wells and a groundwater pump house. Abutting developed parcels include a tile warehouse facility to the east and an ice cream storage facility to the north. A vacant parcel is located to the west. Railroad Avenue and the Metro North corridor abut the site to the south.

The fuel cell facility would consist of five DFC3000 fuel cell units manufactured by Fuel Cell Energy, Inc. of Danbury, Connecticut within a 246-foot by 276-foot fenced compound area. Each fuel cell unit would generate 2.8 MW of energy capacity for use in Bridgeport. The total 14 MW of power would be introduced into UI's distribution system via underground feeders to existing distribution circuits adjacent to the site. Output from the facility would be generated at 400 volts and stepped up to 13.8 kilovolts to interconnect with the distribution system. UI's system can support the incoming power and would offload an equivalent distribution capacity, thus reducing electrical congestion in the Bridgeport area. The interconnection is under review with UI.

The main components of each fuel cell unit are two fuel cell modules that perform the electrochemical operations, gas desulphurization equipment, water treatment equipment, electric blowers, a start-up burner and electrical equipment including an inverter, a transformer, and a switchgear station.

Each fuel cell unit would provide power by consuming natural gas through chemical reactions rather than through combustion. Natural gas for the facility would be obtained from a Southern Connecticut Gas Company pipeline located on State Street. The gas enters the fuel cell and reacts electro-chemically with a nonflammable molten carbonate electrolyte to produce DC electric current that would be converted to AC current before entering the distribution grid.

The electrical efficiency of the fuel cell units would be enhanced by the addition on an organic Rankine cycle (ORC) that uses waste heat to heat an organic fluid to spin an electric generator. The ORC would increase efficiency from approximately 47% to 51%. The ORC equipment, including a generator, heat exchangers and an air-cooled condenser, would be located in the center of the facility.

The fuel cell park would require 60,480 gallons of water per day. Water would be obtained from an existing municipal supply line. Approximately 32,400 gallons of wastewater per day would be discharged to the city wastewater line. Bridgeport Fuel has reached agreements with the City regarding both water supply and discharge.

Each fuel cell unit is 30 feet high, 50 feet wide and 60 feet long. Fuel cell performance gradually decreases over time, reducing efficiency and power output. To maintain optimum performance the fuel cell modules would be replaced every three to five years, depending on the efficiency of the modules. The remaining components of the fuel cell unit have a service life of twenty years.

Operation of the facility would have little impact on the environment. Air emissions would not be significant and would comply with all applicable state and air quality standards. No air permits would be required. Noise emissions from blowers, condensers, pumps and fans would be below City and state regulatory standards at the property line and would not be detectable at surrounding sensitive receptors. To keep noise emissions at minimum levels, the blowers that pump fresh air into each unit would be fitted with a silencer and the ORC generator would be wrapped in a sound dampening material.

Excavated soil would be characterized and disposed of according to state and federal regulations.

The proposed facility would have no impact on cultural resources, endangered or threatened species, wetlands or watercourses. Its specific placement on the parcel is designed to avoid the on-site monitoring wells and pump house.

Visual impacts of the facility would be minimal. The surrounding area is industrial/commercial with some vacant parcels. The existing buildings to the east and north, both 30 feet in height, would serve to screen most of the facility from these directions. Visual impacts from the south and west would be mitigated by the installation of a chain link fence with privacy slats to prevent direct views into the facility. Bridgeport Fuel would examine the feasibility of installing landscape pockets on the south side and north corners of the facility to soften the visual uniformity of the site from these aspects.

The fuel cell would be constructed and installed in accordance with applicable American National Safety Institute/CSA and National Fire Protection Association standards. The fuel cell units would feature an automatic monitoring system to shut down the units in the event of an emergency. Prior to operation of the facility, Bridgeport Fuel would meet with the Bridgeport Fire Department and the Local Emergency Planning Committee to review applicable emergency procedures.