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#### November 10, 2020

Melanie A. Bachman, Esq. Executive Director/Staff Attorney Connecticut Siting Council 10 Franklin Square New Britain, CT 06051

Re: Petition No. 1406 – Doosan Fuel Cell America, Inc. Petition for a Declaratory Ruling, Pursuant to Connecticut General Statutes §4-176 and §16-50k, for the Proposed Construction, Maintenance and Operation of a Grid-side 9.66-Megawatt Fuel Cell Facility and Associated Equipment to be Located at 600 Iranistan Avenue, Bridgeport, Connecticut, and Associated Electrical Interconnection to The United Illuminating Company's Existing Congress Street Substation

Dear Ms. Bachman:

Enclosed for filing with the Connecticut Siting Council (the "Council") is NuPower Bridgeport FC, LLC's direct testimony of James Kenney and Dan Donovan in the above-captioned petition.

Given the Council's modifications to its hard copy filing requirements as part of its response to the COVID-19 pandemic, by this letter, NuPower submits to the Council and the service list an electronic copy of the motion and one hard copy of the filing will be mailed to the Council's office.

Should the Council have any questions regarding this filing, please do not hesitate to contact me.

Very truly yours,

Bruce L. McDermott

Enclosure

cc: Service List

**Murtha Cullina LLP** 265 Church Street New Haven, CT 06510 T 203.772.7700 F 203.772.7723

#### STATE OF CONNECTICUT

#### CONNECTICUT SITING COUNCIL

Doosan Fuel Cell America, Inc. Petition for a Declaratory : Petition 1406

Ruling, Pursuant to Connecticut General Statutes §4-176 and §16-50k, for the Proposed Construction, Maintenance and Operation of a Grid-side 9.66-Megawatt Fuel Cell Facility and Associated Equipment to be Located at 600 Iranistan Avenue, Bridgeport, Connecticut, and Associated

Electrical Interconnection to The United Illuminating :

Company's Existing Congress Street Substation : November 10, 2020

#### **DIRECT TESTIMONY OF JAMES KENNEY AND DAN DONOVAN**

- Q. Please identify yourselves.
- A. James Kenney. I am James Kenney, Installation Manager at Doosan Fuel Cell America, Inc. My office address is 101 East River Drive, East Hartford, CT 06612.
   Dan Donovan. I am Dan Donovan, Manager at NuPower Bridgeport FC, LLC. My office address is 103 North Park Avenue, Easton, CT 06612.
- Q. What is the purpose of your testimony?
- A. Mr. Kenney and Mr. Donovan: The purpose of our testimony is to provide additional information concerning the proposed project that will comprise twenty one (21) natural-gas fueled PureCell® Model 400 phosphoric acid fuel cells and associated equipment that will provide 9.66-megawatts ("MW") of power. We hope this information will assist the Connecticut Siting Council in its review and consideration of the project.

- Q. Mr. Kenney, would you please provide some background on Doosan and its experience with projects like the one that is the subject of this petition.
- Α Mr. Kenney: The Doosan Corporation is a global company with 42,000 employees and worldwide revenue of more than \$16 billion. Our global businesses span a range of products and services in infrastructure support and power generation. including nuclear power, steam turbines, power plant boilers, water desalination, construction equipment, machine tools and engines for a variety of applications. Doosan operates more than 500 fuel cell units worldwide producing over 230 MW with many more coming on line in the next year. The reliability and resiliency attributes of our fuel cells are felt during grid outages where our systems continue to run, providing essential electricity and heat to critical facilities. Such was the case in the northeast during winter storm Alfred in 2011 and Superstorm Sandy in 2012. Doosan fuel cells kept the power running during these critical times of need. The State of Connecticut continues to be an emerging market for our noncombustion energy systems, as fuel cells can contribute greatly to the State's goals of reducing greenhouse gas emissions, reducing peak load, and improving the reliability of the electric utility system. Doosan fuel cells are currently supplying clean and secure power to a diverse set of customers in a variety of industries such as hospitals, universities, data centers, industrial manufacturers, municipalities, supermarkets, residential buildings and waste water treatment facilities who require clean, efficient power 24/7/365. Currently, Doosan has nearly 20 MW installed in Connecticut along with another 30 MW either awarded or under construction, due in large part to the State's foresight in making fuel cells a Class I renewable energy source.

- Q. Mr. Donovan, Siting Council Interrogatory 7 refers to meetings that have taken place with the City of Bridgeport. Has the City taken a position on the Project?
- A. Mr. Donovan: Yes. Please see the letter from Joseph Gresko to Melanie Bachman which is attached to this testimony as Attachment 1. In the letter the City indicates that the "plans for this project are consistent with the overall intent of Plan Bridgeport Bridgeport's Plan of Conservation and Development (POCD)" and that the City finds the Project "is in the best interests of the City and will provide significant fiscal and conversation benefits." Finally, the letter concludes that the City "supports the Connecticut Siting Council approval of this Project".
- Q. What specifically does the POCD say about the Project?
- A. Mr. Donovan: In Section 5 of the POCD entitled, "Bridgeport Values Nature" the 7<sup>th</sup> goal is to continue to shift towards clear and renewable energy sources and the POCD make specific reference to this project: "Support state funding efforts for solar thermal energy and fuel cell technology with the continued expansion of the Bridgeport Thermal Energy Project with NuPower."
- Q. Has the Project been reviewed and approved by ISO-NE?
- A. Mr. Donovan: As we said in response to the Council's interrogatory 3, the Project has completed a Transmission System Impact Study required by ISO-NE. On July 14, 2020 ISO-NE issued a letter to UI in which it stated that following a review of the proposed Project no "significant adverse effect on the reliability or operating characteristics of the transmission facilities of UI, the transmission facilities of another Transmission Owner or the system of any other Market Participant were identified." See Attachment 2.

- Q. In discussing how the Project will be interconnected to Ul's Congress Street Substation in response to Siting Council interrogatory 2, Doosan stated that following a study by UI it was determined that the existing duct bank would not accommodate the new cabling for the Project and that a new duct bank/overhead route will be constructed. Can you describe the possible location of that new route?
- A. Mr. Donovan: UI and NuPower have signed an Interconnection Participation MOU. See Attachment 3. The MOU provides that the parties will work together to design and construct the electric interconnection. Under that agreement, NuPower will be responsible for the civil component of the interconnection and has hired Black & Veatch to assist in this effort. Black & Veatch is one of the world's leading electrical engineering design firms for utility infrastructure. The UI facility study in Attachment 4 includes the current proposed electrical interconnection route. UI and NuPower will finalize the interconnection route as part of the interconnection design phase.
- Q. Do you have any additional comments beyond what was provided in the petition about the safety aspects of the Project?
- A. Mr. Kenney: The Project represents a clean and safe method of electricity generation in a manner consistent with state and federal policy to protect public health and safety. The Project will generate electricity in a clean and environmentally acceptable manner compared to conventional generation such as combustible natural gas, coal, or oil as fuel. In terms of safety, the Project will meet all applicable safety requirements for construction, operation and electrical interconnection. Once complete, each floor will provide the maximum protection

- against falls including guardrails and kick plates while also insuring efficient operation of the Project.
- Q. Can you provide the Council with a drawing or photograph showing what the Project will look like from a street view?
- A. Mr. Kenney: Yes. Doosan fuel cells are currently in operation numerous multi-level projects in South Korea. The most recent project to come on line is the Daesan Hydrogen Fuel Cell Power Plant where Doosan supplied 114 fuel cells. That project is shown in Attachment 5. That project is the world's first and largest fuel cell by-product hydrogen power plant. The plant can produce 50 MW of power. Another multi-level project utilizing Doosan fuel cells is shown in Attachment 6: Korea South-East Power Company Bundang site where Doosan has three multi-level projects totaling 54 fuel cells. Finally, Attachment 7 is a rendering of the Bridgeport project.
- Q. Would you please describe what is depicted in the rendering.
- A. Mr. Kenney: Yes. The rendering depicts what is proposed in this project. The project consists of twenty one (21) PureCell® System Model 400 fuel cell units which will be housed within the structure as shown in the rendering in Attachment 7. The fuel cells and their associated cooling modules will be installed on a 3 ½ story steel and concrete structure. As stated in the petition, each fuel cell is 8'4" wide by 27'4" long by 9'11" tall. The floors of the structure will be made of reinforced concrete in order to provide support for the units and that is the same design that has been used on multi-story structures in Korea.
- Q. What is the distance between the I95 roadway and the structure?

- A. Mr. Kenney: The structure is a minimum of 5' from the property line and the distance from the property line to the I95 roadway varies from approximately 6 feet to 8 feet as depicted on the site survey so therefore the setback is approximately 12' from the I95 roadway. The structure is not attached to the bridge.
- Q. Have you taken into consideration the possibility that an individual driving on I95 might try to throw objects, including garbage, on to the roof of the structure?
- A. Mr. Kenney: We have taken this into consideration in the project's design with a protective barrier that will protect the project's equipment.
- Q. On the left side of the rendering there does not appear to be any units. Why is that the case?
- A. Mr. Kenney: That is the location where the electrical gear will be located. I should note that the rendering is not perfectly dimensioned but is intended to give a general idea of the structure we want to construct.
- Q. Attachment 3 to the Petition is PURA's final decision in Docket No. 18-08-14, PURA Review of the Combined Heat and Power Project Solicitation Pursuant to Conn. Gen. Stat. Section 16-258e. Why was that decision included in the Petition?
- A. Mr. Kenney and Mr. Donovan: In hindsight the Decision did not need to be included as the matter discussed within the Decision do not directly relate to the project being considered by the Siting Council.

The Decision in Docket No. 18-08-14 relates to an application by UI for review and approval of a proposed power purchase agreement ("PPA") between itself and NuPower Bridgeport FC LLC ("NuPower"). The relevant project at issue in the PPA is a 10 MW combined heat and power ("CHP") district energy project in

Bridgeport, Connecticut and the power aspect of the project will consist of the 21 fuel cell project being considered by the Council.

Connecticut General Statutes § 16-258e, requires the procurement of energy resources in a distressed municipality with a relationship to district heating and thermal loops. Section 16-258e requires UI to conduct a procurement for electricity and renewable energy credits from a CHP system located in one of those municipalities that "(1) has a nameplate capacity of not more than ten megawatts, (2) is in a configuration that is compatible for use with a district heating system, as defined in section 16-258, (3) is owned by a thermal energy transportation company, and (4) may include fuel cells." After reviewing the proposal, UI "may enter into a power purchase agreement with a thermal energy distribution company for the purchase of electricity and renewable energy credits for a period of not more than twenty years."

Section 16-258e(b) then provides that PURA may approve such a PPA offered by UI if it finds that the agreement "(1) complies with the requirements of this section, and (2) serves the long-term interests of ratepayers." In Docket No. 18-08-14, PURA approved the request of UI to enter into the PPA.

- Q. In your opinion, does the Siting Council have jurisdiction over the thermal loop and are you asking for the Council's approval to construct, operate and maintain the thermal loop?
- A. Mr. Donovan: It is our understanding that pursuant to the Siting Council's statutes that the thermal loop is not a "facility" as defined in Conn. Gen. Stat. Section 16-50i. However, the Council does have jurisdiction over the fuel cell project and it is

- only that part of district thermal loop that is the subject of the PPA in Docket No. 18-08-14 that we are asking the Council to approve in the petition.
- Q. If the thermal loop is not developed what will happen to the fuel cell project and can it operate without the thermal loop?
- A. Mr. Donovan: Yes. While the PPA with UI does have a default for not meeting certain conditions of thermal use there are multiple triggers in the PPA before a default can occur and ultimately the parties could ask PURA to review a revised PPA that might omit the various conditions of thermal use.
- Q. In addition to the benefits of the Project that are discussed in Section VI of the Petition do you believe the Project offers any additional benefits?
- A. Mr. Kenney and Mr. Donovan: Yes. The Project provides a clear public benefit by generating and providing a constant and reliable source of electricity that will help stabilize the grid during peak hours when there is high demand. In addition, the fuel cell technology operates regardless of weather or other factors that limit the production of electricity by intermittent renewables such as solar or wind. The Project will also have the added benefit of creating up to 20 construction jobs and generating over \$5,000,000 in local tax revenue over 20 years.
- Q. Would you provide a technical description of the Project?
- A. Mr. Kenney: Certainly. As shown in Attachment 7, the 21 fuel cell units will be housed within the 3 ½ story steel and concrete structure. Each fuel cell is 8'4" wide by 27'4" long by 9'11" tall. The proposed installation will have four (4) 2500 kVA and one (1) 1500 kVA, 13.8kV/480V transformers, low voltage and medium voltage switchgear, and associated metering equipment. A reverse osmosis system will provide treated water to the fuel cell power modules. A centralized

purge system will be installed, including compressed gas storage tank and associated piping.

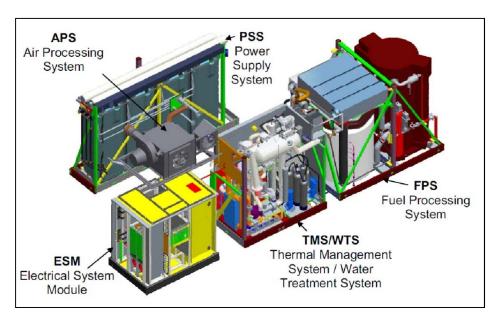


Figure 1: PureCell® System Model 400 Fuel Cell.

The fuel cells use hydrogen to generate electricity. Many countries are now focused on expanding hydrogen production in order to meet their green house gas reduction goals. Because of the current lack of available hydrogen fuel in the United States, the fuel cell internally reformulates the natural gas into its own hydrogen fuel along with oxygen as a byproduct. The fuel cell produces electricity by physically passing the hydrogen through its fuel cell stack. Once this is completed, the hydrogen combines with the oxygen to form clean water which supports the fuel cell's internal cooling. As a result of the inherent nature of the fuel cell electrical production process, there is an extremely small emission level and water discharge.

Q. In Siting Council interrogatory 45 the Council notes that the June 10, 2020 letter from the Department of Energy and Environmental Protection says "the air

emissions criteria within Table 1 on Petition p. 10 is not accurate." Do you have a response to that statement?

A. Mr. Kenney and Mr. Donovan: At the bottom of the second page of the DEEP's letter the following appears:

It should be noted, however, that although these emissions are not currently regulated under air permitting, state law, in accordance with the 2018 Act Concerning Climate Change Planning and Resiliency, calls for a 45 percent reduction in greenhouse gas emissions by 2030 (from 2001 levels) and an 80 percent reduction by 2050.

As set forth in the response to Interrogatory 45, Doosan does not believe the information presented in Table 1 is inaccurate nor does Doosan believe that the DEEP's letter reaches that conclusion. The DEEP letter does – incorrectly in our opinion – suggest that projects like this one will make the state's ability to achieve its climate goals more difficult.

- Q. Why do you say that Doosan does not agree with DEEP that projects like this one will make reaching climate goals more difficult?
- A. Mr. Kenney: The DEEP's letter and its statements about climate goals does not negate the fact that an effective way to achieve immediate term CO2 emission reductions is through increased efficiency, including the efficiency of the power generation that supplies the grid with electricity. Fuel cell projects effectively reduce climate-forcing CO2 emissions by displacing less efficient central station generation and by avoiding utility "line losses" and the emissions associated with replacing such losses. In addition, the Project's use of the fuel cell's waste heat in the thermal loop will increase the fuel cell's efficiency to over 90%.

As the Council is no doubt aware, fuel cells are a Class I renewable energy resourse (Conn. Gen. Stat. § 16-1(a)(20)(A)(iii)) so the General Assembly clearly

intended that emissions reduction options not be limited only to zero-emitting resources. Indeed, the states LREC/ZREC program, which were from the outset divided into both zero emitting and low emitting categories, shows that the legislature sought to encourage a two pronged approach of supporting both fuel cells and zero-emitting resources.

The DEEP letter does not consider that fuel cell projects in Connecticut reduce natural gas use and reduce CO2 emissions by displacing less efficient, dirtier combustion generators. The health and environmental impacts of combustion-related pollutants such as NOx, SO2, and PM are very significant and readily quantifiable. In fact, calculations of the economic and health benefits associated with reducing these combustion-related pollutant emissions have been found to exceed the economic and health benefits of reducing GHG emissions on a per-ton basis. Because fuel cells use a non-combustion reaction to generate energy, they do not emit the pollutants that create air quality problems like SO2, NOx, and Particulate Matter. In fact, by merit of their high capacity factor and the marginal generation that they displace, fuel cells are the most effective technology commercially available for reducing the air quality impacts of electricity and heating systems.

- Q, Do you have any comments to the June 26, 2020 letter from the Department of Transportation Office of Rails to the Siting Council?
- A. Mr. Donovan: Yes. In the DOT's letter it indicates that the Office of Rail needs more information concerning how the proposed fuel cell will be connecting to the transmission system on monopoles within the Connecticut Department of Transportation Right of Way. On October 9<sup>th</sup> the project notified the DOT that the

proposed interconnection will not be connecting to the transmission system using monopoles within the railroad right of way. See Attachment 8.

- Q. Have you reviewed the DOT's June 10, 2020 letter and if so do you have any comments on the letter?
- A. Mr. Donovan: Yes, we have reviewed the letter and will continue to work with the DOT to obtain the encroachment permit at the time of construction. Otherwise, our meetings with the DOT have been productive and DOT has not expressed any concerns to us about the location of the project. It should be noted, however, that the reference to the encroachment permit in the DOT letter concerns the electric distribution lines that will run from the project to UI's Congress Street substation and in doing so will cross a Connecticut Railroad Right of Way. Finally, the obligation to obtain the encroachment permit will be UI's and not Doosan's or NuPower's.
- Q. Does this conclude your testimony?
- A. Mr. Kenney and Mr. Donovan: Yes.

#### CITY OF BRIDGEPORT, CONNECTICUT

999 BROAD STREET BRIDGEPORT, CONNECTICUT 06604 TELEPHONE (203) 576-7201 FAX (203) 576-3913

October 13, 2020

Melanie A. Bachman, Esq. Executive Director/Staff Attorney Connecticut Siting Council 10 Franklin Square New Britain, CT 06051

Dear Ms. Bachman:

Re: Petition No. 1406 - Doosan Fuel Cell America, Inc. petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a grid-side 9.66-megawatt fuel cell facility and associated equipment to be located at 600 Iranistan Avenue, Bridgeport, Connecticut, and associated electrical interconnection to the United Illuminating Company's existing Congress Street Substation

The City of Bridgeport has been working closely with Doosan and NuPower in their plans for a fuel cell project to be located at 600 Iranistan Avenue on a vacant property bounded by Railroad Avenue and I-95. The City has met with representatives from the project on several occasions and the City has appreciated the project's collaborative outreach efforts. The plans for this project are consistent with the overall intent of Plan Bridgeport – Bridgeport's Plan of Conservation and Development (POCD). The City is very comfortable in taking the position that this project is in the best interests of the City and will provide significant fiscal and conversation benefits. If the project is approved by the Council it will deliver additional tax revenue to the City, create employment opportunities and encourage the development of and significantly contribute to Connecticut's clean energy future.

Our City has gained a well-deserved reputation for innovation, resilience and sustainability through the support and adoption of projects like these. As Connecticut's most populous city located along Long Island Sound, we are keenly aware of the dangers associated with global warming and especially with rising sea levels. This is truly a unique opportunity to bring all the environmental and financial benefits together under one project.

The City supports the Connecticut Siting Council approval of this Project and we are looking forward in anticipation to the start of its construction.

oseph P. Gresko

⊈reen Initiatives Coordinator

City of Bridgeport



Alan McBride
Director, Transmission Services & Resource
Qualification

July 14, 2020

Mr. Edward Roedel Avangrid 100 Marsh Hill Road Orange, CT 06418

Subject: Bridgeport Fuel Cell Project - Proposed Plan Application (PPA) UI-20-G03

Dear Mr. Roedel:

This letter is to inform you that, pursuant to review under Section I.3.9 of the ISO Tariff, no significant adverse effect has been identified with regard to the following PPA:

**UI-20-G03** – Generator application from Avangrid/United Illuminating (UI), for the Bridgeport Fuel Cell Project. The in-service date of the project is December 1, 2021. The Reliability Committee (RC) reviewed the materials presented in support of the proposed project and did not identify a significant adverse effect on the reliability or operating characteristics of the transmission facilities of UI, the transmission facilities of another Transmission Owner or the system of any other Market Participant.

Having given due consideration to the RC review, ISO New England has determined that implementation of the plan will not have a significant adverse effect upon the reliability or operating characteristics of the Transmission Owner's transmission facilities, the transmission facilities of another Transmission Owner, or the system of a Market Participant.

A determination under Section I.3.9 of the ISO Tariff is limited to a review of the reliability impacts of a proposed project as submitted by Participants and does not constitute an approval of a proposed project under any other provisions of the ISO Tariff.

Sincerely,

/s/ Al McBride Alan McBride Director, Transmission Services and Resource Qualification

cc: Proposed Plan Applications

# NuPower/United Illuminating Interconnection Participation Memorandum of Understanding Dated as of October 14, 2020

Following up on the September 23, 2020 Technical Meeting before the Public Utilities Regulatory Authority ("PURA") in Docket No. 18-08-14, *PURA Review of the Combined Heat and Power Project Solicitation Pursuant to Conn. Gen. Stat. Section 16-258e*, on September 28, 2020, representatives of The United Illuminating Company ("UI") and NuPower Bridgeport FC, LLC ("NuPower") (collectively the "parties") met to establish their respective responsibilities for the interconnection of the NuPower Bridgeport fuel cell Project to the UI system. The parties reached a consensus at this meeting on the division of responsibilities and hereby file this Interconnection Participation Memorandum of Understanding ("MOU") with PURA as part of Docket No. 18-08-14 for informational purposes. The parties intend to formalize their agreement for the division of responsibilities in a definitive agreement containing such representations, warranties, covenants, conditions, and terms as are customary of agreements of the type contemplated by this MOU.

Subject to any changes in the definitive agreement, the parties have agreed to assign the interconnection responsibilities into general categories as follows:

Task	NuPower	United Illuminating	Joint
Kickoff Meeting			Х
Development of	X <sup>1</sup>		
Interconnection Route			
Options			
Interconnection Route			Х
Selection			
Electrical Design	X <sup>1</sup>		
Civil Design	X <sup>1</sup>		
Estimated Project	X <sup>2</sup>		
Schedule and Cost			
Civil Design Bid	Х		
Packages			
Civil Contractor	X <sup>3</sup>		
Selection			
Permitting (Civil	Х		
Contractor			
Responsibility Allowing			
NuPower to act as UI's			
agent in order to utilize			
UI's ROW Rights as a			
Public Utility)			
Civil Equipment	Х		
Procurement			
Civil Construction	X <sup>4</sup>		
(outside of the			
Congress Street			
Substation)			
Electrical Cable		X	
Procurement,			
Installation			
Cable		X	
Termination/Splicing			
Electrical Pole and		X	
associated cable work			
Substation electrical		X	
work			
Commissioning,			Χ
Energizing and			
Acceptance			
As Builts			X

<sup>1</sup> Subject to UI review and approval within 20 business days unless delayed by unexpected events such as major storms.

2 Subject to the parties jointly agreeing to the project schedule.

3 Utilizing one of UI's preferred vendors.

4 With the participation, and subject to approval, of a UI Construction Manager.

The United Illuminating Company

By: Patrick McDonnsll
It's VP Regulatory Affairs-CT

**NuPower Bridgeport FC, LLC** 

Ву

By: Daniel Donovan

It's Manager



# Facility Study Report

# **Prepared For:**

# NuPower Thermal Bridgeport LLC 600 Iranistan Avenue, Bridgeport, CT

July 2020

# **Prepared By:**

The United Illuminating Company 100 Marsh Hill Road Orange, CT 06477-3628

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# 1 Executive Summary

NuPower Thermal Bridgeport LLC ("Generator") has requested the interconnection of a 9.66 MW Fuel Cell generator system at 600 Iranistan Avenue, Bridgeport, CT. They request approval for the interconnection through the proposed customer owned four (4) 2,500 kVA and one (1) 1,500 kVA, 13.8kV/480V, Delta/Wye-Grounded interconnection transformers with an impedance of 5.75%. The proposed DG is to be interconnected to The United Illuminating Company's (UI's) distribution system through a dedicated double cable-feeder.

UI has been requested by the Generator to develop a cost estimate ("Facility Study") of the modifications to the electric power system to allow for the safe and reliable interconnection of a proposed 9.66MW generation system. The interconnection point of the proposed generation is located at 600 Iranistan Avenue, Bridgeport, CT.

The proposed interconnection would be through standard pad mounted VISTA™ Model 211 switches. There would be two (2) dedicated, express 13.8kV feeders with primary metering at the customer site. The feeders will be sourced by the Congress Street Substation.

The interconnection point to the proposed facility is at the intersection of Railroad Avenue and Iranistan Avenue in the City of Bridgeport. The property is bounded by Iranistan Avenue to the west, Railroad Avenue to the north and Interstate 95 R.O.W. to the south. The nearest UI underground structure is splicing chamber 853 (SC-853).

UI Distribution Engineering has completed a review of the proposed site and the proposed paths from the source station. Based upon field inspections, observations, existing circuit configurations and UI records, a proposed underground design was created. The proposed design was used to formulate the estimated costs for the infrastructure modifications to support a safe, reliable interconnection. The design assumes that there will be an operational agreement in place between the Generator and UI prior to the commencement of construction and operation.

Once an agreement with NuPower Thermal Bridgeport, LLC has been completed, it is recommended that UI proceed with the detail design, material procurement and construction for the following course of action:

- Develop and agree to a defined set of operational procedures.
- Construct bus extension and install two (2) new breaker positions. Perform testing and commissioning of associated equipment.
- Perform an inspection and, where necessary, prepare the conduits along the paths to accept cables.
- ❖ Where required, based upon existing UI practices and policy, repair, replace and remediate splice chambers and conduits along the underground paths.
- ❖ Install and dead splice the required primary underground cable for the two (2) feeders.
- ❖ Install the UI electrical interconnection equipment at the Generator's site and provide for connection to the customer equipment.
- Install UI equipment for protection, control and monitoring.
- Test and energize the feeders.
- Test and verify protection, control and monitoring systems.

# 2 Scope

The Electric Distribution Company (EDC) has prepared this report outlining the results of the Facility Study (the "**Report**"). The Report may include, but is not limited to:

- a) Specification and estimation of the equipment, engineering, procurement and construction work (including overheads) needed to implement the conclusions of the Distribution Feasibility and Impact Studies along with the Transmission Impact Study;
- b) Estimation of the nature and estimated cost of the EDC's Interconnection Facilities and modifications necessary to accomplish the Interconnection (including, without limitation, an estimation of the time required to complete the construction and installation of such facilities).

# 3 Proposed Construction

# 3.1 On-Site Service Equipment

The point of common coupling (PCC) will be at the Generator's circuit breakers labeled MB1 and MB2 on the Bridgeport 10MW, 21 Unit Conceptual Electrical One-line Schematic, dated 11/21/2019 that can be found in Appendix A. The electrical demark will be the line-side cable terminations at the Padmounted Primary Metering Enclosures (Shallbetter). UI will:

- Supply the material and install the cable and connections between the S&C Vista™ padmounted switches and the Shallbetters
- Reimburse the cost of revenue-settlement metering PTs & CTs
- Install the revenue-settlement meters (2 ION meters) to be purchased by Generator and delivered to UI.

#### The Generator will:

- Provide, install, own & maintain the on-site foundations, conduits & ground grids.
- Provide, own, and maintain the Padmounted Primary Metering Enclosures (Shallbetter)
- Provide (reimbursed by UI) for factory installation of UI High-Accuracy revenuesettlement metering PT's & CT's.
- Provide, install, own & maintain cables and connections starting at the load-side of the Shallbetters.
- Provide, install, own & maintain a 1" rigid conduit to each Shallbetter for 120Vac source to heaters and 1 ½" conduit from each Shallbetter to approved metering enclosures.
- Provide, install, own, & maintain one Ethernet connection to each ION meter and supply and install two (2) approved meter enclosures (Milbank Cat. #S3390-FB-XL-C7).
- Purchase and deliver to UI two ION revenue settlement meters.

#### 3.2 Dedicated Feeders

# 3.2.1 Description

UI has been asked to develop and estimate a preliminary design for the installation of the required equipment to provide for two (2) 13.8kV supply circuits. There will be two (2)

sources to the site. Protection and Control additions and modifications will be required and made at the source substation and at the site. A 13.8kV (nominal) circuit will be constructed with 500kcmil EPR underground cable from each source to the site property. There will be two (2) individual padmounted switches with primary metering located on the site property. A scope of the proposed work is below.

- Several routes were evaluated using company records, photos, manhole cards, previous inspection results etc., in order to find a suitable continuous path that would allow power cable installation from the proposed generator site to the Congress Street Substation.
- Several paths were evaluated through the subject area, which consists mostly of underground infrastructure located within the Bridgeport low voltage secondary network service area.
- These paths presented challenges with either; the number of spare conduits available, the condition of the conduit, the size of the conduit, the size of the splice chambers, the condition of the splice chambers, or combination of any of the above, and an incomplete continuous path from the generator site to the Congress Street Substation. The chambers were evaluated on the number of cables present, the number of existing spare conduit positions, the number of spare positions after the installation of the required cables needed for interconnection and whether there was sufficient working clearance between energized conductors racked on opposing walls per the National Electric Safety Code (NESC). The physical dimensions, age and construction materials used during construction of the chambers were also considered during the evaluation.
- Likewise, the construction method and materials used for the duct-bank were evaluated for age, size and type.
- The existing duct-bank initially considered for placement of the cables in order to interconnect the generator, contains all of the Bridgeport Network feeders. Any current carrying feeders added to this duct-bank decrease the current carrying capacity of all existing feeders in the duct-bank. Additional feeders also increase the probability that a catastrophic electrical event such as; a cable fault, manhole fire or structural collapse of a manhole containing these feeders would cause an extended outage of the Bridgeport Network area and the ability of the generator to export power until such repairs have been made.
- For the above stated reasons an existing, continuous usable path from the generator site to the Congress Street Substation may not exist. UI will continue to search for a path during the next phase of engineering.

# 3.2.2 Proposed Design (Electrical)

• UI Distribution Engineering recommends building new underground civil infrastructure from the Congress Street Substation site to the Generator site located at 600 Iranistan Avenue, Bridgeport. This would require installing approximately 18 new splice chambers and a 4 position 5" PVC concrete encased duct-bank system along a path approximately 5800 ft. in length. This path will also include approximately 2000 ft. of overhead

construction. Upgrades to the existing overhead infrastructure will be required to accommodate the two (2) new aerial cables.

- Extend Bus 3 to include a new breaker cubical (Position 19 Circuit 2552).
- Extend Bus 4 to include a new breaker cubical (Position 34 Circuit 2553).
- Install two (2) new feeders, Circuit 2552 and Circuit 2553 each consisting of 7800 ft. of 3-500 CU EPR UG cable and 3-500 AL EPR aerial cable which would terminate at two S&C Vista type 211 padmounted switches on the generator property. UI would own, operate and maintain the Vista switches. See attached draft Generator one-line detailing complete installation, ownership, operation and maintenance details in Appendix A.
- Each one of the new feeders would be de-rated 10% from UI's published rating for 500 CU UG EPR cable to allow for operation at 100% load factor. Assuming 500 CU UG EPR cable and a 9 duct rating this translates into a new rating of 294 Amps or 6.7 MW (@.95 PF) during the summer months under nonemergency conditions for each feeder. Because a cable could be comfortably operated at 80% of its rating, an operational limit 235 Amps or 5.4 MW (@.95 PF) would be a reasonable limit per circuit.
- Under no circumstance can the full 9.66 MW output of the generator be exported on one circuit.

#### 3.2.3 Proposed Design (Civil)

- The new splice chambers would be built and installed according to current UI standards and NESC requirements allowing multiple means of egress, suitable working clearance between energized conductors, and sufficient means of grounding.
- Typical splice chambers are 6ft. X 14ft. X 7ft. (W X L X D) interior dimensions. This size chamber allows 4 cables to be racked on each long wall. Several other configurations of splice chambers are available as well, and a 4 way octagon design was developed by UI for use in certain situations.
- The end wall of each typical splice chamber will have 4-5" concrete encased conduit positions.
- The maximum size cable that can be installed in a 5" conduit is 3-750 CU EPR.
- See the attached Preferred Path document dated 3-26-2020 for a plan view depiction of the proposed route in Appendix A.

# 3.2.4 Assumptions

Below is a list of assumptions used in creating the estimate to install the dedicated feeders.

- Two new breaker positions will be installed at the Congress Street Substation; one on Bus 3 and another on Bus 4. These new positions will be dedicated to the generator interconnection.
- Reference Substation Upgrades Section for costs associated with the addition of these two
   (2) breaker positions, the costs are not captured in this section.

- Station capacitor banks can be replaced with pole-type capacitor banks freeing up real
  estate on the Congress Street Substation property for a new 16 position distribution
  getaway. The costs to relocate these units are not included in this project.
- UI is able to obtain any easements required for the above mentioned getaway.
- The Congress Street Substation floodwall project will have no negative impacts to the design, schedule or construction of this project.
- Civil engineer hours for this project are estimated at 1600.
- Two (2) S&C Vista type 211 switches and two (2) Padmounted Primary Metering Enclosures (Shallbetter) will be installed at the generator site. They will be installed on slab foundations provided by the Generator.
- Distribution (electrical) engineer hours for the project are estimated to at 600.
- The cost of a Subsurface Utility Engineering investigation done by contractor is estimated to be \$16/ft. X 5800 ft. =\$93,000.
- The engineering design, procurement and construction cycle is expected to take approximately 50 months to complete once notice to proceed has been received by UI.
- No costs for environmental remediation are included in these estimates.
- Construction Management hours are included in these estimates and are estimated to be 600.
- The Generator pays 100% for the cost of the new infrastructure.
- Both cable pulls (two circuits of 3-500 CU EPR 15kV cable) assumed to occur independent of each other. Each UG circuit segment is approximately 5800 ft. in length.
- Both installations of aerial cable along Iranistan Ave will be independent of each other. Each segment of aerial cable is approximately 2000 ft.
- Further cable rating calculations need to be performed to determine if the initial portion of the circuits closer to the substation needs to be 3-750 CU EPR.
- UI will install the ground grid in 18 new chambers.
- Racks will be installed on one eight foot wall, top and bottom section for all 18 new chambers.
- Enough hooks will be installed to train two circuits only in all 18 new chambers.
- Distribution Engineering (Electrical) hours to create work orders, prepare drawings, etc. is 100.
- UI will Prepare, Deliver, Install, Own, Operate and Maintain S&C Vista switches.
- Generator will Purchase (per UI specifications), Deliver, Install, Own and Maintain Shallbetters.
- Generator will make up and own 600 Amp hammerheads on load-side of the Shallbetters and Install, Own and Maintain any secondary wiring for heaters inside of each Shallbetter.
- The maximum cable length between Vista and Shallbetter is not more than 250 ft.
- UI will install 600 Amp hammerheads on W1 and W2 of both 211 type S&C Vista type 211 switches and on the line-side of each Shallbetter.
- Time included for Test Engineering, P&C Engineering, SCADA Engineering to test controls after circuits are energized.
- Time included for close out of the project, create customer one-line, build SCADA display, write Operating Procedure.

- Civil construction is seasonally dependent and will occur between April 1 and November 15.
- Estimate assumes 100% of the poles on Iranistan will need to be changed due to size or class in order to accommodate the aerial cable.
- There are eleven Frontier poles on Iranistan Ave that need to be replaced in order to install aerial cable. UI has no control over Frontier's schedule, procurement or resources.
- There are sixteen UI poles on Iranistan Ave that need to be replaced in order to install aerial cable.
- A detailed pole loading analysis needs to be performed by Field Engineering on all poles along Iranistan Ave.
- Any additional guying for dead end, corner or riser poles will be able to be negotiated with property owners.
- The location of the first and last splice chambers on Iranistan Ave in order to rise from the underground has not been determined and may reduce the 2000 ft. overhead segment and increase the 5800 ft. underground segment by as much as 20%.

# 3.3 Substation Upgrades

#### 3.3.1 Description

Based on the analysis done in the Feasibility Study, the proposed fuel cell generator will be interconnected to two dedicated substation breakers. Currently there are no spare positions available at the Congress Street Substation. However, there is sufficient space for Substation Bus#3 and Bus#4 to be expanded to included two (2) additional breaker positions. NuPower Thermal Bridgeport LLC DG interconnection will have two (2) feeders from Congress Street Substation to the Generator site.

# 3.3.2 Switchgear Construction and Installation of Breaker Position

- Construct bus extension and install new breaker position at Congress Street Substation Bus#3, Position #19 (Feeder #2552) and Bus#4, Position #34 (Feeder #2553).
- Procure qty. (2) 15kV, 25kA, reconditioned and tested 1200A w/2000A caps (18 kAIC) GE AM 13.8-500 6H Magneblast circuit breakers.
- 125VDC Controls to match existing substation switchgear line-up.
- Procure, design and manufacture of indoor switchgear provided with Schweitzer protection relays for overload, overcurrent and other protection.
- Delivery, Vendor Field Services, rigging, and functional checks of switchgear and circuit breakers.

# 3.3.3 Additional design and construction at Congress Street Substation

- UI substation engineering.
- Modifications of existing control room panels.
- Installation support as needed.
- Testing and commissioning of the equipment.
- Removal & installation of door leaf for switchgear installation.
- Relocation of HVAC units.

• Relocation of the Security Camera.

#### 3.3.4 Assumptions, Cost Estimate and Timeline

- Installation of each breaker position will take one week per position and will be performed one breaker at a time to minimize reliability risk.
- De-energization of the substation buses to be executed during minimum load periods either between April and May or October and December.
- The total estimated costs associated with the Breaker from procuring to commissioning and associated switching works with the Normal Backup of Bus 3 or 4 at the Substation is as noted in Table 1.

#### 3.4 SCADA

#### 3.4.1 Description

The Guidelines for Generator Interconnection require SCADA equipment to monitor the generators and the generating facility. Communication equipment for SCADA will also be required at the customer site as well as Congress Street Substation. The proposed design submitted by the Generator was used to formulate the estimated costs for the infrastructure modifications to support a safe and reliable interconnection.

As there is currently no SCADA communication to the customer site, UI will require new SCADA equipment to be installed. The proposed design was used to formulate the estimated costs for the infrastructure upgrade to support a safe interconnection.

# 3.4.2 SCADA Control System

UI Responsibilities:

- Procure the new SCADA equipment to allow for generator and point of interconnection monitoring.
- Modify the database to accommodate the new RTU inputs.
- Build a logic scheme to transmit alarm points and source substation bus load data between customer and the designated substation via the provided communication link.
- Witness test all functionality of the newly installed SCADA equipment.

#### 3.4.3 UI Substation

Based upon the submittal, two (2) new feeder positions will be added to UI's Congress Street Substation. These additions will create the need for work in the substation RTU, relay testing and verification, as well as head end database and display modifications.

#### 3.4.4 Work at the Customer Site

Generator Responsibilities:

- Prepare the new site for the SCADA equipment/cabinet.
- Provide permanent and clear work space about the equipment per NEC/NESC/UI requirements.
- Install the new RTU and Outdoor SCADA enclosure at the customer's site.

- Install all necessary conduits, fittings, and cables for 120volt power, signals and communication to the SCADA cabinet.
  - (1) 120Vac 20A dedicated UPS circuit for SCADA electronics.
- Provide permanent communication path through Avangrid Telecom provided design from 600 Iranistan Avenue to include purchase and installation of any equipment needed to fulfill the design.

#### 3.4.5 Assumptions

The estimate was prepared using the following assumptions:

- 1. All UI labor & availability of UI resources to complete work.
- 2. Space available at 600 Iranistan Avenue for the new panels/cabinets as required.
- 3. The Generator will provide one DNP3 TCP/IP Ethernet port from a SEL 2032 (or like device) to the UI SCADA RTU Cabinet.
- 4. The Generator will provide a dedicated UPS power source to the RTU as mentioned in section 3.5.4.
- 5. Only 1 SCADA RTU required for all SCADA communications at the 600 Iranistan Avenue Site.

#### **Not Included in the SCADA Estimate:**

- Any additional cubicle/cabinet work that may be needed to facilitate the installation.
- Any study costs or outside engineering costs.
- As needed removals of existing field and substation equipment.
- Any UI stock room or shipping charges

#### 3.4.6 Cost Estimate and Timeline

The estimated time for procurement of the SCADA cabinet is approximately 20 weeks. This includes engineering, testing, installation, UI station work, and SCADA database programming. This does not include NuPower Thermal Bridgeport, LLC's timeline for their engineering and construction related to the SCADA and communication work.

#### 4 Project Milestones

- a. Meet with Generator to finalize construction plan and schedule. Generator signs letter of intent for construction work.
- b. Project Manager is assigned and completes project charter for approval. Note, charter must be approved before materials are ordered and Purchase Orders are awarded.
- UI completes detailed engineering design and civil plan drawings are created to install the conduit infrastructure.
- d. Generator signs Responsibility Letter Agreement, Construction Agreement if applicable and returned to UI with payment.
- e. All material is ordered as required by the project (ex. substation breakers, S&C Padmounted Vista Switchgear Type 211, 3-500 Cu EPR 15kV cable, etc.).
- f. UI installs the two (2) substation breakers and all associated material.
- g. UI creates design work orders to prepare equipment and construct underground infrastructure.
- h. UI creates design work orders required to reconstruct Iranistan Ave and install aerial cable.
- i. Generator installs foundations, conduits, ground grid etc. on private property for the installation of the; two (2) S&C Vista switchgear, two (2) Shallbetters, customer owned 15kV switchgear & padmounted transformers.
- j. Generator installs customer owned 15kV switchgear, padmounted transformers and Shallbetters.
- k. UI installs S&C Vista, Type 211 switchgear, pulls and terminates 15kV primary cable from Congress Street Substation to line-side of Shallbetters.
- I. Generator pulls and terminates 15kV primary cable from load-side of Shallbetters to customer owned 15kV switchgear and subsequent equipment.
- m. Generator installs 480v service entrance equipment (MDP) and service conductors.
- n. Generator obtains all required electrical releases.
- o. Schedule & energize when ready.
- p. Refer to UI's DG Group for any other items associated with the DG interconnection.

# **5** Project Assumptions

The following is the list of project assumptions used to create the estimates for the proposed work.

- 1. UI will be able to construct the new underground distribution system as planned.
- 2. UI will install, relocate or replace UI supply facilities in compliance with current standards and construction practices.
- 3. All construction techniques used to install, remove, or replace UI facilities will comply with any and all applicable Federal, State and Local regulations as well as UI Construction Standards.
- 4. UI will not require easements for any UI owned equipment along the City Streets.
- 5. All budgetary estimates are based on a work product in compliance with existing UI and/or industry accepted standards and specifications.
- 6. All civil construction work will be done during the normal business week and hours and will occur between April 1 and November 15.
- 7. All UI electrical work has been estimated based on work performed during UI's normal business hours (M-F). A premium will be required for any labor work performed outside of normal business hours.
- 8. All materials will be ordered and available for installation before Construction begins.
- 9. The UI construction work is weather dependent. For safety reasons, UI will not schedule crews to work on the electrical facilities during inclement weather. There is the possibility of schedule delays due to weather. No value for the costs associated with weather delays is offered.
- 10. Police protection is required for all work on or adjacent to street.
- 11. Labor rates used in creating the estimates are based upon historical averages.
- 12. All estimates are based on 2020 dollars and are subject to change based on labor rates, equipment and material costs at the time of actual construction.
- 13. The base estimate includes contingency values using the suggested contingency percentage amount.
- 14. The estimate is valid for 120 days from the date of issuance of the Study.
- 15. No UI equipment will be installed until payment by the Generator is received.
- 16. UI will be granted access (as needed) on the customer's property to any UI owned, maintained and operated equipment per UI's Terms and Conditions.
- 17. All civil work on Generator's private property is by Generator, including excavation, conduits, fittings, grounding, foundation(s), protective bollards, all backfilling, and site restoration.
- 18. All required permitting for the new electric service will be obtained by the Generator.
- 19. All service entrance equipment including meter socket(s) and service conductors are supplied and installed by Generator per all applicable building codes. Generator is required to contact UI to create the required service application(s).
- 20. This estimate describes the billable portion associated with the modification of the UI infrastructure as a result of the DG installation. Refer to UI's Distributed Generation Group for any other associated billable charges associated with the interconnection.

# **6 Total Estimate**

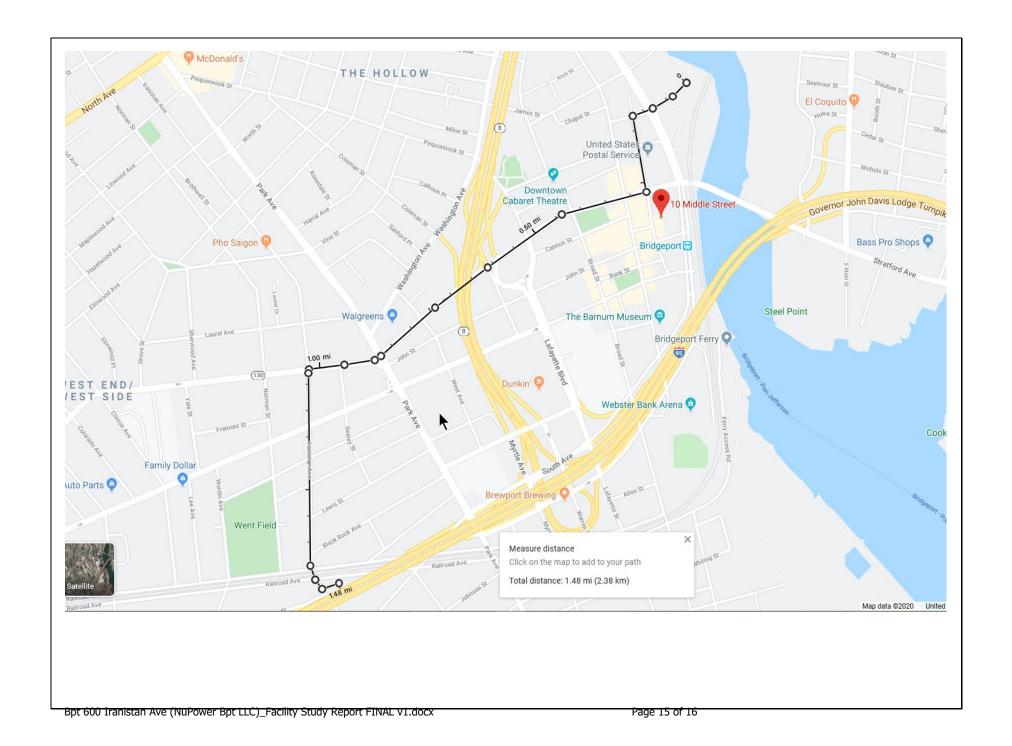
**Table 1 Budget Estimate** 

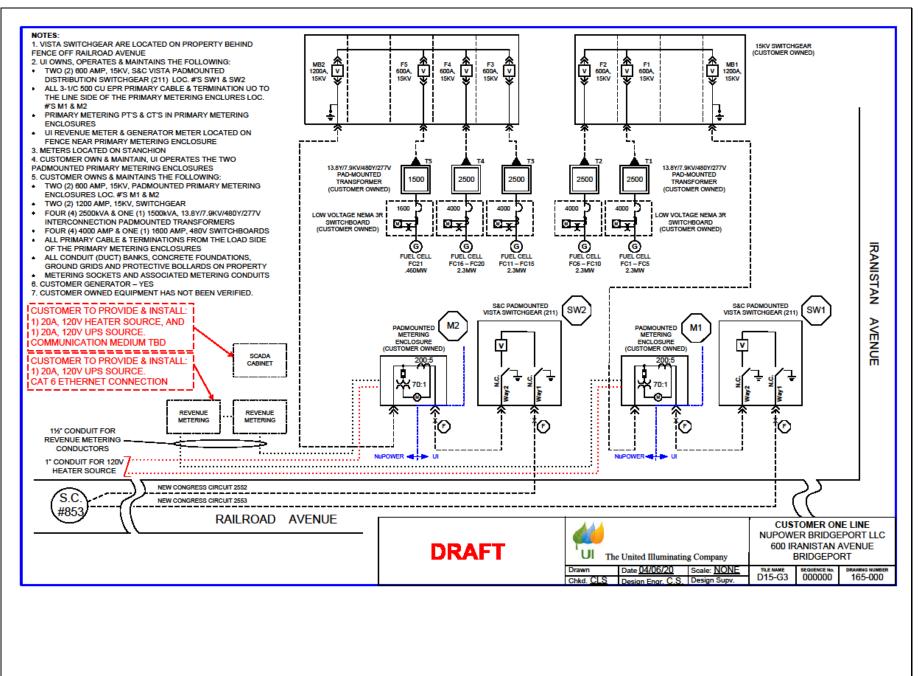
NuPower Thermal Bridgeport LLC				
Sections	Description of Work	Total of Base Estimates	Total of Contingency Estimates	Total of Estimates
3.1 & 3.2.2	Dedicated Feeders – Electrical Design	\$1,626,000	\$488,000	\$2,114,000
3.2.3	Dedicated Feeders – Civil Design	\$5,157,000	\$2,579,000	\$7,736,000
3.3	Substation Upgrade	\$284,000	\$86,000	\$370,000
3.4	SCADA	\$29,000	\$6,000	\$35,000
	Sub-Total	\$7,096,000	\$3,159,000	\$10,255,000
	<b>Total Estimated Cost</b>			\$10,255,000

**NOTE:** 

There may be additional charges associated with the DG installation. This represents the billable charges required for the EPS modifications.

#### 7 Appendix A: Supporting Drawings SUBSTATION SERVICE Congress Street 13.8 kV Switchgear feeder #1 Switchgear feeder #2 15 kV, 4/0 AWG copper EPR cable (length to be determined based on existing duct routing 460kW/511kVA/0.9 pf, 615A 480VAC, 3-Wire, 60Hz **FUEL CELL DETAIL** 15 KV CLASS MV SWGR PURE CELL MODEL 400°PLECTRICAL SEQUENCE OF OPERATION Bridgeport District Heating site Fare Cell Configuration Overview: The 21 Pure Cell Model 400 uses at Bridgeport are UL1741 \$5. certified 4604W/\$11 KVA mode "face clot hat can operate either grain-interactive last in Connected or per independent with the addition of an Dosan supplied "Grid Independent "Cril" switchboods" which contains a 52-8 grid to breaker and a 52-8 load to be inselarforeignept Ottotts charing Stef a ville beingly configuration of the interactive and the option call Switchbood in out provided minimum of the configuration of the configura NEMA 3R The 21 Fuel Cells are connected in 4 groups of 5 and one group of one to 4-4000 amp switchboards and one 1600 amp switchboard, 5 switchboards total. Each switchboard is connected to its own step-up transformer that connects the 480 Volt switchboard to a 13.84V medium voltage distribution switchboard which is then connected to the United Illuminating distribution switchboard which is then connected to the United Illuminating distribution switchboard with is than internonced to the United Illuminating distribution switchboard with its three connected to the United Illuminating distribution switchboard with its three connected to the United Illuminating distribution switchboard with its three connected to the United Illuminating distribution switchboard with its three connected to the United Illumination of the United Illu BRIDGEPORT FUEL CELL BUS NO. 1 BRIDGEPORT FUEL CELL BUS NO. 2 For grid connected operation, each fuel cell's 3 phase, 3 wire 480 volt AC grid output terminals are connected to its 480 volt, 3 p wire 4000 amp (or 1600 amp) switchboard via an 800 amp branch circuit breaker. This switchboard is supplied by a 2500 KVA (or 1500KVA for the 1600 amp switchboard) step-up transformer with a primary voltage of 13,800/7,968 volt grounded wye and a secondary voltage of 480/277 volt grounded wye. The fuel cell contains its own UL1741SA certified Utility voltage and frequency protection utilizing a Schweitzer model SEL547 Relay connected to an 800 A disconnecting circuit breaker. IDLE mode: The fuel cell is isolated from the utility. In this mode, the fuel cell produces electrical power for its internal loads but it AC output terminals are not energized. It's internal output breaker MC8\_INV is open. 2. Startup: During startup, the PureCell Model 400 units each consume approximately 158kW (approx. 70 kW average) of 480 volt 3 phase power for 5 hours through its grid output terminals, which also serve as input terminals during startup. Typically the 5 units a not simultaneously started, so the 158kW represents the maximum startup power consumed at any one moment as a single hard. Grid-connected operation: Once started in grid-connected operating mode internal breaker MCB\_INV is cld delivers up to 460 kW continuously through its output terminals to the Bridgeport MV distribution system swi the power will be exported to UI. Each Model 400 fuel cell system employs its own UL 1741 SA certified grid protection with an SEL547 relay. There is also a redundar site intertie relay in the MV switchgear that will trip the fuel cell offline by opening the medium voltage 52 breaker. Loss of Utility Supply: The fuel cell's UL1741 certified protection (using an SEL547 Relay) detects the loss of commercial power automatically and isolates the fuel cell from the utility. The redundant site protection relay performs the same function and sends a trip signal to each fuel cell. Upon solating from the utility, the fuel cell is in 10.10 mode with is internal breaker MCD, INV Open. FC9 FC10 FC5 FC11 FC12 FC13 FC14 FC15 FC16 FC17 FC18 FC19 FC20 FC21 Return to Grid Connected Mode: Upon restoration of Grid power, each fuel cell will detect commercial power, automatically synchronice, reconnect (reclose MCS\_INVI) and return to parallel operation after a 5-minute delay and also reset of the externa-restundant protection relay. Upon reconnection with the utility, each fuel cell will begin at GNW and increase power at ISWI/se back to the dispatch setting of 460kW. 460KWIS11KVA 480 VAC 3 PHASE, 3 WIRE UL 1741 SA CERTIFIED FUEL CELL POWER PLANT SEE DETAIL A Shutdown: Upon operator selection of a manual shutdown, or automatic shutdown due to certain internal power plant protection equipment, the power plant will crose producing electrical power. It is internal outpub breaker MCS\_WV will open and the gas supply from 15.50 degree operating temperature beat to 1s.135 degrees standly temperature. Cool down is exomptible they recite that to 1s.00 degree standly temperature, cool down is composited the preventive beat to 1s.135 degrees standly temperature, cool down is composited by rejecting the cool down. RATED OUTPUT 460KW /511KVA, 0.9 PF RATED OUTPUT CURRENT 615 AMPS @ RATED KVA OUTPUT TYPE 460V AC, 3 PHASE, 3 WIRE 10 MW (9.66MW) FUEL CELL BLOCK @460KW PER FUEL CELL 24° x 36°





# ATTACHMENT 5

# Daesan Hydrogen Fuel Cell Power Plant







By email & U.S. mail

October 9, 2020

Mr. Andrzej Mysliwiec
Transportation Supervising Engineer
Facilities & Transit, Bureau of Engineering & Construction
State of CT, Department of Transportation
2800 Berlin Tpk, P.O. Box 317546
Newington, CT 06131

Subject: Petition 1406, construction of 9.66 MW fuel cell at 600 Iranistan Ave., Bridgeport

Dear Mr. Mysliwiec:

Per your letter (copy attached) of June 26<sup>th</sup> please be advised that the proposed interconnection will not be connecting to the transmission system using monopoles within the railroad right of way.

Your kind acknowledgment of receipt of this notification would be much appreciated. Thank you for your continued assistance as it relates to this project.

Yours truly, Gui hunt

J.Scott Guilmartin

NuPower, Bridgeport FC LLC