

**STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL**

Doosan Fuel Cell America, Inc. Petition for a)	
Declaratory Ruling, Pursuant to Connecticut Conn.)	Petitions 1406 and 1406A
Gen. Stat. §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)	September 21, 2021
Iranistan Avenue, Bridgeport, Connecticut)	

**ALLCO RENEWABLE ENERGY LIMITED’S MOTION TO CHANGE THE
PROCEDURAL SCHEDULE TO ALLOW FOR ADDITIONAL DISCOVERY**

On May 11, 2020, Doosan Fuel Cell America, Inc. (“Doosan”) filed a petition (the “First Petition”) for a declaratory ruling with the Connecticut Siting Council (“Council”), as agent for NuPower Bridgeport FC, LLC (“NuPower”), requesting a certificate of environmental compatibility and public need is not required for the construction, operation and maintenance of 9.66-megawatts (“MWs”) of natural-gas-fueled fuel cells and associated equipment (together, the “Project”). The Project would be located in an environmental justice community in Bridgeport that has among the highest hospitalizations and emergency room visits for asthma in the State of Connecticut.

In its December 18, 2020, decision rejecting the First Petition, the Council stated:

The Council considered and identified the following deficiencies and potential adverse effects on public health and safety that include, but are not limited to:

1. Project plans provided lack site detail;
2. The petition does not address natural gas safety issues;
3. The petition does not address the safety implications of the proposed facility’s location in relation to other existing infrastructure (ex. railroad, highway, electric transmission line);
4. The petition does not address potential vapor plume hazards to the adjacent highway or any potential mitigation measures; and
5. The petition does not address the potential to incorporate noise mitigation measures prior to the commencement of facility operation.

On March 31, 2021, filed a renewed petition (the “Second Petition”) with the Council.

In its Second Petition, NuPower described the ice and fog situation on I-95 caused by the proposed Project as follows:

J. Ice and Fog

The facility will be located on the site parcel so as to reduce the potential for fog or ice from the Project from impacting I-95. Additionally, the fuel cell vents will not be combined but rather will be routed individually to the top of the structure and extended 9' above the base of the top floor of the structure at approximately 57' above the ground level. The Project's design mitigates the facility's plume by locating the fuel cell exhaust vents on the side of the structure opposite the highway and locating the dry air-coolers between the exhaust and the highway. The dry heated air provided by the dry air-coolers will serve to mix with the exhaust gas to evaporate fog-like water vapor plumes.

In response to the Council's December 18, 2020 decision in Petition 1406, NuPower and Doosan retained Trinity Consultants to analyze the source-induced fog and ice from the facility's exhaust streams. Trinity utilized the California Puff ("CALPUFF") model FOG codes to determine the fogging and icing impacts from the 21 exhaust vents. CALPUFF determines the frequency of visible plume impacts at receptor points and predicts the length and height of visible plumes. *The model indicated that the Project will have an insignificant impact.* During the period 2016-2020 the modeled plume-induced conditions produced only one hour of icing conditions and three total hours of fog over the five year period. In comparison, natural meteorological conditions produced 116 hours over the same period.

(emphasis added.)

On June 21, 2021, Allco Renewable Energy Limited ("Allco") filed a motion to intervene, which was granted by the Council. On June 24, 2021, Allco submitted a letter in support of the request for a hearing filed by Joe Provey. In Allco's letter, Allco pointed out that once the Trinity Report was actually reviewed, it was clear that what NuPower characterized as "insignificant" was actually the creation of "life-threatening hazardous driving conditions that the petitioner's expert, Trinity Consultants, concedes the project's continuous vapor plume would cause on I-95." Allco Letter at 1.

Obviously recognizing that NuPower's second attempt at addressing safety issues on I-95 had (like the vapor plume) evaporated, NuPower needed a new plan. Now NuPower seeks a

third bite at the apple with what is an unproven, experimental design that is not supported by any engineering, safety or sound analysis.

On August 27, 2021, NuPower submitted a new report from Trinity Consultants based upon a completely different design for the project. The new design described by NuPower claims that:

it is possible to duct the project's exhaust to the cooling module intakes. Undertaking that modest modification of mixing the original exhaust with the dry air of the cooling modules results in exhausts with significantly lower water vapor concentration and increased exit velocity. This modification will not alter the position of the exhaust vents relative to the highway, as illustrated in Attachment CSC-26-1.

See, NuPower Letter of August 27, 2021 at 1.

NuPower's answer A-CSC-32, sent to the Council on August 18, 2021, further elaborates on the newest design modification:

The exhaust will be directly ducted to the intake side of the cooling modules where it will be diluted by up to 67,283,128 CFM of warm dry air and dispersed over a wide area reducing or eliminating the likelihood of a vapor plume. The CALPUFF FOG model, which was used by Trinity to analyze the potential of fogging and summarized in Trinity's March 24, 2021 report did not reflect mixing the exhaust with high velocity, hot air from the cooling modules. However, subsequent to the Trinity report being issued, it has been determined that it is possible to duct the exhaust to the cooling module intakes. Trinity has concluded that mixing the original exhaust with dry air of the cooling modules will result in exhausts with significantly lower water vapor concentration and increased exit velocity. These changes are expected to reduce the overall plume-induced fog and icing events as originally modeled by lowering the water vapor concentration in the exhaust as it enters the atmosphere. The March 24th report results, which forecast slight annual increases in fog, would be further reduced or eliminated.

The new Trinity Report is signed by Simone Wallace, whose linked-in profile indicates that she possesses an M.S. in Meteorology.

No revised engineering designs were submitted to reflect the newest design modifications. No revised engineering analysis was submitted with respect to the operations of

the project reflecting the newest design modifications. No analysis was submitted analyzing the impacts of the new design on such aspects such as safety, operations or sound (including Infrasonic and Ultrasonic) from the introduction of the continuous high moisture stream of the exhaust. No analysis was submitted analyzing the impacts of the new design on such aspects as the ability of the cooling modules to work now that the intake into the cooling modules will no longer be ambient air but high temperature, high moisture air. Nor is there any explanation as to how the ultimate vapor plume is reduced, or where the new exhaust stream is directed.

In the First Petition, the petitioner described the “normal condition” of operation of the Project as “White steam exiting power plant at exhaust chimney, above panel #6 (It can be a large amount of white steam depending on ambient conditions).” That same page described a “Potential Abnormal Condition” as “Dark colored smoke exiting chimney or any other part of enclosure.” The recommended response is “Establish safe perimeter...Contact Doosan Fuel Cell America Control Center (860) 727-2847.” First Petition, Attachment 5, Emergency Response Plan, p. 5.

Normal Condition	Potential Abnormal Condition	Response
<u>Fuel Cell</u> White steam exiting power plant at exhaust chimney, above panel #6 (It can be a large amount of white steam depending on ambient conditions)	Dark colored smoke exiting chimney or any other part of enclosure	1. Establish safe perimeter 2. Contact Doosan Fuel Cell America Control Center (860) 727-2847
	Observable fire or heavy smoke at any point on fuel cell	1. Press Fuel Cell ‘Stop Button’ – Only if safely accessible! 2. Dial 911 or Local Emergency Response Number 3. Establish safe perimeter 4. Contact Doosan Fuel Cell America Control Center (860) 727-2847

Now the potential abnormal condition of dark colored smoke appears be ducted through the cooling module.

The fuel cell generates electricity and heat. Usually, heat must be removed quickly in order to avoid membrane dehydration and material degradation. At higher operating temperatures, the heat transfer rate is increased due to larger temperature gradient between the fuel cell and ambient condition. Now, however, the new design substantially reduces that gradient.

The new design, and the absence of engineering plans and analysis of the new design, makes it impossible for the Council to conclude that the Project does not have a substantial adverse effect. As a result, more discovery is necessary which would, at a minimum, include serving additional interrogatories and receiving complete and thorough answers to those interrogatories. The requested relief concerns critical issues in this proceeding, and is essential to Allco's right of participation in this proceeding.

The lack of analysis related to the new design also introduces an additional basis calling into question the validity of the sound report. Other bases for calling into question the validity of the sound report are listed in Allco's Interrogatory #22 to petitioner, among which is the fact that the sound analysis being conducted at a height of ten feet from the ground when the source of the sound is approximately 70' 6" above ground level, and higher than surrounding structures. *See*, Second Petition at 8. ("The total height of the facility with the cooling fans will be approximately 70' 6" above ground level and approximately 84' 6" above mean sea level.")

NuPower states that the cooling modules are the dominant noise source. *See*, Initial Petition, Att. 12 at 3. *See also, id.* at 21 ("Operation of the Doosan fuel cells may have significant acoustic impact at all of the closest Residential Zone properties to the north, north east and south east sides of the 600 Iranistan Avenue site.") *See also*, Second Petition at 20 ("The primary sources of noise for the proposed project are the dry air coolers located on the top floor of the

structure.”)

As it is, the project’s sound is projected to be at the legal limit. *See, id.* at 21. (“Railroad and South Avenue industrial properties should see airborne noise levels from the 21 fuel cells no higher than 69 dBA which is just below the industrial noise limit of 70 dBA. . . . Noise mitigation may be recommended to bring the fuel cell noise levels down to airborne noise values less than 51 dBA or less than the background plus 5 dB in the Residential Zones and below 70 dBA for the business at 571 Iranistan Avenue.”)

Remarkably in this docket, 21 fuel cells somehow produce less noise than the one analyzed in docket 1355 for Carla’s Pasta. *Compare*, Second Petition, Att. M, Report of Acoustical Technologies, May 8, 2020, at 3 (“The speakers produced overall A-weighted sound pressure of approximately 86 to 87 dBA at 5 meters and 77 to 84 dBA at 10 meters (ref20 microPascals) from the proposed fuel cell locations at ground level) with petition in docket 1355, Report of Acoustical Technologies, September 25, 2018, at 2 (“The speakers produced average overall A-weighted airborne sound pressure levels of approximately 93 dBA at 5 meters and 88 dBA at 10 meters (reference 20 microPascals) at the proposed fuel cell power and cooling module locations.”) That discrepancy is yet another basis for calling into question the validity of the sound report.

The cooling module is depicted in the image below (excerpted from the petition in docket 1355):

Figure 2. Doosan Fuel Cell Cooling Module at the Mount Sinai Hospital Site in Hartford CT



Without any engineering plans or analysis, it is impossible to know what the introduction of the exhaust from the project would do to the sound impacts of twenty-one the cooling modules that are approximately 70 feet above the ground and approximately ten feet higher than the top of I-95's concrete barrier. *See*, A-CSC-25 ("The top of the highway concrete barrier is at an approximate elevation of 60 feet. The top of the cooling modules is at an approximate elevation of 71 feet.") Even the slightest increase in noise may put the project over the legal limit. Note, however, that even coming in under the legal limit does not equate to no substantial adverse environmental effect.¹

¹ *See, e.g.*, Allco interrogatory to petitioner number 22c, which petitioner refused to answer:

Page 20 of the Noise Report states: "The P 11 residence at 720 Black Rock Avenue is expected to see airborne noise levels of 62 dBA with all the fuel cells operating. Other homes along Black Rock Avenue should see similar airborne noise levels." The World Health

Increases in temperature affect sound transmission.² In addition, dry air absorbs far more acoustical energy than does moist air. This is because moist air is less dense than dry air (water vapor weighs less than air). Now the air in the cooling modules will be moister.

CONCLUSION

The new design, and the absence of engineering plans and analysis of the new design, makes it impossible for the Council to conclude that the Project does not have a substantial adverse effect. As a result, more discovery is necessary which would, at a minimum, include serving additional interrogatories and receiving complete and thorough answers to those interrogatories. The requested relief concerns critical issues in this proceeding, and is essential to Allco's right of participation in this proceeding.

Respectfully submitted,

/s/Thomas Melone

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Organization ("WHO") recommends that "[w]here noise is continuous, the equivalent sound pressure level should not exceed 30 dBA indoors, if negative effects on sleep are to be avoided. When the noise is composed of a large proportion of low-frequency sounds a still lower guideline value is recommended, because low frequency noise (e.g. from ventilation systems) can disturb rest and sleep even at low sound pressure levels."

<https://www.who.int/docstore/peh/noise/Comnoise-4.pdf>. In light of the WHO's recommendations, isn't a 62db sound level for the Black Lane residents a substantial adverse environmental impact on them? If not, please explain why not.

² See, e.g., <https://www.softdb.com/effect-of-wind-and-temperature-gradients-on-sound-waves/>.