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July 26, 2021

Connecticut Department of Energy & Environmental Protection
Bureau of Energy and Technology Policy
79 Elm Street
Hartford, CT 06106

RE: SCEF Bid Preference Written Comments

Dear Bureau of Energy and Technology Policy,

The National Fuel Cell Research Center ("NFCRC") hereby submits comments to the Connecticut Department of Energy and Environmental Protection ("DEEP") per the July 8, 2021 Notice of Opportunity for Public Comment and Public Meeting on bid preferences for the Shared Clean Energy Facility ("SCEF") Program for the Year 3 Procurement.

NFCRC Background

The NFCRC facilitates and accelerates the development and deployment of fuel cell technology and systems; promotes strategic alliances to address the market challenges associated with the installation and integration of fuel cell systems; and educates and develops resources for the power and energy storage sectors. The NFCRC was established in 1998 at the University of California, Irvine by the U.S. Department of Energy and the California Energy Commission in order to develop advanced sources of power generation, transportation and fuels and has overseen and reviewed thousands of commercial fuel cell applications.

NFCRC Comments on Questions Detailed in July 8, 2021 DEEP Notice

1. Discuss and provide support for any bid preferences that DEEP should consider for the Year 3 Procurement, and/or subsequent procurement years.

Consistent with previous NFCRC filings and comments submitted to DEEP and the Connecticut Public Utilities Regulatory Authority (“PURA”), the NFCRC supports the following bid preferences for the Year 3 SCEF Procurement and/or subsequent procurement years:

- Prioritization of Environmental Justice Communities
- Resilience
- Brownfields

All of the above bid preferences should be applied equally and fairly across all technologies, and must not favor one technology in a subjective fashion. These bid preferences will be discussed further in the following responses to questions.

2. Should a bid preference for projects located on brownfields or landfills continue to be applied for Year 3? If yes, explain why and at what weighting value. If no, explain why not.

The NFCRC supports the continued application of a bid preference that provides a twenty (20) percent price reduction for projects built on landfills and brownfields, for scoring purposes. The price reduction facilitates competition between multiple technologies and the NFCRC re-emphasizes that the discussion should not be limited to solar considerations.

Benefits of fuel cell systems include the provision of 24/7, clean, load-following power at close to 100% capacity factors. Importantly, this high capacity factor corresponds to the production of clean, renewable electric energy (MWh) per unit of power capacity (MW) that is on the order of six (6) times that of solar power systems (assuming a 15% capacity factor for solar) and on the order of three (3) times that of wind power systems (assuming a capacity factor of 30% for wind). Thus, investments in fuel cell capacity produce vastly more renewable energy than intermittent power systems per unit of capacity installed. This translates into substantially more GHG reductions per MWh. Unlike investments in intermittent renewable systems, installations of fuel cell systems can be used by the utility to (1) support local capacity and spinning reserve requirements that are used for grid reliability, and (2) serve as an alternative to costly utility system transmission and distribution upgrades to this system. In addition, the energy density of fuel cell systems significantly reduces the land footprint required for onsite generation, as small as 1/20th of an acre for one MW of generation, allowing for operation in high density urban and suburban areas while retaining increased acreage available for habitat restoration and preservation.

3. How should DEEP acquire cost information for project development while maintaining the competitiveness of the procurement? For example, what is the price premium on land, development and other project costs for developing on a brownfield and/or landfill? Similarly, what is the price premium for other recommended qualitative preferences?

The NFCRC has no comment at this time.

4. For each bid preference identified in response to Question 1 and/or 2, what clear standards, terms, parameters, or metrics should be used to evaluate whether a project qualifies for the bid preference?

The NFCRC has no comment at this time.

5. Discuss and provide support for a bid preference for projects located in and benefitting distressed municipalities and/or environmental justice communities. What are those potential benefits and how should they be quantified? What are the potential drawbacks and/or concerns with siting projects in distressed municipalities and/or environmental justice communities? What metrics should DEEP use to evaluate whether a project located in a distressed municipality and/or environmental justice community qualifies for a bid preference? How should distressed municipalities and/or environmental justice communities be identified for qualification purposes under the Request for SCEF Proposals (RFP) for the Year 3 Procurement?

Air quality impacts remain the most important bid preference topic for projects to benefit distressed municipalities and environmental justice communities. The NFCRC proposes that a key metric for projects located in these communities be the reduction and/or avoidance of criteria air pollutant emissions, or the maintenance of stringent air quality standards.

Fuel cell systems are zero-emission with respect to nitrogen oxides, carbon monoxide, sulfur oxides, and particulate matter and commonly displace traditional emergency backup generators (almost exclusively diesel combustion generators) that emit criteria air pollutants and greenhouse gases (GHG). This displacement is especially critical given that some of Connecticut's most densely populated counties are nonattainment zones,¹ that suffer from poor air quality, and face major challenges in achieving clean air for the many citizens that live and work within these areas. These especially include economically disadvantaged communities that are often disproportionately burdened by air pollution and the risks of COVID-19.

6. Relative to Question 5, how can DEEP and the Authority ensure such a community or municipality: (a) is willing to host a proposed project; and (b) has adequate opportunity to provide feedback about the proposed project?

The NFCRC has no comment at this time.

7. Recognizing Conn. Gen. Stat. § 22a-20a does not apply to SCEF, is there anything in the statute that could be adapted to provide a bid preference in SCEF, such as a Community Environmental Benefit Agreement (CEBA)? If yes, what clear standards, terms, parameters, or metrics should be used to evaluate whether a project qualifies for such a bid preference?

The NFCRC has no comment at this time.

¹ United States Environmental Protection Agency, *Connecticut Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants*, data current as of January 31, 2021 available at: [Connecticut Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants | Green Book | US EPA](#)

8. How does a resiliency bid preference comport with the legislative intent of §16-244z of the General Statutes of Connecticut? How do such resilience projects comport with the Modified Program Requirements relative to SCEF subscriber credits?

A resiliency bid preference clearly comports with the legislative intent of §16-244z of the General Statutes of Connecticut. Resilient SCEF projects provide significant benefits to SCEF subscribers, as detailed below.

9. Should a bid preference for resilient projects, e.g., microgrids, mobile projects, be applied for Year 3? If yes, explain why and at what standard and weighting value. If no, explain why not.

The NFCRC supports a Year 3 bid preference of 30% for scoring projects that support resilience by maintaining backup power during an outage, including critical infrastructure and microgrids. Resilience is often discussed across state agencies and the legislature in the aftermath of a major grid outage event, which events are increasing in frequency in Connecticut. The importance of resilience has, however, been minimized in actual energy policy and programs. As an example, the 2020 Value of Distributed Energy Resources Draft Study² (filed in Connecticut PURA Docket No. 19-06-29) did not value resilience in a meaningful way, nor did the recent Connecticut draft Integrated Resources Plan that gives a passing reference to resilience³ without a plan to address the mandate to create resilient power resources given in Executive Order No. 3.⁴

Including a bid preference for resilience of SCEF projects is an important step in securing near-term continuous and backup power resources that can operate, in some cases producing both heat and power, during the longest duration outages to maintain power in both public and private critical facilities including fire stations, police stations, hospitals, supermarkets, gas stations, university campuses, schools that also serve as emergency shelters, and telecommunications (including the 911 emergency call system). Both projects behind-the-meter and projects in front-of-the-meter should be included in this bid preference, in order to provide the broadest benefits, and to further support the installation of microgrids – without diesel generators.

Fuel cell resiliency has been demonstrated during hundreds of real-world natural disaster and grid interruption events for communities, commercial and industrial energy consumers. To wit, over 60 fuel cell systems maintained power to telecommunication sites during widespread outages caused by Superstorm Sandy in the Northeast and the Bahamas in 2012.⁵ Fuel cells have been installed on the utility side of the meter to ride through outages in Connecticut, Delaware, and Long Island. Millions of customers lost power in the four storms that buffeted the East Coast from March 2-22 in 2018, including those served by the electric grid in the vicinity of nine fuel cell microgrid sites. Despite the combined 26 electric utility outages, all nine fuel cell microgrids in this region maintained power throughout these grid outage events. Other fuel cell systems in the Northeast have powered critical communications and

² Connecticut Department of Energy and Environmental Protection and Public Utilities Regulatory Authority, *Value of Distributed Energy Resources in Connecticut (draft)*, July 2020.

³ Connecticut 2020 Draft Integrated Resources Plan at 91.

⁴ State of Connecticut by His Excellency Ned Lamont Executive Order No. 3, September 3, 2019 at 1.

⁵ Fuel Cell and Hydrogen Energy Association, *Enhancing the Role of Fuel Cells for Northeast Grid Resiliency*, February 2015, available at:

<https://static1.squarespace.com/static/53ab1fccc4b0bef0179a1563/t/54e5e838e4b0072e73714e4b/1424353336299/Northeast-Resiliency-White-Paper-February-2015.pdf>

emergency shelters in the aftermath of these storms. Fuel cells have also supplied critical load power to a healthcare facility during triple-digit temperature heat waves that triggered outages for 57,000 customers in Southern California in 2018. Additionally, fuel cells withstood the 6.0 magnitude Napa earthquake in 2014, the Sonoma fires in 2018 and the recent July 2019 Ridgecrest earthquake, continuously providing power and essential services to customers. During the July 2019 blackout in New York and New Jersey, Home Depot stores across New York maintained power with fuel cell based microgrids.⁶

Commercial fuel cell systems are available on the market and have been deployed for utility backup power, government communication networks, and telecommunications applications that scale from below 1kW to multi-MW capacities for nearly two decades. There are more than 5,000 telecommunication and cable locations using fuel cell systems for backup power in North America, hundreds of which are in the Northeast serving power requirements ranging from under 200 Watts to over 10kW in urban, rural, and remote settings. Fuel cell systems have provided backup power to telecommunications during natural disasters like hurricanes in the Southeastern U.S. and the Caribbean, and in California after earthquakes and wildfires. During Tropical Storm Alfred in 2011 and Hurricane Sandy in 2012, fuel cell systems were instrumental in providing backup power for cell towers and keeping cell phone communications open for many in New York, New Jersey and Connecticut.⁷

10. What other information not provided in response to any of the above questions would be useful in establishing bid preferences for the Program or increasing the benefits of the Program to environmental justice communities?

The NFCRC strongly supports the inclusion of resilience as a heavily weighted bid preference that could have an immediate impact on environmental justice communities by replacing diesel generators and eliminating their future adoption, thus improving air quality and creating immediate health benefits to members of the community. Clean distributed generation, such as that produced by fuel cell systems, has unique features and capabilities to address the need for air quality in geographically diverse communities and serve as alternative power and heat generation sources for users in those communities. Valuing long-duration resilience in the scoring of SCEF projects will offset the use of diesel generators, especially in environmental justice communities that are often disproportionately impacted by poor air quality and its enduring negative health effects.

Fuel cell systems directly displace traditional emergency backup generators (almost exclusively diesel combustion generators) that emit criteria air pollutants and GHG. The resulting reductions of carbon and criteria air pollutants from stationary fuel cells can also make a direct positive impact on local communities.

Through the fuel flexibility of fuel cells and the ability to operate continuously and follow fluctuating electrical (and thermal) loads, fuel cell systems can also provide a critical role in enabling increased penetration of renewable solar and wind resources on the grid. These features of fuel cell systems allow

⁶ <https://www.bloomenergy.com/blog/fuel-cell-powered-microgrids-keep-home-depot-stores-open-through-new-york-power-outages>

⁷ U.S. Department of Energy, *Calling All Fuel Cells*, December 7, 2012. Available at: <https://www.energy.gov/articles/calling-all-fuel-cells>

them to reduce pollutant emissions and improve air quality over and above the improvements that can be made with solar, wind, and energy storage systems alone. By providing always-on zero criteria pollutant emission power, fuel cells can increase adoption of intermittent renewable wind and solar resources in Connecticut while significantly increasing the generation of decarbonized and pollutant-free electricity.

Conclusion

In closing, the NFCRC strongly encourages DEEP to establish Year 3 SCEF bid preferences for energy equity, resilience and landfill and brownfield sites to create immediate positive impacts in local communities.

Sincerely,

A handwritten signature in black ink, appearing to read "Jack Brouwer", with a long, horizontal flourish extending to the right.

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