

BEFORE THE NEW YORK
STATE PUBLIC SERVICE COMMISSION

In the Matter of the Value of Distributed Energy : Case. 15-E-0751
Resources : October 28, 2019

WRITTEN COMMENTS OF
FUELCELL ENERGY, INC.

FuelCell Energy, Inc. (“FuelCell”) hereby submits its Written Comments to the New York Public Service Commission (“PSC” or the “Commission”) in connection with the above referenced proceeding and in response to the Notice Soliciting Comments on the Petition and Staff Whitepaper entitled “Whitepaper Regarding High-Capacity-Factor Resources” (“Whitepaper”).

Introduction and Background

FuelCell is in its 50th year of operation and is headquartered in Danbury, Connecticut with its global manufacturing facility located in Torrington, Connecticut. FuelCell’s fuel cell power plants are exported all over the world and currently has over 300 MW of stationary fuel cells installed, in backlog, or under award on three continents with many more projects under development. FuelCell’s clean, efficient fuel cells have generated over 9 billion kWh of power.

The stationary carbonate fuel cells of FuelCell are well suited to many applications. FuelCell’s carbonate SureSource fuel cells come in 3 sizes: 1.4MW, 2.8MW, and 3.7MW, which are scalable for any project size and are capable of

installation in combined heat and power applications and for grid-scale electricity. There are FuelCell SureSource systems installed at a number of universities including Central Connecticut State University, the University of Bridgeport, the University of California at San Diego, San Francisco State University and many others. Additionally, the company has combined heat and power fuel cell systems operating at hospitals including Hartford Hospital and UC Irvine Medical Center and at industrial facilities, including the Pepperidge Farm Bakery and at Pfizer. There are FuelCell grid-scale systems providing power at a 15MW plant in Bridgeport, Connecticut, and a 59MW installation in South Korea, which is the largest in the world. The 59MW Korean installation is a combined heat and power installation that supplies heat to a local district heating system.

FuelCell's installations form the backbone of several microgrids, including a state of the art microgrid in Woodbridge, Connecticut, installed in collaboration with the local utility that connects critical facilities including police, fire, town hall and the high school with continuous power in times of grid outage, while supplying heat to the high school. The microgrid at the University of Bridgeport uses FuelCell's SureSource 1500 fuel cell system to ensure continued power to critical facilities in the event of a storm or grid failure.

In California, FuelCell recently signed a contract with Toyota to install one of FuelCell's trigeneration carbonate fuel cells at the Port of Long Beach that, in addition to the electricity and heat produced by the fuel cell, will also produce the hydrogen needed by Toyota to fuel its hydrogen vehicles coming into the port.

FuelCell's SureSource fuel cells are easy to site, occupying less than an acre of land per 10MW installed, as compared to approximately 70 acres per 10MW of solar

installed. FuelCell's capacity and availability factors exceed 90%, providing steady, reliable power irrespective of weather. Fuel cells are easily sited in urban areas and FuelCell's projects contribute to the remediation and restoration to the tax rolls of brownfields. Fuel cell projects can provide voltage stability and avoid the need for costly transmission and substation upgrades. Moreover, fuel cells are cost competitive to the grid in certain high cost regions such as California and the East Coast. The cost effectiveness of FuelCell's fuel cell installations is greatly enhanced when thermal use, resiliency and reliability are included in the evaluation.

FuelCell appreciates this opportunity to provide the following comments to the Commission on the Whitepaper in the Matter of the Value of Distributed Energy Resources ("VDER").

Comments

Environmental Value Eligibility

Fuel cell systems operating on any fuel are known to reduce GHG emissions.

Accordingly, FuelCell asks the Commission to correct the record.

Significant reductions in greenhouse gas ("GHG") emissions are achieved with fuel cell systems through:

1. Availability and high capacity factor of generation; and
2. Built-in, always-on resiliency (eliminating the need for back-up power).

Therefore, FuelCell requests that the Commission correct the record on the following erroneous statements on page 5 of the Whitepaper:

In addition, fuel cells using natural gas for generation often have greenhouse gas emissions similar to average greenhouse gas emissions of New York’s grid, which means that generation by fuel cells that replaces use of the grid may have a minimal or no impact on net greenhouse gas emissions. This is particularly true where the waste heat from the generator is not employed to heat buildings or for another useful purpose. Furthermore, as New York’s grid becomes cleaner as the result of the CES and CLCPA, these resources are likely to have greater carbon emissions than the grid average. Therefore, in addition to not clearly reflecting utility savings, continuing to provide the Environmental Value to fuel cells using natural gas and other non-eligible technologies would not reflect the actual environmental benefits, or lack thereof.¹

The above statements from the Whitepaper are factually incorrect. Indeed, fuel cell systems operating on both natural gas and renewable fuel have dramatically reduced GHG emissions in New York and elsewhere.



Figure 1: GHG and Criteria Air Pollutant Reductions from Fuel Cell Systems

Note that the most significant GHG and criteria air pollutant reductions in California’s Self-Generation Incentive Program have been achieved primarily from

¹ Staff Whitepaper, at 5.

systems operating on natural gas.² With a substantial deployment of intermittent and diurnal varying renewables with low capacity factors, California is experiencing challenging grid stability issues and gaps in power generation.

FuelCell's fuel cells are ultra-clean and have unique benefits that can further clean energy strategies. Fuel cells operating on natural gas are considered Class I renewable resources in Connecticut, New York, Pennsylvania, Delaware, Indiana, Maine, New Hampshire, Ohio, Oklahoma, West Virginia and Puerto Rico. South Korea is the largest global market for fuel cells with over 200MW installed. The Korean renewable portfolio standards, which include fuel cells operating on natural gas, were promulgated to reduce carbon emissions and develop local manufacturing of clean energy generation products to accelerate economic growth.

FuelCell's MW scale SureSource fuel cells cost effectively offer customers operating savings, improved resiliency through full grid-independent microgrid operation, achievement of environmental goals with near zero criteria pollutants and a low carbon footprint, fuel flexibility with the ability to run on natural gas or anaerobic digester gas, and additional benefits through heat recovery for combined heat and power applications. SureSource fuel cells are between 47% and 60% electrically efficient, beating traditional average grid efficiency of 35% and can achieve greater than 80% efficiency in a combined heat and power mode.

FuelCell's carbonate fuel cell technology is also capable of cutting edge applications that represent the future of energy. FuelCell is in the early stages of

² *SGIP 2016-2017 Self-Generation Incentive Program Impact Evaluation Report*. Submitted by Itron to Pacific Gas & Electric Company and the SGIP Working Group, September 28, 2018. Available at: <https://www.cpuc.ca.gov/General.aspx?id=7890>.

construction on a demonstration project funded in part by the United States Department of Energy at a coal plant in Alabama owned by the Southern Company. At this project, FuelCell's carbonate fuel cell will take in the flue gas from the coal plant and concentrate and remove up to 90% of the carbon in the coal plant flue gas. In contrast with traditional carbon capture processes, this technology actually produces electricity, thus adding to the revenue stream, as opposed to other carbon capture technologies that consume electricity and add cost.

FuelCell recommends that Commission Staff consistently use marginal emissions in calculating the reductions of GHG emissions from fuel cell systems, rather than average emissions as proposed by the Whitepaper. The approach of using marginal emissions as a baseline is technically and entirely consistent with how New York is calculating the GHG emissions of other technologies and the Benefits Cost Analysis Framework.³ The New York State Energy Storage Roadmap and New York State Energy Research and Development Authority ("NYSERDA") staff recommendations were adopted by the Commission in the *Order Establishing Energy Storage Goal and Deployment Policy*:

The greenhouse gas (GHG) or carbon impact of energy storage is highly dependent on three main factors:

1. The carbon emissions from the generator(s) that charge the energy storage, or the marginal generator at the time of charging if charging from the grid
2. The carbon emissions of the displaced marginal generator(s) when the storage discharges

³ Case 14-M-0101 - Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, Order Establishing the Benefit Cost Analysis Framework (issued January 21, 2016): "Benefits and Costs Included in the Framework," Appendix C, page 2.

3. The round-trip efficiency and ‘parasitic’ losses of energy storage, which refer to the energy losses associate with charging, discharging and maintaining charge[.]⁴

The Whitepaper recommends a methodology that would ignore the significant environmental value of fuel cell systems, and the significant air quality benefits provided by fuel cell systems. The reduced level of criteria air pollutants and air toxics achieved by non-combustion fuel cell systems is unmatched on a per-kW basis, considering the high capacity factor of fuel cell systems, and virtually no criteria air pollutant or air toxics emissions.

It is important to appreciate that fuel cells are a non-combustion technology that emit negligible NOx, Sox, and particulate pollutants, while efficiently producing power through a chemical reaction. Although fuel cells do emit some carbon dioxide, it is only a fraction of the carbon dioxide emitted by traditional combustion generation because of the inherent efficiency of direct power conversion without combustion. Unlike renewable zero carbon resources, fuel cells provide steady continuous power, avoiding the need for backup or peaking generation to solve intermittency issues.

FuelCell respectfully asserts that it would be unfortunate to ignore these many benefits, while simultaneously allowing the installation of combustion-based, polluting generation, would be counter to New York’s Reforming the Energy Vision (“REV”) initiatives that seek to “accelerate deployment of a broad spectrum of renewable

⁴ New York Public Service Commission, *Order Establishing Energy Storage Goal and Deployment Policy*, issued December 13, 2018 (the “Storage Order”) in Case 18-E-0130, In the Matter of Energy Storage Deployment Program.

technologies at various scales ... with a consistent emphasis on projects that provide benefits to the grid.” New York State Energy Plan, Volume 1 at 69.

New York has “made great strides in reducing the emissions of air pollutants that are harmful to public health through its leadership and participation in [Regional Greenhouse Gas Initiative] and other air quality and clean energy initiatives.” Id. at 19. However, many areas currently suffer from poor air quality and face major challenges in achieving clean air and this is particularly true for economically disadvantaged communities that are often disproportionately burdened by air pollution.⁵ The Commission should consider DER such as fuel cells—which produce a wide range of energy, environmental, and economic benefits and award fuel cells environmental value because of the significant value they provide to the state and its citizens. “By off-setting emissions from combustion technologies, fuel cell systems are ideally suited to balance intermittent wind and solar power on the grid while maximizing the GHG and [air quality] co-benefits of renewable energy.”⁶ Moreover, the full lifecycle benefits of fuel cell systems – such as the fact 90% of fuel cell systems can be recycled at end of life and do not end up in landfills – also reduce adverse community impacts.

⁵ See, Disproportionate Exposures in Environmental Justice and Other Populations: The Importance of Outliers, Am J. Public Health, December 2011.

⁶ *Air Quality and GHG Emission Impacts of Stationary Fuel Cell Systems*, An Assessment Produced by the Advanced Power and Energy Program at the University of California, Irvine, March 2018. Available at: http://www.apep.uci.edu/Research/whitePapers/PDF/AQ_Benefits_Of_Stationary_Fuel_Cells_BenMAP_Final_041718.pdf

Existing Projects

Any project with a current deposit should receive full Environmental Value, consistent with policy precedent.

All current projects should be given the current VDER Environmental Value, with a sufficient transition period after a new order is adopted. FuelCell additionally recommends that the PSC first enact changes to the Clean Energy Standard that are required by the enacted Climate Leadership and Community Protection Act (“CLCPA”) that has added Section 66-p to the Public Service Law (“PSL”), and then apply these changes to VDER.

In the Whitepaper, Commission Staff proposes that any project qualifying after August 13, 2019 receive compensation and that this change take effect immediately. Staff Whitepaper at 3, 6.

FuelCell recommends that, consistent with prior precedent, projects with executed contracts are given a 90-day transition period after acceptance of the order. FuelCell does not support the proposed retroactive application of a new policy that has not yet been procedurally implemented by the Commission, which could also have a negative impact on material investments in clean energy. New York State’s general rule⁷ of statutory construction against retroactive operation is applicable to an administrative regulation. 2 N.Y. Jur. 2d Administrative Law § 182; *Meyer v. Zimmer*, 197 Misc. 653, 97 N.Y.S.2d 457 (N.Y. City Ct. 1950), opinion adhered to on reargument,

⁷ See *Strang v. State*, 206 Misc. 734, 736, 134 N.Y.S.2d 871, 873 (Ct. Cl. 1954), which states that “[t]he new statute did change procedure and the mode of attaining a right and thus appears to fall within the exception to the general rule that statutes will not be retroactively construed. 1 McKinney’s Consolidated Laws, Statutes, (1942 ed.), § 55.”

197 Misc. 894, 98 N.Y.S.2d 1003 (N.Y. City Ct. 1950); *Independent Payphone Ass'n of New York, Inc. v. Public Service Com'n of State of New York*, 5 A.D.3d 960, 774 N.Y.S.2d 197 (3d Dep't 2004) (rules promulgated by federal agencies may not be applied retroactively without the express permission of Congress). “It is well settled that retroactivity is not favored in regulatory changes and, absent language requiring such a result, regulations will not be given retroactive effect.” *Zajdowicz v. New York State & Local Police & Fire Ret. Sys.*, 267 A.D.2d 863, 865, (1999). Therefore, administrative rules and regulations are to be applied prospectively, unless there is a clear indication of contrary intent. *Rudin Management Co., Inc. v. Commissioner, Dept. of Consumer Affairs of City of New York*, 213 A.D.2d 185, 623 N.Y.S.2d 569 (1st Dep't 1995). These same rules of retroactive applicability have also been applied by the Commission. See *In Re Seward Park Hous. Corp.*, No. 96-E-0577, 1996 WL 581724 (Sept. 20, 1996) (stating “[a]s to Seward Park's claim that the revised vote regulation should be given retroactive effect, *the intent to apply a regulation retroactively must be clearly stated at the time of adoption*. Nothing in the adoption of the modification to §96.2(e)(1) indicates such an intent.” Emphasis added). In *In Re Seward Park Hous. Corp.*, the Commission also stated “[e]ven where intended, applying a regulation retroactively raises difficult legal questions. See *Rieseberg v. State of New York*, 40 Misc.2d 676 (Ct. of Claims, 1963).” Additionally, it has not been the Commission’s past practice to make immediate changes. For example, projects that initially qualified under the Net Energy Metering tariff were given 90 days to complete study and pay deposit:

Customers will be eligible for Phase One NEM where their DER project: (a) meets the eligibility rules for NEM; (b) is interconnected on or after March 10, 2017; (c) has a payment made for 25% of its interconnection costs, or has its Standard Interconnection Contract executed if no such payment is required,

within 90 business days of the date of this order; and (d) for CDG projects, has a payment made for 25% of its interconnection costs, or has its Standard Interconnection Contract executed if no such payment is required, before the capacity limit for CDG projects under Phase One NEM is reached, which is established by this order for each interconnecting utility.⁸

The Whitepaper Proposals Risk 40MW of Projects Important to Long Island Residents

The Whitepaper's proposals to alter the way fuel cells operating on natural gas are environmentally valued serve to threaten the substantial environmental, economic, and reliability benefits that were the basis of their selection in the first place.

In July of 2017, PSEG Long Island selected three fuel cell projects under its Fuel Cell Resources Feed-in Tariff, totaling 39.8 megawatts. Each fuel cell project will serve a different LIPA electrical substation on Long Island, including:

- An 18.5 megawatt project located near the Brookhaven Rail Terminal in Yaphank.
- A 13.9 megawatt combined heat and power project in the town of Brookhaven.
- A 7.4 megawatt project in the Yaphank Solid Waste Management Center.

These projects were selected for a number of reasons, including their ability to serve the goals of the Tariff by strategically siting distributed generation resources exactly where needed in a manner that is highly supportive of the State's objective of REV.

⁸ New York Public Service Commission, *Order on Net Energy Metering Transition*, Phase One of Value of Distributed Energy Resources, and Related Matters, March 9, 2017.

These three projects address the reliability and resiliency needs on Long Island by locating clean, quiet and affordable power interconnected at key existing electrical substations, which as described in the tariff, “will benefit from the highly reliable injection of a constant power supply.” Indeed, LIPA listed and ranked the nine most severely challenged substations that could benefit and the three fuel cell projects are being sited at three of the top four most challenged substations: Yaphank Solid Waste Management Center (number 1), Clare Rose (number 2), and Brookhaven Rail Terminal (number 4). Finally, as stated by LIPA, in aggregate the three fuel cell projects will allow LIPA to defer over \$78 million in T&D upgrades that would otherwise be needed.

Conclusion

FuelCell appreciates the opportunity to provide comments on the Whitepaper and encourages the Commission to make decisions based on data, facts and judicious policy implementation.

Respectfully submitted,



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