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FuelCell Energy 2015 IEPR Comments on Southern California Electricity Infrastructure Assessment

Additional submitted attachment is included below.

August 31, 2015

California Energy Commission
Dockets Office, MS-4
1516 Ninth Street
Sacramento CA 95814-5512

Re: 2015 Integrated Energy Policy Report (2015 IEPR): Workshop on Southern California Electricity Infrastructure Assessment

I. Introduction

FuelCell Energy, Inc. (FCE) submits these comments to the California Energy Commission (Commission) regarding proposed contingency mitigation options and multi-agency planning to assure electric system reliability in Southern California. FCE is a leading integrated fuel cell company that designs, manufactures, sells, installs, operates and services ultra-clean, highly efficient stationary fuel cell power plants for distributed power generation. Our fuel cell plants are operating in more than 50 locations in nine countries. The growing installed base and backlog exceeds 300 megawatts. In California, the company has 19 operating facilities (with many operating on on-site or in-state biogas) and an experienced, full-time sales and support team throughout the state.

To assure electric system reliability in Southern California, the Commission is focusing on two types of mitigation measures: (1) short-term once-through-cooling compliance date deferral for selected power plants, and (2) a conventional combustion generator option. FCE encourages the Commission to prioritize other methods of mitigating expected shortfalls in local capacity that are more consistent with the state's overarching clean energy and climate protection goals.

II. Southern California Resource Needs and Shifting Climate Policy Goals

The impacts of climate change are already being felt in California, and will disproportionately affect the state's most vulnerable populations.[1] Governor Brown's response has been bold and decisive, proposing to increase from one-third to 50 percent the electricity derived from renewable sources; reduce petroleum use in cars and trucks by up to 50 percent; and double the efficiency savings from existing buildings and make heating fuels cleaner.[2] Governor Brown has also recognized that the state must reduce the release of methane, black carbon and other potent pollutants across industries, and manage farm and rangelands, forests and wetlands so they can store carbon.[3] California's agencies and thought leaders have taken rapid steps to define the issues and key factors necessary to implement the Governor's directives.

[1] http://gov.ca.gov/news.php?id=19048
[2] See Edmund G. Brown Jr. Inaugural Address (January 5, 2015) http://gov.ca.gov/news.php?id=18828. Senate Bill 350, which is currently being considered by the Legislature, would codify these objectives, including an increase in renewable electricity to 50% by 2030.
[3] Id.

On April 29, 2015 Governor Brown issued an executive order that requires the California Air Resources Board (CARB) to cut GHG emissions to 40 percent below 1990 levels by 2030.[4] This is an incremental step towards the goals of AB 32, passed in 2006, which requires the reduction of greenhouse gas (GHG) emissions to 80 percent below 1990 levels by 2050.

III. The Role for Stationary Fuel Cells

The Southern California Reliability Plan should expressly include consideration of stationary fuel cells as a resource that can meet reliability objectives without compromising the state's ambitious goals for reducing GHGs and other pollutants. The reality is that no single power resource can meet all of the objectives identified by the Commission, other state agencies, investor-owned utilities and relevant stakeholders. As a proven form of clean distributed generation, stationary fuel cells provide many benefits of other "preferred" resources without compromising the reliability or predictability of conventional resources. Unlike many options, fuel cells such as those manufactured by FCE can be set to a predictable and variable output capacity without loss of efficiency. In addition, they are responsive to key concerns raised in the Governor's Task Force Report regarding natural gas power plant siting in the South Coast Air Quality Management District (SCAQMD) and throughout the state. FCE's fuel cell plants also can provide predictable reactive power (20 MVAR @ 25 MW) and offer a real alternative to synchronous condensers.[5]

Unlike a conventional gas peaker plant, which generates air pollution in the summer when ozone air quality is already at its worst, fuel cell plants provide reliable, efficient year-round electricity with virtually zero criteria pollutant emissions. Stationary fuel cell installations also offer many attributes complementary to intermittent renewable resources with an emissions profile far lower than gas combustion plants.

In the last decade, our plants have emerged from smaller, customer-side applications to larger, utility-scale projects, often replacing conventional power generation. These installations are unique in their ability to provide efficient, reliable, high quality power and, in the case of combined heat and power (CHP) applications, waste heat, while requiring minimal water consumption and avoiding the pollution and acoustic impacts of combustion resources.[6]

IV. The Future for Stationary Fuel Cells: Biogas, Hydrogen and Carbon Capture

Stationary fuel cells are an ideal resource from the perspective of the state's fuel use and environmental priorities. FCE stationary fuel cell power plants can operate directly on natural gas, onsite biogas, or directed biogas. The plants are "renewable ready" and can offer the Southern California basin the only form of truly predictable capacity with zero greenhouse gas impact and near zero criteria pollutant emissions.

Moreover, as California builds a biogas infrastructure to support both transportation and stationary power generation, fuel cell plants will offer a zero carbon predictable power solution.

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[4] Executive Order B-30-15.
[5] Additional MVAR are available at lower real power (MW) outputs (i.e. 34 MVAR @ 10 MW).
[6] http://www.casfcc.org/2/StationaryFuelCells/WhyFuelCells.aspx

In thinking about increased penetration of renewables and reduction of GHGs, a key question has been which type of renewable energy California should use to achieve a 50 percent goal. Last year, Energy and Environmental Economics, Inc. (E3) released a study commissioned by the state's five largest electric utilities that explored the technical, environmental, and economic implications of raising the Renewables Portfolio Standard (RPS) from 33 percent by 2020 to 50 percent by 2030.[7] In that study, E3 evaluated a number of potential scenarios to achieve a 50 percent RPS, and concluded that "the most valuable integration solutions are those that can reduce solar-driven overgeneration during daylight hours when the system experiences low load conditions."[8] Accordingly, E3 recommended procurement of a more diverse portfolio of renewable resources, which included 4,422 GWh of electricity generated from biogas resources – more than doubling the base case of 2,133 GWh.

Substantially increasing the amount of biogas-derived generation is consistent with the CARB May 7, 2015 concept paper outlining a Short-Lived Climate Pollution Reduction Strategy, in which the agency sets out to "identify strategies and funding mechanisms to encourage and streamline the use of the cleanest technologies to advance the state's air quality, water quality, climate change, and other environmental objectives. Such technologies or strategies may include fuel conditioning of biogas to remove contaminants before vehicle use, injection into the natural gas pipeline, or *fuel cells for electric generation*" (emphasis added).[9]

In addition to meeting renewable energy targets and GHG reduction, criteria air pollutant reduction is another significant state objective, particularly for the SCAQMD. California's air quality issues have led to a legislative mandate for supporting projects with low criteria pollutant emissions and a CARB standard for criteria pollutants. Significant reduction of stationary-source NOx is an important step on the path to meet federal air quality attainment standards.

FCE's fuel cell technology is versatile and capable of producing multiple value streams including the on-site production of high purity hydrogen in addition to ultra-clean electricity and usable heat. This application helps to address the need for a hydrogen fueling infrastructure by cleanly and affordably generating high-purity hydrogen in urban locations. An ideal application is at wastewater treatment facilities to utilize renewable biogas as the fuel source and generate power and heat for the water treatment process and zero-carbon hydrogen for transportation. Price points are competitive with existing hydrogen generation technologies, and the environmental profile is much more attractive than traditional hydrogen generation technologies. This reflects the virtual absence of pollutants by fuel cells and low carbon footprint when utilizing natural gas and carbon-neutral when fueled by renewable biogas.

As recently noted by U.S. EPA Administrator Gina McCarthy, FCE's fuel cell technology can also be used to capture carbon emissions from existing fossil-fueled combustion plants and combustion-based industrial facilities. When in "carbon capture" mode, our fuel cells can destroy approximately 70% of the combustion plant's smog-producing NOx pollutants and produce additional power in an environmentally friendly manner.[10]

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[7] http://blog.ucsusa.org/powering-california-with-50-percent-renewable-energy-by-2030-393
[8] https://ethree.com/documents/E3_Final_RPS_Report_2014_01_06_with_appendices.pdf at 16.
[9] http://www.arb.ca.gov/cc/shortlived/concept_paper.pdf at 14.
[10] Remarks by U.S. EPA Administrator Gina McCarthy, 4/23/2015, available at

FCE is an industry leader in fuel cell projects using on-site and in-state directed biogas. As outlined in the E3 study discussing alternatives for achieving a 50 percent RPS, renewable biogas projects should play an increasingly important role in the shifting clean energy policy mix. Using on-site biogas allows customers such as wastewater treatment facilities and food and beverage processors to avoid the release of this greenhouse gas into the atmosphere or eliminate gas flaring, which emits pollutants and wastes a potential revenue source. The only thing holding back more of these projects it the need for thoughtful policies enabling and advancing them.

V. Conclusion

Stationary fuel cell plants provide a better alternative than either proposed mitigation measure (compliance date deferrals or combustion generators) to assure electric system reliability in Southern California. Consideration of fuel cells as "preferred resources" is consistent with the Energy Action Plan,[11] the California Public Utilities Commission's approach to procurement,[12] and investor-owned utility procurement plans.[13] Unfortunately, California investor-owned utilities currently have little incentive to procure electricity generated by a natural gas fuel cell project over a conventional combustion gas plant. The procurement process emphasizes the importance of "preferred resources" but makes little distinction between natural gas powered fuel cells and natural gas combustion. This lack of distinction creates real barriers that limit fuel cell alternatives that could provide system reliability and be in the best interest of ratepayers.

Stationary fuel cells have enormous potential to help Southern California with grid resiliency issues and can at the same time assist the state with meeting other objectives, such as health-based standards for stationary power generation, future renewable energy goals, and reducing greenhouse gas emissions that contribute to global climate change. We look forward to working with agency and industry stakeholders to advance California's ambitious policy agenda while increasing the visibility of our technology.

Respectfully submitted,

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http://yosemite.epa.gov/opa/admpress.nsf/a883dc3da7094f97852572a00065d7d8/338ed1dee5f0006a85257e3000514f3e!OpenDocument

[11] Energy Action Plan II, Implementation Roadmap for Energy Policies, September 21, 2005, p.2. See also 2008 Energy Action Plan Update pp. 15-16

[12] D.13-02-015 p. 3.

[13] See, e.g. SCE Track 1 Procurement Plan p.2.