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July 30, 2020

California Energy Commission
Docket Office, MS-4
Re: Docket No. 20-IEPR-04
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: IEPR Commissioner Workshop on Assessing the Future Role of Microgrids in California: Docket No. 20-IEPR-04

Doosan Fuel Cell America, Inc. is a global leader in providing clean, continuous-duty, cost-competitive stationary fuel cell energy systems. Our PureCell® systems operate 24/7 with high efficiency and ultra-low emissions, allowing our customers to generate their own electricity and heat onsite while reducing their utility expenses and environmental emissions. In addition to operating on natural gas and renewable natural gas, Doosan produces systems that operate directly on hydrogen which can be produced by renewables such as wind and solar and stored for base load generation when needed.

Doosan Fuel Cell America, Inc. was founded on the strength of the people and technology developed at United Technologies over the past fifty years. We are building on the value of the organization and aspire to be the technology and market leader in the fuel cell industry. Our headquarters are in Connecticut at the site of our world-class fuel cell R&D and manufacturing facilities.

The State of California is one of the most important markets for the emerging fuel cell sector, and fuel cells are contributing greatly to California's goals of reducing greenhouse gas

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emissions, reducing peak load, and improving the reliability of the electric utility system. Doosan fuel cells are installed at nineteen customer sites across California, supplying 15 MW of clean and secure power to a diverse set of customers in a variety of industries. Worldwide, Doosan operates more than 600 units producing over 270 MW with many more coming on line in the next year.

Comments

Doosan Fuel Cell America, Inc. feels that there are many attributes specific to fuel cell systems that will help meet the goals of the State of California when it comes to creating microgrids that will value and ensure the ability of technologies to reliably island for long durations while decreasing both GHG and criteria air pollutant emissions. Microgrids that use fuel cell systems as baseload power generators can immediately disconnect from the grid and island when circumstances demand, for days or weeks as required. Stand-alone fuel cell systems as distributed energy resources (DER) can also create resiliency outside of a microgrid configuration and provide continuous clean power in addition to islanding connection to critical loads on-site.

Doosan suggests the State of California incorporate the following recommendations:

1. Require all generation sources to be CARB certified for distributed generation
2. Implement a single standardized tariff for customer-owned, behind-the-meter microgrids.

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3. Make important changes to the existing fuel cell net energy metering (NEM) tariff to improve resiliency for critical facilities

4. Require health risk assessments for all temporary generation deployments and permanent microgrid installations

Other specific recommendations:

Prioritizing and Streamlining Interconnection Applications

SB 1339 defines "Distributed Energy Resources" as "an electric generation or storage technology that complies with the emissions standards adopted by the State Air Resources Board pursuant to the distributed generation [DG] certification program requirements of Section 94203 of Title 17 of the California Code of Regulations, or any successor regulation."[1]

All other NEM technologies (not just solar and storage) should be included as system types to ensure the greatest immediate impact and reliable performance. Due to technical limitations of energy storage during long-duration grid outages, fuel cells and other distributed generation systems should be included as eligible system types, due to their instantaneous long-duration backup power.

Unpredictable externalities, such as weather conditions, do not impact the reliability of a fuel cell system. Fuel cells provide extended run power without criteria air pollutant or air toxics

[1] Senate Bill No. 1339, Chapter 566, Sec. 2, Ch. 4.5, 8370 (b). Chaptered September 19, 2018. Available at: https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1339

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emissions, attributes that should be prioritized based on the duration of power required at sites that includes critical facilities and vulnerable populations.

Tariff Modernization to Maximize Resiliency Benefits

To truly maximize resiliency benefits through tariff modernization, the Commission should recognize the large-scale and long-duration storage limitations of lithium-ion batteries due to energy density, in addition to other challenges,[2] and include other CARB DG-certified distributed energy resources in the tariff modifications.

Doosan makes the following recommendations to modernize tariffs through amalgamation and maximize resiliency benefits through the creation of one tariff, rather than modifying separate tariffs for individual technologies within one microgrid. This approach allows a microgrid to more fully meet customer requirements and for rapid deployment of the best fit technology solution, in the 2020 wildfire season. Such a tariff would facilitate clean, long-duration backup power at commercial, industrial, municipal, and campus microgrids, in addition to residential paired solar and storage systems.

The single microgrid tariff should address the following barriers to customer-owned, behind-the-meter microgrids:

1. ***Address non-bypassable charges for departing load customers***

[2] Saeedmanesh, A., Mac Kinnon, M. and Brouwer, J. *Hydrogen is Essential for Sustainability, Current Opinion in Electrochemistry* 2018, 12:166–181.

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Customer generation departing loads are subject to utility non-bypassable charges even when electric service is partially or wholly discontinued. Under the existing NEM tariff, customers using fuel cell systems for electric generation are exempt from non-bypassable charges.[3] The new microgrid tariff should exempt customers using CARB DG-certified microgrids from non-bypassable charges.

2. *Reduce standby charges*

Under the existing NEM tariff, customers using fuel cell systems for electric generation are also exempt from standby charges.[4] To the extent that charges for transmission and distribution services are recovered through demand charges in any billing period, no standby charges shall apply in that monthly billing cycle to fuel cell customer-generators.[5] The new microgrid tariff should also exempt behind-the-meter customers from standby charges.

3. *Streamline interconnection of individual microgrids with multiple technologies deployed within them by a single-point of interconnection*

[3] https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_SCHEDS_E-DCG.pdf
[4] https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_SCHEDS_NEMFC.pdf
[5]

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Streamlined interconnection processes for the microgrid services that are required during PSPS events need to exist. Fuel cells can provide additional grid services needed during PSPS events, with a larger size and the ability to island and export continuously.

Fuel cells are inverter-based technologies that are operating in commercial and industrial facilities today, behind-the-meter and in front-of-the-meter grid-connected - with the ability to take on the backup power load requirement. Fuel cell systems do provide grid services, including KVAR, voltage and power factor dispatch. Fuel cell systems also meet the UL1741-SA certification, which requires these capabilities.

As non-combustion generation devices, paired with storage, wind, solar, demand response, or other technologies, fuel cells can serve as the backbone for microgrids that integrate numerous distributed energy resources and controls. Microgrids that use fuel cell systems as baseload power can immediately disconnect from the grid and island (operate autonomously) from the larger grid when circumstances demand (e.g., during grid outages or Public Safety Power Shutoff (PSPS) events). The fuel cell installation inherently operates as an energy management system, with critical loads for backup power already identified and immediately followed in the case of an outage. A fuel cell system can smoothly transition from grid parallel operation to fully power the load for any length of grid outage if fuel is available, without interruption to the end user, and seamlessly re-connect to the utility grid network when its power is restored.

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4. ***Allow for sizing of generation to accommodate additional loads during emergency situations and eliminate nameplate capacity restrictions.***

This includes but is not limited to 1) sizing at the peak load, and 2) sizing to meet the needs of an emergency shelter, grocery store, hospital campus, etc. during an emergency. Also, the current fuel cell NEM tariff is capped at 5 MW for name plate capacity. There are several facilities—hospitals, wastewater treatment facilities, data centers—that have larger loads than this cap and the tariff should not constrain their ability to carry these loads during outages.

Utility Initiatives

Investor-owned utility and community resiliency plans should account for all loads on the system and scenarios to ensure proper microgrid operation for all technologies. Fuel cell systems have operated in microgrids on the east coast and California, seamlessly transitioning to the microgrid mode, with the lowest emissions possible, due to proper utility and project developer planning and coordination amongst IOUs, CCAs, municipalities and project developers that is essential for successful deployment.

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For a consistent definition of clean power, all utility proposals for microgrids in using the CPUC tariff should require all technologies and system types to meet the California Air Resources Board (CARB) Distributed Generation Certification[6] requirements.

Doosan expresses support of one utility proposal to enable permanent Distributed Generation-Enabled Microgrid Services (DGEMS) through a Make-Ready Program to invest in the infrastructure needed to allow high-priority substations and associated downstream infrastructure to operate as microgrids using distributed generation ("DG"). The DGEMS program would be further enabled by Doosan's recommendations to:

- Create a single microgrid tariff that includes multiple technologies in Phase I of the proceeding.
- Expedite and streamline interconnection to all distributed generation systems via a single point of interconnection.

Doosan further supports the proposed Community Microgrid Enablement Program ("CMEP") to provide incremental technical and financial support on a prioritized basis for community requested microgrids for PSPS mitigation purposes. PG&E can guide these communities to the best fit technologies to enable long-duration service to multiple facilities.

Doosan would like to emphasize the importance of coordination between the IOUs, local air districts and CARB in siting, specifying and operating generation equipment, as well as monitoring and reporting air quality – as a priority. The NFCRC recommends that air

[6] https://ww2.arb.ca.gov/our-work/programs/distributed-generation-certification-program

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monitoring and reporting apply not just to temporary generation but across the microgrid program due to the continuous (i.e. long-duration and nighttime) power requirements of generation that could have significant air quality impacts.

A recent CARB report estimates that the use of generators during October 2019 PSPS events emitted 166.4 tons of NOx, 19.4 tons of PM, and 8.9 tons of Diesel PM. Nine tons of diesel PM is equivalent to emissions from almost 29,000 heavy duty diesel trucks (above 14,000 lbs.) driving on California roadways for the period of one month (on average each truck drives around 3,000 miles per month).

Temporary generation has an immediate impact at the local level and inform future emissions requirements that could mitigate the negative health impacts of PSPS. The local air districts are already set up to monitor air quality, and generation already requires a local air permit (there are existing exemptions for fuel cells and other clean stationary generation sources). Again, CARB DG-Certification should also be required for all temporary generation sources.

Conclusion

Doosan appreciates the opportunity to comment on the 2020 IEPR Commissioner Workshop on Assessing the Future Role of Microgrids in California and recommends that the CEC highlight the use of fuel cell systems. The IEPR should prioritize technologies that also reduce air pollutants and increase resiliency, both of which have direct positive impacts on all California communities.

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