



NEWS RELEASE

FuelCell Energy Highlights Advances in Renewable Biogas Applications using SureSource Fuel Cell and Proprietary Gas Treatment Systems

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- Improving reliability and efficiency of renewable biogas applications since first commercial shipment in 2003
- Unique chemistry of carbonate fuel cell avoids de-rating power plant when using on-site biogas
- Proprietary advanced systems developed by FuelCell Energy for cleanup and monitoring of on-site biogas
- Proprietary cleanup skid increases the volume of biogas usable for power generation

DANBURY, Conn., Dec. 30, 2019 (GLOBE NEWSWIRE) -- **FuelCell Energy, Inc.** (Nasdaq: FCEL), a global leader in delivering clean, innovative and affordable fuel cell solutions, recently **announced** the start of commercial operation of the 2.8 megawatt fuel cell project located at the city of Tulare, California's waste water treatment facility. This milestone is the culmination of fifty years of innovation optimizing the application of SureSource power plants for power generation with on-site renewable fuels.

Using biogas began with the company's very first commercial power plant shipment in 2003. That first 250 kW system operated on digester gas at a Kirin Brewery in Japan. A year later the company started the first prototype of today's 1.4MW SureSource 1500 at the King County Wastewater Treatment plant in Renton, Washington. In subsequent years, the company has deployed over 20 MW of fuel cell systems operating on renewable biogas at wastewater treatment facilities agricultural facilities and breweries in California and around the world, leading up to the recently commissioned 2.8 MW Tulare project and the in-development 1.4 MW San Bernardino project.

FuelCell Energy's continued focus on innovation led to a series of improvements in the gas cleaning and purification techniques the company uses to execute on-site biogas applications, leading to the best in class solution for clean power generation from this abundant and ever growing renewable resource. Some of the key advances developed



through this extensive experience include the following:

- **Dual-fuel capability:** In the first Kirin brewery application in 2003, the brewery did not make biogas on the weekends, and natural gas was not available. FuelCell Energy developed a feature that allowed its molten carbonate fuel cells to operate on propane during biogas outages. Now all FuelCell on-site biogas projects include a backup fuel capability, with the on-site biogas backed up by a secondary supply of natural gas or directed biogas.
- **Fuel-blending capability:** At the King County facility, while consistent full power output was desired, the biogas production rate varied through the week. FuelCell Energy developed a feature that allowed its fuel cells to operate on any blend ratio of biogas and natural gas, keeping output at the plants level while biogas availability fluctuated. This fuel blending feature is now standard on FuelCell Energy's platform and supports any project with varying biogas availability.
- **Improved gas cleanup:** Biogas has approximately 60% of the energy content of natural gas due to dilution with carbon dioxide. Biogas includes impurities such as moisture and high levels of sulfur. The carbon dioxide dilution does not cause a problem for carbonate fuel cells as a result of unique properties of the carbonate electrochemistry, however the gas needs to be dried and the sulfur needs to be removed. Early projects used third-party suppliers for gas treatment systems, which suppliers used a variety of approaches based mostly on internal combustion engine experience. Some of those systems were ineffective or unreliable, and in some cases led to projects not meeting expectations due to fuel contamination. Realizing the need to leverage its own research and development expertise, FuelCell Energy developed in-house an improved, proprietary clean-up system. The first SureSource Treatment™ system has been operating flawlessly at the City of Riverside since September 2016, and will be a key element of all biogas projects going forward.
- **Advanced Gas Monitoring:** Sulfur cleanup is very important to fuel processing, and available technologies for continuously measuring sulfur concentration did not have the sensitivity or reliability needed to protect the fuel cell. FuelCell Energy developed a proprietary approach to sulfur detection exponentially more sensitive than anything available on the market. This technology has been operational at Riverside, was recently installed on the Tulare project, and will be a key part of all future projects.

FuelCell Energy, Inc. Media Snippet: FuelCell Energy, Inc.

These advances uniquely position FuelCell Energy to maintain a market leadership position and capture significant market share associated with the growing biogas power generation opportunity. The U.S. Department of Agriculture has previously estimated the potential for electricity generation from biogas in the United States is 4.7

GW, consisting of 0.6 GW wastewater, 2.6 GW landfill, and 1.5 GW agricultural¹. The World Biogas Association estimates the global potential for wastewater and landfill gas opportunities to be 40 – 50 times that of the United States, and the agricultural potential more than 200 times.² Only a fraction of this potential is currently being used for power generation, meaning that biogas methane is being vented or burned in flares, negatively impacting the environment. Widespread application of on-site biogas power production using the advanced technologies developed at FuelCell Energy can eliminate this waste and contribute to global decarbonization objectives.

1 https://www.usda.gov/oce/reports/energy/Biogas_Opportunities_Roadmap_8-1-14.pdf

2 https://www.worldbiogasassociation.org/wp-content/uploads/2019/09/WBA-globalreport-56ppa4_digital-Sept-2019.pdf

Cautionary Language

This news release contains forward-looking statements within the meaning of the safe harbor provisions of the Private Securities Litigation Reform Act of 1995, including, without limitation, statements with respect to the Company's anticipated financial results and statements regarding the Company's plans and expectations regarding the continuing development, commercialization and financing of its fuel cell technology and business plans. All forward-looking statements are subject to risks and uncertainties that could cause actual results to differ materially from those projected. Factors that could cause such a difference include, without limitation, changes to projected deliveries and order flow, changes to production rate and product costs, general risks associated with product development, manufacturing, changes in the regulatory environment, customer strategies, unanticipated manufacturing issues that impact power plant performance, changes in critical accounting policies, potential volatility of energy prices, rapid technological change, competition, and the Company's ability to achieve its sales plans and cost reduction targets, as well as other risks set forth in the Company's filings with the Securities and Exchange Commission. The forward-looking statements contained herein speak only as of the date of this press release. The Company expressly disclaims any obligation or undertaking to release publicly any updates or revisions to any such statement to reflect any change in the Company's expectations or any change in events, conditions or circumstances on which any such statement is based.

About FuelCell Energy

FuelCell Energy, Inc. (NASDAQ: FCEL) delivers efficient, affordable and clean solutions for the supply, recovery and storage of energy. We design, manufacture, undertake project development of, install, operate and maintain megawatt-scale fuel cell systems, serving utilities and industrial and large municipal power users with solutions that include both utility-scale and on-site power generation, carbon capture, local hydrogen production for transportation and industry, and long duration energy storage. With SureSource™ installations on three continents and millions of megawatt hours of ultra-clean power produced, FuelCell Energy is a global leader in designing, manufacturing, installing, operating and maintaining environmentally responsible fuel cell power solutions. Visit us

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