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NEWS RELEASE

SoCalGas and Electrochaea Announce Commissioning of New Biomethanation Reactor System Pilot Project

Innovative project with U.S. Department of Energy's National Renewable Energy Laboratory converts renewable electricity into renewable methane for storage in existing natural gas pipelines

LOS ANGELES, August 13, 2019 – [Southern California Gas Co.](#) (SoCalGas) and [Electrochaea](#) today announced the commissioning of the nation's first scalable biomethanation reactor system at the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) Energy System Integration Facility in Golden, Colo. The technology uses renewable electricity to convert hydrogen into pipeline quality methane for use in homes, businesses and in transportation. Over the next 24 months, the project will assess the commercial viability of this power-to-gas approach to energy storage and decarbonization and provide insights into potential mega-watt scale system designs. The announcement was made in conjunction with NREL's third annual Partner Forum.

Biomethane, or renewable natural gas, is created through this bioreactor system in a two-step process. First, renewable electricity, generated by the sun, passes through an electrolyzer where water molecules are split into hydrogen and oxygen, storing the renewable electricity as hydrogen gas. The newly-created "green" hydrogen is combined with carbon dioxide and piped into the reactor where [archaea microorganisms](#) produce renewable natural gas by consuming hydrogen and carbon dioxide and emitting methane. The system is capable of recycling carbon dioxide from a myriad of sources, such as ethanol plants and anaerobic digesters, preventing greenhouse gas emissions and displacing the consumption of fossil methane. The catalyst was originally developed at the University of Chicago and the basic methanation system was designed by Electrochaea and demonstrated in Europe.

The project in Colorado builds upon and advances research previously conducted by Electrochaea of Munich, Germany. The reactor system operates at a 50 to 60 percent efficiency. For every 10 kilowatts-hour of power received by the water electrolysis model, the equivalent of 5 to 6 kilowatts-hour of methane is created by the microbes.

"This is an exciting time in the development of clean energy," said Yuri Freedman, senior director of business development for SoCalGas. "In order to achieve our climate goals, we need to find solutions to the difficult problem faced with renewables like wind and solar – the issue of intermittency, and extensive mismatches between the periods of renewable energy generation and consumer demand. This project shows our existing natural gas pipeline infrastructure can store excess renewable energy for periods of time ranging from seconds to months."

“We are pleased to be a part of this partnership and to see biomethanation provide a versatile tool for the nation’s renewable energy portfolio”, commented Mich Hein, CEO of Electrochaea. “With SoCalGas and NREL demonstrating the scalability of this technology we can soon realize safe and reliable storage of renewable energy well beyond the capacity of batteries. A simultaneous benefit will be lowering the overall carbon intensity of the natural gas grid, as we have already accomplished with parts of the electrical power grid.”

The next phase of the project will focus on improving the process efficiency, automating plant operations, reducing capital costs and identifying locations in the western U.S., including California, where grid-scale energy storage would be most beneficial and cost-effective.

Studies show that without long-term storage solutions, by 2025 California is expected to waste enough renewable energy each year to power Los Angeles County, the most populous county in the United States, for more than a month.

Electrolytic hydrogen, renewable natural gas and nascent technologies like biomethanation and long-term energy storage through power and gas grid integration are part of [SoCalGas’ integrated plan](#) to help California achieve its ambitious climate goals.

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About SoCalGas

Headquartered in Los Angeles, [SoCalGas®](#) is the [largest natural gas distribution utility](#) in the United States. SoCalGas delivers affordable, reliable, clean and increasingly renewable natural gas service to 21.8 million customers across [24,000 square miles](#) of Central and Southern California, where more than 90 percent of residents use natural gas for heating, hot water, cooking, drying clothes or other uses. Natural gas delivered through the company's pipelines also plays a key role in providing electricity to Californians— about [45 percent of electric power generated](#) in the state comes from gas-fired power plants.

SoCalGas’ vision is to be the [cleanest natural gas utility in North America](#), delivering affordable and increasingly renewable energy to its customers. In support of that vision, SoCalGas is committed to replacing 20 percent of its traditional natural gas supply with renewable natural gas (RNG) by 2030. Renewable natural gas is made from waste created by dairy farms, landfills and wastewater treatment plants. SoCalGas is also committed to investing in its natural gas system infrastructure while keeping bills affordable for our customers. From 2014 through 2018, the company invested nearly \$6.5 billion to upgrade and modernize its natural gas system to enhance safety and reliability. SoCalGas is a subsidiary of [Sempra Energy](#) (NYSE: SRE), an energy services holding company based in San Diego. For more information visit [socalgas.com/newsroom](#) or connect with SoCalGas on [Twitter](#) (@SoCalGas), [Instagram](#) (@SoCalGas) and [Facebook](#).

About Electrochaea

On the basis of biocatalysis, Electrochaea offers a power-to-gas key technology which has been patented internationally. It cost-effectively recycles CO2 and simultaneously produces storable and versatile usable

Renewable Natural Gas from renewable electrical energy. The first industrial scale plant operates successfully in Denmark.

Plants of more than one gigawatt of capacity are targeted by 2025. Managing directors are Mich Hein (CEO) and Doris Hafenbradl (CTO). As CBO & Director of Business Strategy, Francesco di Bari is responsible for business development activities. Gorm Teper completes the management team as Director of Project Execution.