

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Adopt  
Biomethane Standards and Requirements,  
Pipeline Open Access Rules, and Related  
Enforcement Provisions.

Rulemaking 13-02-008  
(Filed February 13, 2013)

**ELECTROCHAEA CORPORATION OPENING COMMENTS ON  
THE PROPOSED DECISION IMPLEMENTING SENATE BILL 1440  
BIOMETHANE PROCUREMENT PROGRAM**

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## SUBJECT INDEX OF RECOMMENDED CHANGES

- The definition of biomethane in Finding of Fact 6 is incorrect and the PD should be revised to reflect Electrochaea’s correction of the biomethane definition.
- The Commission should include in the assessment of proposed pilot projects consideration of whether the project is capable of expansion and the potential of the technology in the longer term.
- The Proposed Decision should be revised to authorize a broader range of pilot projects for any renewable natural gas technologies capable of expansion and that have long term potential to supply decarbonized fuel.

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THE PROPOSED DECISION IMPLEMENTING SENATE BILL 1440  
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In accordance with Rule 14.3 of the California Public Utilities Commission’s (“Commission”) Rules of Practice and Procedure, Electrochaea Corporation (“Electrochaea”) submits the following opening comments on Revision #1 of Commissioner Rechtschaffen’s Proposed Decision Implementing Senate Bill 1440 Biomethane Procurement Program (“Proposed Decision” or “PD”), issued on January 6, 2022.

**I. INTRODUCTION AND SUMMARY**

Electrochaea supports the implementation of a well-designed biomethane procurement program that supports the decarbonization of California’s gas infrastructure in meeting the State’s climate objectives. Our comments are focused on (1) a clear definition of the renewable gas that qualifies for the renewable gas standard and (2) further clarity on the topic of biomass to biomethane pilot projects.

Electrochaea’s interest in this proceeding is primarily focused on the foundation this decision will provide not just for the short-term renewable gas standard, but for the support of current and future technologies, which can provide low-carbon intensity gas to the State. Electrochaea provides a decarbonized fuel alternative to fossil gas in California using a microorganism called Archaea. Through a biomethanation process, carbon dioxide and renewable hydrogen are combined to produce renewable methane. The renewable hydrogen can

be generated using renewable power, and the resulting renewable methane produced through Electrochaea's proprietary process is of a quality that can be delivered through or stored by the State's existing gas infrastructure, making it a drop-in replacement for fossil natural gas. This power-to-gas process is a flexible technology that can utilize the existing natural gas infrastructure and existing markets to serve California's core and noncore customers.

Electrochaea's comments on the PD are intended to encourage further refinement of a biomethane procurement framework to accommodate emerging technologies including power to gas.

## **II. DISCUSSION**

### **A. The Proposed Decision Must Establish a Technology-independent Definition of Renewable Gas that Qualifies for the Renewable Gas Standard**

In the short-term, the Proposed Decision is focused on production of biomethane from organic waste that will be diverted from landfills. The biogas that will be produced from the organic waste primarily contains methane and CO<sub>2</sub>. To prepare the biogas for gas grid injection, the CO<sub>2</sub> must be separated from the methane and in current practice the CO<sub>2</sub> is vented into the atmosphere. This fact is recognized in the PD and it is stated that this CO<sub>2</sub> should be sequestered or utilized.<sup>1</sup> Biomethanation is one such method of utilization that results in the production of additional biomethane, typically between 70-100% more biomethane. It is critical that this additional methane qualify as a renewable gas to meet the renewable gas standard targets.

In Electrochaea's opening comments on the Phase 4A Staff Proposal,<sup>2</sup> we noted the following:

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<sup>1</sup> PD at 35.

<sup>2</sup> Electrochaea Corporation Opening Comments on Administrative Law Judge's Ruling Directing Parties to File Comments on Phase 4A Staff Proposal and Related Questions, June 30, 2021, available at <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M394/K797/394797011.PDF>.

[I]t is unnecessary and restrictive of evolving technologies to define biomethane as coming from anaerobic digestion. Senate Bill 1440 states “For purposes of this article [SB1440], ‘biomethane’ means a biogas that meets the standards adopted pursuant to subdivisions (c) and (d) of Section 25421 of the Health and Safety Code for injection into a common carrier pipeline.” By listing the possible sources of biomethane, the Staff Proposal unnecessarily disqualifies new technologies that were not commonly known or adequately considered at the time of writing.<sup>3</sup>

In the PD it is indicated that biomethane and bio-synthetic natural gas (“bio-SNG”) are categories of renewable gas that would qualify for the procurement targets. An inclusive definition of biomethane which anticipates all low-carbon intensity drop-in replacements for natural gas without prescribing a particular technology would further expand decarbonization of the fuel supply. The potential of expanding renewable natural gas (“RNG”) technologies is especially important considering concerns regarding the ability of the utilities to achieve the biomethane targets set by the PD and the overall availability of renewable fuels in California.<sup>4</sup>

In Finding of Fact (6), the PD states that biomethane is methane produced by bacterial activity in organic material.<sup>5</sup> However, this is incorrect and needs to be revised. Biomethane is produced by anaerobic digestion of biomass both by bacteria and by archaea, two different organisms in different domains within the tree of life.<sup>6</sup> Electrochaeta provides revisions correcting the definition of biomethane in the Appendix to these comments.

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<sup>3</sup> *Id.* at 12.

<sup>4</sup> “We acknowledge that it may be difficult to achieve the eight million-ton target by 2025, as addressed in the Joint Utilities’ opening comments, but recommend that the gas IOUs’ respective procurement plans should evaluate feasibility and provide guidance on compliance mechanisms necessary to meet the 2025 target.” (PD at 26.)

<sup>5</sup> PD at 42.

<sup>6</sup> There are three domains of life: Bacteria, Archaea, and Eukarya. Bacteria and Archaea are both microorganisms, but they are distinct. Within the Bacteria and Archaea there are organisms that are methanogenic (produce methane). (See, e.g., Pampillón-González L, Ortiz-Cornejo N, L, Luna-Guido M, Dendooven L, Navarro-Noya Y, E., *Archaeal and Bacterial Community Structure in an Anaerobic Digestion Reactor (Lagoon Type) Used for Biogas Production at a Pig Farm*. *J Mol Microbiol Biotechnol* (2017) 27:306-317, available at <https://www.karger.com/Article/FullText/479108> (“Anaerobic

**B. The Proposed Decision’s Discussion of Authorized Pilot Programs Requires Clarification and Could Be Further Improved to Encourage Feasible Technologies.**

The PD authorizes Pacific Gas and Electric Company (“PG&E”) and Southern California Gas Company (“SoCalGas”) to propose more than one pilot project each, and authorizes PG&E and SoCalGas to propose pilot projects that procure “bio-SNG from forest, agricultural, and urban wood waste pyrolysis and gasification projects using methanation.” In addition, it is stated that the pilots should “propose methods for using CO<sub>2</sub> in CCS/U projects rather than venting to the atmosphere.”<sup>7</sup> Electrochaea emphasizes that the additional renewable methane produced from the available CO<sub>2</sub> must qualify for the renewable gas standard. Electrochaea also encourages the Commission to require that the pilot projects include an assessment of the operational, decarbonization, and economic assessments of these technologies to be scaled up for long-term potential.

These pilot programs are an opportunity for utilities to exercise discretion in considering a broader suite of available renewable gas technologies and should not be limited by the definitions in SB 1440. Electrochaea encourages the Commission to authorize pilots that open the door to a wider range of solutions that will decarbonize the fuel supply beyond gasification and pyrolysis. Pilots should be permitted to be technology agnostic, with the utilities able to assess pilots based on long-term potential of the technologies to provide low-carbon intensity gas to the State.

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digestion consists of synergistic and sequential processes done by bacterial and archaeal groups.”); V. Moset, A. Cerisuelo, P. Ferrer, A. Jimenez, E. Bertolini & M. Cambra-López, *Microbial examination of anaerobic sludge adaptation to animal slurry*, *Environmental Technology* (2013) 35:6, 749-758, available at <https://www.tandfonline.com/doi/abs/10.1080/09593330.2013.848940>.

<sup>7</sup> PD at 37.

The Appendix to these comments suggests changes to Ordering Paragraph 22 that are intended to eliminate conflict between the language in the PD and the pilot programs described in the ordering paragraph, and suggests that utilities be permitted a more technology neutral approach to selecting pilot projects.

### **III. CONCLUSION**

Electrochaea appreciates the opportunity to provide opening comments on the Proposed Decision and encourages the Commission to revise the Proposed Decision to encourage a broader suite of renewable gas technologies.

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Respectfully submitted,

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## APPENDIX

### Electrochaea Corporation's Proposed Changes to the Findings of Fact, Conclusions of Law, and Ordering Paragraphs for the Proposed Decision

(Proposed deletions are struck out, proposed additions are double underlined.)

#### Changes to Finding of Fact 6

6. Biomethane is methane produced by ~~baeterial~~ microorganism activity in organic material.

#### Changes to Ordering Paragraph 22

22. Southern California Gas Company and Pacific Gas and Electric Company shall file an application no later than January 1, 2023, proposing at least two ~~woody biomass gasification pilot~~ projects focused on conversion of biomass to biomethane. These pilot projects shall include the procurement of bio-SNG from forest, agricultural, and urban wood waste pyrolysis and gasification projects using methanation. In addition, Southern California Gas and Pacific Gas and Electric Company may also propose pilots supplying RNG by other processes that have significant potential to reduce GHG emissions based on a life cycle analysis of the technology. Southern California Gas Company and Pacific Gas and Electric Company shall explore ~~and~~ coordinateion of such gasification projects and strategic placement with the pilot projects authorized for the Department of Conservation by Senate Bill 155. The project cost shall include pipeline extensions to the pilot facilities. Pipeline extensions should facilitate future potential extensions for additional projects and the pilots should propose methods for using carbon dioxide in carbon capture and storage or use projects rather than venting it to the atmosphere. Pilots proposed should test technologies that are capable of expansion and that have significant potential to increase the renewable natural gas supply in the longer term.