DOCKETED	
Docket Number:	23-IEPR-06
Project Title:	Hydrogen
TN #:	252346
Document Title:	Josh Harmon Comments - PG&E Comments on IEPR Workshop on the Potential Growth of Hydrogen
Description:	N/A
Filer:	System
Organization:	Josh Harmon
Submitter Role:	Public
Submission Date:	9/21/2023 5:18:06 PM
Docketed Date:	9/22/2023

Comment Received From: Josh Harmon
Submitted On: 9/21/2023
Docket Number: 23-IEPR-06

PG&E Comments on IEPR Workshop on the Potential Growth of Hydrogen

Additional submitted attachment is included below.

Josh Harmon
CEC Liaison
State Agency Relations

1415 L Street, Suite 280
Sacramento, CA 95814
(628) 777-4138
Joshua.Harmon2@pge.com

September 21, 2023

California Energy Commission
Docket Number 23-IEPR-06
715 P Street
Sacramento, CA 95814

RE: IEPR Commissioner Workshop on the Potential Growth of Hydrogen

Pacific Gas and Electric Company (PG&E) appreciates the opportunity to comment on to the California Energy Commission's (CEC) Integrated Energy Policy Report (IEPR) Commissioner Workshop on the Potential Growth of Hydrogen held on September 8, 2023.

PG&E acknowledges the need for further education and clarification of the role for hydrogen in California's energy future and welcomes the opportunity to collaborate with agencies and stakeholders who support decarbonizing California's energy system as quickly as possible. PG&E is committed to reaching a net-zero energy system by 2040, five years ahead of California's statewide goal. To make this transition, we expect a diverse mix of resources to be available—including broad electrification, cleaner fuels such as RNG and hydrogen, nature-based solutions, and carbon capture, storage, and utilization.

It is through this lens that we provide the following recommendations to the California Energy Commission (CEC) and the other state agencies leading the transition to a clean, sustainable, and net-zero emissions energy system.

PG&E recommends that the CEC review and support mid-stream hydrogen infrastructure investments targeted at decreasing permitting and hydrogen transportation costs.

During a workshop for SB 1075 on September 5th, the California Air Resources Board (CARB) noted that 'permitting and building of infrastructure to support climate and air quality goals' will be an area in need of significant work ahead. The State can reduce both the time and cost of hydrogen deployment at scale by supporting projects that seek to validate use of existing infrastructure for hydrogen transport. Therefore, PG&E recommends the State pursue and financially support projects that decrease the dependency on permitting.

The Federal government has various programs designed to facilitate hydrogen production (IRA hydrogen production tax credit), and end uses, (DOE Hydrogen Hubs program). However, there remains a gap in

financial support to implement full-scale hydrogen transportation infrastructure.[1] PG&E recommends the CEC support mid-stream infrastructure for the transport of hydrogen and identify opportunities to close this gap by providing funding for projects that unlock the potential of the entire hydrogen system by connecting production to end uses.

PG&E recommends the CEC to support development of programs to facilitate hydrogen blending into existing natural gas infrastructure.

The CPUC is currently examining hydrogen blending in Rulemaking 13-02-008: *Decision Directing Biomethane Reporting And Directing Pilot Projects To Further Evaluate And Establish Pipeline Injection Standards For Clean Renewable Hydrogen.* In this proceeding, the CPUC's Energy Division has identified three key considerations for hydrogen blending into existing natural gas pipeline systems:

1) Is injection of hydrogen into the methane system a good environmental solution?
2) Is the risk worth the reward?
3) How do test scenarios translate to broader system impact?

While these questions are explicitly being asked in a CPUC Rulemaking they are also relevant to the CEC as it explores the potential for Hydrogen through the IEPR. Below we address each of these key questions:

Hydrogen Injection

PG&E believes that injection of hydrogen into the existing natural gas pipeline system is a good environmental solution and will allow for benefits to be achieved sooner than waiting for dedicated hydrogen infrastructure. In the short- to medium-term, all means of emissions reduction should be considered given the urgency of the climate crisis before us.

However, another important metric is the cost to implement emissions reduction strategies as affordability must go together with decarbonization. The State's energy system cannot be transitioned immediately, so incremental progress should be pursued wherever practical and possible. While challenges exist, hydrogen is one of the most promising avenues to reduce the emissions associated with the use of energy delivered through the natural gas pipeline system.

In addition to reducing emissions from gas combustion, blended hydrogen can be separated after delivery through the pipeline network, enabling the use of 100% hydrogen in applications such as transportation, industrial feedstock, green ammonia for agriculture, and small-scale power generation.

For example, electric microgrids that can help reduce risks to the larger electric grid can be powered by clean renewable hydrogen and are technically viable today, as demonstrated by PG&E's microgrid project designed to support the city of Calistoga. When hydrogen is used with fuel cells in this way there are zero emissions apart from water. Deblending technology is within

[1] PG&E is investing in mid-stream hydrogen infrastructure research through participation in DOE's Pipeline Blending CRADA (HyBlend) and other Joint Industry Projects (through PHMSA, California Energy Commission, Pipeline Research Council International, etc.). These research projects close knowledge gaps at a laboratory scale. Financial assistance to implement full-scale research is needed.

the scope for demonstration at the Hydrogen to Infinity project and PG&E is already in conversation with several vendors working in this space.

Risk / Reward

PG&E agrees that the assessment of risk and ensuring safety are key considerations related to blending of hydrogen into natural gas infrastructure.

The Hydrogen to Infinity (H2∞) project[2] will enable large scale decarbonization of natural gas networks by demonstrating it is safe to leverage existing infrastructure for long-distance transmission of hydrogen. This will minimize the need for capital intensive new pipeline networks to deliver hydrogen at scale and minimize the need to permit new pipelines.

Pacific Gas and Electric Company (PG&E) and partners are in the engineering design stages of this major initiative (which was announced in May 2022) as the centerpiece of PG&E's efforts to explore the use of hydrogen as a fuel to help reduce greenhouse gas (GHG) emissions. H2∞ will be the most comprehensive end-to-end hydrogen study and demonstration site in the US—carrying out full-scale, real-world testing of high hydrogen concentrations at high system pressures. It will fill critical gaps in global knowledge about how to implement carrying high-concentration blends in existing high-pressure transmission systems. The H2∞ project will be a leap forward, providing information that will help advance global efforts to utilize hydrogen as a valued tool in society's decarbonization toolbox.

The H2∞ facility includes low-carbon hydrogen production and significant consumer loads, full-scale testing in high-pressure transmission assets with a comprehensive RD&D program, education and training facilities for workforce transition and internal and external stakeholder education, as well as a hydrogen refueling station to support local low-carbon fleets.

Transmission pipelines are more economical than trucks for long distance transportation of large amounts of hydrogen. Using existing infrastructure would be less expensive than constructing new systems. Robust research around the world has yielded valuable information about low hydrogen concentrations in low-pressure distribution systems. However, to significantly reduce GHG emissions, higher hydrogen concentrations are needed, and the blended fuel will need to be transmitted at higher pressures to carry fuels long distances.

H2∞ will fill critical safety and system-integrity information gaps, advancing understanding of how blends with different hydrogen concentrations will affect transmission infrastructure when transmitted at high pressures. This ambitious endeavor will enhance US leadership in adopting alternative fuels to reduce our carbon footprint.

As the benefits of H2∞ will be shared well beyond PG&E customers we request support from the Joint Agencies, including the CEC, and from ARCHES, in our pursuit of state and federal funding to reduce the financial burden on PG&E customer rates. Hydrogen to Infinity is a project that can enable large-scale decarbonization in a cost-effective way that may be replicated across the country.

[2] https://www.pge.com/en_US/about-pge/environment/hydrogen.page?WT.mc_id=Vanity_hydrogen

Due to the nationwide and interconnected nature of natural gas infrastructure, PG&E recommends the CPUC engage the National Association of Regulatory Utility Commissioners (NARUC) on the topic of hydrogen blending. PG&E could be a host to a national collaboration of utilities, overseen and supported by various utility commissions working synergistically to decarbonize the interstate natural gas systems. PG&E recently discussed the Hydrogen to Infinity project with leadership from the Pipeline and Hazardous Materials Safety Administration (PHMSA), and this coordination with NARUC was one of their recommendations.

Test Scenarios

Comprehensive full-scale research and testing programs that build on and validate existing research and small-scale models will effectively simulate real-world conditions. In collaboration with leading global experts, including staff from national laboratories, PG&E's H2∞ project will focus on the impact from hydrogen blending on all aspects of gas transmission, which is not fully understood by the industry. The project has three components: (1) research, development, and demonstration (RD&D); (2) education; and (3) market activation,

For RD&D, the primary components are:

- Full-Scale Pipeline Loop—built and operated as real-world natural gas transmission pipelines are, but completely standalone so that tests can be run safely
- Full-Scale Destructive Testing—facilities to enable full-scale equipment compatibility and leak, materials, and integrity testing
- Laboratory—advanced research and testing facility, control center and digital infrastructure for monitoring and controlling the pipeline and testing equipment

A partial list of program topics ranges from materials compatibility over long durations and varied operating conditions, operations and maintenance including training for workers, welding considerations, leak detection, inspection practices, measurement and control, and compression.

PG&E recommends the CEC oppose additionality requirements for clean hydrogen production.

The US Treasury Department is tasked with providing implementation guidance for the new, Section 45V of the tax code, created under the Inflation Reduction Act, which establishes a clean hydrogen production tax credit. One aspect under consideration for the guidance is the concept of additionality, where only hydrogen produced from newly installed renewable energy projects would be eligible for the tax credit. PG&E opposes the implementation of an additionality requirement for two main reasons:

1. Requiring new dedicated renewable energy resources to be deployed for hydrogen production would significantly increase the total cost to produce clean hydrogen, undermining the intent of the hydrogen production tax credit.
2. California already curtails excess renewable energy[3] that could be used to produce clean hydrogen. Additionality requirements would strand more renewable energy that could be used to decarbonize electricity at a future time when new renewables aren't sufficient.

[3] In 2022, California has curtailed more than 1,860 gigawatt-hours of wind and solar. http://www.caiso.com/informed/Pages/ManagingOversupply.aspx

The California Independent System Operator includes energy storage as a solution to renewables' curtailment[4] and hydrogen production fits this role well as an energy storage medium.

PG&E agrees with the sentiment of additionality requirements, in that we do not want hydrogen production to result in any increase in carbon emissions. Rules that enable high-GHG emission hydrogen production are counterproductive to our company goals and would not show good leadership on climate action. Ideally, all renewable power is used instead of being curtailed. This is the best use of existing resources and encourages rapid hydrogen infrastructure deployment.

--

PG&E appreciates the opportunity to comment on the CEC's IEPR Commissioner Workshop on the Potential Growth of Hydrogen and looks forward to continuing to collaborate with the CEC. Please reach out to me if you have any questions.

Sincerely,

Josh Harmon
State Agency Relations

[4] https://www.caiso.com/informed/Pages/ManagingOversupply.aspx