



Clean Hydrogen Program
 Energy Research and Development Division
 California Energy Commission
 715 P Street
 Sacramento, CA 95814

December 20th, 2023

Re: Clean Hydrogen Definition

INTRODUCTION

On behalf of the Greenlining Institute, Sierra Club CA, Asian Pacific Environmental Network (APEN), the Climate Center, Local Clean Energy Alliance, Center on Race, Poverty, and the Environment, Pacific Environment, Center for Community Action and Environmental Justice (CCAIEJ), Natural Resources Defense Council (NRDC), Mothers Out Front, Physicians for Social Responsibility - Los Angeles (PSR-LA), and Just Solutions Collective, we urge the California Energy Commission, “CEC”, to adopt the definition of clean hydrogen below for the Clean Hydrogen Program and all solicitations under the program.

The Clean Hydrogen Program, the “Program”, was established to demonstrate hydrogen projects in California that “help reduce sector-wide emissions” and “maximize air quality, equity, health, and workforce benefits”.¹ We are concerned that the Program’s current definition² is not extensive enough to ensure hydrogen production is truly clean and zero emissions, and does not support the buildout of energy sources that harm environmental justice communities. We urge the CEC to adopt our proposed definition of clean hydrogen so that hydrogen demonstration projects funded through the Program can become a standard in California for hydrogen research and deployment that adheres to environmental and equity guardrails.

The language bolded below is our definition of clean hydrogen for the Program and the italicized language provides further insights into our concerns.

Definition

Clean hydrogen is hydrogen that is produced through electrolysis of water using eligible renewable energy sources:

- 1. Eligible renewable energy sources are defined under the California Renewables Portfolio Standard Program (Article 16 (commencing with Section 399.11) of Chapter 2.3 of Part 1 of Division 1 of the Public Utilities Code)**
- 2. Electricity used must be end-to-end zero emissions, meaning that there are zero greenhouse gases or co-pollutants [air and water] from the electricity production or electricity feedstock production, including but not limited to NOx, methane, ammonia, and volatile organic compounds. Feedstock sources including biomass and digester gas must not be permitted.**

Under the end-to-end zero emissions standards, feedstock sources such as biomass and digester gas must not be permitted. The biomass industry has a concerning legacy of polluting low-income communities of color in the U.S.³ and many in the scientific field dispute the inclusion of biomass as “renewable” given its inaccurate carbon neutral or carbon negative assumptions from net emissions due to regrowth.⁴ Production of digester gas, or “factory farm” gas, from the dairy industry in California has been a major contributor to groundwater contamination, harmful air pollution including ammonia which can seriously impact human health⁵, and other negative impacts on communities living in the Central Valley⁶.

Including biomass and digester gas as part of the developing hydrogen industry in California will incentivize pollution⁷ and perpetuate the harmful impacts these industries have in low-income communities of color. We cannot support a definition of clean hydrogen that includes biomass and digester gas, and strongly recommend that the CEC do not fund hydrogen pilot projects that use these feedstock sources.

¹ [Bill Text: CA AB209 | 2021-2022 | Regular Session | Chaptered | LegiScan](#)

² From Clean Hydrogen Program’s draft solicitations: “Clean hydrogen is defined as hydrogen that is produced from water using eligible renewable energy resources, as defined in California Public Resources Code Section 25741, and is subject to the requirements of Public Utilities Code 399.12(e)(1)(A)-(D) and 399.12(e)(2) or produced directly from eligible renewable energy resources.”

³ [Siting of Wood Pellet Production Facilities in Environmental Justice Communities in the Southeastern United States](#)

⁴ [Serious mismatches continue between science and policy in forest bioenergy](#)

⁵ [Ammonia emissions from agriculture and their contribution to fine particulate matter: A review of implications for human health - ScienceDirect](#)

⁶ [Dairy Digesters: Not A Solution - Leadership Counsel for Justice & Accountability](#)

⁷ [California Has Provided Incentives for Methane Capture at Dairies, but the Program May Have ‘Unintended Consequences’](#)

Clean hydrogen production must also be consistent with the following three pillars:

1. Additionality

- a. The facility generating the electricity used for the production of clean hydrogen demonstrates that the electricity it uses comes from a new renewable generation resource developed specifically to serve the clean hydrogen production process, consistent with prohibitions of resource shuffling in subdivision (a) of Section 454.53 of the Public Utilities Code**

A concern with hydrogen production from renewable energy sources is "resource shuffling". This is when existing renewable sources are used to produce hydrogen, an electricity-intensive process, that prevents these renewable sources from being used in other sectors. This could then necessitate operating polluting fossil fuel power plants, consequently resulting in more carbon emissions actually being emitted through hydrogen production. The pillar of additionality is necessary for any scenario of clean hydrogen production to ensure that the process is not straining the state's existing renewable resources. Additionality must be specified under any PPAs and tradeable renewable energy credits should not be allowed.

2. Deliverability

- a. The new renewable generation resource must be located and interconnected in the same electric distribution circuit in which the clean hydrogen production facility is sited.**

Deliverability ensures that hydrogen is produced only through renewable resources within the balancing area. Establishing regional barriers helps address the resource shuffling issue and prevents increased demand from polluting electricity sources.

3. Hourly Matching

- a. Clean hydrogen production occurs exclusively during the same hours as the facility generating the electricity operates, matched on an hourly basis, and puts forth an hourly renewable energy certificate for purposes of demonstration.**

Requiring hourly matching further ensures that clean hydrogen production is directly drawing on renewable resources at all times.

Clean hydrogen production must not exacerbate water scarcity issues in California. Local water supply availability, competing water rights, and water-efficient methods must be considered in the siting and design of clean hydrogen production projects and discussed in a public forum.

Hydrogen produced through electrolysis will be a significant consumer of precious freshwater resources in the U.S.⁸ California already struggles with water shortages, including from the Colorado River Basin, and clean hydrogen projects must not exacerbate those existing environmental and community impacts.⁹ There are many potential sources for the high-purity water needed for electrolysis. The CEC must fully consider challenges with the energy-water nexus in California from clean hydrogen production by identifying water supply sources with the least impact as well as utilizing water-efficient methods, such as wastewater treatment and recycling, as part of the system design. Having a public engagement process to discuss

⁸ [Water consumption from electrolytic hydrogen in a carbon-neutral US energy system - ScienceDirect](#)

⁹ [Water requirements for various approaches to hydrogen production: Quantitative, Siting, and Resilience Considerations - IEER Report prepared for Just Solutions Collective](#)

appropriate water sources for clean hydrogen projects, as well as the environmental justice impacts of wastewater treatment or desalination plants and the disposition of their attendant waste streams, and potential concerns with local water supply availability and water rights will be critical to avoid exacerbating water justice issues. The public engagement process should at minimum include community engagement to vet the approaches, conducting a thorough analysis of potential impacts, and building the engagement timeline in coordination with the project timeline to ensure adequate time to correct for unintended consequences as needed.

Conclusion

Clean hydrogen is only clean with these guardrails on its production. The CEC must take the initiative to set an example of how truly clean hydrogen is produced and deployed in California. The signed organizations urge the CEC to adopt our definition of clean hydrogen for the Clean Hydrogen Program, and in all subsequent solicitations, to meet the Program's goals of reducing emissions and prioritizing community. We welcome the opportunity to work with the CEC further to create a standard for clean hydrogen in its hydrogen demonstration projects.

Sincerely,

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