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Comments on Clean Hydrogen Progam Workshop

Please accept the attached comment document from Climate Action California and 350 Humboldt regard the ideas presented at the recent workshop on Clean Hydrogen

Additional submitted attachment is included below.

December 12, 2022

Rizaldo Aldas, Program Manager for Renewable Energy and Advanced Generation Research and Development, Energy Research and Development Division
Kevin Uy, Manager, Energy Generation Research Office, Energy Research and Development Division
California Energy Commission
By online submission

Re: Comments on CEC Clean Hydrogen Workshop, December 2, 2022

Thank you for the excellent presentation of the Energy Commission's (CEC's) proposed program to encourage the production of green hydrogen. Subject experts at Climate Action California and 350 Humboldt believe that the emphasis on producing hydrogen via electrolysis of water using wind and solar energy is exactly the right benchmark for the technology California needs to reach our climate goals. We especially appreciated the examples you cited of projects by Air Products and Plug Power.

We strongly disagree, however, with several remarks made during verbal feedback by representatives of industries wishing to use carbon-containing feedstocks as part of this program. Such technologies should not be supported by this program.

- The highest priority for all projects supported should be to achieve the lowest carbon intensity per kg of hydrogen produced, measured in Scopes 1, 2, and 3 and via life cycle assessment of impacts on emissions. As we know, electrolysis is likely the most efficient process for creating hydrogen because it operates as close to reversibility as possible, thus creating minimum entropy, i.e. minimum waste heat. The efficiency can be as high as 72% as you point out. CEC should support **research on novel production technologies only if preliminary calculations and beta testing reveal that the lifecycle emissions profile of the new approaches are lower than that of electrolysis.**
- For obvious reasons, **the second highest priority should be to achieve the minimum carbon emission goal at the lowest possible cost.** As an example, biomass is not cost-competitive and continues to be used only because it is heavily subsidized. Most important, burning biomass is very inefficient due to waste heat produced. **The use of biomass to power H_2 production should not be funded for research by CEC.**
- The third priority should be to **minimize both water use and emissions of criteria and climate pollutants such as PM2.5 and NO_x.**

Environmental Justice considerations: Use of electrolysis should minimize impacts to local communities as it produces minimal toxic pollutants. Regarding siting, the plant only needs to be located near a source of water (such as recycled water from a wastewater plant) and have access to renewable electric power. By contrast, hydrogen produced using carbonaceous fuel sources

must have access to a means of transport of the raw material which is likely to expose vulnerable communities to yet more pollution.

We also agree with speakers at the workshop that the end use of any hydrogen produced under this program must not be for petroleum refining. Existing refineries must be rapidly phased out if California has any hope of meeting its climate goals, so investing in new sources of clean hydrogen for a climate-destroying industrial base is illogical as well as counterproductive and wasteful. **Due to its high cost and low efficiency compared to direct use of electricity, H_2 should be used only for applications that are difficult to electrify, such as aviation, marine shipping, heavy duty trucks, metals, glass, and concrete as well long-term utility energy storage.**

In addition, we want to take this opportunity to register our disagreement with elements of CEC's September 21, 2021 GFO-21-502 Pre-Application Workshop, "Advancing Cost and Efficiency Improvements for Low Carbon Hydrogen Production.", Baldomero Lasam of your Energy Research and Development Division proposed research in the following areas:

- *Hydrogen production technology from biogas or biomethane in partnership with a dairy digester facility*
- *Hydrogen production technology from biogas or biomethane in partnership with a wastewater treatment facility with fully operational digester and biogas system*
- *Hydrogen production system that generates other value products such as heat and power.*

We strongly disagree that there is any equivalence between the first two suggestions. Biogas produced from human sewage waste is an inevitable byproduct of civilization and public health. and biogas produced by dairy manure has the perverse impact of encouraging dairy farmers to increase the amount of waste they produce because of the financial incentives of the Low Carbon Fuel Standard Program. **The CEC should not invest in any research effort that encourages excess production of methane because of the huge climate impact of methane emissions.** If we are to cope effectively with climate change, dairy farmers must inevitably reduce herd sizes, thus avoiding the necessity of manure lagoons; and pursue other manure mitigation strategies such as vermifiltration or aerobic composting which do not produce methane. It is only a matter of time before the urgency of the climate crisis brings these shifts in the cattle/dairy industries to reality. In the meantime, California's energy policies must not exacerbate the current emissions profile of our state.

Thank you for the opportunity to comment on CEC's efforts to promote truly clean, green hydrogen. We are available to discuss our comments with you at any time.

Sincerely,

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For 350 Humboldt