September 19, 2023

To: Air Resources Board
1001 I Street, Sacramento, CA 95814
P.O. Box 2815, Sacramento, CA 95812
Via comment submission portal and email: hydrogen@arb.ca.gov

RE: Joint Comments – SB 1075 Report: Hydrogen Development, Deployment, and Use: September 5 Kickoff Workshop

Thank you for the opportunity to comment. We are a diverse group of organizations that agree on bedrock principles for any application of hydrogen in meeting California's climate and air quality goals. On behalf of the undersigned organizations, we urge the joint agencies to produce an SB 1075 Implementation Report that includes the following recommendations:

- That meaningful community engagement from design to completion of any hydrogen production, delivery, or end use project is ensured;
- That any hydrogen used or produced in California is produced via electrolysis through clean and renewable sources, namely solar, wind, and geothermal, and that there is no role for hydrogen produced with fossil fuels or other polluting feedstocks and processes, including wood biomass and biogas;
- That the “three pillars” of hydrogen production be adopted: 1) Hydrogen generators to be powered by *new* sources of zero-emissions electricity that 2) Directly supply the grid the electrolyzers are connected to, and 3) Do so at the same time that the generators are running – hourly matching;
- That robust monitoring, prevention, and enforcement against leaks in hydrogen infrastructure is unambiguously required;
- That discourages hydrogen end uses that are better served by direct electrification, such as light duty vehicles where funds should only be invested in hard-to-electrify

transportation modes, and prioritizes early green hydrogen deployment in sectors that have no known path to electrification, like feedstock use for industry;
- That recommends ceasing publicly funded RD&D into blending hydrogen into existing pipelines, minimizes other forms of long distance hydrogen delivery, and that emphasizes co-location of production and end use;
- That end uses of green hydrogen in a decentralized model with colocation of production and end use, and for community resilience purposes be evaluated.

Regarding each report element outlined in section 38561.8 in SB 1075 (*italics*), we offer the following comments and recommendations (note: report elements have been truncated):

(1) Policy recommendations regarding the use of hydrogen, and specifically regarding the use of green hydrogen, in the state to help achieve the state's climate, clean energy, and clean air objectives.

- The state's emphasis should be on advancing renewables-based electrolytic hydrogen rather than establishing policies that foster the continued deployment of hydrogen end uses that use fossil fuel-based hydrogen;
- The state should only explore early green, renewables-based hydrogen deployment in sectors that have no path to electrification, like feedstock use for industry, and only explore its use as an energy carrier in a limited number of hard-to-electrify sectors;
- CARB's Scoping Plan assumptions regarding hydrogen's role in the transportation sector are highly unlikely to serve as a valid climate pathway for the transportation sector, particularly given that CARB itself has stated that green hydrogen is unlikely to meet the demand from the hydrogen market share the Scoping Plan assumes;
- State support for hydrogen should in no way slow down, impede, undermine, or replace direct electrification, which is about three times more energy-efficient than hydrogen;
- Hydrogen should not be blended in existing natural gas pipelines. Because hydrogen leaks easily, one key strategy to avoid leakage is to move it around as little as possible. The Hydrogen Blending Impacts Study by the University of California, Riverside[1] did not identify a level of hydrogen blending that would not jeopardize safety and reliability.

(2) "A description of strategies, consistent with the state's climate, clean energy, and clean air requirements, supporting hydrogen infrastructure, including needed infrastructure for production, processing, delivery, storage, and end uses in difficult-to-decarbonize sectors of the economy for the purpose of preparing infrastructure and end uses for green hydrogen deployment…while ensuring that hydrogen infrastructure will support the employment of a skilled and trained workforce in California to perform that work."

- The primary strategy, from a clean air, clean energy, and climate emissions perspective, is to begin with a focus on getting renewables-based electrolytic hydrogen production to an environmentally and economically viable stage;

[1] https://www.cert.ucr.edu/hydrogen-impacts-study

- Many of the skills present among the workforce – pipefitting, electrical work, etc., are directly transferable to hydrogen. The report should include a strategy for building a diverse and inclusive workforce in the hydrogen industry.

(3) A description of the potential for other forms of hydrogen, outside of green hydrogen, to achieve emission reductions that can contribute to achieving the state's climate, clean energy, and clean air objectives.

- Truly sustainable and equitable biogenic feedstocks are very limited, with the rest fraught with potential environmental and environmental justice harms. Therefore biogenic feedstocks should not be prioritized in future hydrogen deployment;
- Getting green hydrogen right is enough of a challenge. Grey, blue, pink (nuclear-based) and bio-based electrolytic hydrogen are all incompatible with California's energy, air quality, and climate policies. And there is also a need to acknowledge the stranded asset risks of blue hydrogen.

(4) An analysis of how curtailed electrical generation could be better utilized to help meet the goals set forth in this division, including, but not limited to, whether curtailed electrical generation could be made available for the production of green hydrogen.

- The report should include a frank analysis of whether hydrogen production can feasibly use excess renewables without also increasing fossil-fueled generation and spiking emissions. It should analyze whether there is actually a business model in which grid-tied electrolyzers can use excess renewables. Given the costs of deploying electrolyzers, it is unclear how an investment in electrolyzers could pencil out for hydrogen producers who only operate in the few hours of the year when there are excess renewables on the grid.

(5) An estimate of the amount of reduced emissions of greenhouse gases and air quality benefits the state could achieve through deploying green hydrogen through a variety of scenarios, the costs associated with using green hydrogen, and the associated health and environmental impacts of prioritizing the development of various forms of hydrogen, when compared to other alternatives.

- We are concerned about overestimations of public health and emissions benefits from deployments of hydrogen, given the general historical tendency to overestimate the timeline for scaling hydrogen as a decarbonization solution;
- The current fossil-based steam-reformed production of hydrogen is a hazardous use that results in ongoing public health threats[2];
- Consider the environmental injustices that biomethane production exacerbates. Producing hydrogen from dairy biomethane requires industrial agriculture facilities to rely on the manure management practices that pose the greatest public health risks for neighboring communities. We urge an honest acknowledgement of the dangers of creating a market for pollution;

[2] See Appendix 2: Oil Refining — A Hazardous Use of Hydrogen
https://theclimatecenter.org/wp-content/uploads/2023/06/Hydrogen-Policy-Guidance-August-2023-The-Climate-Center.pdf

- Water resource demands of a scaled up green hydrogen sector must be taken into consideration;
- To the extent the report considers blue hydrogen, it is important that it consider the full range of environmental harms;
- The report should also conduct an analysis on impacts to historically disadvantaged communities given that many proposed hydrogen projects will be located in EJ communities (e.g. safety concerns with hydrogen leakages, impacts of continued NOx emissions from natural gas plants that are considering blending hydrogen).

(6) An analysis of the potential for opportunities to integrate hydrogen, including green hydrogen, production and application with drinking water supply treatment needs, particularly for advanced treatment water supplies such as desalination, potable reuse, and salt and contaminant removal projects.

- End uses such as these should consider green hydrogen exclusively. Allowing fossil fuel-based hydrogen for these purposes serves only to extend the lifetime of the oil and gas industry, counter to California's climate and clean energy goals.

(7) Policy recommendations for regulatory and permitting processes associated with transmission and distribution of hydrogen, including green hydrogen, from production sites to end uses.

- One of the hallmarks of solar/hydrogen electrolysis hydrogen production is that it can be deployed just about anywhere there is abundant sunshine. Policy priority should be given to deployment scenarios that avoid long distance delivery altogether, and prioritize colocation of production with end use.

(8) An analysis of the life-cycle greenhouse gas emissions from various forms of hydrogen, including green hydrogen production.

- We cannot rely on the false assumption that electrolytic hydrogen is rendered carbon-neutral through credit trading;
- Analysis of biogenic hydrogen must reject the incorrect assumption of carbon negativity of biomethane and treat methane as a co-product;
- Include an exhaustive assessment, using best and latest available science, on hydrogen as an indirect climate pollutant and the risks of leakage and potential atmospheric warming effects;
- Analysis of blue hydrogen must fix GREET's[3] incorrect assumptions on methane leakage and use inputs that reflect the high leakage rates in the shale basins that supply California's fossil gas.[4]

[3] Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation model: https://www.energy.gov/eere/bioenergy/articles/greet-greenhouse-gases-regulated-emissions-and-energy-use-transportation

[4] Diana Burns and Emily Grubert, Attribution of production-stage methane emissions to assess spatial variability in the climate intensity of US natural gas consumption, 2021 *Environ. Res. Lett.* 16 044059 https://iopscience.iop.org/article/10.1088/1748-9326/abef33 (estimating a production-stage methane leakage rate of 2.8% for gas consumed in California).

(9) An analysis of air pollution and other environmental impacts from hydrogen, including green hydrogen, distribution and end uses.

- We agree that this should be carried out thoroughly in the report.

Thank you for your consideration of these issues. We would be happy to make ourselves available to discuss these concerns further.

Respectfully Submitted,

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cc:
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California Public Utilities Commission
California Independent System Operator