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RE: CARB Workshop (July 8): The Role of the Industrial Sector in Meeting California's Carbon Neutrality Goals

The California Hydrogen Business Council¹ (CHBC) appreciates the California Air Resources Board's (CARB) attention to greenhouse gas emissions in the industrial sector as a critical piece to achieving carbon neutrality in California, and the opportunity to comment on the presentations and issues discussed during the July 8 workshop.

The CHBC is comprised of over 100 organizations involved in the business of hydrogen. Our mission is to advance the commercialization of hydrogen in the energy sector, including transportation, goods movement, and stationary power systems, to reduce emissions and dependence on oil.

Renewable hydrogen (including carbon-neutral or decarbonized hydrogen) has great potential to help reduce greenhouse gas (GHG) emissions in the industrial sector, as recognized by the U.S. Department of Energy's H2@Scale program.²

Renewable hydrogen can help decarbonize ammonia production, which currently has limited options for GHG reduction, as well as ammonia-based agricultural products, which are imported in massive quantities into the state. It can also eliminate GHG emissions from hydrogen used in oil refineries, which currently account for 31% of GHG emissions from California's industrial sector.³

A similar approach California takes towards other sectors can apply to decarbonizing the industrial sector: start with efficiency, minimize waste and unnecessary consumption, and utilize clean, low, or zero carbon fuels otherwise. Electrification and solar thermal steam are important strategies that should be deployed, but they cannot reduce emissions from the sector entirely.

¹ The views expressed in these comments are those of the CHBC, and do not necessarily reflect the views of all of the individual CHBC member companies. CHBC Members are listed here: <https://www.californiahydrogen.org/aboutus/chbc-members/>

² See recent grant solicitation: <https://www.energy.gov/articles/department-energy-announces-31-million-funding-advance-h2scale>; And this report : https://www.gas-for-energy.com/fileadmin/G4E/pdf_Datein/g4e_2_17/gfe2_17_fb_Satyapla.pdf

³ Source: CARB: https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2014/ghg_inventory_trends_00-14_20160617.pdf

Renewable hydrogen is among the solutions that will be needed. Technologies to produce renewable hydrogen, such as electrolysis and steam methane reforming for bio-based gas, have been utilized for decades and in many ways are more commercially mature than electrification or other strategies that the state is relying upon to reduce emissions.

What is missing is a supportive policy framework to scale-up production of renewable hydrogen to bring down costs and accelerate emissions reductions. In view of California's support for ambitious policies that seek to turn over and eliminate emissions from millions of vehicles and buildings within a short time frame, addressing just hundreds of industrial facilities in California could actually be considered comparatively simple. It is worth considering that according to CARB's inventory, California's dozen or so refineries generate more emissions than all of the 14 million households in California, combined.⁴ A dedicated plan and workable policy framework to deploy renewable hydrogen at these few facilities could rapidly reduce emissions from this sector in its entirety, likely by 2030, while bringing down costs of renewable hydrogen to accelerate greenhouse gas reduction in other sectors, like transportation, electricity generation, and building energy. The International Energy Administration recommends focusing on clean hydrogen in industry as a key strategy for driving down costs and achieving scale for use in other sectors.⁵

We encourage the state's policy approach to reducing emissions from the industrial sector to go beyond the Cap-and-Trade Program, and similar to other sectors, including those covered by Cap-and-Trade, to lay out detailed pathways to achieve carbon neutrality. This should be done in the next Scoping Plan, if not before. Our specific recommendations include:

- Allowing hydrogen and methanated hydrogen access to the pipeline, so that renewable hydrogen projects can come online and access markets, to begin to scale and reduce costs, while repurposing existing infrastructure for decarbonization. Whereas up to 20% blends of hydrogen are being allowed in industrialized locations like eastern Germany,⁶ California's current limit at .01%, should be revisited and reasonably expanded, immediately.
- Opening a public process to develop policy and regulatory recommendations to assess the displacement of fossil fuels in the industrial sector with hydrogen.
- Developing a roadmap to assess GHG emissions reduction strategies and opportunities of the industrial sector.
- Conducting an independent assessment (for example by state agencies, the California Council on Science and Technology, or another qualified organization) regarding the potential for, and impacts of, displacing large fractions of natural gas in the pipeline with renewable or carbon neutral hydrogen to scale use in the industrial sector and beyond.
- Analyzing the cross-sector impacts and benefits of deploying renewable hydrogen in the industrial sector, for example reduced costs that enable deployment for zero carbon electricity generation, zero emissions transportation, storage, and renewable power integration.
- Enabling access to wholesale electricity markets and other potential low cost electricity for electrolytic hydrogen production, especially during periods of overgeneration, to help make renewable hydrogen cost competitive.

⁴ https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2016/ghg_inventory_trends_00-16.pdf

⁵ Future of Hydrogen, Executive Summary, IEA, June 2019 <https://webstore.iea.org/download/summary/2803?fileName=English-Future-Hydrogen-ES.pdf>

⁶ <https://www.eon.com/en/about-us/media/press-release/2019/hydrogen-levels-in-german-gas-distribution-system-to-be-raised-to-20-percent-for-the-first-time.html>

- Conducting assessments of the economic benefits and jobs impacts associated with accelerating renewable hydrogen production for the purpose of industrial sector greenhouse gas emissions reductions in California.
- Supporting pilot projects to demonstrate applications of renewable hydrogen to reduce industrial sector emissions.
- Supporting research to reduce costs associated with production of renewable hydrogen and its derivatives, including through the EPIC program.

If California creates a comprehensive strategy, the emissions and economic benefits to the state would be significant. We look forward to continuing to work with you through the Scoping Plan development process and in other forums to this future forward, and ensure the game changing promise of industrial sector emissions reduction.

Thank you for your consideration.

Best regards,



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California Hydrogen Business Council