California Hydrogen Business Council

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Center for Resource Solutions
1012 Torney Avenue
San Francisco, CA 94129

Re: Renewable Hydrogen Update to the Green-e® Renewable Fuels Standard

Dear CRS:

California Hydrogen Business Council (CHBC) represents 100 organizations involved in the business of hydrogen. CHBC's members include utilities, air quality organizations, producers, distributors, and offtakers of hydrogen, including transit districts. CHBC appreciates the opportunity to submit these additional comments on the proposed "Renewable Hydrogen Update to the Green-e® Renewable Fuels Standard," which are supplemental to the comments we submitted on August 29 with the Bioenergy Association of California.

Our comments here focus on one aspect of the proposed update: the requirement for hourly matching starting in 2030 that renewable electricity or RECs must be generated within the same hour that the hydrogen is produced.

The heart of the argument that hourly matching is needed to ensure accurate calculation of carbon emissions is technically incorrect. While it is true that failure to properly account for consequential emissions when renewable power credits are generated at one time and retired at another time can lead to inaccurate GHG accounting, hourly matching (as opposed to hourly emissions tracking) is only one way among many to address this and is the costliest way. Hourly matching within a single balancing area without transmission constraints ensures that there will be no consequential emissions from renewable power production and use, but there are more flexible ways to address the issue. For example, consequential emissions can be offset by the retirement of additional Energy Attribute Credits (or "EACs").[1]

In markets that have binding Renewable Portfolio Standards and/or carbon regulations, as California does, temporal matching in the form of storage and firm renewable resources will evolve through market forces. Overlaying mandates will interfere with optimal market-based resource additions and dispatch.

Changing policy to track temporal matching must take into account what is possible today with tracking systems. As the tracking system for the Western Electricity Coordinating Council (WECC) that includes California, WREGIS does not currently have an hourly tracking system,

[1] Clean Energy Institute at University of California Irvine, comments submitted to Treasury on Section 45V February 26, 2024.

there will continue to be uncertainty in timing of hourly matching implementation until many questions are answered. These questions include:

- who will possess the data required to track hourly;
- how difficult or easy will it be to put this required data into a tracking systems;
- how do we validate the information for regulatory compliance.

Tracking systems will take time to develop and system development cannot commence until final regulations are in place. It may not be technically feasible to implement hourly time stamped EACs as soon as 2030. Hourly matching also departs from the annual matching required of EACs used in the California Renewable Portfolio Standard program today, and provisions for the use of EACs in the California LCFS program.[2] Although some entities are working on developing EACs that feature an hourly time stamp, current tracking systems do not have such a feature. When coupled with geographic and additionality conditions, regional systems such as WREGIS would need multiple different products to track compliance. System design cannot begin until final regulations are in place, and until the regional tracking systems determine how they will recover costs for system design and implementation. Further information is needed before the earliest practical implementation date of the final regulations can be determined, including the time for robust piloting and validation prior to widescale roll-out of a multi-billion-dollar financial instrument tracking system.

The requirement of hourly matching necessarily increases hydrogen production cost. Arguing otherwise implies that energy storage is free, that firm renewable resources are no more costly than wind and solar power, or that electrolyzer capacity can be increased without cost. All these claims are false. Hourly matching increases the cost of hydrogen production and delivery, as the cost of storage is not free, and energy storage or increased electrolyzer capacity would be required to comply with the hourly matching requirement on a grid that is already subject to greenhouse gas provisions and RPS compliance to meet the most stringent decarbonization targets in the country. This will impact the cost-competitiveness of producing green hydrogen and will negate the positive impacts of the $3/kg subsidy from federal Section 45V implementation. When the hydrogen industry collectively advised federal lawmakers that $3/kg was an appropriate level of incentive for renewable electrolytic hydrogen to be cost-competitive, it was with the explicit understanding that the use of unbundled EACs would be permitted. Had the provision of the proposed guidance been envisioned, the necessary subsidy would have been significantly increased.

The argument in favor of hourly matching is that time shifting of renewable power production and use by creating renewable energy credits at times of high renewable production and retiring them at times of low or no renewable production increases grid emissions. This is possible but, as shown by ACORE and E3[3], based on the marginal hourly emissions in most locations, such emissions are near zero in most locations. In California, natural gas is the

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[2] California Air Resources Board, Low Carbon Fuel Standard regulation at LCFS Regulation | California Air Resources Board

[3] A. Olson, G. Gangelhoff, A. Fratto, H. Felicien, and K. Walter, “Analysis of Hourly & Annual GHG Emissions Accounting for Hydrogen Production,” Energy & Environmental Economics, April, 2023, [Online]. Available: www.ethree.com

marginal dispatchable resource in all hours for the vast majority of hours in the year. Over-generation of solar power by a producer during the day reduces gas-fired power and consumption of the same amount of power at night creates emissions in the same amount. The entire transaction is zero power. In this case, requiring simultaneity of supply and demand has only one effect, increasing cost. A recent study by MIT published in the journal *Nature* showed that the most stringent carbon intensity thresholds required for the 45V incentive could easily be achieved in grids with RPS requirements as high as 60% or more with no need for hourly matching.[4]

Moreover, in markets with 100% carbon-free energy standards, such as in California, consequential emissions due to changes in grid dispatch cannot occur. By mandate, the grid dispatch must meet the mandated renewable power or carbon constraint irrespective of what voluntary procurement transactions occur. As a consequence, the percentage of carbon-free power on the grid in the evening will continue to increase through expanded supply of electricity storage (to store renewable energy) and/or renewable generation. Clean hydrogen is absolutely essential to complete this transition as well as the transition to a zero-carbon transportation sector. Increasing the cost of renewable hydrogen will likely result in a delay in expanding the supply of firm renewable resources, which is against the interests of those promoting carbon-free energy and transportation sectors.

CHBC urges CRS to not recommend an hourly matching requirement as part of its Renewable Hydrogen update to the Green-e® Renewable Fuels Standard.

Sincerely,

Tim McRae

Vice President for Public Affairs

[4] Giovanniello, M.A., Cybulsky, A.N., Schittekatte, T. *et al.* The influence of additionality and time-matching requirements on the emissions from grid-connected hydrogen production. *Nat Energy* **9**, 197–207 (2024). https://doi.org/10.1038/s41560-023-01435-0 (Related open source working paper available at: https://energy.mit.edu/wp-content/uploads/2023/04/MITEI-WP-2023-02.pdf