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Center for Resource Solutions comments on Clean Hydrogen Program

Additional submitted attachment is included below.

Dec 14, 2022

California Energy Commission (CEC)
Docket Unit, MS-4
Docket No. 22-ERDD-03
715 P Street, Sacramento, California 95814
Submitted Electronically

RE: CALIFORNIA ENERGY COMMISSION (CEC) DEC 1, 2022 STAFF WORKSHOP ON THE IMPLEMENTATION OF THE CLEAN HYDROGEN PROGRAM (DOCKET: 22-ERDD-03)

Dear California Energy Commission Staff,

CRS appreciates this opportunity to submit comments in response to the CEC Clean Hydrogen Program (Docket 22-ERDD-03). We support the Clean Hydrogen Program and Assembly Bill (AB) 209 as it was passed and signed into law. Please find below our comments on the Dec 1, 2022 Staff Workshop on the Implementation of the Clean Hydrogen Program (hereafter "Dec 1 Workshop") and the CEC's Questions for Stakeholders on slide 28 of Staff's presentation at the Dec 1 Workshop.

BACKGROUND ON CRS AND GREEN-E®

CRS is a 501(c)(3) nonprofit organization that creates policy and market solutions to advance sustainable energy and has been providing renewable energy and carbon policy analysis and technical assistance to policymakers and other stakeholders in California for over 20 years. CRS also administers the Green-e® programs. For over 20 years, the Green-e® program has been the leading independent certification for voluntary renewable electricity products in North America. In 2021, the Green-e® Energy program certified retail sales of over 110 million megawatt-hours (MWh), serving over 1.3 million retail purchasers of Green-e® certified renewable energy, including over 309,000 businesses.[1] The Green-e® Renewable Fuels program was launched in 2021, initially as a standard and certification for biomethane products and associated environmental attributes. This program is in the process of expanding to certify green hydrogen transactions and programs and can serve as a guide for CEC as it helps accelerate the adoption of biomethane and green hydrogen, while ensuring that they are from sustainable renewable resources and meet the highest environmental standards, and that customers are protected in their purchase and ability to make verified usage claims.

[1] See the 2022 (2021 Data) Green-e® Verification Report (soon to be published) here for more information: https://www.green-e.org/verification-reports

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COMMENTS ON THE CLEAN HYDROGEN PROGRAM

1. Are the proposed topics a feasible and impactful approach? If not, what are your recommendations?

The CEC Staff's presentation at the Dec 1 Workshop describes incentivizing clean hydrogen produced by an array of different technologies, requiring that large-scale centralized clean hydrogen production be limited to electrolysis, while onsite/distributed clean hydrogen production remain technology-neutral. To understand if projects using these technologies are impactful, the production of clean hydrogen must be traceable and verifiable. Book-and-claim accounting practices for renewable electricity and renewable natural gas (i.e., biomethane) rely on energy attribute certificates (e.g., Renewable Energy Credits & Renewable Thermal Credits) to demonstrate clean energy use. The sections below describe the use of Renewable Energy Credits (RECs) for hydrogen produced by electrolysis, and Renewable Thermal Credits (RTCs) for hydrogen produced by steam methane reforming (SMR) for clean hydrogen production and use claims that meet the requirements of AB 209.

Allowing hydrogen production facilities to purchase attributes and use contracts to demonstrate use of renewable energy for hydrogen production (book-and-claim) is essential to the feasible implementation of a Clean Hydrogen Program. Requiring the retirement of these attributes or verifying their contractual delivery for use in renewable energy for hydrogen production avoids double counting. Relying on existing market mechanisms and established best practices facilitates the growth of clean hydrogen.

Hydrogen Produced by Electrolysis

Given the CECs ability to establish project eligibility and other guidelines, the CEC should set requirements on what it means to "produce" clean hydrogen.[2] Verifying the "use" of clean hydrogen produced from an electrolyzer requires renewable energy certificates (RECs). RECs are defined very clearly in California by the California Public Utilities Commission (CPUC) as including "all renewable and environmental attributes."[3] As such, RECs are required to substantiate delivery and use of renewable electricity and the specified carbon intensity (CI) of a renewable generation unit. They are the legal and most precise means of tracking renewable electricity[4] and therefore, the appropriate tool to verify that renewable electricity is being used to produce clean hydrogen from an electrolyzer. Whether renewable electricity is procured for hydrogen production using onsite generation, a power purchase agreement (PPA), or a utility program, for example, the associated RECs should be retired to

[2] See California AB 209. Article 4. 25664.1. (a)
[3] See CAL. PUB. UTIL. CODE § 399.12(h)(2).
[4] Comments to the U.S. Securities and Exchange Commission (SEC) on Proposed Climate-Related Disclosures for Investors. Available at: https://resource-solutions.org/document/061722/

substantiate exclusive use of renewable electricity at that hydrogen production facility and prevent double counting. In the case that the renewable generator(s) used is not registered with the Western Renewable Energy Generation Information System (WREGIS), RECs or generation attributes should be transferred and retired contractually on behalf of hydrogen production.

Using RECs in this way is consistent with the AB 209 requirement to avoid supplanting or duplicating different systems for tracking renewable energy use and avoid double counting.[5] The eligible resources for the Clean Hydrogen Program are consistent with California's Renewable Portfolio Standard (RPS), which requires the use of RECs. By setting REC retirement requirements for the verification of clean hydrogen production using renewable electricity, the Clean Hydrogen Program maintains this consistency with the RPS and avoids double-counting with state programs.

The RECs in a Green-e® certified product are verified under the Center for Resource Solutions' Green-e® program, and the seller of a Green-e® certified product is required to disclose the quantity, type, vintage, and geographic source of each certificate. Center for Resource Solutions also verifies that the RECs are not sold more than once or claimed by more than one party. CEC can use Green-e® certification to assist with verification under this program.

Hydrogen Produced by Steam Methane Reforming

In the United States, 95 percent of hydrogen is produced by SMR, a reaction between a methane source, such as natural gas, and high-temperature steam[6]. Biomethane, also known as renewable natural gas (RNG), is increasingly becoming a solution for commercial and residential customers who want an effective way to use fuels with lower lifecycle greenhouse gas emissions and offers a pathway to accelerate the transition to a clean energy economy and presents an opportunity to lower the carbon intensity of Hydrogen produced by SMR.

RNG markets and the CI ratings of the fuel are well-established by the Environmental Protection Agency (EPA) as well as several state programs. The EPA Renewable Identification Number (RIN) Program is an incentive to produce RNG and California's Low Carbon Fuel Standard (LCFS) allows RNG producers to generate credits based on RNG's lower carbon intensity.

There are multiple pathways for producing RNG, each with their own environmental and social considerations. Many of the same factors that are relevant to producing high quality renewable energy, such as accounting for fuel delivery, using sustainable resources, credit vintage requirements, and

[5] See California AB 209. Article 4. 25664.1. (d)
[6] For further discussion see U.S. IRS (2020). HYDROGEN STRATEGY Enabling A Low-Carbon Economy. Available at: https://www.energy.gov/sites/prod/files/2020/07/f76/USIRS_FE_Hydrogen_Strategy_July2020.pdf

facility age have bearing on RNG production as well. The Green-e® Renewable Fuels program can serve as a guide for the eligibility rules for the Clean Hydrogen Program to ensure that RNG used in hydrogen production meets the highest standards and has positive impacts.

Renewable Fuel Certificates (RFCs) should be required as proof that SMR Hydrogen is produced with RNG. An RFC represents the environmental benefits of one dekatherm of renewable gas. For each dekatherm of renewable fuel produced, an equivalent RFC is produced. Purchasing and pairing RFCs with gas supply substantiates claims of using and receiving the benefits of that renewable fuel. Using RFCs for verification also avoids supplanting or duplicating different systems for tracking renewable fuels use and avoids double counting. RFC purchases also help build a market for renewable fuels. Increased demand for, and production of, renewable fuels helps avoid fossil natural gas extraction and processing, and helps make use of waste materials.

The RFCs in a Green-e® certified product are verified under CRS's Green-e® program, and the seller of a Green-e® certified product is required to disclose the quantity, type, vintage, carbon intensity, and geographic source of each certificate. Center for Resource Solutions also verifies that the RFCs are not sold more than once or claimed by more than one party. CEC can use Green-e® certification to assist with verification under this program

4. How should we weigh different benefits, and which should we be prioritizing the most?

AB 209 articulates additional objectives for the Clean Hydrogen Program beyond accurate accounting of renewable energy used for hydrogen production, such as reducing sector-wide emissions, prioritizing projects that benefit geographically diverse areas of the state, and projects that maximize air quality, equity, health, and workforce benefits.[7] To meet these objectives, CEC may also want to align the timing of electricity use for hydrogen production with the timing of renewable generation for electrolyzers, consider the facility age of that renewable generation, the region of generation, as well as the effect of that renewable generation on grid emissions (avoided emissions).

Time of Generation (vintage)

CRS can help CEC investigate and determine what REC vintage requirements are appropriate for the Clean Hydrogen Program. Historically, best practices in both voluntary and regulatory markets have set requirements for the vintage (i.e., time of production) for RECs depending on their use case. While there is variation on vintage requirements depending on reporting programs, renewable energy leaders such

[7] See California AB 209. Article 4. 25664.1. (e)-(g)

as CDP, RE100, and the Green-e® Energy program recognize that RECs should be paired with generation that is reasonably close to the time the electricity was consumed.[8]

Time of Use

As a minimum requirement for credible renewable electricity usage claims in the U.S., the Green-e® Energy program's 21-month vintage window—which includes the calendar year in which electricity use occurred, the last six months of the prior calendar year, and the first three months of the following calendar year—is a commonly used vintage requirement for RECs. However, depending on CEC's objectives and to ensure that hydrogen production benefits local renewable energy production, time-matching local renewable electricity generation (and RECs) to hydrogen production, e.g., using an hourly REC vintage requirement, may be important for this particular use. While RECs can facilitate this hourly accounting, most Tracking Systems have not yet integrated more precise (e.g., hourly) vintage data into their systems. The market conditions necessary to sustain time-matching of RECs at scale will not likely be ready until likely 2025.

We do not recommend that CEC delay moving forward with incentivizing clean electricity use in the Clean Hydrogen Program until hourly RECs and other market infrastructure needed to support and scale hourly tracking and trading of generation attributes is created and widely available. Requirements can be set for hourly tracking that start at a later date and ramp up. In the meantime, CEC can support the development of tracking systems to accommodate hourly claims— integration of all-resource tracking and more precise vintage and location data.

Regional Considerations

While there is no need to limit REC use based on generator location or transaction type (e.g., "bundled" vs. "unbundled" renewable energy) to ensure accurate accounting and credible renewable electricity usage claims, CEC may again consider geographic restrictions on RECs to achieve local and decarbonization objectives. CRS will also be investigating these questions and gathering stakeholder feedback as part of the standard setting process for the Green-e® Renewable Fuels program.

Facility Age

In addition to vintage and geographic requirements, setting restrictions on facility age for renewable generators has long been a tool of voluntary and compliance markets to encourage new generation. With this market in a nascent stage, the Green-e® Renewable Fuels program will be exploring the potential market effects of a facility age (i.e., "new date") requirement for electricity used in hydrogen production. Though an appropriate facility age requirement has yet to be determined, a principal

[8] RE100 Technical Working Group. (2016). Making Credible Renewable Electricity Usage Claims. Available at: https://www.there100.org/sites/re100/files/2020-09/RE100%20Making%20Credible%20Claims.pdf

concern is the risk of existing renewable generation shifting if there is a higher financial return for its use in hydrogen production. This could create an equity issue as renewable energy that is currently being delivered, particularly to residential customers, could end up being reallocated to hydrogen production for the benefit of large corporate and commercial customers. Purchasing from newer facilities is also important if CEC's objective is to drive more production of clean energy. To best incentivize renewable energy and thus hydrogen production that is sustainable, equitable, and impactful, the Clean Hydrogen Program should seek to encourage generation from newer facilities.

Using the Green-e® Programs

The eligibility rules for the Clean Hydrogen Program regarding electric generator facility age, generation vintage, and geographic restrictions, etc. should be based on CEC's goals and desired impact. CEC could use the Green-e® programs to verify both renewable electricity and renewable fuel use for clean hydrogen production using Green-e® Energy's current rules plus additional rules that align with CEC's goals.

The Green-e® programs are developed by working and advisory groups comprised of environmental nonprofit organizations, academic experts, and industry stakeholders to provide environmental, technical, and market input. CRS is beginning a process next year to determine the rules for these factors for green hydrogen in our Green-e® Renewable Fuels certification program. As the administrator of the Green-e® programs, CRS staff would be happy to set up a call to discuss best practices and the appropriate verification measures for renewable electricity and RNG usage. CRS has extensive experience developing reporting and verification processes, and has advised state, national, and international agencies on verification approaches and procedures.

Electricity Carbon Intensity Scores from Emitting Generation

If the time of (or hourly) production and use is being accounted for, then grid power used for hydrogen production should be accounted for based on the hourly mix of generating resources at the time of production plus the attributes associated with that generation. CRS could work with CEC verifying hourly and time-coincident use of local generation both with and without time-stamped/hourly RECs.

We thank you for this opportunity to provide comments on the Clean Hydrogen Program. Please feel free to reach out with any questions or comments.

Sincerely,
Lucas Grimes
Manager, Policy