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November 14, 2022

Via e-mail: cleanh2standard@ee.doe.gov

U.S. Department of Energy
James V. Forrestal Building 1000 Independence Avenue Southwest
Washington, D.C. 20585

Re: Comments on DOE's draft Clean Hydrogen Production Standard (CHPS)

Thank you for the opportunity to provide comments on the draft Clean Hydrogen Production Standard (CHPS). The Washington State Department of Commerce is pleased to offer comments on a few key aspects of the proposed standard.

Overall, we are encouraged by the coordinated approach that the Department of Energy is bringing to advancing the clean hydrogen economy, including through this draft standard, connected to recommended strategic end uses in the draft National Clean Hydrogen Strategy and Road Map, the Regional Clean Hydrogen Hubs program, and related efforts. We see this as a strong, multi-faceted approach to advancing clean hydrogen, though driving down costs and developing targeted end-uses in key regions.

In relation to the draft CHPS in particular, we are encouraged by the overall approach to evaluating the full lifecycle emissions of clean hydrogen, which will help to ensure that clean hydrogen is produced and used in ways that contribute to economy-wide greenhouse gas reductions and help to reach net-zero greenhouse gas (GHG) emissions across the country.

Our specific comments on the draft are provided below for your consideration.

1. Data and Values for Carbon Intensity
1.b. Lifecycle analysis to develop the targets in this draft CHPS were developed using GREET. GREET contains default estimates of carbon intensity for parameters that are not likely to vary widely by deployments in the same region of the country (e.g., carbon intensity of regional grids, net emissions for biomass growth and production, avoided emissions from the use of waste-stream materials). In your experience, how accurate are these estimates, what are other reasonable values for these estimates and what is your justification, and/or what are the uncertainty ranges associated with these estimates?

Overall, we support use of the GREET model for this CHPS, as it will align with Washington State's Clean Fuel Standard (CFS) that will be implemented starting January 2023. Use of the GREET model is already seen by many state regulators in Washington State and beyond as a reasonable way to assess emissions.

Alignment between the CHPS and our state CFS will add clarity and encourage coordination across programs.

Additionally, the GREET model has the ability to accommodate user-defined fuel mix information, providing locally-specific data, and this option should be permitted as part of CHPS and related federal hydrogen programs. More information on this is provided below under 3.a. and 3.c.

2. Methodology

2.a The IPHE HPTF Working Paper (https://www.iphe.net/iphe-working-paper-methodology-doc-oct-2021) identifies various generally accepted ISO frameworks for LCA (14067, 14040, 14044, 14064, and 14064) and recommends inclusion of Scope 1, Scope 2 and partial Scope 3 emissions for GHG accounting of lifecycle emissions. What are the benefits and drawbacks to using these recommended frameworks in support of the CHPS? What other frameworks or accounting methods may prove useful?

We encourage DOE to use dual carbon intensity standards in CHPS. The first standard would include only direct GHG accounting, related to the GHG emissions directly associated with the life cycle of hydrogen, including feedstocks. This will help to direct part of the incentives related to this program towards improving the feedstocks, production processes and technologies that are deployed in the production of hydrogen. The second aspect of the carbon intensity standard should track direct plus indirect GHG emissions associated with the full life cycle of hydrogen production. This includes book-and-claim accounting methods such as using renewable energy credits (RECs), which enable accounting for clean electricity and GHG reduction attributes that contribute to the lifecycle emissions associated with the hydrogen. This combined approach supports pragmatic GHG accounting and incentivizes GHG reductions in a power grid by creating methods to account for additional use of renewables above the amounts reflected in the average generation mix of the grid.

It is important to establish the basis for carbon intensity calculations, as GREET has multiple options. The GREET model includes default values that can be used in the carbon intensity calculation, but the CHPS may need to provide some additional guidance. Such guidance may include:

- Global warming potential of GHG gases, as GREET has options to use different IPCC Assessment Report numbers;
- Criteria for considering avoided GHG emissions in the carbon intensity calculations;
- Relevant allocation methods to distribute the GHG impacts among co-products, if applicable, including hydrogen;
- Identifying energy sources that are considered GHG free;
- Whether the fuel supply chain infrastructures are going to be accounted in the carbon intensity calculation;
- Specification that the system boundary will be well-to-gate.

Additionally, it is important to allow the use of third-party verification requirements that may be required or supported by states' Low Carbon Fuel Standard (LCFS), CFS, or related programs, as long as they meet the ISO 14067 requirements. CHPS should include methods for recognition of the third-party verifier accreditation system in states' LCFS, CFS and related programs.

3. Implementation

3.a. How should the GHG emissions of hydrogen commercial-scale deployments be verified in practice? What data and/or analysis tools should be used to assess whether a deployment demonstrably aids achievement of the CHPS?

We encourage CHPS to require third-party verification for all hydrogen fuel pathways, and determine the verification frequency based on issues including the burden it causes on the hydrogen supplier, the risk of carbon intensity variation, and others. We also encourage recognition of state LCFS, CFS and related verification programs if they meet the ISO 14067 requirements.

3.c Should renewable energy credits, power purchase agreements, or other market structures be allowable in characterizing the intensity of electricity emissions for hydrogen production? Should any requirements be placed on these instruments if they are allowed to be accounted for as a source of clean electricity (e.g. restrictions on time of generation, time of use, or regional considerations)? What are the pros and cons of allowing different schemes? How should these instruments be structured (e.g. time of generation, time of use, or regional considerations) if they are allowed for use?

All claims of the use of renewable electricity in hydrogen production should be verified by the creation and retirement of renewable energy certificates (RECs) through the existing tracking systems, such as the Western Renewable Energy Generation Information System. The creation and retirement of RECs in these systems provides documentation that electricity was generated using renewable energy and that the entity retiring the REC holds a unique claim on these attributes. There is no need for alternative tracking methods, such as contract attestations, given the universal availability of rigorous REC tracking systems, and use of alternative tracking methods increases the risk that renewable attributes will be double-counted.

Book-and-claim accounting of RECs is used in clean fuel standards in Oregon and California and, starting in 2023, in Washington. This approach provides an important mechanism for fuel producers to document their claims on an electricity supply with a lower carbon intensity than the grid-supplied power otherwise available to that producer. Book-and-claim accounting provides consistent accounting whether the lower-intensity electricity is procured through the many variations of purchased power agreements, utility green power programs, and acquisition of renewable energy certificates.

We think there may be merit in considering additional requirements regarding time of generation and use, and tools such as hourly RECs may support this approach. As the amount of storage in the power system increases, close matching of generation time and consumption time will be less feasible and less necessary.

3.e. Atmospheric modeling simulations have estimated hydrogen's indirect climate warming impact (for example, see Paulot 2021). The estimating methods used are still in development, and efforts to improve data collection and better characterize leaks, releases, and mitigation options are ongoing. What types of data, modeling or verification methods could be employed to improve effective management of this indirect impact?

It is important to that CHPS and related programs support careful measurement of hydrogen leakage in each production processes and incorporating hydrogen's indirect warming effect when the science is established. Recent studies suggests that it has a Global Warming Potential 11 times that of carbon dioxide (over a 100-year time horizon). Since our understanding is emerging this should be a priority for reevaluation and update as the CHPS is reviewed and updated in future.

4. Additional information.

We encourage an aligned approach between CHPS and the proposed 45V hydrogen production tax credit (PTC). It will be beneficial if the methodology and criteria are closely aligned, as this will enable producers to qualify for the highest production tax credit level using RECs and related tools.

Thank you for the opportunity to submit comments. Please feel free to reach out with any questions.

Sincerely,

Glenn Blackmon
Manager, Energy Policy Office
Washington State Department of Commerce