BCSE Comments on Proposed Regulations Related to the Section 45V Clean Hydrogen Production Tax Credit under the Inflation Reduction Act

February 26, 2024

Thank you for the opportunity for the Business Council for Sustainable Energy (BCSE) to provide its views in response to the request for comments on the proposed regulations related to the Inflation Reduction Act's (IRA) Section 45V Credit for the Production of Clean Hydrogen, Section 48(a)(15) Election to Treat Clean Hydrogen Production Facilities as Energy Property (REG 117631-23).[1]

BCSE commends Congress and the Biden Administration for enactment of the Infrastructure Investment and Jobs Act (IIJA) and the IRA, as well as providing annual appropriations to support Hydrogen Hub development and the accelerated production and deployment of hydrogen resources.

In this submission, BCSE provides general views in response to the request for comments on the proposed regulations for the 45V credit. For detailed responses, BCSE would like to acknowledge the submissions made by the American Clean Power Association, the Coalition for Renewable Natural Gas, the Fuel Cell and Hydrogen Energy Association and GTI Energy, among others. BCSE urges the consideration of the issues and recommendations included in these submissions.

About the Business Council for Sustainable Energy

The BCSE, founded in 1992, is a clean energy trade association, spanning a broad spectrum of industry sectors, including energy efficiency, energy storage, natural gas, renewable energy, sustainable transportation and emerging decarbonization technologies. BCSE also has an independent small- and medium-size businesses initiative under its banner, the Clean Energy Business Network (CEBN). Together, the BCSE and CEBN represent the full range of the clean energy economy, from Fortune 100 companies to small businesses working in all 50 states supporting over 3.2 million U.S. jobs.

Hydrogen as a Decarbonization Solution

Hydrogen and related technologies, such as electrolyzers, fuel cells, and turbines, can play a key role in decarbonizing many sectors, including medium- and heavy-duty transportation, residential and commercial heating, power generation, and hard-to-decarbonize industries such as ammonia and steel.

In addition to the programs and policies enacted under the IIJA and the IRA, BCSE notes the U.S. Department of Energy's (DOE) initiatives to support expanded use of hydrogen, as recognized by the findings of the *U.S. National Clean Hydrogen Strategy and Roadmap*[2] and the formation of the Hydrogen Shot program.

[1] Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election to Treat Clean Hydrogen Production Facilities as Energy Property, Notice of Proposed Rulemaking and Notice of Public Hearing, 88 Fed. Reg. 89,220 (Dec. 26, 2023)

[2] See Energy.gov; U.S. National Clean Hydrogen Strategy Roadmap; https://www.hydrogen.energy.gov/docs/hydrogenprogramlibraries/pdfs/us-national-clean-hydrogen-strategy-roadmap.pdf (accessed January 8, 2024).

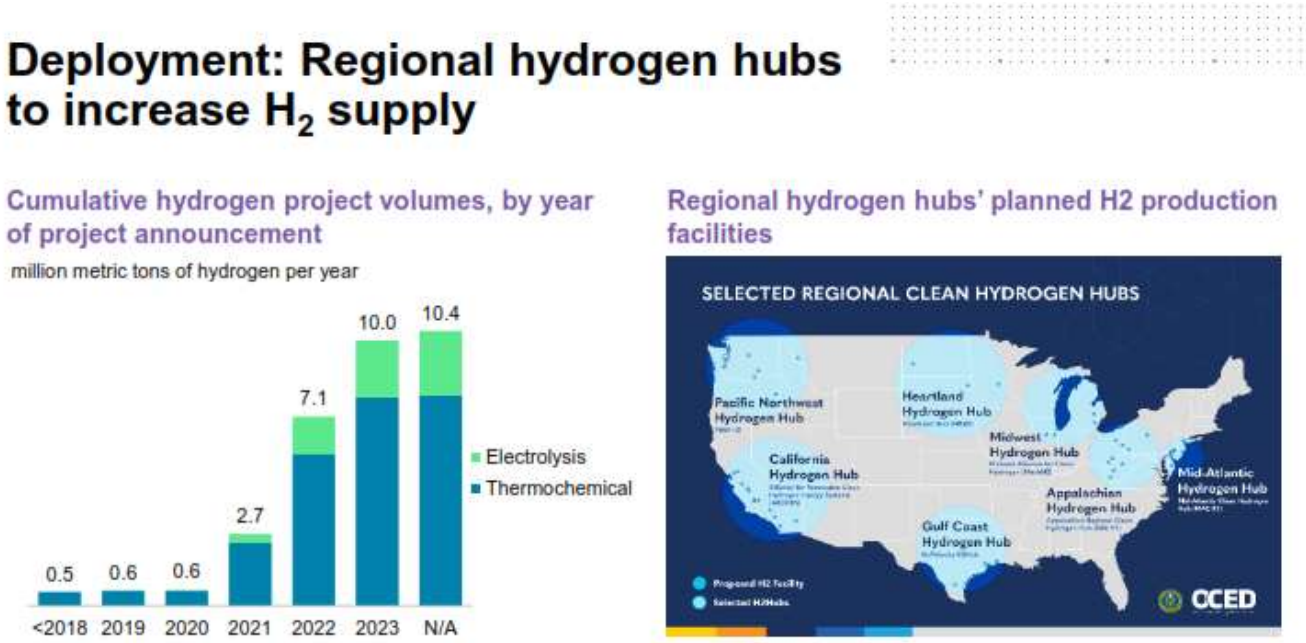
According to the 2024 Sustainable Energy in America Factbook, published by BloombergNEF in partnership with the BCSE, the U.S. is a global leader in hydrogen production. Following the passage of the IIJA and the IRA, investments in hydrogen have soared. In 2023, $1.9 billion was invested in hydrogen-producing projects in the US – representing a year-on-year jumps of 82%.

Approximately 10.4 million metric tons of hydrogen capacity per year have been announced across the U.S. to date. The steep rise in project announcements from 2020 to 2023 is credited to a favorable policy environment for hydrogen producers, such as the IIJA and IRA.

Over 70% of the US's announced hydrogen volume is composed of blue hydrogen, or hydrogen produced from natural gas with carbon capture, due to the low cost of natural gas. By contrast, the renewables needed to produce hydrogen via electrolysis with renewable electricity are relatively expensive.

The Biden administration's regional Hydrogen Hubs plan to contribute an additional three million metric tons of hydrogen per year once all four phases of the program are complete.[3]

Figure 1: From the 2024 Sustainable Energy in America Factbook, published February 21, 2024



[3] 2024 Sustainable Energy in America Factbook, produced by the Business Council for Sustainable Energy and BloombergNEF, February 21, 2024, www.bcse.org/factbook.

General Comments on the Design and Implementation of the 45V Clean Hydrogen Production Tax Credit

The IRA established the 45V tax credit for qualified clean hydrogen produced after 2022 at a qualified clean hydrogen production facility in the U.S. during the ten-year period beginning on the date the facility is originally placed in service. The 45V tax credit is calculated by multiplying the applicable amount by the kilograms of qualified clean hydrogen produced based on the lifecycle greenhouse gas (GHG) emissions rate that results from the production of qualified clean hydrogen. Qualified clean hydrogen is defined in 45V to include hydrogen that is produced through a process that results in a lifecycle GHG emissions rate of not greater than 4 kilograms of carbon dioxide equivalent (CO2-e) per kilogram of hydrogen. The IRA also provides an election for a taxpayer to receive a direct payment or to transfer the credit.

The Proposed Rule outlines the proposed regulations for determining eligibility and seeking a credit for the production of clean hydrogen. The Council appreciates the work of the staff at the Department of the Treasury (Treasury) and the Internal Revenue Service (IRS) to issue the proposed regulations for this new tax credit that has the potential to expand the production of clean hydrogen and catalyze significant economic development and job creation in the United States.

Further, the ten-year eligibility period provides a generational opportunity to leverage private sector capital for public benefit. As such, the implementation rules are critical to delivering the results on the ground.

However, BCSE members are concerned that the proposed regulations will inhibit the ability to achieve the clean hydrogen deployment objectives of the Biden Administration and Congress. Further, without modifications, U.S. leadership in this game-changing technology could be put at risk.

As noted in the comments submitted by the Fuel Cell and Hydrogen Energy Association, “the ability to scale manufacturing in the U.S. depends on the market having enough certainty to place purchase orders. If Europe and other countries implement more producer-friendly hydrogen policy regimes, the manufacturing base that would otherwise be located here in the United States will instead move to other markets with more favorable clean hydrogen policies.”

The following sections discuss several areas where modifications to the proposed regulations are requested. Of note, as a diverse coalition, not all BCSE members take a position or endorse the recommendations listed below.

Clarify that the GREET Model for the Taxable Year of Project Decision and Commencement Can be Used for the Entire Project Period, With the Opportunity to Use an Updated Model

Certainty and predictability around the determination and calculation of life-cycle emissions as it relates to accessing the Clean Hydrogen Production Tax Credit is critical. The statute requires the use of the GREET model (or a successor) to determine emissions rates for purposes of Section 45V. The proposal requires that qualified clean hydrogen producers should rely on an annually updated GREET model. However, the potential for continuous changes to the GREET model’s assumptions each year can create a level of uncertainty that increases project risk and thereby jeopardizes tax equity and project financing.

While it is unclear whether changes in the GREET model from year-to-year would be material, the lack of clarity that this question raises creates potential investor risk.

As such, BCSE recommends that the proposed regulations revise the definition of the "most recent GREET model" for purposes of determining the "lifecycle greenhouse gas emissions" to mean the most recent GREET model for the taxable year in which the final investment decision is reached and the project commences, and permit the taxpayer to rely upon such model for the full credit period; or, if there is an updated GREET model that best computes the lifecycle GHG emissions rate based on the taxpayer's facts and circumstances, then the taxpayer may have the option to use an updated GREET model during the credit period.[4]

Expand the 2023 GREET Model to Allow Common Technologies and Feedstocks to be Used to Produce Clean Hydrogen

The Argonne National Laboratory has provided the 45VH2-GREET (2023 GREET model) for implementation of the Section 45V tax credit.

BCSE recommends that the final rule expand the hydrogen production pathways in the 2023 GREET model to include common technologies and feedstocks used to produce qualified clean hydrogen.

The 2023 GREET model currently excludes several clean hydrogen production pathways industry participants are pursuing, including but not limited to, methane pyrolysis, high-temperature water electrolysis from non-nuclear sources, tri-generation, geologic hydrogen, cryogenic fractionation in combination with autothermal reforming, ethanol steam reforming, among others. BCSE supports expanding the 2023 GREET model to include such pathways. At present, these pathways are left with increased uncertainty in requiring use of a provisional emissions rate ("PER"), which may not be approved, leading to significant barriers to obtaining project financing.

In addition, neither the proposed regulations nor the current 2023 GREET model allow for the use of renewable biomass feedstocks other than those derived from landfill gas. Similar to what California recognizes already in the Low Carbon Fuel Standard ("LCFS"), the IRS and the Treasury should recognize carbon reductions from dairy and swine gas, as well as fugitive methane sources currently in the 2023 GREET model, as well as swine-based inputs.

Permit Greater Data Flexibility in the 2023 GREET Model to Maximize Emission Reduction Activity

As proposed, the 2023 GREET model does not allow for flexibility to adjust the background data that would maximize emissions reduction activity. Examples of currently locked background data that should instead be treated as foreground data that can be adjusted in accordance with the actual attributes of an individual project include the distance of a natural gas pipeline, the emissions associated with renewable natural gas, the emissions associated with natural gas, and methane leakage rates. Flexibility to use actual inputs, rather than modeled, will incentivize deployment of emissions reduction technologies not only at the project level, but also reduce emissions upstream. If a certified, lower-carbon intensity natural gas is allowed as foreground data, the 45V tax credit can incentivize the reduction of GHG from natural gas production and encourage the adoption of

[4] Please see: Code section 45V(c)(1)(B) and Prop. Treas. Reg. §§ 1.45V-1(a)(8)(i) and (ii).

new technologies to avoid methane leakage. BCSE recommends that the final rule provide the opportunity for updates in key background data sets.

Modify the Three-Pillars Approach for Electricity and for the Use of Energy Attribute Credits

As noted above, the Clean Hydrogen Production Tax credit provides a generation opportunity to expand U.S. leadership in producing clean hydrogen. Critical to this success, is the ability to have a strong and resilient U.S. domestic market, with consistent demand and competitive prices for clean hydrogen. As the industry is growing, flexibility is needed to ramp up production and create a sustainable supply and demand balance.

Establishing the three-pillar approach, (i) incrementality, (ii) temporal matching, and (iii) deliverability,[5] as prescribed in the proposed regulations would stifle the development of the clean hydrogen market at a critical time. Further, the three pillars are not included in the statue as written.

BCSE members share their views on the impacts of implementing the three pillars in detail in their comment submissions. Understanding concerns about induced emissions. the Proposed Rule as currently drafted would significantly increase costs, delay deployment and projects and risk U.S. investment in domestic clean hydrogen. The proposal also creates uncertainty with the implementation of several Regional Clean Hydrogen Hubs.

BCSE members offer a range of suggested modifications to the three pillars approach as proposed. They include eliminating the three pillar requirements on the use of Energy Attribute Certificates (EACs). However, if the three pillars are not removed, modifications should be made to:

- Provide grandfathering for certain projects, for the full life of these projects.
- Allow a longer transitional period through 2032 for the temporal matching, incrementality and deliverability requirements to be implemented.
- Incorporate a longer transition period for the incremental requirement and an exemption to the incremental requirement for EACs procured from nuclear and hydropower electricity generators.
    - However, if a general exemption is not provided, then it is recommended that the government provide multiple options, as presented in the proposed regulations, for determining whether an EAC satisfies the incremental requirement.
- Include a safe harbor for EACs purchased from electricity generators located in a jurisdiction with greenhouse gas emissions caps, clean power mandates, or renewable portfolio standards (or similar policies). This would recognize the significant efforts already underway at states to proactively pursue renewable deployment and grid decarbonization.
- Clarify that if a specific clean electricity generator(s) is directly connected to a qualified clean hydrogen production facility and the electricity from such generator is solely used for the production of qualified clean hydrogen, then an EAC is not required.

[5] Prop. Treas Reg. § 1.45V-4(d)(3).

Implement Rules that Enable Renewable Natural Gas to Be Used to Produce Clean Hydrogen

BCSE appreciates the Proposed Rule's recognition that Renewable Natural Gas (RNG) provides an existing pathway for clean hydrogen production. [6]

When organic wastes decompose, they emit methane—a potent GHG—in the form of biogas. Managing these wastes and emissions are an important step toward meeting the methane and GHG emission reduction goals of the Biden Administration and Congress.

RNG is derived from biogas that has been captured (rather than emitted into the atmosphere) from existing organic waste streams—including animal and agricultural wastes, municipal wastewater, and municipal solid waste in landfills. The biogas is cleaned and conditioned to remove contaminants and concentrate the methane to achieve quality standards necessary to blend with or substitute for conventional natural gas. RNG projects also help manage wastes (not create them), providing economic and other environmental benefits to local communities across the United States.

RNG is available today to replace conventional natural gas in the production of hydrogen through such technologies as steam methane reformation as well as serving as a high-BTU, clean source of energy in other hydrogen production processes, including electrolytic processes.

The Proposed Rule did not include specific regulations for RNG-to-hydrogen pathways, but did provide information regarding how IRS is anticipating regulating such pathways for purposes of the 45V tax credit. We appreciate these efforts, including acknowledging that sourcing of RNG feedstock, which is largely distributed through the U.S. natural gas commercial distribution system, can be achieved through "book-and-claim" chain of custody tracking systems.

While referred to as "book-and-claim" for ease of reference here, the industry actually uses what is referred to as a mass balance approach where the RNG is injected into the same distribution system from which gas is withdrawn for downstream uses. The mass balance approach to custody transfers has a long history in the natural gas market and has been recognized in several regulatory programs without identified cases of fraud or "double-counting." These systems have worked, and existing frameworks should continue to be available for hydrogen production facilities to show use of RNG as a feedstock or as process energy for electrolysis.

To ensure the full potential of an RNG-to-clean hydrogen pathway, BCSE supports the recommendations offered in the submission made by the Coalition for Renewable Natural Gas and urges the final rule to incorporate the following elements:

<u>Modify the 2023 GREET Model to Include a Broader Range of Feedstocks</u>

As noted in the section above, the statute requires the use of the GREET model (or a successor) to determine emissions rates for purposes of Section 45V. The GREET model has included RNG pathways in its modeling for

[6] DOE, *U.S. Department of Energy Clean Hydrogen Production Standard (CHPS) Guidance*, at 3, 6 (2023), *available at* https://www.hydrogen.energy.gov/docs/hydrogenprogramlibraries/pdfs/clean-hydrogen-production-standard-guidance.pdf.

some time, including recognizing that RNG facilities avoid emissions in cases where the biogas may otherwise have been flared or released into the atmosphere. These avoided methane emission benefits are key and an important part of any lifecycle analysis for RNG.

The 2023 GREET model includes a landfill gas pathways for hydrogen production, but should be expanded to include, at a minimum, Biogas from Anaerobic Digestion of Animal Waste, Biogas from Anaerobic Digestion of Wastewater Sludge, Biogas from Anaerobic Digestion of MSW, and RNG-to-hydrogen via electrolysis.

Further, BCSE supports the use of default assumptions to ensure these pathways are allowed, but, certain site-specific factors for each pathway would better reflect the GHG emissions for certain RNG facilities. Further, to provide certainty for investment, it is recommended that the emissions rate can be updated if material changes are made to a facility, rather than checking emissions each year. Finally, individualized emissions rates should be permitted for use should a facility wish to demonstrate additional emission reductions.

Remove "First Productive Use" Requirement for RNG

BCSE recommends that the "first productive use" requirement be removed from the final regulations. This requirement would likely exclude viable RNG projects that could support clean hydrogen production today. RNG projects have a long runway from development to operation, and do not necessarily match up initial operations with the startup of a hydrogen facility. Thus, requiring the RNG project and the hydrogen production facility to come on-line in the same year (or for the RNG project to come on-line after) could reduce the number of facilities that could participate. Further, the requirement would also cause a significant value discrepancy for new RNG projects creating a market distortion.

If the "first productive use" requirement is not eliminated, then a grandfather rule and a transitional period through 2032 should be included in the final rule.

Permit Taxpayers to Use EACs for RNG, Fugitive Methane and Other Similar Feedstocks

The proposed regulation has raised concerns with "induced emissions," a type of indirect emission that is attributed to the production of renewable electricity in one region for which credit is used in another region that requires increased energy to meet the demand in that region." In the context of RNG, approaches to avoid induced emissions are not needed, due to the operations of the natural gas market.

Specifically, conventional natural gas is displaced by RNG when it is injected into the U.S. natural gas commercial distribution system, removing the need for time-matching requirements. RNG has a steady flow year-round and there is substantial storage available that can be used to address any seasonal differences in demand. The industry typically balances supply and demand on at least a monthly basis, and hydrogen production is often tracked on a quarterly basis.

Similarly, because of the interconnectivity of the natural gas pipeline value chain and based on the delivery tracking systems long established, there is no need to impose regional geographic restrictions for RNG. The entire North American natural gas pipeline system is the proper geographic scope for the 45V tax credit and the federal Renewable Fuel Standard (RFS) program typically sets the market for RNG "credits," on a national level.

Currently, hydrogen production is not typically co-located with RNG production or fugitive methane capture, and new deliverability requirements would needlessly limit access to customers and offtake partners that stand to benefit from reducing their emissions from the use of lower-cost, clean hydrogen. Furthermore, the GREET model does not recognize regional restrictions at this time so placing such restrictions on RNG certificates before the government decides on regional methane emission rates is arbitrary and not justified.

While there may currently be regional differences in leak rates, recent methane regulations will drive all production to equivalent rates, and that is especially true for new production subject to the EPA methane New Source Performance Standard. Further, the IRS and the Treasury should seek to avoid the significant costs and emissions associated with hydrogen liquefaction and transportation.

Because there are long-standing delivery tracking systems, there is a means already to tie the hydrogen producer to the RNG being claimed to be used for purposes of the 45V tax credit. The IRS should use existing systems, to the extent applicable and practicable, to support the use of the tax credit for RNG. This includes, but should not require, an electronic system of tracking that has been used for RNG—M-RETS Renewable Thermal Tracking System, that can be a model for other programs and should be an available option to use. This system, as well as the federal RFS and California Low Carbon Fuel Standard (LCFS) can be verified. In fact, the RFS and California LCFS offer existing infrastructure and experts to make those verifications.

Confirm the Application of Book and Claim System for RNG and Clarify that the North American Interconnected Pipeline Grid

The proposed regulations sought comments on whether or how a book and claim system could be applied to hydrogen producers using RNG. Such a system is an established market that already works within regulatory frameworks, such as LCFS and the RFS program. Accordingly, the IRS and the Treasury should look at the precedents set by these frameworks and leverage the historical learnings that have already occurred when developing additional guidance on the 45V Credit regarding RNG.

The IRS and the Treasury should institute a book and claim provision for RNG without geographic restrictions. The current Proposed Rule only supports landfill gas physically connected to the production facility. Expanding the rule to include landfill and dairy other waste that is geographically dispersed will help unlock the production and use of RNG and fugitive methane from waste products that would otherwise vent methane into the atmosphere. This can be accomplished if the IRS and the Treasury establishes a book and claim system like as is currently used by the LCFS program.

Please do not hesitate to contact BCSE President, Lisa Jacobson with any questions. Thank you for your consideration.