CARBON UTILIZATION RESEARCH COUNCIL
ADVANCING FOSSIL ENERGY SOLUTIONS

February 26, 2024

Lily Batchelder
Assistant Secretary, Tax Policy
U.S. Treasury Department
1500 Pennsylvania Avenue NW
Washington, DC 20220

Douglas W. O'Donnell
Deputy Commissioner for Services and Enforcement
Internal Revenue Service
1111 Constitution Avenue NW
Washington, DC 20224

Submitted via the Federal eRulemaking Portal at: www.regulations.gov

Re: Comments of the Carbon Utilization Research Council (CURC) on the Notice of Proposed Rulemaking for the Section 45V Credit for the Production of Clean Hydrogen ("Proposal") (REG-117631-23)

Dear Assistant Secretary Batchelder and Deputy Commissioner O'Donnell:

The Carbon Utilization Research Council (CURC) appreciates the opportunity to submit these comments on the Proposal. CURC is a membership coalition focused on technology solutions for the responsible and sustainable use of our fossil energy resources, including carbon capture and storage (CCS); carbon capture, utilization, and storage (CCUS); and clean hydrogen. CURC has a broad membership reflective of the full and diverse CCS ecosystem, including natural gas and coal power plant owners, equipment manufacturers, technology innovators, national associations that represent the power sector, labor unions, fossil fuel producers, non-governmental entities, and state, university, and technology research organizations that are all leading innovators in the development and deployment of CCS technology.

I. Background on Carbon Utilization Research Council

CURC engages with federal policymakers to ensure that the United States pursues advanced fossil energy technologies that support the long-term, environ mentally responsible use of those resources. CURC serves as a source of credible, nonpartisan, technology-based information to Congress and the Executive branch. CURC structures and participates in several activities designed to equip policymakers with current information on the development and application of advanced fossil energy technologies, including CCUS and clean hydrogen.

CURC members recognize that CCUS is an important part of any decarbonization scenario. Meeting climate goals requires a flexible power system that can manage variable generation sources and meet fluctuating demand. Coal- and natural gas-fired power plants will continue to be a part of the nation's electricity supply well into the future, and CCUS allows those plants to provide decarbonized electricity to support the reliability and affordability of the electric grid and power new industrial load applications such as electrolytic hydrogen production. CCUS will also enable hydrogen production from applications such as steam methane reforming. As

technology improves, supporting infrastructure is developed and expanded, and costs fall, CCUS deployment will play a crucial role in reducing electric sector emissions and other industrial or transportation applications using decarbonized hydrogen. Along with those changes will come new and transitioned jobs, export opportunities, and other economic benefits in addition to the environmental benefits CCUS provides.

A number of CCUS projects are advancing around the world. Over 500 projects have been announced that are in various stages of development across the CCUS value chain. Several projects are also advancing in the United States. For example, Project Tundra, led by CURC member Minnkota Power Cooperative, is being designed to capture up to 4 million metric tons of CO_2 annually from Minnkota's Milton R. Young Station in North Dakota. This is but one example of several CURC member companies that are moving forward with their commitments to develop and adopt CCUS in their ambitions to decarbonize.

CURC members are contributing to a growing CCUS sector and believe CCUS will make an important contribution to decarbonizing our economy. The IIJA demonstration funding and the IRA-enhanced Section 45Q tax credit are sparking interest in new investments in CCUS technologies and projects necessary to achieve those objectives.

CURC submits the following comments on Treasury's Proposal.

II. Clarification of Treatment of 45V with 45Q Carbon Sequestration Tax Credits.

The Proposal states a taxpayer can't take the 45V hydrogen production credit if the 45Q credit is "allowed" for that taxable year or any prior taxable year for CO_2 captured by the carbon capture equipment included in the hydrogen production facility. CURC is confirming that the term "allowed" means the taxpayer has taken the 45Q credit on its tax return, not that it is eligible for the 45Q credit.

The statute is drafted to preclude taking 45V if the 45Q has already been taken by the taxpayer for the qualified facility and not the other way around. CURC is seeking clarification that qualified hydrogen production facilities can start with the 45V credit and then switch to claim 45Q for any taxable year during the 10-year 45V credit window, and the taxpayer is not allowed to switch back to 45V. CURC is also seeking clarification that at the end of the 10-year 45V credit window, the taxpayer can take 45Q for the taxable years during the remainder of the 12-year 45Q credit window.

CURC is seeking clarification that Carbon capture equipment that is only capturing CO_2 from an electric generating facility that is providing power to a hydrogen production facility is not included in the definition of the hydrogen production "qualified facility". CURC agrees that this is also true even if the same taxpayer owns both the electric generating facility and the hydrogen production facility, the taxpayer would be allowed to take the 45Q credit on CO_2 captured from the electric generating facility and the 45V credit on the hydrogen production facility.

III. The 45VH2-GREET Model is Inadequate.

The 45VH2-GREET model has too many parameters of hydrogen production processes locked down as fixed assumptions that may not be changed by the user (defined as "background data" in

the Proposal's supporting DOE Guidelines document)[1]. The Proposal defines background data as parameters for which bespoke inputs from hydrogen producers are unlikely to be independently verifiable with high fidelity. This differs from the standard H2-GREET model which allows for some of these parameters to be input by the user.

A. Upstream methane emissions

One example of these inadequacies is the distance of pipeline transmission, whether for natural gas or renewable natural gas (RNG) derived from landfill gas (LFG); 45VH2-GREET 2023 mandates the national average length of the pipeline transmission, 680 miles, when this distance is easily verified when specific sources of gas are utilized for a production facility (e.g., LFG, or facility located near a gas processing facility).

Another variable, the upstream methane leakage rate, is fixed by the 45VH2-GREET model for the natural gas supply chain at 0.9% in background data. This is unacceptable. As DOE notes, methane emissions monitoring and mitigation is undergoing rapid change.[2] Many hydrogen production facilities will have access to verified data that documents a methane leakage rate lower than 0.9%. Certified (or differentiated) natural gas must be able to use a different methane leakage rate. Being unable to do so limits the taxpayer's ability to accurately reflect and be rewarded for the lower CO_2 intensity of the hydrogen produced. Treasury determined that a third-party verification protocol as required in the 45Q credit program is sufficient for purposes of validating the demonstration of secure geologic storage of CO_2 in enhanced oil recovery operations (pursuant to certain methodologies); third party verification should also be adequate to validate methodologies to determine the upstream leakage rate for purposes of 45V. Further, subpart W of EPA's GHG reporting rule, when it is finalized, may be another pathway to verify the upstream leakage rate. Given that there is a fee imposed on methane emissions that must be reported under this program, this demonstration should be sufficient to report and include those emissions reductions in the computation of the CO_2 intensity score.

45VH2-GREET is expected to be updated approximately annually and future versions are anticipated to include additional hydrogen production technology pathways not currently represented, as well as refined and updated estimates of background data, however this is not helpful to taxpayers who want to develop early hydrogen production facilities or obtain differentiated supplies of natural gas or RNG.

The Proposal allows DOE to decline to review a provisional emission rate (PER) application if the feedstock is represented in 45VH2–GREET, even if the taxpayer can demonstrate that the underlying assumptions (that is, background data) does not represent their feedstock. To use the PER process, the hydrogen production pathway that the taxpayer is utilizing must be consuming a feedstock that is not represented in 45VH2–GREET (e.g., a type of biomass that is not represented in the model). This must be changed. Any hydrogen production facility must be allowed to apply for, and receive, a PER in a timely manner from DOE. To do otherwise penalizes taxpayers who have made investments in differentiated sources of methane (natural gas) or other feedstocks with lower CO_2 intensities than those assumed in 45VH2-GREET. Without a PER that provides for the CO_2 intensity of the hydrogen production pathway, those

[1] U.S. Department of Energy, "Guidelines to Determine Well-to-Gate Greenhouse Gas (GHG) Emissions of Hydrogen Production Pathways using 45VH2-GREET 2023", December 2023.
[2] Ibid, p. 16.

projects will not be built, further limiting the creation of a clean hydrogen industry. Taxpayers that invest in ways to create more efficient and lower CO_2 emitting processes should have their efforts recognized and the emissions reductions counted as part of the 45V process. In order for projects to proceed in a timely manner, DOE must issue a PER within 90 days of receiving a complete application for a PER.

B. Lack of specific CCS system inputs

45VH2-GREET 2023 does not allow an input for the quantity of co-product steam to exceed 17.6% of the total energy content (LHV) of all steam and hydrogen produced. The amount of steam produced can be measured by meters and verified, therefore the quantity of co-produced steam should be foreground (variable) data in the model. For methane reformer hydrogen production technologies utilizing carbon dioxide (CO_2) capture and sequestration (CCS), the model does not allow users to account for steam co-products because it assumes that excess steam would be used to power the CCS plant. DOE's Guidelines paper acknowledges that assumption is not correct for all pathways, but that the model cannot evaluate them at this time. The model also assumes the same energy/CO_2 emission penalties for any system utilizing CCS. That is clearly an incorrect assumption as there are different types of CCS systems with different efficiencies (e.g., cryogenic CO_2 capture processes have higher overall efficiency and negligible steam requirements when compared to amine-based systems).

45VH2-GREET is expected to be updated approximately annually and future versions are anticipated to include additional hydrogen production technology pathways not currently represented, as well as refined and updated estimates of background data, however this is not helpful to taxpayers who want to develop early hydrogen production facilities.

The Proposal allows DOE to decline to review a provisional emission rate (PER) application if the hydrogen production technology is represented in 45VH2–GREET, even if the taxpayer disagrees with the underlying assumptions (that is, background data) or calculation approach used by the most recent 45VH2–GREET. To use the PER process, the hydrogen production pathway that the taxpayer is utilizing must use a hydrogen production technology that is not represented in 45VH2–GREET (e.g., pyrolysis). This must be changed. Any hydrogen production facility must be allowed to apply for, and receive, a PER in a timely manner from DOE. To do otherwise penalizes taxpayers who have made investments in more efficient processes, including CCS systems, than those assumed in 45VH2-GREET. Without a PER that provides for the CO_2 intensity of the hydrogen production pathway, those projects will not be built, further limiting the creation of a clean hydrogen industry. Taxpayers that invest in ways to create more efficient and lower CO_2 emitting processes should have their efforts recognized and the emissions reductions counted as part of the 45V process. In order for projects to proceed in a timely manner, DOE must issue a PER within 90 days of receiving a complete application for a PER.

IV. Treatment of Fossil Electricity Generation with CCS as a Clean Electricity Resource

The Proposal requests comments on whether electricity generated by an existing fossil-fuel electric generating facility that adds CCS and reduces its emissions should be considered an incremental source of minimal-emitting electricity if the addition of the CCS had a COD that is no more than three years before the relevant hydrogen production facility was placed in service.

CURC agrees that the facility should be considered incremental and strongly encourages the "look-back" time to be increased to five years. This would allow a little more flexibility in the coordination of timing between the COD of the CCS facility and the construction and start-up of the hydrogen production facility.

On the related question, CURC believes that, depending on its CO_2 emission rate, it is appropriate to treat an existing fossil-fuel electric generating facility as a new source of minimal-emitting generation on the grid that would not be associated with induced grid emissions. Because of the very high cost of adding a CCS system, the treatment would be the same as the current treatment of an existing renewable electricity source being considered "new" if the cost of retrofitting the existing renewable electricity facility is as least 80% of the value of the retrofitted renewable electricity facility.

The Proposal requested comment on what information would be needed to allow for qualifying energy attribute certificates (EACs) representing fossil fuel-fired electricity generating facilities that have added CCS—particularly on whether there are safeguards that can ensure that a hydrogen producer's purchase and use of electricity from such a facility does not result in indirect GHG emission due to the dynamics of the electricity market and electric grid. Again, the answer here is the same as above: similar treatment be given to existing renewable electricity generating facilities that make substantial investments to upgrade.

CURC members believe that the calculation of the emission rate of CO_2 out of the stack plus any leakage of CO_2 from secure geologic storage[3], divided by the net MWh delivered to the grid is all the information required to determine whether the EACs are acceptable for purchase and use by hydrogen production facilities.

Sincerely,

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[3] Final 45Q Rule, 86 Fed. Reg., beginning at 4740.