ModernHydrogen

February 23, 2024

Submission VIA the Federal eRulemaking Portal

Internal Revenue Service
CC:PA:LPD:PR (REG-132569-17)
Room 5203
P.O. Box 7604, Ben Franklin Station
Washington, DC 20044

Re: REG-117631-23: Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election to Treat Clean Hydrogen Production Facilities as Energy Property

From: Mothusi Pahl, Vice President, Business & Government Affairs,
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Dear IRS Representatives:

Thank you for the additional opportunity to comment on the proposed rulemaking regarding IRA provisions for clean hydrogen production and investment. Our current comments primarily relate to methane feedstocks and methane pyrolysis pathways and the 45VH2-GREET model. We are available to provide additional context and rationale.

Summary of Requests

- Add **methane pyrolysis pathways** to recognize this commercially available clean hydrogen production category; pathways should be flexible and adaptable for different technologies (e.g., thermal, non-electric, electric) and operating environments
- Add **methane feedstock pathways** including multiple categories of RSG, RNG and biogas and allow flexible methane access to increase availability and reduce costs of clean hydrogen production
- Add **upstream methane emissions** from multiple methane feedstock pathways to foreground data and support development and use of tracking & verification mechanisms
- Add **solid carbon as a valorized co-product**, which is a result of the pre-combustion carbon capture in the methane pyrolysis process
- Allow for **mass-based emissions allocation** to reduce administrative burden on smaller production facilities
- Account for **emissions from vehicle miles traveled (VMT)** from production facility gate to point of use to reflect real-world emissions of the entire lifecycle
- Provide **certainty on LCA methodology** for the lifetime of a project to reduce risk and accelerate project investment and clean hydrogen production

About Modern Hydrogen and Methane Pyrolysis

Modern Hydrogen decarbonizes natural gas through distributed methane pyrolysis technologies. The process generates clean hydrogen and solid carbon from methane feedstocks for commercial and industrial uses. It is a practical and cost-effective emissions reduction solution, which leverages existing energy supplies, infrastructure and workforces.

Modern started producing and delivering clean hydrogen for US gas utilities in 2023. It offers distinct advantages over currently available technologies for specific end uses and applications including industrial decarbonization, heavy transportation fuels and gas utility blending. The company is based in the State of Washington and employs 70 people. Learn more at www.modernhydrogen.com.

Additional Comments

GREET Model: definition of the latest version of 45VH2-GREET

Overall, IRA incentives and rules specifics are key to final investment decisions and project economics. Providing certainty on the LCA process and related incentives at the beginning of the initial 45V claim tax year will likely generate more clean hydrogen faster and at a lower cost than “shifting the goalposts” throughout the life of a clean hydrogen production facility.

To encourage clean hydrogen production, the taxpayer should have the option to choose the more favorable 45VH2-GREET model that was current as of the first day of the taxpayer's tax year or, alternatively, a successor model. Similarly, decisions on provisional emissions rate (PER) applications should be based on the 45VH2-GREET model available as of the first day of the applicable tax year. Importantly, the first LCA determination should apply for the lifetime of the project (absent production process changes) and be at the discretion of the taxpayer to shift to a more favorable successor model. This ensures that the baseline project financial assumptions or better apply to the project, which will encourage project development.

The risk of 45V-related PER or GREET model changes that negatively impact project economics will delay and/or discourage investment decisions, ultimately increasing costs, reducing project development and related benefits of low-GHG hydrogen production.

As soon as possible, include methane pyrolysis pathways in 45VH2-GREET to recognize the low-GHG hydrogen production potential of this adequately demonstrated technology. Include flexibility to account for distinct methane pyrolysis technologies, e.g., concurrent combustion & pyrolysis, plasma, microwave, photonic. And consult with methane pyrolysis technology providers to inform the model.

Emissions Accounting: valorized co-products

Include solid carbon as an eligible valorized co-product, which is generated from methane pyrolysis and similar pre-combustion carbon capture technologies and has multiple commercial and industrial uses.

Include the option for a mass-based allocation approach, which is simpler to manage and verify and can reduce abuse. System expansion is much more complex and burdensome to manage and verify, especially when those co-products are sold into a diverse array of end markets, customers and products.

Emissions Accounting: foreground data

Allow distinct upstream methane loss rates in foreground data to encourage use of lower-GHG methane feedstocks to improve LCA results. This will also encourage supply of a variety of low-GHG methane sources.

Support market-based mechanisms for tracking and verifying methane emissions data for all feedstocks to allow for accurate LCAs. This can facilitate market development and efficiency. Current examples of credible, high-fidelity data sources include MiQ Certification for natural gas and M-RETS Renewable Thermal Tracking System for RNG.

In addition, hydrogen that is delivered to the end user with lower total emissions, for example through hydrogen production facilities co-located with the end user or point-of-sale (e.g., hydrogen refueling station) or via pipelines (instead of vehicles with associated VMT GHGs), should be favored for the credits. Well-to-gate analysis ignores post-production hydrogen transportation, storage and dispensing, some of the most emissions-intensive aspects of hydrogen use across the economy, and we feel those emissions are worth factoring into these credits.

Safeguards

The current “well-to-gate” LCA system boundary may encourage behavior that results in real-world GHG emissions beyond the defined incentive limits of CO2e/kg when hydrogen end uses are not located near production facilities. To safeguard against incentivizing production of clean hydrogen that is intended for delivery to a remote end user over long distances in high-GHG emission vehicles:

- account for emissions from gate-to-point-of-use in the LCA methodology; and/or
- include a limit on vehicle miles traveled (VMT) and/or a CO2e generated between a hydrogen production facility (gate) and delivery to an end use customer at point-of-use or retail distribution; and/or
- create an emissions accounting credit process to reflect the lower full lifecycle emissions of on-site production (at/near point of use) that does not require vehicular transport and associated GHGs from vehicle miles traveled (VMT)

Absent this safeguard, the real-world lifecycle emissions per kilogram of hydrogen may be greater than existing hydrogen supplies – at a significantly greater cost and counter to congressional intent. Existing terms from federal rules developed by the Environmental Protection Agency include "the emissions from Vehicle Miles Traveled per kg of hydrogen from the point of production to delivery at point of use (gate-to-tank), as determined under the most recent Motor Vehicle Emission Simulator (commonly referred to as the ‘MOVES model’).”

To avoid abuse, rules should stipulate that any clean hydrogen produced that claims a tax credit is required to be produced for commercial use (e.g., not vented, flared or used in the production process) and cannot be transferred back to the original hydrogen producer for use in producing more hydrogen for additional tax credit claims. Rules should also ensure that byproducts from any hydrogen production process are not produced with the intent to dilute the emissions impact of the net delivered hydrogen. Further, only net clean hydrogen output should be eligible for tax credit claims – not the gross hydrogen produced, which can include hydrogen consumed in the production process.

No certification parties should share ownership with hydrogen users, producers, equipment manufacturers, service providers or any other entity involved in the hydrogen production landscape.

Companies, organizations, or joint ventures with shared ownership between hydrogen users and producers should have regular third-party audits of calibrated metrology equipment, flowmeters and indirect book accounting practices to ensure stated production volumes are accurate.

Renewable Natural Gas and Fugitive Sources of Methane

Regarding applying conditions that "would be logically consistent with but not identical to the incrementality, temporal matching, and deliverability requirements for electricity derived EACs," we encourage flexible access to low-to-negative GHG methane sources and the rapid development of tracking and verification methods to validate distinct methane feedstock carbon intensity, as well as other measures that may accelerate production of clean hydrogen that meets the technology-agnostic LCA to qualify for the relevant tax credits, as intended.

Specifically, include a wider range of methane feedstocks and allow book and claim provisions without geographic restrictions with the region defined as the North American interconnected pipeline grid. Do not apply hourly temporal matching to any methane sources as it is unfeasible based on current market practices. And allow new and existing RNG facilities to shift to hydrogen production at any time.

Less burdensome alternatives that do not increase the risk of duplication, fraud, or improper payments under section 45V

We encourage recognition of the value of decarbonized natural gas, renewable natural gas and biogas as a cost-effective and near-term decarbonization strategy. This includes recognition of pre-combustion CCUS in the form of solid carbon and CO2e of avoided emissions, and support for a protocol for solid carbon offsets.