



February 26, 2024

SUBMITTED ELECTRONICALLY VIA THE FEDERAL RULEMAKING PORTAL AT www.regulations.gov

Internal Revenue Service
CC:PA:LPD:PR (REG-117631-23)
Room 5203
P.O. Box 7604
Ben Franklin Station
Washington, DC 20044

RE: Notice 2023-28359 Comments

Dear Commissioner Werfel,

BayoTech, Inc. ("BayoTech") appreciates this opportunity to provide comments in response to the Department of Treasury's proposed regulations related to the clean hydrogen production credit contained in Notice 2022-28359 – Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election to Treat Clean Hydrogen Production Facilities as Energy Property.

BayoTech is a full-service hydrogen production, delivery, and storage technology company headquartered in Albuquerque, New Mexico. We are focused on deploying a new, small-scale, and highly efficient model of producing and delivering hydrogen using local hydrogen production hubs directly at or adjacent to hydrogen customer demand. This is achieved by producing hydrogen on a small scale with our unique and efficient technology designed at the Department of Energy's (DOE) Sandia National Laboratories. By combining highly efficient hydrogen generation, localized production facilities, and renewable natural gas (RNG), BayoTech can provide low-carbon hydrogen to communities across the United States, at or immediately adjacent to demand, and in geographic locations that are electrical grid and water-constrained or otherwise not ideally situated for larger scale hydrogen production or electrolyzers. This economical approach not only utilizes existing water and gas utility infrastructure and avoids placing an undue burden on strained electrical grids; it also lowers well-to-wheel lifecycle emissions and avoids both the costs and emissions associated with hydrogen liquefaction and long-distance transportation, providing a low-carbon solution to the country's hydrogen needs today.

As a pioneering force in the hydrogen industry, we are making reliable, cost-effective, low-carbon hydrogen accessible today. Since 2022, BayoTech has produced hydrogen from its pilot facility in Albuquerque. In November 2023, BayoTech completed its first commercial hydrogen production facility in Wentzville, Missouri, after more than 50,000 local man-hours and with the help of more than 20 local suppliers. The Wentzville hub is set to generate 350 tons of hydrogen annually. It serves a wide range of customers, including customers operating zero-emission fuel cell equipment and hydrogen-intensive industrial processes.

Permitting for BayoTech's second hydrogen hub is actively underway. The state-of-the-art hydrogen production facility will be co-located at the Port of Stockton in California. This pivotal location underscores BayoTech's dedication to expanding hydrogen infrastructure in key regions for goods movement, meeting the increasing demand for clean energy in ports. The establishment of this facility signifies a significant milestone in BayoTech's mission to create a network of distributed hydrogen production hubs across the United States. Positioned strategically, these hubs will cater to growing demand centers, demonstrating BayoTech's commitment to driving the adoption of hydrogen as a sustainable energy source while fostering economic growth and environmental responsibility.

These facilities support more than just the hydrogen economy by creating local jobs for the construction and operation of the generation facilities. BayoTech's innovative generators support manufacturing jobs in Farmington, NM, and its high-pressure storage and transport equipment support manufacturing jobs in Tulsa, Oklahoma. BayoTech is committed to sourcing many critical components for its hydrogen generation and transport equipment from reputable suppliers based in the United States. BayoTech prioritizes partnerships with suppliers located in key American cities such as Houston, Texas; Hatboro, Pennsylvania; and St. Louis, Missouri. This commitment not only ensures the quality and reliability of our products but also fosters local economic growth and supports communities across the nation. BayoTech has also partnered with Wentzville's Ranken Technical College to develop a program to equip the growing hydrogen workforce with the technical skills needed to support the future of the industry.

We appreciate the Biden-Harris Administration's recognition of the importance of hydrogen to achieving the United States' decarbonization goals by passing the Inflation Reduction Act (IRA). To that end, we believe that it is critical that the Treasury Department (Treasury) publish a final rule that brings immediate and achievable emissions reductions, supports local jobs, and grows the larger clean hydrogen energy economy. Treasury will achieve the above by ensuring multiple technology applications for producing reliable hydrogen. This includes establishing a robust RNG pathway for hydrogen producers like BayoTech to utilize geographically dispersed RNG resources, which is both consistent with Congressional intent as well as existing programs like the California Low-Carbon Fuel Standard (LCFS) and federal Renewable Fuel Standard (RFS).

In order to realize the IRA's goal of creating a robust domestic hydrogen market while reducing overall GHG emissions, Bayotech offers the following comments and asks that Treasury incorporate these changes in the final version of the rule. We look forward to working with Treasury and the Internal Revenue Service (IRS) on the and implementation of the Section 45V tax credit.

1) Treasury Should Recognize the Role of Avoided Emissions from RNG and Include an RNG Production Pathway in the Final Rule.

RNG can be used to achieve drastic emissions reductions. Sourced from biogas found in various waste streams such as municipal solid waste landfills, wastewater treatment plants, farms, and food production facilities, RNG undergoes a refining process to produce a pipeline-quality fuel that is interchangeable with fossil natural gas once injected into the grid. This versatility extends to applications as a feedstock for hydrogen production facilities. The U.S. Environmental Protection Agency (EPA) supports RNG projects due to their significant reduction in GHG emissions, particularly from energy consumption and waste management, representing a crucial step towards achieving carbon neutrality.¹ RNG demonstrates a nearly net-zero carbon impact, reducing GHG emissions by up to 95% compared to diesel, and can even have a negative carbon impact when utilized in scenarios where biogas would otherwise be released into the atmosphere. This information is supported by carbon intensity comparisons among different fuels, including RNG, derived from various sources.²

The Administration has set several ambitious goals for the hydrogen industry both in the near- and long-term. However, achieving these milestones will require a viable RNG pathway in Treasury's final rule for the Section 45V tax credit. In June 2021, DOE launched the Hydrogen Energy Earthshot (Hydrogen Shot) to reduce the cost of clean hydrogen to a levelized cost of \$1 per 1 kilogram in 1 decade ("1 1 1"). Furthermore, in June 2023, DOE published its National Clean Hydrogen Strategy Roadmap, wherein it lays out a pathway for a demand scenario of 10 million metric tonnes (MMT) of clean hydrogen annually by 2030. BayoTech applauds these targets and wants to see industry stakeholders and the larger country achieve them. However, the hydrogen industry is already facing costly headwinds. Recent modeling and figures project a 2030 range of the global levelized cost of hydrogen between \$2.5 and \$4.³ This underscores the necessity of a comprehensive RNG pathway for the Section 45V tax credit. It would propel the United States towards its hydrogen goals by simultaneously making low- to zero-emissions carbon hydrogen affordable.

a) Preserve Recognition of the Deep Carbon Reductions Associated with Dairy Gas in the GREET Model in the Final Rule.

Similar to the life-cycle analysis California recognizes in the state's LCFS, Treasury should recognize the carbon reductions from dairy gas in the Argonne GREET Model. If the application of the GREET model to the 45V tax credit is modified so as not to recognize dairy gas, it will prevent the dairy industry from being able to

¹ EPA, *An Overview of Renewable Natural Gas from Biogas*, (July 2020), pg. 1, https://www.epa.gov/sites/default/files/2020-07/documents/lmop_rng_document.pdf ("EPA RNG Overview").

² Argonne National Laboratory, *Renewable Natural Gas for Transportation*.

³ The Hydrogen Council and McKinsey & Company, *Hydrogen Insights 2023*, (December 2023), pg. 19, <https://hydrogencouncil.com/wp-content/uploads/2023/12/Hydrogen-Insights-Dec-2023-Update.pdf>.

utilize otherwise fugitive methane.⁴ Without a comprehensive RNG pathway, Treasury would leave significant, immediate, necessary, and feasible emissions reductions on the table. Therefore, we ask that the final rule acknowledge and incorporate the well-established carbon reductions associated with dairy gas as a viable pathway for claiming the Section 45V tax credit.

b) Incorporate the Different Forms of Hydrogen Production Outlined by the California GREET 3.0 Model in Determining Eligible Pathways for Hydrogen Production in the Final Rule.

The CA GREET 3.0 model was developed by the California Air Resources Board to provide estimated carbon intensity (CI) scores for a variety of different energy pathways. This model is one approach that is recognized and respected by many industry experts and policymakers across North America. The CA GREET 3.0 model recognizes hydrogen produced through both electrolysis and natural gas fueled steam methane reforming (SMR) technology. CI scores for these different technologies vary depending on the impact to the electrical grid, as well as the need for compression or liquefaction and transportation of hydrogen, which BayoTech's production and distribution model minimizes. Additionally, RNG sourced from agricultural, municipal waste, and other biogenic sources and delivered through the natural gas grid can further support carbon emission reductions by providing low or negative carbon feedstock for hydrogen production. This allows some SMR systems to generate carbon-negative hydrogen, something that's not yet possible with electrolysis-produced hydrogen. Given this, we ask that Treasury recognize viable pathways for all the different forms of hydrogen outlined by the CA GREET 3.0 model in the final version of the 45V tax credit.

2) The Final Rule Should Establish a Book and Claim Accounting System for RNG.

Treasury should sanction the ability to book and claim – or to register, track, and account for – the chain of custody on RNG credits to qualify for the Section 45V tax credit. By doing so, Treasury would establish a critical element for implementing the tax credit. A book and claim system for RNG is consistent with congressional intent, has precedent on the state and federal level, and will provide the nascent hydrogen industry with the necessary flexibility to achieve a scale consistent with the Administration's goals.

⁴ Argonne National Laboratory, *Renewable Natural Gas for Transportation*.

The natural gas market has historically utilized a displacement method known as book and claim accounting to track the chain of custody, where RNG is injected into the same pipeline system as natural gas, displacing fossil-based gas. This method, supported by rigorous recordkeeping, is widely adopted across various renewable gas procurement programs in the U.S. and internationally. The EPA has endorsed the concept in the RFS and the LCFS programs in states like California and Oregon. This approach enables the tracking of RNG deliverability via commercial pipelines. Given the interconnected nature and substantial storage capacity of the U.S. pipeline system, hydrogen producers should be credited for the RNG they purchase and inject into the pipeline infrastructure anywhere in the North American pipeline system.

The establishment of a book and claim accounting system is fully consistent with the Congressional intent behind the passage of the IRA and the Treasury Department's implementation of the Section 45V credit. On August 6, 2022, prior to the U.S. Senate passing the IRA, Chairman of the Senate Environment and Public Works Committee Tom Carper (D-DE) and Senate Finance Committee Chair Ron Wyden (D-OR) engaged in a colloquy to clarify the legislative intent behind the Section 45V hydrogen production tax credit.⁵ During that colloquy, the Senators clearly conveyed that Treasury should institute a book and claim system for RNG in the implementation of the Section 45V incentive:

“the [Treasury] Secretary shall recognize and incorporate indirect book accounting factors, also known as a book and claim system, that reduce effective greenhouse gas emissions, which includes, but is not limited to, renewable energy credits, renewable thermal credits, renewable identification numbers, or *biogas credits*.”

In addition to this colloquy, Members of Congress from both the United States House of Representatives and Senate wrote letters to Treasury advocating for book and claim accounting for RNG on July 17, 2023, and November 6, 2023, respectively.^{6 7} Given this clear display of congressional intent, Treasury should publish a final rule with an RNG book and claim system consistent with the spirit of the IRA when it was passed.

⁵ Congress.gov, *Congressional Record*, Vol. 168, Issue 133. (August 6, 2022), pgs. S4165-S4166, <https://www.congress.gov/congressional-record/volume-168/issue-133/senate-section/article/S4165-3>.

⁶ Reps. Jim Costa (D-CA), Jimmy Panetta (D-CA), and David Valadao (R-CA), *House Letter to Treasury Department*. (July 17, 2023).

⁷ Sens. Joe Manchin (D-WV), Maria Cantwell (D-WA), Sherrod Brown (D-OH), Joe Manchin (D-WV), Dick Durbin (D-IL), Kirsten Gillibrand (D-NY), Patty Murray (D-WA), John Fetterman (D-PA), Tammy Duckworth (D-IL), Kyrsten Sinema (I-AZ), Bob Casey (D-PA), and Gary Peters (D-MI), *Senate Letter to Treasury Department*. (November 6, 2023).

Treasury should also adopt a “book and claim” accounting system to maximize the potential emission reductions from an RNG pathway. We recommend that individual hydrogen production facilities be granted flexibility in supplying hydrogen to offtake partners and downstream consumers. A book and claim accounting system provides this flexibility and would foster an innovative and competitive commercialization pathway for the hydrogen industry. So long as the hydrogen produced meets the eligibility thresholds set out in the statute and is in line with the guidelines of the Treasury’s final rule, hydrogen producers like BayoTech could claim the production tax credit (PTC) while expanding the selection of potential offtake partners. This way, the Section 45V PTC will provide a strong signal to support the economic value of low carbon intensity hydrogen, and facility operators will be afforded the ability to adjust their approach as needed. A well-structured book and claim system will facilitate market transactions between buyers and sellers and increase the volumes necessary to reduce the price of hydrogen and reach the Administration’s goal of \$1 per 1 kilogram of clean hydrogen by 2030.

a) Use of M-RETS for Verification

Using book and claim accounting for energy sources and feedstocks requires a transparent and well-defined reporting and recordkeeping methodology by all involved parties. Existing programs, such as California’s LCFS, provide well-established protocols for registering, verifying, and accounting for carbon emission reduction pathways.

BayoTech recommends that Treasury endorse the Midwestern Renewable Energy Tracking System (M-RETS) program to electronically track renewable thermal certificates (RTCs) for parties seeking to claim the tax credit. This electronic tracking system is already used in several state-level renewable fuel programs.⁸ The use of an accredited third-party verification such as M-RETS would ensure a clear system of accountability, liability, and reputational credibility that avoids conflicts of interest, attempts at fraud, and instances of double counting that may present themselves in self-verification schemes.

3) The Final Rule Should Not Apply the Three Pillars Approach to Hydrogen Produced Using RNG.

a) Additionality and Alleviating Unnecessary Burdens Imposed by the “First Productive Use” Concept.

⁸ <https://www.mrets.org/m-rets-renewable-thermal-tracking-system/>

Treasury has introduced a “first productive use” concept that limits RNG pathways by creating a de facto strict additionality requirement. Treasury should eliminate or clarify “first productive use” in a way that leaves open various RNG pathways. For smaller-scale steam-methane reformation (SMR) production units like those built by BayoTech, deploying carbon capture equipment is not economical, leaving RNG pathways as the ideal option for reducing lifecycle emissions. BayoTech’s distributed, smaller-scale production model enables us to avoid well-to-wheel emissions and immediately allow communities to switch from diesel to zero-emission hydrogen, including fleets, ports, inland ports, industrial parks, and other end uses. This model meets initial local demand where the customer is co-located with a Bayotech hydrogen production facility and allows us to scale production to meet demand over time.

The proposed "first productive use" requirement poses significant challenges for new and existing RNG projects, leading to market distortions, increased risk of stranded assets, complexity, and higher consumer prices. To maintain investor confidence and ensure a robust RNG supply, the “first productive use” restriction should be eliminated for RNG, particularly for smaller-scale production units like those deployed by BayoTech. Small SMR production facilities will not have the same purchasing power as large-scale, centralized SMR and will be at a disadvantage in complying with first productive use restrictions on RNG. Installing carbon capture equipment is also far less economical for smaller facilities. Section Four of these comments discusses these differences and the need for a small-scale producer carve-out.

b) Stringent Time-Matching Is Unnecessary to Implement for RNG.

Time-matching would be unnecessary to implement for an RNG certificate book and claim accounting system. Unlike electricity, gas is stored in the grid until it is delivered. Potential RNG-based hydrogen producers have no "hour of the day" considerations as others might have with electricity. Once injected into the gas grid, RNG is indistinguishable from fossil gas and can be stored and transmitted freely. Hourly time matching is unnecessary for RNG delivery, as RNG can be stored for longer periods, making monthly or quarterly accounting periods more appropriate. Therefore, we recommend that hydrogen producers monitor their procurement of low-carbon gas and align it with their hydrogen production on a monthly, quarterly, and/or annual basis.

Unlike RNG, renewable electricity credits, or energy attribute certificates (EACs) as they are named in the proposed rule, issued in various programs differ in

value and rules by state where temporal rules have been established. Temporality is meant to account for the value delta between regional electricity grids and precisely account for emissions. However, this does not apply when hydrogen producers directly purchase RNG rather than relying solely on credits. For example, under the RFS, Renewable Identification Numbers (RINs) maintain a consistent value nationally, regardless of state regulations.

c) The Proposed Deliverability Requirements Should Not Apply to RNG.

Likewise, if Treasury imposed deliverability requirements, it would restrict new production sites and potentially create an unworkable final rule for taxpayers. Currently, hydrogen production is not typically co-located with RNG production, 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. This is certainly the case with BayoTech, where a core piece of the emissions reduction value is in the fact that production units are sited as close to the end user as possible. Treasury should seek to avoid the significant costs and emissions associated with hydrogen liquefaction and transportation. Additionally, RNG is inserted into the common carrier U.S. pipeline system, a fully interconnected national gas grid, where it is indistinguishable from other natural gas molecules.

Overall cost-effectiveness, carbon reduction, and reliability of energy are more important than the energy source. This has proven true for renewable electricity, and we expect it to also be true for hydrogen.

BayoTech's SMR is a proven, well-developed technology that can leverage geographically dispersed RNG feedstocks. The small footprint and modular design can be sited closer to customers to provide a cost-effective, zero carbon, and reliable hydrogen supply. For example, our Wentzville, Missouri facility required no additional gas infrastructure and was constructed in twelve weeks after all permits were obtained. BayoTech's model relies on the co-location of hydrogen facilities next to industry users and is, therefore, unique in establishing a much smaller overall footprint compared to large-scale hydrogen producers. This ability to place a source of hydrogen near hydrogen consumers creates an immediate pathway to reduce overall emissions exposures to frontline communities. BayoTech facilities can be sited near fleets, ports, or industrial parks, reducing or eliminating emissions exposure from the transportation of fuels, as well as replacing diesel and other fuel sources with greater carbon dioxide emissions.

4) Consideration for Small Hydrogen Producers

As explained above, the electrical grid considerations driving Treasury’s pursuit of the “three pillars” in the context of renewable electricity credits do not apply to RNG and the natural gas grid. However, should Treasury impose burdensome three pillars-like restrictions on RNG, Treasury should carve out small-scale, distributed SMR production for which carbon capture and storage (CCS) is uneconomical. In this scenario, smaller SMR production facilities that will be at an inherent compliance disadvantage relative to larger SMR producers would be exempt from any form of the “three pillars” regulations imposed by Treasury. Large SMR producers may have the advantage of accessing multiple tax credits due to their scale and production volume. However, smaller SMR producers face challenges in competing with these larger players, especially when it comes to financial resources and market presence. Large SMR producers can absorb the high costs of CO₂ transport and storage, variable costs, and capital costs that come with reducing their carbon intensities through CCS. Hydrogen production from an SMR system with CCS is approximately 55% more expensive than a regular SMR system.⁹ Smaller SMR producers also have less purchasing power relative to larger producers, putting them at a disadvantage in navigating any first productive use restrictions on RNG.

By introducing a carve-out based on production volume and/or annual carbon emissions, policymakers can ensure flexibility for smaller production units to procure RNG through the interconnected natural gas grid. This ensures that smaller players that are more rapidly deploying hydrogen production hubs and accelerating hydrogen production on a local and regional basis can compete more effectively in the market and contribute to the growth of the hydrogen economy. This will facilitate more rapid switching from diesel to hydrogen fuel, lower the carbon intensity through RNG, and avoid the emissions associated with long-distance hydrogen transportation.

To make this distinction, Bayotech recommends Treasury exempt from any three pillars-like requirements hydrogen production facilities whose annual CO₂ emissions fall below the annual 12,500 metric tonnes capture threshold for “other industrial facilities” under the Section 45Q Tax Credit for Carbon Sequestration. Under existing Treasury policy, these smaller industrial facilities are not eligible for the Section 45Q tax credit, as it is generally uneconomical for them to install carbon capture equipment. Small hydrogen producers face the same challenges regarding the high costs of installing carbon capture equipment. Therefore, it is imperative that Treasury’s final rule under Section 45V

⁹ U.S. Department of Energy, *U.S. National Clean Hydrogen Strategy and Roadmap*, (June 5, 2023), pg. 44, <https://www.hydrogen.energy.gov/docs/hydrogenprogramlibraries/pdfs/us-national-clean-hydrogen-strategy-roadmap.pdf>.

allows small-scale hydrogen producers to have maximize flexibility to decarbonize their operations through RNG offsets.

Small SMRs can play a complementary role to larger-scale hydrogen production facilities. While large-scale projects may benefit from economies of scale, small SMRs offer flexibility, scalability, and decentralization advantages. Small SMR facilities are faster to deploy and can be located closer to urban centers, meeting the demand for hydrogen in emerging applications such as zero-emission fuel cell vehicle fleets. Therefore, imposing the same 12,500 metric tonnes of CO2 threshold established in the Section 45Q tax credit to the Section 45V final rule would recognize the distinct contributions of small SMRs and promote a diversified portfolio of hydrogen production technologies.

By including a carve-out for small SMR producers, policymakers can level the playing field between small and large producers while simultaneously encouraging innovation and diversity in the hydrogen production sector. This supports the development of a more robust and resilient hydrogen economy by fostering competition and ensuring that smaller players have a fair chance to participate and thrive.

Thank you again for the opportunity to provide comments and feedback regarding the Section 45V Credit for Production of Clean Hydrogen. We stand ready to be a resource to the Department of Treasury and look forward to the issuance of a strong final rule.

Sincerely,

DocuSigned by:
Brian L. Johnson
65BD5930CFA541D...

Brian L. Johnson, Esq.
General Counsel and Corporate Secretary
www.bayotech.us
mobile/text (619)990-0290