



February 26, 2024

Honorable Danny Werfel
Commissioner
Internal Revenue Service
CC:PA:LPD:PR (REG-117631-23)
Room 5203, Internal Revenue Service
PO Box 7604
Ben Franklin Station
Washington, DC 20044

Dear Commissioner Werfel:

Docket ID: IRS-2023-0066-0001

On behalf of the Heartland Hydrogen Hub (HH2H), I appreciate this opportunity to submit comments on the Internal Revenue Service (IRS) notice of proposed rulemaking (NPRM, or proposed guidance) relating to the credit for the production of clean hydrogen established by the Inflation Reduction Act (IRA). HH2H is one of seven projects selected for award negotiation under the U.S. Department of Energy (DOE) Regional Clean Hydrogen Hubs Program established pursuant to the Bipartisan Infrastructure Law (BIL).¹ HH2H and its partners are currently in the process of contract negotiations for a program valued in excess of \$4 billion with \$925 million in federal funding.

HH2H is a collaborative partnership between the University of North Dakota Energy & Environmental Research Center, Xcel Energy, Prairie Horizon Energy Solutions LLC (TC Energy Development Holdings Inc. [together with its affiliates, TC Energy] and MPC Investment LLC [MPC]) to produce low-carbon hydrogen, decarbonize regional supply chains, and create clean energy jobs across Minnesota, Montana, North Dakota, South Dakota, and Wisconsin. The multistate collaboration of HH2H partners includes trade groups, universities, disadvantaged communities, and tribal nations with meaningful participation in this initiative. HH2H consists of three primary project locations spread across a strategic northern-tier hub region that has abundant natural resources for producing clean hydrogen as well as infrastructure that might be leveraged for future hydrogen export. These projects will demonstrate clean hydrogen production by incorporating renewable natural gas and transmission-constrained low-carbon electricity from nuclear, wind, and solar assets across the region. HH2H will help reduce carbon dioxide (CO₂) emissions by upward of 1 million metric tons per year and was selected by DOE to advance the role of clean hydrogen in the nation's decarbonization strategy.

¹ Biden-Harris Administration Announces \$7 Billion for America's First Clean Hydrogen Hubs, Driving Clean Manufacturing and Delivering New Economic Opportunities Nationwide | Department of Energy.

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The HH2H application was submitted in spring 2023, pursuant to DOE's implementation of the BIL and following enactment of the IRA in August 2022. The clean hydrogen projects submitted under the HH2H proposal were conceptualized based on the plain language and congressional intent of the Section 45V tax credit authorized by the IRA. It was determined that the clean hydrogen production methods under each project within HH2H could achieve a life cycle greenhouse gas emission rate that meets or exceeds the thresholds prescribed by the IRA. As such, the Section 45V tax credit provides a critical incentive for the economic viability of the clean hydrogen projects proposed by HH2H and successful implementation of the hub in alignment with DOE and the Administration's overall strategy to achieve commercialization of clean hydrogen production and diverse end use. As stated by DOE's Pathways to Commercial Liftoff: Clean Hydrogen report:² "The clean hydrogen market will be accelerated by historic commitments to America's clean energy economy, including equities in the Inflation Reduction Act and the Infrastructure Investment and Jobs Act. *Together* [emphasis added], these supply-side incentives can make clean hydrogen cost-competitive with incumbent technologies in the next 3–5 years for numerous applications."

Unfortunately, the IRS's proposed guidance seeks to limit the utilization of existing energy resources as envisioned by HH2H to produce clean hydrogen and places unworkable restrictions on clean hydrogen feedstocks. The result will significantly limit, if not outright preclude, the production of clean hydrogen as proposed by HH2H, and HH2H partners will be compelled to reevaluate their commitment to HH2H. If finalized in its current form, the guidance will undermine the purpose of the Section 45V tax credit as well as the efforts of DOE and other federal programs to advance clean energy production.

HH2H offers the following observations and feedback on specific provisions of the NPRM.

Energy Attribute Certificates

Incrementality

The proposed guidance provides that for electric generation to meet the requirements of an Energy Attribute Certificate (EAC), the electric generating facility must have a commercial operations date (COD) "that is no more than 36 months before the hydrogen production facility for which the EAC is retired is placed in service."³ This requirement would preclude the use of renewable and nuclear resources to produce clean hydrogen as proposed within HH2H as the COD of the intended electric generation facilities would predate the proposed hydrogen facilities by more than 36 months.

Further, this provision creates unnecessary and additional risk at the time of final investment decision (FID). For example, the proposed structure enables a viable scenario in

² Pathways to Commercial Liftoff – Clean Hydrogen (energy.gov).

³ 88 Fed. Reg. 89229 (Dec 26, 2023).

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which FID must be reached without complete awareness of eligible renewable electric generation projects committed to the hydrogen project. Essentially requiring that clean hydrogen producers self-develop or form renewable development partnerships is an interpretation beyond the scope of Section 45V as stated within the IRA. However, should the IRS maintain some form of this structure in the final guidance, the IRS should allow 1) EACs from sources with a COD within a reasonable period of the *commence construction date* of the hydrogen facility versus the placed in service date and 2) flexibility for EACs from the time period between the COD of an electric generation facility and respective hydrogen production facility to be allocated to alternate offtakers to ensure the generation facility is economically viable. A look-back period tied to the starting point of a hydrogen production project would allow project developers greater flexibility to identify and secure EAC procurement earlier in the project timeline.

The NPRM contemplates a formulaic approach to allow for incrementality from existing clean generation to count toward the incrementality requirement.⁴ HH2H is supportive of this approach, but the formulaic approach threshold of 5% is inadequate to provide meaningful scale for clean hydrogen production. This threshold should be set at a minimum of 10%. For example, Xcel Energy is already experiencing curtailments of its renewable generation in the HH2H region of 10%. Furthermore, the existing incrementality requirements prevent the use of existing nuclear generation from earning the 45V tax credit, in conflict with the policy framework established by the BIL that directs DOE to support the use of nuclear generation in hydrogen production. The formulaic approach must be inclusive of all existing low-carbon assets, including wind, solar, nuclear, and hydroelectric, and should be at least 10%. Allowing nuclear energy to produce hydrogen along with curtailed wind and solar allows the entire system of carbon-free generation to be optimized and nuclear generation delivered to its fullest capability in a safe and reliable manner. Further, this percentage should be evaluated by DOE to allow for a higher percentage in instances of sustained curtailed renewable energy resources.

Deliverability

Another required attribute for eligibility of EACs is that electricity must be generated within the same region, derived from DOE's National Transmission Needs Study (NTNS) released on October 30, 2023.⁵ The NTNS is an important tool to identify transmission constraints and needs in certain geographic areas. However, it is not a suitable reference for determining deliverability of electric generation to specific clean hydrogen projects. For example, the proposed guidance and the 45VH2-GREET user manual note that the Midcontinent Independent System Operator (MISO) balancing authority is split across two regions,^{6,7} which would prohibit the eligibility of EACs from generation for a clean hydrogen project within the

⁴ 88 Fed. Reg. 89231 (Dec 26, 2023).

⁵ 88 Fed. Reg. 89249 (Dec 26, 2023).

⁶ 88 Fed. Reg. 89228 (Dec 26, 2023).

⁷ Guidelines to Determine Well-to-Gate Greenhouse Gas (GHG) Emissions of Hydrogen Production Pathways using 45VH2-GREET 2023 (energy.gov).

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proposed scope of HH2H, despite a viable transmission path for the generation facility within the respective MISO zone.

To ensure the most efficient deployment of EACs from generation to enable clean hydrogen production, the IRS should utilize Regional Transmission Organization/Independent System Operator subzones, such as MISO Local Resource Zones, to establish deliverability. These zones are utilized for studies such as MISO's Loss of Load Expectation Study Report.⁸

Temporal Matching

Finally, the proposed guidance also requires that EACs produced by electricity generated after January 1, 2028, must be within the same hour that a hydrogen facility uses electricity to produce hydrogen. As acknowledged by the IRS,⁹ hourly tracking systems for EACs are not widely available nor fully developed, and the timeline for systems capable of broad deployment remains unclear. In finalizing this guidance, the IRS should carefully evaluate the readiness level of hourly matching and the cost to hydrogen production if hourly matching is required and allow sufficient flexibility to maintain annual tracking of EACs as necessary to ensure a transparent EAC-trading system and documented emission reduction. Hourly matching is not expected to be technically or economically feasible until 2032 or later.

In sum, the three attributes associated with eligible EACs as proposed may potentially lead to increased grid congestion and are counterproductive to efficient buildout of renewable generation. Barring the development of new generation specific to a clean hydrogen facility, the burden of meeting these criteria and/or incorporating new generation will fall on electric utilities serving a hydrogen project, leading to increased complexity and costs as utilities develop generation and transmission assets in a rapidly evolving regulatory and market environment. Case in point, HH2H partners estimate that the incrementality requirement alone could lead to increased EAC costs of 60%–165% by the end of the decade, which would translate to significant hydrogen cost increases. If implemented, these criteria will serve as a significant barrier to the production of hydrogen from electrolysis.

Renewable Natural Gas

The proposed guidance also contemplates conditions for the use of renewable natural gas (RNG) and fugitive sources of methane in clean hydrogen production that “would be logically consistent with but not identical to the incrementality, temporal matching, and deliverability requirements”¹⁰ for EACs. To apply this construct to methane, the IRS proposes that clean hydrogen production be the “first productive use” of such methane and that hydrogen producers

⁸ MISO, Planning Year 2024–2025 Loss of Load Expectation Study Report, available at MISO One Voice Style Guide (misoenergy.org).

⁹ 88 Fed. Reg. 89233 (Dec 26, 2023).

¹⁰ 88 Fed. Reg. 89238 (Dec 26, 2023).

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have a pipeline interconnection and measurement using a revenue grade meter.¹¹ The proposed guidance also indicates that there will be additional requirements to “reduce the risk that entities will deliberately generate additional biogas for purposes of the section 45V credit.”¹²

Like the above-mentioned concerns relative to incrementality and deliverability for EACs, these conditions also impose unnecessary and overly restrictive requirements that will limit the ability of HH2H partners to utilize RNG to produce clean hydrogen. The proposed regulation inquires on whether to limit eligibility of methane sources to avoid additional production of waste. Proposed concepts include defining a certain date or waste or waste streams that were produced before a certain date, such as the date that the IRA was enacted. HH2H partners view this as a harmful concept, not only because it would artificially constrain the organically growing RNG market, an important and technologically sound method of finding beneficial use for biogas and fugitive emissions, but because the available RNG today is insufficient to serve the anticipated demand generated from current planned blue hydrogen projects.

Further, requiring a petition to the Secretary for a provisional emissions rate (PER) for RNG feedstock derived from nonlandfill sources would stifle beneficial development of alternate RNG feedstocks that currently make up approximately 30% of North American RNG production, such as from food and animal waste. A streamlined and predictable pathway for establishing a PER for less prevalent feedstock, such as biogas derived from renewable diesel refining, would align the new hydrogen economy with existing industry in a way that optimizes available resources. Without confidence on EAC availability and associated carbon intensity (CI) measurement, blue hydrogen projects will be challenged to achieve eligibility for meaningful 45V tax credit tiers and cast doubt on ability to achieve DOE’s Hydrogen Energy Earthshot Initiative to reduce the cost of clean hydrogen by 80% to \$1 per kilogram in one decade.

Incrementality

From the standpoint of a business development timeline, hydrogen production plants take much longer to construct (~3–4 years) than RNG facilities (~2 years). This mismatch means securing new low-CI feedstock necessary for hydrogen production cannot happen until midway through the development of a hydrogen project, requiring that a long period of development be performed at-risk. If a strict Incrementality and “first productive use” requirement is put in place, hydrogen project developers will be forced to bear undue development risk for feedstock, and RNG developments would be incented to commit their gas to other offtakes or simply not execute on the RNG project.

Deliverability

As experienced development partners of RNG projects and traders of EACs derived from RNG facilities, including domestic and international book-and-claim deals, HH2H partners

¹¹ 88 Fed. Reg 89239 (Dec 26, 2023).

¹² Id.

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understand the importance of a broad sourcing footprint to identify interested parties for EAC offtake which are critical to RNG project financing. Limiting source facility pairing to a region akin to those defined for electricity EAC would harm progress on RNG development as well as access to credits for blue hydrogen.

Allowance of a flexible book-and-claim accounting system will be critical for efficient access to the geographically dispersed RNG production footprint. Because of the disparity between production volume by facility and consumption from a single blue hydrogen project, paired with the need for hydrogen projects to locate near end use (commonly industrial), there is typically a mismatch between optimal locations for hydrogen projects and proximate availability of negative-CI feedstock for RNG production. For example, there are only 3000 dairy cows in the surrounding counties of the facility proposed by Prairie Horizon Energy Solutions, with an estimated production capacity of only 0.17 MMscf/day RNG, fulfilling only approximately 6% of the potential plant demand.¹³

Temporal Matching

In addition to geographic dispersion, RNG deals are often structured “as-generated” with a quarterly or annual volume minimum. The experience of HH2H partners in RNG sales aligns with this structure. Large utilities abide by annual minimum volumes, given the nature of RNG production and deliverability. This construct limits the ability to match RNG sales as the IRS intends for electric generation. The vast storage assets present in existing U.S. natural gas pipeline infrastructure balance the production cycles of RNG and lend credibility to the use of a book-and-claim system for procurement. Such a system is currently employed by the U.S. Environmental Protection Agency’s Renewable Fuel Standard and in Low-Carbon Fuel Standards across the country and in Canada.

With the application of CO₂ capture and utilization of RNG, natural gas is anticipated to be a critically important feedstock for the production of clean hydrogen by HH2H partners and developers across the nation. It is a cost-effective pathway to produce clean hydrogen and, when leveraged with electrolytic hydrogen, will be essential to establishing clean hydrogen supply at scale to enable meaningful end use development and associated decarbonization. The final guidance should allow for the use of this resource consistent with the intent of the IRA.

Conclusion

HH2H partners recognize the role that clean hydrogen can play in a clean energy revolution, and HH2H is working diligently with DOE to develop a regional clean hydrogen hub that will help enable economy-wide decarbonization. HH2H checks all the boxes with respect to the establishment of clean hydrogen development pathways through the utilization of renewables, nuclear, and natural gas resources for the production of clean hydrogen; it also pursues hydrogen storage and continued advancement of carbon capture and storage technology.

¹³ USDA National Agricultural Statistics Service, May 9, 2022.

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These are all necessary elements to accelerate the pace and scale of hydrogen development envisioned by DOE through the U.S. National Clean Hydrogen Strategy and Roadmap, as “key to meeting our climate goals...in a strategic and holistic way.”¹⁴

The Section 45V tax credit is a crucial incentive to spur HH2H and other first movers into demonstrating the cost-effective production of clean hydrogen. If the IRS’s guidance does not allow for a wide range of low-carbon technologies to be utilized as intended by the IRA, it will stifle efforts to achieve the Hydrogen Shot goal of \$1 per kilogram within a decade. As the proposed guidance stands, the scope and benefits of these proposed projects will have to be reevaluated and possibly removed in their entirety. HH2H partners encourage the IRS to adopt rules that ensure the environmental integrity of clean hydrogen while still enabling a nascent industry to develop. HH2H partners have also submitted comments that provide additional analysis of the impacts of the proposed guidance.

Again, DOE selected HH2H because of its value to the development of a national hydrogen market and ability to quickly implement first-of-a-kind clean hydrogen projects that will lower emissions in a diverse set of hard-to-decarbonize end uses. On behalf of HH2H, I urge the IRS to make appropriate revisions in its final guidance that will allow HH2H and other clean hydrogen producers to unlock the full potential of this clean fuel, advance our economy, and reduce emissions.

Thank you again for this opportunity to submit comments and the careful attention that the IRS is providing to this important issue.

Sincerely,

DocuSigned by:

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Charles D. Gorecki
Heartland Hydrogen Hub

CDG/mro

¹⁴ U.S. National Clean Hydrogen Strategy and Roadmap (energy.gov).