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

RE: Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election to Treat Clean Hydrogen Production Facilities as Energy Property.

Submitted via Federal eRulemaking portal: www.federalregister.gov

Ambient Fuels appreciates the opportunity to comment on the notice of proposed rulemaking (Proposed Rule), Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election to Treat Clean Hydrogen Production Facilities as Energy Property, issued by IRS and Treasury (collectively, Treasury) on December 26, 2023. We applaud the efforts of the White House, Treasury, Dept. of Energy, EPA, and others to deliver a low carbon hydrogen future. We do, however, have strong concerns about the temporal matching requirements in the Proposed Rule.

Executive Summary

Enabling annual time matching for early-mover projects is the single most critical item to revise in the guidance.

- ***The current requirements for hourly matching for all hydrogen projects as of 1/1/2028 risk significantly constraining this promising new industry in its infancy.***
- ***Alternatively, providing annual matching for first-mover projects for the life of the tax credit (sometimes referred to as "grandfathering" in industry parlance) will enable the U.S. to become the global leader in green hydrogen, create jobs and a domestic supply chain, and ensure our ability to reduce greenhouse gas emissions in the industrial sector long term.***

Ambient Fuels endorses the time matching recommendations submitted by the American Clean Power Association (ACP). Ambient Fuels' comments below share our company's real-world experience on the front lines of industrial decarbonization to augment the strong and holistic submissions by ACP and like-minded entities.

Ambient Fuels is a pioneering pure-play green hydrogen developer. Unlike most others you will hear from in this process, we don't have any other lines of business: all we do – all day long, day in, day out – is develop electrolytic hydrogen production plants. To be successful in those pursuits, we speak daily with prospective customers from hard-to-abate sectors.

Based on our extensive customer engagement over the past two years, we see significant challenges in the hourly matching requirements in the draft 45V guidance. As explained further below, the proposed rules will effectively require "hourly matching" from the onset, increasing the cost of green hydrogen and impeding adoption by cost-sensitive customers with no regulatory mandate and limited other motivations to make the switch.

This, in turn, will make it a certainty that many of these customers – and even whole sectors of the economy – simply do nothing to reduce their emissions at all or permanently opt for alternatives like blue hydrogen that have higher emissions than green hydrogen. Ambient Fuels strongly urges all parties to support annual matching for the duration of the tax credit for early-mover green hydrogen projects.

Background on Ambient Fuels

Backed by leading sustainable infrastructure investors including Generate Capital, Ambient Fuels is well-capitalized and active across the United States. In just over two years since inception, we have built a diverse team of professionals drawn from traditional energy and process sectors and renewable energy who operate out of New York City, Houston, Tulsa and other geographies. We are the poster children of the decarbonization and job creation potential of the Inflation Reduction Act.

Ambient Fuels is a different kind of green hydrogen producer. Our strategy puts the green hydrogen customer first – typically, we pursue hydrogen offtake first and design green hydrogen solutions to the customers' specifications, on or near their property. Often, these projects are in heavy industrial zones, turning our electrolyzers into a billboard for green hydrogen, industrial decarbonization, and the benefits of the IRA. Unlike large, integrated renewable energy companies or industrial gas suppliers, we are not tied to any specific power generation or infrastructure assets and can put green hydrogen production where it is needed most.

We have gathered extensive evidence from the field in pursuit of our customer-first strategy. Since the beginning of 2022, Ambient Fuels has engaged with over one hundred potential green hydrogen customers from heavy industry, including leading companies from the refining, ammonia, chemicals, shipping, aviation, and utilities sectors.

The Customer Situation

We possess market leading knowledge about customers' motivations and propensity to adopt green hydrogen based on our commercial approach. Key themes from our deep engagement with heavy industry include:

- In some industrial areas that might appear ripe for green hydrogen deployment, existing users of hydrogen are already over-supplied with gray hydrogen and will not pay even a modest premium to switch to cleaner hydrogen

- Many customers will choose blue hydrogen over green if it is more economic to do so, and once they choose blue, they are likely to make long term contractual or capital investment commitments and thereafter be unlikely to adopt green in the foreseeable future
- Heavy industrial customers require a steady, around the clock supply of hydrogen which can't be dependent on external factors such as intermittent renewable energy production, and which must be delivered at their plant gate
- Buyers require confidence in their hydrogen supply and will not make the switch if they view a green hydrogen project as being too risky – such as by not being able to secure the necessary EACs from renewable suppliers (project-on-project risk)
- Some progressive industrial corporations already have robust programs for procurement of renewable energy and would be poised to extend that for hydrogen utilization in an annual matching scenario (which is consistent with most corporate renewables programs today); however, the hourly matching requirements in the draft guidance do not fit these programs, creating a significant barrier to existing corporate customer adoption.

There is currently low demand for green hydrogen given the nascent nature of the market. If buying green hydrogen is too costly or difficult, potential customers will simply do nothing, or pursue blue hydrogen instead, missing the opportunity to reduce greenhouse gas emissions. Prospective customers will be incentivized to wait until green hydrogen costs drop to ensure they can secure a competitive price for their hydrogen purchases. This will delay adoption for years or prevent it altogether, in turn slowing down the development of the domestic supply chain.

Adverse Impacts of Hourly Matching Provisions in Draft Guidance

The Proposed Rule provides:

- The general rule that an EAC satisfies the temporal matching requirement if the electricity represented by the EAC is generated *in the same hour* that the taxpayer's hydrogen production facility uses electricity to produce hydrogen.
- A transition rule to allow an EAC that represents electricity generated before January 1, 2028 to fall within the general rule...if the electricity represented by the EAC is generated *in the same calendar year* that the taxpayer's hydrogen production facility uses electricity to produce hydrogen.

The provisions enabling the use of EACs generated during the same calendar year as hydrogen production use through 2028 (i.e., annual matching) are useless under the current guidelines and will lead to an effective requirement to use EACs generated in the same hour as hydrogen production use (i.e. hourly matching) from the onset.

Hydrogen project power and EAC supply contracts, project design, and equipment warranty, service and other project agreements that are required for financing cannot be designed to 'convert' to hourly-match in year-3; as such, capital providers will underwrite these deals as though they are hourly-matched from the start.

There will be direct and adverse impacts from forcing hourly matching immediately as required under the Proposed Rule, including a significant increase in green hydrogen price.

- Limiting the hours in which electrolyzers can run to match renewable generation shapes will lower utilization, leading to more expensive hydrogen unit economics
- Boosting utilization by managing hourly-level renewable energy production uncertainty will require that hydrogen producers over-procure renewables, adding cost and commodity risk
- Achieving steady flow with mismatched intermittent renewables will require the addition of costly hydrogen storage (or battery storage for electricity), increasing capital expenses and reducing competitiveness
- Hourly matching will make it more likely for electrolyzers to be sited next to renewable generation to make them economically viable – far away from the industrial customers that need the green hydrogen, thus increasing transportation costs and further reducing competitiveness
- Hourly matching will exacerbate the challenge of securing the right mix of incremental (new build) renewable energy in key markets, particularly wind. Given the absence of liquid EAC markets to meet hourly, incremental, and regional requirements, EACs will need to be procured via (V)PPA and at very specific resource mixes to optimize hydrogen pricing. Wind supply will be significantly more important than solar, but there is not enough wind in the interconnection queues (solar dominates, including in ERCOT and Delta). Assembling hourly matched portfolios will also limit green hydrogen producers' ability to mitigate renewable project development risks (i.e., interconnection, permitting, supply chain) by limiting choice and flexibility.
- Hydrogen producers seeking hourly matched renewable supply will be competing at a disadvantage for scarce renewables, in specific allocations, with other corporate and utility buyers who do not face the same stringent hourly requirements, who can move more quickly to transact, and who do not present the project-on-project risk associated with a new build green hydrogen plant.

Many third-party studies have pointed at the cost premium associated with hourly matching[i,ii,iii,iv], and our real-world experience modeling hydrogen pricing for customer proposals substantiates the fact that hourly matching adds both significant cost and risk. Even the Federal Government is not held to a strict hourly standard; under Executive Order 14057, all U.S. Federal agencies will be required to "(i) purchase 100% carbon-free electricity on a net annual basis by 2030: and (ii) purchase 50% carbon-free electricity on a 24/7 basis by 2030."[v]

Hourly matching for green hydrogen will delay and/or prevent customer adoption and slow down domestic supply chain development, further impeding progress down the cost curve. Under hourly matching, we are not yet sure if the issue will become "how long will this take?" vs. "will there ever be a market?", but neither is a question we should be asking given the urgent need to decarbonize hard-to-abate heavy industry. ***Under an hourly matching regime, green hydrogen will face a significant and existential issue, and both decarbonization and domestic supply chain progress will suffer as a result.***

Recommended Solution on Time Matching:

Ambient Fuels supports a compromise position, where annual matching for the life of the tax credit is enabled for some interim period for first-mover projects. Sometimes referred to as "grandfathering", this approach is a necessity to economically price near-term green hydrogen offtake agreements, achieve sufficient utilization factors, and start the 'flywheel' for the sector.

Ambient Fuels endorses the temporal matching recommendations put forward by ACP in its comments. In summary, we support the following:

- Apply a start of construction metric to determine the 2028 transition date so that hourly time-matching is imposed on projects that are placed in service after 2032
- Exempt first-mover projects (i.e., those that are placed in service before the required switch to hourly-matching) from transitioning to hourly time-matching
- If Treasury does not support a full exemption from the hourly requirement for early movers (even though that would be the most effective and administrable solution to scale the industry), consider adopting a formulaic approach in which first-movers only need to meet a certain percentage of hourly matching for the tenure of the tax credit

For brevity, we have not replicated the entire language put forward by ACP, yet we are aligned with those recommendations.

Conclusion

Ambient Fuels is deeply appreciative of the Administration's support for green hydrogen via the 45V Credit for Production of Clean Hydrogen. We likewise value the opportunity to provide input to Treasury and are available for follow-up discussion as needed, including regarding our critical firsthand customer experience. With targeted adjustments to the 45V Proposed Rule, Treasury can ensure the green hydrogen market launches and is here to stay, creating long-term greenhouse gas reductions. Providing early movers with annual time matching for the life of the tax credit is the single most important change that Treasury should contemplate as it finalizes the guidelines. When that guidance is in place, Ambient Fuels will be ready to tackle the toughest decarbonization challenges with scalable green hydrogen solutions.

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[i] ACORE / E3. "Analysis of Hourly & Annual GHG Emissions". April 2023. https://acore.org/resources/analysis-of-hourly-annual-ghg-emissions-accounting-for-hydrogen-production/

[ii] Woodmac. "Green hydrogen: what the Inflation Reduction Act means for production economics and carbon intensity." March 2023. https://www.woodmac.com/news/opinion/green-hydrogen-IRA-production-economics/

[iii] BCG. "Green Hydrogen: An assessment of near-term power matching requirements". April 2023. https://media-publications.bcg.com/Green-Hydrogen-assessment-of-near-term-power-matching-requirements.pdf

[iv] MIT Energy Initiative. "Producing hydrogen from electricity: How modeling additionality drives the emission impact of time-matching requirements". April 2023. https://energy.mit.edu/wp-content/uploads/2023/04/MITEI-WP-2023-02.pdf

[v] EPRI. "24/7 Carbon-Free Energy: Matching Carbon-Free Energy Procurement to Hourly Electric Load". December 2022. https://www.epri.com/research/products/000000003002025290