Comments on US Tax Code Section 45V Credit for Production of Clean Hydrogen Proposed Regulations

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

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The Honorable 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

Re: Comments of LanzaTech Global, Inc., 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:

LanzaTech Global, Inc. (Nasdaq: LNZA) "LanzaTech" is the US-based carbon recycling company transforming waste carbon into sustainable raw materials for everyday products. As an expected clean hydrogen user, LanzaTech is responding to the Department of the Treasury and Internal Revenue Service proposed regulations relating to the credit for production of clean hydrogen (Tax Code Section 45V) as established by the Inflation Reduction Act of 2022 (IRA).

If properly implemented, the 45V clean hydrogen production credit can provide a strong, world-leading policy tool enabling the scaling of clean hydrogen production, infrastructure, and use, helping move technologies down the cost curve and contributing to mid-century climate goals.

Company Background

LanzaTech, based in Skokie, Illinois, is a biotechnology/biomanufacturing company. Our technology captures pollution and carbon emissions, such as those from industrial facilities like steel mills, and transforms them into chemical building blocks for the material economy. The core LanzaTech technology is gas fermentation, which works like a brewery but using special bacteria that can consume carbon pollution instead of yeast that eat sugars. This gas fermentation process can consume carbon monoxide (CO), carbon dioxide (CO_2) and hydrogen (H_2). LanzaTech represents the clean hydrogen consumer in the hydrogen economy. We require cost competitive, reliably sourced, low carbon intensity or "clean" hydrogen at our point of use (i.e., gas fermentation facility). Hydrogen is an essential element for producing chemicals and fuels from CO_2. Use of clean hydrogen allows very high rates of fixing waste carbon into carbon-dependent fuels and products for hard-to-abate sectors like aviation and production of apparel, packaging, cleaning products, fragrances and more. The sources of waste carbon can include industrial gases; gasified solid wastes such as agricultural or forestry wastes, or municipal solid waste; and atmospheric CO_2.

Context for Our Comments

Hydrogen is a key enabler to unlock the full potential of gas fermentation to recycle waste carbon into needed fuels, chemicals, and products, replacing virgin fossil fuels and establishing circular and sustainable carbon supply chains. Only clean (i.e., low-carbon-intensity) hydrogen will meet LanzaTech's use case as we work to reduce GHG emissions from several hard-to-abate sectors, therefore, LanzaTech seeks truly "clean hydrogen" as measured in Life Cycle Analysis (LCA). The company has deep expertise in LCA and a commitment to accurately accounting for GHG emissions in our projects.

Accessing clean hydrogen will require development of a clean hydrogen economy and supply chains starting with domestic production through transport and delivery that makes clean hydrogen available in sufficient quantities, throughout the US and at affordable prices.

LanzaTech, after direct engagement with Congress, was excited to see enactment of the 45V tax credit and we support technology-neutral, performance-based policy which became the legislative approach for 45V tax credits. As evidenced by the resulting investment announcements in US projects and frenzied debate and response by countries around the world, Congress crafted what was viewed by many stakeholders as the world-leading policy in support of clean hydrogen. Unfortunately, the pending proposed regulations for 45V includes a series of

new burdensome, restrictive, and potentially insurmountable requirements that were not expressly authorized by Congress in the IRA and will impede the development of clean hydrogen in the US thus harming US clean energy leadership.

If these proposed regulations remain unchanged, the great hope expressed by Congressional leadership and the Administration in the IRA's potential to meet near- and longer-term climate goals, including by creating a viable clean hydrogen economy, will fall well short of the mark. Inexplicably, the Administration has chosen to create requirements solely for clean hydrogen production under this 45V tax credit that are not being required of the myriad other IRA, Infrastructure Jobs and Investment Act (a.k.a. Bipartisan Infrastructure Law), the CHIPS ("Creating Helpful Incentives to Produce Semiconductors") and Science Act or other authorized and appropriated programs that encourage electrification of facilities, sectors, industries, and end-use energy requirements. Holding the nascent clean hydrogen industry to a different standard will serve only to impede successful deployment of these technologies and their climate abatement potential, while ceding what had widely been considered a major opportunity for US global leadership in competition with Europe, China, Japan, South Korea, India, and others.

To be constructive, our comments include recommendations for clarity and workability on important aspects of the proposed regulations, particularly around approving new clean hydrogen production pathways and LCA requirements through which the Administration is creating and implementing new policy – ranging from the electrolytic hydrogen production and upstream power sector restrictions to modeling parameters and systems for taxpayer input and redress, where appropriate.

As a member of the Clean Hydrogen Future Coalition (CHFC), we endorse the comments provided by CHFC, to which LanzaTech will provide the below supplementary and complementary comments.

CHFC Recommendations

The CHFC recommendations are to ensure market conditions exist that allow a nascent industry to take root. Without these changes, including clear support for early mover projects, the bankability and financing of early projects will be hampered, and even previously announced projects may be halted. CHFC's detailed comments are centered on the following critical recommendations that must be addressed in final Treasury guidance and are presented in no order of priority:

(1) A taxpayer may use the most recent 45VH2 GREET model available at the time the taxpayer's project begins construction and use that model for the full ten-year tax credit claiming period. The taxpayer has the option to elect to use the most recent 45VH2 GREET model available during the ten-year tax credit claiming period.

(2) A taxpayer may use annual time-matching if the taxpayer's project commences construction before January 1, 2030, for the life of the tax credit claiming period.
(3) A taxpayer meets the clean electricity incrementality requirements if the source of clean electricity used to power the hydrogen facility is operational (commercial operations date or "COD") within five years from the first taxable year the taxpayer claims the tax credit.
(4) The 45VH2-GREET model must be updated in the final rule to allow foreground inputs to account for the use of differentiated natural gas supplies.
(5) Special rules for early projects: projects that are placed in-service by January 1, 2030, will have no incrementality requirements, six regions for deliverability, and annual time-matching of energy attribute certificates (EACs) for the ten-year credit claiming period.
(6) Any project, even if its feedstock and product technology is currently represented in 45VH2-GREET, can apply for a provisional emission rate (PER).
(7) Standard book-and-claim accounting principles must be used for renewable natural gas (RNG) and differentiated natural gas.
(8) Allow for a 10% curtailment of electricity from existing clean resources safe harbor to allow the curtailed electricity to meet the incrementality requirements.

LanzaTech Comments

Hydrogen production routes

- **Clarity**. The proposed regulations, on their face, include a clear definition of "facility" within the context of a qualified clean hydrogen production facility, namely: "the term *facility* means a single production line that is used to produce qualified clean hydrogen. A single production line includes all components of property that function interdependently to produce qualified clean hydrogen. Components of property function interdependently to produce qualified clean hydrogen if the placing in service of each component is dependent upon the placing in service of each of the other components to produce qualified clean hydrogen." [§1.45V-1(a)(7)] This clarity of definition is very important for potential projects and is highly appreciated.

- **Fair Procedures Needed for Other Clean Hydrogen Production Pathways**. Unfortunately, when moving to the next level of qualification, specifically the procedures for determining lifecycle GHG emissions rates for qualified clean hydrogen (e.g., meeting carbon intensity thresholds for credit value estimation), Treasury shifts the requirements into GREET modeling. The version of the GREET model proposed for use in this rulemaking includes only two specific pathways for biomass gasification, limited to "corn stover and logging residue with no significant market value with potential CCS". This extremely narrowly-modeled feedstock is an illustration of the proposed regulations applying LCA modeling in a way that creates barriers to actual

facility qualification via the proposal's requirement that computation of the relevant 45V LCA-derived credit value is only accessible to specific hydrogen production pathways. This must be remedied to fulfill congressional intent of providing credits on a technology-neutral basis.

- As noted in the proposal, the current version of 45VH2-GREET includes 8 pathways. The proposal would require any additional pathways, or expansions of any of these, be approved via a proposed but poorly-defined Provisional Emissions Rate (PER) process. Clarity around this PER process is essential for taxpayers considering gasification pathways for clean hydrogen production.
- **We strongly recommend that taxpayers be afforded the opportunity for seeking a PER at an earlier stage of project development than the proposal's post-front-end engineering and design (FEED) requirement**. As the US Department of Energy can attest, significant amounts of capital ranging into the tens of millions of dollars are required to reach and complete the FEED stage of project development.[1] For projects relying on clean hydrogen usage at affordable costs, the 45V tax credits will in many, if not all cases, determine economic feasibility. It is therefore unrealistic, unfair, and ill-advised for the Treasury to require project developers to commit such significant resources to a project before having the ability to ascertain what credit values may or may not be available. The 45V IRA statute did not suggest any hurdles for taxpayers in obtaining a PER, rather providing in the law's plain language that "a taxpayer producing such hydrogen may file a petition with the Secretary for determination of the lifecycle greenhouse gas emissions rate with respect to such hydrogen." [IRA §45V(c)(2)(C).] If a project timeline measure is required for PER submission, we would recommend allowing projects within the FEL-2 (Front-End Loading) stage, which is typically the starting point for a feasibility study and setting the engineering design basis, which involves significant investment.
- We propose that 45VH2-GREET be updated immediately and on an ongoing basis for additional clean hydrogen production pathways, including gasification of a much wider range of biomass wastes.

[1] For example, DOE-FOA-0002936 offered $10 million of DOE funding to be added to $10 million of company cost share to get to engineering concept that was 30% complete, consistent with a FEED study. OCED eXCHANGE: Funding Opportunity (energy.gov)

Understanding the Consequences of New Electrolytic Hydrogen Production Requirements

- The Administration should carefully consider the ramifications of the proposal's new policy requirements under the guise of LCA modeling including the so-called "three pillars" of incrementality (also known as additionality), temporal matching and geographic deliverability. If implemented, the rules will ground an industry before it can take off because it will harm the bankability of the first and early-of-a-kind projects that are needed to drive down cost in an energy transition.
- With very little public record supporting these policy additions to what Congress required within the IRA for 45V, these new impositions will undoubtedly have real-world consequences for clean hydrogen deployment overall, and geographically, limiting deployment, creating insufficient supply to meet projected demand, and raising costs for clean hydrogen users. This is already having an impact in the market on forward pricing of clean hydrogen, which can greatly impact project economics and viability.
- The regulations should, instead, encourage and protect investments in new clean hydrogen production. Important suggestions in coalition comments include providing certainty to early hydrogen production facility projects and only requiring fundamental changes in project mechanics (e.g., moving from annual to hourly matching) when such systems are widely available.

Thank you for the opportunity to comment on these proposed regulations. In summary, the legislative vision and approach for 45V tax credits would position US leadership with a world-leading policy that facilitates the growth of clean hydrogen in the US. The proposed implementation by Treasury does not do so and instead will impede the development of clean hydrogen in the US thus harming the US position in clean energy. Therefore, we encourage Treasury to consider the changes recommended in this response, as well as others from stakeholders such as CHFC. We look forward to working with the Administration to help ensure US leadership in bringing clean hydrogen solutions to the market and meeting mid-century emissions reduction goals.