December 03, 2022

Via Electronic Submission to: www.regulations.gov

Internal Revenue Service
CC:PA:LPD:PR (Notice 2022-58)
Room 5203
P.O. Box 7604, Ben Franklin Station
Washington, DC 20044

Re: Valero Comments to Internal Revenue Service Request for Comments for Clean Hydrogen and Clean Fuel Production (Notice 2022-58)

To Whom It May Concern:

Please find below the comments of Valero to Internal Revenue Service (IRS) Notice 2022-58, *Request for Comments for Clean Hydrogen and Clean Fuel Production*, issued on November 3, 2022. Valero appreciates the opportunity to provide feedback on this guidance.

I. About Valero

Valero Energy Corporation and its subsidiaries (collectively, "Valero") are major suppliers of both traditional and low carbon renewable fuels to the U.S. market. In addition to being one of the world's largest independent refiners, Valero was the first traditional petroleum refiner to enter the large-scale ethanol production market and is now one of the largest ethanol producers in the U.S. Valero is one of the largest renewable diesel producers in the world, and as such is credited with significant contributions toward meeting the declining carbon intensity targets under the California Low Carbon Fuel Standard. In accordance with commitments to shareholders to further reduce greenhouse gas (GHG) emissions, Valero is actively engaged in renewable diesel expansion projects and is pursuing carbon sequestration opportunities. As a fuel producer that is already playing a significant role in reducing GHG emissions from the transportation sector, we ask that IRS consider our unique frame of reference in evaluating the views and recommendations presented in these comments.

II. IRS's Request for Comment

Valero appreciates the opportunity to provide comments on Notice 2022-58, *Request for Comments on Credits for Clean Hydrogen and Clean Fuel Production*. Valero has the following comments responding to many, though not all, of the questions posed in the Request:

.01 Credit for Production of Clean Hydrogen

(1)

(a) Section 45V defines "lifecycle greenhouse gas emissions" to "only include emissions through the point of production (well-to-gate)."[3]

Which specific steps and emissions should be included within the well-to-gate system boundary for clean hydrogen production from various resources?

The system boundary for purpose of determining the GHG emissions should include processing, transportation, fugitive and sequestered emissions associated with the production of hydrogen, up to the outlet flange of the production facility (after hydrogen compression). Connected carbon capture and sequestration (CCS) facilities may, at the option of the taxpayer, be defined as part of the clean hydrogen production system boundary, even if the sequestration facility is located at a remote location. In such cases, the emissions from the CCS activities, including transport and sequestration, should be included in the clean hydrogen production system boundary.

Where multiple feedstocks or processes may operate within a single facility, the system boundary should specify which feedstocks or processes are applicable, such that multiple systems may exist within a single facility. If CSS is included in the clean hydrogen production system boundary, such CCS systems should have the ability to define multiple systems within a single CCS process (e.g., multiple clean hydrogen producers accessing common carrier carbon dioxide (CO_2) pipelines and sequestration sites). Hydrogen product, co-products such as steam, and facility processing emissions must be allocated to each system accordingly. Allowance of multiple systems within a single facility is necessary to maximize clean hydrogen production by incentivizing incremental clean hydrogen production from different potential production processes within a taxpayer's fence line.

(b)(i) How should lifecycle greenhouse gas emissions be allocated to co-products from the clean hydrogen production process?

For example, a clean hydrogen producer may valorize steam, electricity, elemental carbon, or oxygen produced alongside clean hydrogen.

Where a clean hydrogen production process produces co-products, the hydrogen producer should have the flexibility to select the methodology for allocating lifecycle GHG emissions to co-products, as allowed within the Argonne GREET model – e.g., displacement method, Btu-based allocation.

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(ii) How should emissions be allocated to the co-products (for example, system expansion, energy-based approach, mass-based approach)?

Emissions for the hydrogen producer should be reduced according to a displacement methodology. The reduction in a hydrogen producer's emissions due to the production of a co-product would be equivalent to the lifecycle emissions avoided due to substitution of the co-product for other produced material. The hydrogen producer should have the flexibility to select the basis for allocating emissions to co-products, as allowed within the Argonne GREET model – e.g., displacement method, Btu-based allocation.

For example, a clean hydrogen production process may result in excess steam production that can be exported for use outside the facility. Such excess steam, if utilized in another industrial process, may directly displace steam that would otherwise have been generated in a boiler heated by fossil fuel combustion. The avoided emissions associated with this by-product steam should be attributed to the hydrogen production as a displacement credit to decrease the hydrogen's lifecycle emissions.

(d) If a facility is producing qualified clean hydrogen during part of the taxable year, and also produces hydrogen that is not qualified clean hydrogen during other parts of the taxable year (for example, due to an emissions rate of greater than 4 kilograms of CO2-e per kilogram of hydrogen), should the facility be eligible to claim the § 45V credit only for the qualified clean hydrogen it produces, or should it be restricted from claiming the § 45V credit entirely for that taxable year?

If the hydrogen producer processes Feedstock A for part of the year and Feedstock B for the remainder of the year, such that:

- Feedstock A would produce hydrogen with emissions exceeding 4 $kgCO_2e/kgH_2$, and
- Feedstock B would produce hydrogen with emissions below 4 $kgCO_2e/kgH_2$,

then the producer should be eligible to claim § 45V credit for the hydrogen produced from Feedstock B.

A clean hydrogen producer should also have the option to designate a portion of its total product as clean product, proportionate to the environmental attributes of the low carbon feedstocks processed at a qualified facility. Additionally, producers should have the option to allocate low carbon feedstocks to a designated volume of resulting clean hydrogen production.

For example, if a hydrogen producer simultaneously processes a combination of feedstocks, such that:

- Feedstock A, on its own, would produce hydrogen with emissions exceeding 4 $kgCO_2e/kgH_2$,
- Feedstock B, on its own, would produce hydrogen with emissions below 4 $kgCO_2e/kgH_2$, and
- Feedstocks A and B combined would produce hydrogen with emissions exceeding 4 $kgCO_2e/kgH_2$,

then the producer should have the ability to designate a portion of the total produced hydrogen as qualified clean hydrogen under § 45V, proportionate to the volume and environmental attributes of Feedstock B.

Alternatively, if a hydrogen producer simultaneously processes a combination of feedstocks, such that:

- Feedstocks A and B combined would produce hydrogen with emissions below 4 $kgCO_2e/kgH_2$,

then the producer should have the ability to designate the total volume of hydrogen produced as qualified clean hydrogen under § 45V, based on the volume and environmental attributes of Feedstock A and B combined.

Allowing for the concentration of environmental attributes is consistent with other Federal and International GHG and carbon reduction standards, including the U.S. Environmental Protection Agency (EPA) Renewable Fuel Standard (RFS) and United Kingdom Renewable Fuel Transport Order (RTFO).

(e) How should qualified clean hydrogen production processes be required to verify the delivery of energy inputs that would be required to meet the estimated lifecycle greenhouse gas emissions rate as determined using the GREET model or other tools if used to supplement GREET?

Verification of the energy inputs used by the taxpayer in the Argonne GREET model or for use in a provisional emissions rate methodology should be based upon the energy input producer's production records and an independent third-party's verification audit of the energy inputs produced, supporting commercial contracts between the energy input producer and the clean hydrogen producer, and the supporting transfer documents, including: invoices; product transfer documents; and volumetric measurement data from flowmeters, ammeters, tank gauges, etc., which support such transactions. This is consistent with current industry practices utilized for compliance with both domestic and international renewable fuel programs, including the EPA RFS, the California Low Carbon Fuel Standard (LCFS), the European Union Renewable Energy Directive (RED II), the United Kingdom RTFO, and the upcoming Canadian Clean Fuels Regulation (CFR).

Additionally:

- Utility and feedstocks that use specific GHG emissions factors (i.e., non-default values) should use values determined through Argonne GREET modeling. If the emissions factor does not exist in either default or specific values within Argonne GREET due to the process or feedstock not being available as a modeling option, the taxpayer should utilize the values set forth in the provisional emissions rate.
- Verification audits of these specific factors should be allowed as a common (joint) verification audit with the hydrogen producer that is receiving the feedstocks, or may be verified independently by the feedstock supplier. If the feedstock supplier has a separate verification audit to qualify for another tax benefit, this verification should be allowed for use in this program in lieu of a second verification audit.

(i) How might clean hydrogen production facilities verify the production of qualified clean hydrogen using other specific energy sources?

In addition to the verification audit processes described in section (.01)(1)(e) above for the verification of energy inputs, the verification of the production of qualified clean hydrogen using other specific energy sources should include third-party verification audits of such other specific energy sources, the clean hydrogen producer's volumetric production records, measurement data (e.g., flowmeters, ammeters, tank gauges etc.), and the producer's Argonne GREET model (or provisional emissions rate methodology) inputs and outputs in reaching the reported kilograms of CO_2e per kilogram of hydrogen produced.

(ii) What granularity of time matching (that is, annual, hourly, or other) of energy inputs used in the qualified clean hydrogen production process should be required?

The Argonne GREET model is not designed to accommodate specific time matching (e.g., hourly) of inputs (feedstocks), but rather considers that all inputs together represent a consistent and relevant representation of the lifecycle process of the fuel produced (i.e., clean hydrogen). In many cases feedstocks are (or can be) delivered to a fuel producer in bulk and stored until the time of consumption, rendering any feedstock production time matching immaterial in the fuel production process or the GHG emissions profile of the fuel produced. However, all feedstocks should be subject to a third-party verification audit of their GHG emissions profile, their total volumes produced, and the specific volumes sold to the fuel producer to ensure the producer's final fuel meets the Argonne GREET model emissions output calculations and that there is no double counting of the feedstock(s) used in the fuel's production process.

Specific to the concept of high-frequency time matching:

1) The burden of tracking, operating and auditing data based on an hourly analysis is infeasible and disincentivizes the development low carbon hydrogen projects.

- A requirement to apply high-frequency time matching may result in apparent periods of over-performance followed by periods of non-compliant performance. The periods of over-performance would not generate additional incentives from the production of clean hydrogen and thus not benefit the taxpayer, while the non-compliant performance period would result in the inability of the hydrogen to meet the clean hydrogen emissions requirements, resulting in the loss of the tax credit for the affected quantity of hydrogen produced, undermining the intent of the clean hydrogen production incentive. Therefore, a requirement for high-frequency time matching would result in a failure of the project to recognize the benefit of the tax credit in proportion to the actual reduction of GHG emissions achieved and may serve to disincentivize the taxpayer from participating in the production of clean hydrogen utilizing certain inputs, specifically electricity produced from wind and solar.
- The time alignment of high-frequency data would need to be subject to audit. The complications associated with the proper time-stamping of data (e.g., considerations of daylight saving time) would need to be understood by auditors and regulators alike. Such burdens are avoided when consumption is measured on a monthly basis, preferably using commercial transaction data, such as invoices and the supporting measurement documents.
- A high-frequency analysis could only be performed on portions of the systems that have continuous data. Most data, such as feedstock GHG attributes, are not available in the resolution needed to perform an hourly analysis. Therefore, a complex tracking and allocation process would be required to apply low-frequency data back to the individual production hours. For example:
  - If a truck of renewable propane is delivered from a hydrogenated vegetable oil plant to a clean hydrogen producer, then it must be considered for its transportation distance and GHG emissions factor determined by its source. Such properties for each shipment would have to be applied on a first-in-first-out (FIFO) basis in order to correctly apply feedstock GHG emissions across each individual hour. Application of such accounting is overly burdensome and hard to audit.
  - If the above example were evaluated on a monthly basis, then the feedstock's GHG emissions contribution would be applied on a time period more consistent with its consumption. Therefore, the feedstock's emissions would be properly applied without the need for complex allocation methodologies.

2) The concept of high-frequency time matching is attempting to solve the unique concern of incremental electricity use by applying a high-resolution calculation method to all processes. There are less burdensome means to reflect the change in electricity usage that do not require high-frequency calculations.

3) The primary underlying argument for the use of high-frequency time matching is that incremental power consumption will come from additional fossil fuel use, which is not necessarily true.
   - During peak demand periods, it is conceivable that shortfalls will be met by consuming additional fossil fuels. Indeed, fossil fuels are important to balancing the grid demand. However, power grids on average are lowering their GHG emissions, which can be demonstrated through a review of Argonne GREET or eGRID data. Similarly, grid demand varies as a function of population and other variable factors. As such, it should not be assumed that a clean hydrogen project by itself will result in a substantial increase in the consumption of fossil fuels used for electrical generation. Such considerations are better understood over an averaged time-frame. The annual averages provided by Argonne GREET and eGRID models will provide more reliable data in this regard.
   - Argonne GREET modelling will continue to reflect the long term grid average power consumption through its annual updates to the model.

4) High-frequency time matching often speaks to the concepts of additionality and Power Purchase Agreements (PPA). These concepts are used to allocate a specific source of low GHG electricity toward a specific project. As such, any project that makes use of dedicated electricity will use a specific emissions factor associated with the source of the additional power. However, if that power is provided by wind, solar, or other naturally interruptible source, then a high-frequency time matching requirement would limit clean hydrogen production to fall within generation hours. Instead, matching should be based on the total volume contracted to the clean hydrogen producer from the low GHG electricity producer and verified by a third-party auditor to ensure the total low GHG electricity production meets or exceeds the contracted volume sold to the clean hydrogen producer. For example:
   - A new electrolyzer project contracts with a power company to install 1 MW of additional solar panel generation capacity. The electrolyzer consumes 0.25 MW continuously each day (6 MWh/day). The solar array averages 1 MW for 8 hrs/day (8 MWh/day). Under an hourly time-matching methodology, the electrolyzer would only be able to generate clean hydrogen for 8 hrs/day, consuming just 2 MWh of power. However, under a monthly averaging methodology, the electrolyzer would generate clean hydrogen continuously while consuming less total power than what was generated by the additional solar array.
   - PPAs can provide a mechanism for ensuring the proper allocation of the low GHG electricity provided to any particular grid and to the subsequent appropriate end user, ensuring double counting does not occur.

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(2) Alignment with the Clean Hydrogen Production Standard. On September 22, 2022, the Department of Energy (DOE) released draft guidance for a Clean Hydrogen Production Standard (CHPS) developed to meet the requirements of § 40315 of the Infrastructure Investment and Jobs Act (IIJA), Public Law 117-58, 135 Stat. 429 (November 15, 2021).

The CHPS draft guidance establishes a target lifecycle greenhouse gas emissions rate for clean hydrogen of no greater than 4.0 kilograms CO2-e per kilogram of hydrogen, which is the same lifecycle greenhouse gas emissions limit required by the § 45V credit. For purposes of the § 45V credit, what should be the definition or specific boundaries of the well-to-gate analysis?

As commented in section (.01)(01)(a), the system boundary for the purpose of determining the GHG emissions should include processing, transportation, fugitive and sequestered emissions associated with the production of hydrogen, up to the outlet flange of the production facility (after hydrogen compression). Connected carbon capture and sequestration (CCS) facilities may, at the option of the taxpayer, be defined as part of the clean hydrogen production system boundary, even if the sequestration facility is located at a remote location. In such cases, the emissions from the CCS activities, including transport and sequestration, should be included in the clean hydrogen production system boundary.

Where multiple feedstocks or processes may operate within a single facility, the system boundary should specify which feedstocks or processes are applicable, such that multiple systems may exist within a single facility. If CSS is included in the clean hydrogen production system boundary, such CCS systems should have the ability to define multiple systems within a single CCS process (e.g., multiple clean hydrogen producers accessing common carrier CO_2 pipelines and sequestration sites). Hydrogen product, co-products such as steam, and facility processing emissions must be allocated to each system accordingly. Allowance of multiple systems within a single facility is necessary to maximize clean hydrogen production by incentivizing incremental clean hydrogen production from different potential production processes within a taxpayer's fence line.

(3) Provisional Emissions Rate. For hydrogen production processes for which a lifecycle greenhouse gas emissions rate has not been determined for purposes of § 45V, a taxpayer may file a petition with the Secretary for determination of the lifecycle greenhouse gas emissions rate of the hydrogen the taxpayer produces.

(a) At what stage in the production process should a taxpayer be able to file such a petition for a provisional emissions rate?

The "provisional emissions rate" concept incorporated by Treasury into I.R.C. § 45V(c)(2)(C) is intended to be available to hydrogen production processes "for which a lifecycle GHG emissions rate has not been determined" for the purposes of § 45V. Taxpayers should have the ability to petition the Secretary for a provisional emissions rate in either of the following scenarios:

- Facility-specific conditions differ from those represented in the Argonne GREET model in a way that impacts lifecycle emissions (e.g., GHG emissions associated with renewable feedstocks are lower than the values incorporated into Argonne GREET); or
- The taxpayer uses a novel hydrogen production process that is not included in the Argonne GREET model.

In either scenario, the taxpayer should be able to engage with Treasury/IRS or its designee at any point in the project development process, from initial project design and investment decision through project commencement and production.

Allowing taxpayers to engage with the relevant entities responsible for making a determination regarding a provisional emissions rate at any stage in the project development process affords taxpayers a higher degree of certainty regarding project development and investment decisions than would be available under any other timing requirements.

A taxpayer should be able to file a formal petition to establish a provisional emissions rate at any stage in the project development process, as long as the petition includes verification by an unrelated party of the lifecycle analysis and proposed emissions rate. Upon receipt of a complete petition to establish a provisional emissions rate, the IRS should be obligated to issue a determination within 90 days. As part of the verification audit process established in I.R.C. § 45V(c)(2)(B)(ii), a reconciliation must occur, in which the provisional emissions rate is corrected based on actual operating data, and § 45V tax credits are adjusted accordingly.

Unless and until the lifecycle GHG emissions rate can be determined using the Argonne GREET model, the taxpayer and the taxpayer's verifier/auditor should be able to rely upon the provisional emissions rate and accepted methodology agreed to between the taxpayer and the relevant issuing entities for calculating the applicable § 45V tax credit.

Valero's comments above are based on our interpretation of "provisional emissions rate" and an assumed process by which a provisional emissions rate is applied for and a determination made. In the event that Treasury and IRS interpret the meaning of "provisional emissions rate" or the accompanying procedure differently, Valero encourages the IRS to ensure that the process of petitioning for, receiving, and operating with a provisional emissions rate include the following key items:

- Review, approval/rejection, and determination of provisional emissions rates should occur within 90 days of petitioning;
- In the event that actual operating data result in higher or lower emissions for a produced quantity of clean hydrogen, the taxpayer should be required to "true-up" the provisional emissions rate to the actual emissions rate and subsequently update any tax filings for credits claimed by the taxpayer under § 45V for the quantity of fuel affected without

penalty. Additionally, if appropriate, the provisional emissions rate for the facility should be revised to the actual operating emissions rate;

- A provisional emissions rate should be specific to the facility for which the taxpayer engages with Treasury or the IRS, or relevant issuing entity, unless and until the lifecycle GHG emissions rate can be determined using the Argonne GREET model; and
- The taxpayer and the taxpayer's verifier/auditor should be able to rely upon the provisional emissions rate and accepted methodology agreed to between the taxpayer and the relevant issuing entities for calculating the applicable § 45V tax credit.

Finally, Treasury and IRS should clarify that a taxpayer is not required to seek a provisional emissions rate for clean hydrogen production processes for which the emissions can be calculated utilizing the Argonne GREET model, which provides a rigorous methodology to calculate emissions using default values and user defined inputs allowed within the model.

(b) What criteria should be considered by the Secretary in making a determination regarding the provisional emissions rate?

Criteria that should be considered by the Secretary in making a determination regarding the provisional emissions rate include:

- The scientific basis of the lifecycle methodology and robustness of underlying data submitted with a petition for a provisional emissions rate, and/or
- Third-party auditing undertaken prior to the request for a provisional emissions rate.

(4) Record Keeping and Reporting.

(a) What documentation or substantiation do taxpayers maintain or could they create to demonstrate the lifecycle greenhouse gas emissions rate resulting from a clean hydrogen production process?

As addressed in section (.01)(1)(e), taxpayers participating in domestic and international renewable fuel programs, including; the EPA RFS, the California LCFS, the European Union's RED II, the United Kingdom's RTFO, and the upcoming Canadian CFR maintain detailed third-party audited records of feedstock input volumes and emissions, process volumes and emissions, and Argonne GREET (or the applicable model's) emissions rates for the fuels produced.

As part of the verification audit process established in I.R.C. § 45V(c)(2)(B)(ii), taxpayers will be required to maintain detailed records supporting the emissions rates of their clean hydrogen production for the full "well-to-gate" system. Where applicable taxpayers should be allowed be allowed to utilize compliance with those record-keeping requirements for tax return purposes. IRS should treat all such records as Confidential Business Information.

(b) What technologies or methodologies should be required for monitoring the lifecycle greenhouse gas emissions rate resulting from the clean hydrogen production process?

Consistent with the requirements set forth in § 45V, third-party verification audits provide IRS's primary monitoring tool to ensure that a taxpayer's clean hydrogen production process yields the emissions rates supporting their claim of the § 45V tax credit, as this process covers the full "well-to-gate" lifecycle.

Please see the detailed responses in section (.01)(1)(e), which address the types of records, documents, and methodologies required to ensure a robust and accurate third-party verification.

(c) What technologies or accounting systems should be required for taxpayers to demonstrate sources of electricity supply?

Taxpayers should be able to rely on electricity suppliers' third-party verification audits, their underlying supply contracts or PPAs, and transactional invoices and other accounting records to support the volume and emissions of the electricity supplied. Where a taxpayer has relied on the third-party audited records of an electricity supplier, the verification audit should provide a safe harbor for the taxpayer in relying on the emissions data provided by such electricity provider.

(d) What procedures or standards should be required to verify the production (including lifecycle greenhouse gas emissions), sale and/or use of clean hydrogen for the § 45V credit, § 45 credit, and § 48 credit?

Consistent with the methodologies applied in the "well-to-gate" full lifecycle verification audits discussed throughout these comments, sales should be supported by documentation such as contracts; invoices; supporting emissions data; product transfer documents; and volumetric measurement data from flowmeters, ammeters, tank gauges, etc., which support such transactions. Use, which is also subject to the third-party verification audit requirements, should be supported by engineering and process design data supporting such use and volumetric measurement data from flowmeters, ammeters, tank gauges, etc., which also support such use.

(e) If a taxpayer serves as both the clean hydrogen producer and the clean hydrogen user, rather than selling to an intermediary third party, what verification process should be put in place (for example, amount of clean hydrogen utilized and guarantee of emissions or use of clean electricity) to demonstrate that the production of clean hydrogen meets the requirements for the § 45V credit?

As required by the statute and consistent with the methodologies applied in the "well-to-gate" full lifecycle verification audits discussed throughout these comments, the use of the produced clean hydrogen will be subject to third-party verification audit; however, the use of the

clean hydrogen shall not be included in the "well-to-gate" emissions rate of the clean hydrogen which was produced by the taxpayer, as the system boundary for the clean hydrogen production process emissions rate ends at the "gate" or production flange, as described in section (.01)(1)(a).

(f) Should indirect book accounting factors that reduce a taxpayer's effective greenhouse gas emissions (also known as a book and claim system), including, but not limited to, renewable energy credits, power purchase agreements, renewable thermal credits, or biogas credits be considered when calculating the § 45V credit?

Low Carbon Gases

IRS should allow for the use of book-and-claim for the movement of low carbon intensity natural gas, renewable natural gas (RNG), and other renewable gases that are supported by commercial contracts and subject to annual third-party audit verification.

For projects applying book-and-claim, the developer should utilize the applicable facility-specific and region-specific fugitive emissions.

For projects utilizing grid supplied natural gas, the developer should utilize the grid emissions incorporated into the Argonne GREET model.

Book-and-claim accounting refers to the chain-of-custody model in which decoupled environmental attributes are used to represent the ownership and transfer of transportation fuel under low carbon fuel programs without regard to physical traceability. While physical supply chains are being built, the book-and-claim option drives demand via the sale and purchase of certificates or credits. While creating a critical mass of certified material, book-and-claim also provides market access to all within the industry, regardless of their global location or size. Allowing for book-and-claim use of low carbon natural gas and RNG in the production of qualified clean hydrogen will facilitate clean hydrogen investment and production, while ensuring the projects meet the lifecycle GHG emissions requirements of the program.

Allowing for the use of book-and-claim is consistent with other domestic and international GHG and carbon reduction standards, including: the EPA RFS, California LCFS (Cal. Code Regs. Tit. 17 § 95488.8(i)(2)(B)), and European programs (RED II and RTFO) which recognize indirect accounting for pipeline injected biomethane that is either claimed as a transportation fuel or claimed as a feedstock to produce hydrogen for transportation purposes. Valero urges IRS to adopt a book-and-claim model for low carbon natural gas, RNG, and other renewable gases used in the production of hydrogen, which includes an audit standard that can be validated and traced by a third-party verifier.

Low Carbon Electricity

Direct "behind-the-meter" electricity production should not be the only method allowed for hydrogen producers to demonstrate that electricity emissions intensity differs from default

grid values for hydrogen production under § 45V. Rather, hydrogen producers should be able to utilize certain contractual market structures to establish a linkage to specific sources of low carbon electricity.

IRS should develop a standard that ensures such contractual structures establish: 1) that the hydrogen producer is the sole acquirer of the environmental attributes associated with the amount of electricity generation that is claimed, 2) a contractual relationship exists between the hydrogen producer and a specific low carbon electricity project (or bundle of projects), and 3) that such contracts are established between generators and consumers within the same Independent System Operator (ISO) or Regional Transmission Operator (RTO), ensuring a feasible grid interconnection exists.

As noted by the EPA, "State Renewable Portfolio Standard (RPS) policies are a major demand driver for [Renewable Energy Credits] (RECs), as state RPS policies create demand for RECs by requiring utilities to generate or purchase an increasing number of RECs annually to demonstrate increasing delivery of renewable electricity to their customers. RPS policies also define which RECs are eligible to meet that demand by defining the project types and geographic locations from which utilities must source RECs to use towards compliance. States' distinct RPS eligibility and compliance requirements create distinct state compliance markets with different REC [qualities and] prices."[1]

Not all RECs are created equally. "RPSs may also have special provisions targeting specific resources that further magnify the price differences between RECs meeting the provision's eligibility requirement and those that do not. One common special provision of state RPSs are 'solar carveout' policies that require utilities to generate or purchase RECs from in-state or in-region solar facilities. Solar carveouts are the main mechanism that drives up the price of solar RECs (SRECs) and create significant price differentials between various types of RECs. Since RECs are also used to demonstrate voluntary delivery and use of renewable energy in the United States, demand by state compliance can affect REC prices in the voluntary market, albeit for RECs from specific resources and locations."[2]

While the structure, flow, and tradability of RECs lend themselves well to RPS compliance programs, or even ESG reporting, the volatility of the credit markets, combined with the spot nature of RECs trading, are not effective as a feedstock input into a manufacturing production process. While some RECs may fail to meet IRS standard, there are some RECs that effectively serve to meet the commercial and regulatory limits imposed on regulated utilities operating in local ISOs or RTOs, which IRS should allow for use to generate tax credits under § 45V. For example, a long term "green tariff" contract with a regulated utility may offer the environmental attributes, via a so-called "REC", to a hydrogen producer as evidence of purchased of electricity from a low carbon power source, utilizing a REC as a way of commercially executing a long term PPA in a regulated electricity market. These RECs would

[1] https://www.epa.gov/sites/default/files/2017-09/documents/gpp-rec-arbitrage.pdf
[2] *Id.*

likely demonstrate more certainty than other RECs generated as part of a state's RPS program that are openly exchange traded for renewability compliance purposes. Therefore, the purchase of RECs, or other market traded "paper credits," on a spot basis would not sufficiently establish such a linkage and should not be allowed under § 45V, while environmental attribute (RECs) derived from low carbon electricity producers physically linked within a local ISO or RTO should be allowed.

Power Purchase Agreements (PPAs) are another example of a contractual relationship that should be allowed in characterizing the intensity of electricity emissions for hydrogen production under § 45V. In stark contrast to RPS based RECs, which are the tradable "creditized" by-product for enabling state electricity renewability compliance obligations, PPAs are direct or indirect contractual structures that can vary depending on whether the local electricity market is regulated or deregulated. PPAs are effective tools to match electricity producers and consumers within a regional market that are similar to the well-established "book-and-claim" accounting processes applied to natural gas and consistent with other domestic and international GHG and carbon reduction standards, including: the EPA RFS, California LCFS (Cal. Code Regs. Tit. 17 § 95488.8(i)(2)(B)), and European programs (RED II and RTFO). When contracts are established between generators and consumers within the same ISO or RTO, IRS should allow the hydrogen producer to apply the environmental attributes of the low carbon electricity within the production process, as allowed for in the Argonne GREET model. IRS should not allow PPAs where a feasible grid interconnection does not exist between the electricity generator and consumer.

Similar to the other audit requirements referenced throughout these comments, IRS should require a third-party audit of any qualifying contractual commitments and low carbon supporting documents.

(g) If indirect book accounting factors that reduce a taxpayer's effective greenhouse gas emissions, such as zero-emission credits or power purchase agreements for clean energy, are considered in calculating the § 45V credit, what considerations (such as time, location, and vintage) should be included in determining the greenhouse gas emissions rate of these book accounting factors?

The IRS, for purposes of the § 45V tax credit, should apply regional considerations when evaluating the utilization of low carbon electricity in the generation of qualified clean hydrogen. Projects should be connected to the source of low carbon electricity directly in cases where the low carbon electricity producer is not directly connected to the local ISO or RTO. Or, alternatively, the project and the low carbon electricity producer should both be directly connected to the local ISO or RTO, with the parties having the ability to contract for any low carbon electricity production within the projects respective local ISO or RTO.

See also the detailed response in section (.01)(1)(e)(ii) regarding time matching and section (.01)(4)(f) regarding book-and-claim.

(5) Unrelated Parties.

(a) What certifications, professional licenses, or other qualifications, if any, should be required for an unrelated party to verify the production and sale or use of clean hydrogen for the § 45V credit, § 45 credit, and § 48 credit?

IRS should look to the types of certifications and licenses required by EPA for auditors authorized to perform Quality Assurance Plan (QAP) audits under 40 C.F.R Part 80, and the California Air Resources Board (CARB) for third-party verifiers under the California LCFS program.

(b) What criteria or procedures, if any, should the Treasury Department and the IRS establish to avoid conflicts of interest and ensure the independence and rigor of verification by unrelated parties?

Similarly, EPA and CARB have established auditor training, certifications, and rules which clearly address conflict of interest. IRS should allow for an auditor to address compliance across multiple programs (e.g., RFS, LCFS, CFR etc.), without such activities constituting a conflict of interest. Consistent with EPA's QAP program, IRS should allow the same auditor to perform auditing for a taxpayer across multiple programs and without requiring an arbitrary and frequent rotation of auditors, as required by CARB. Such rotation is unnecessary and places an unreasonable demand on the market availability of auditors with specialized skills and certifications to perform such services.

(c) What existing industry standards, if any, should the Treasury Department and the IRS consider for the verification of production and sale or use of clean hydrogen for the § 45V credit, § 45 credit, and § 48 credit?

Consistent with current industry practices utilized for compliance with both domestic and international renewable fuel programs, including: the EPA's RFS, the California LCFS, the European Union's RED II, the United Kingdom's RTFO, and the upcoming Canadian CFR, Treasury and IRS should rely on the robust independent third-party verifications of the full "well-to-gate" clean hydrogen system boundaries, including, but not limited to:

- The producer's Argonne GREET model (or provisional emissions rate methodology) inputs and outputs in reaching the reported kilograms of CO_2e per kilogram of hydrogen produced.
- The clean hydrogen producer's records of energy inputs and volumetric production records, measurement data (e.g., flowmeters, ammeters, tank gauges etc.)
- Sales should be verified by documentation routinely maintained in the taxpayer's business, such as contracts; invoices; supporting emissions data; product transfer documents; and volumetric measurement data from flowmeters, ammeters, tank gauges, etc., which support such transactions.

- Use should be demonstrated by engineering and process flow data supporting such use and volumetric measurement data from flowmeters, ammeters, tank gauges, etc., which also support such use.

(6) Coordinating Rules.

(a) Application of certain § 45 rules.

(ii) Section 45V(d)(1) states that the rules for facilities owned by more than one taxpayer are similar to the rules of § 45(e)(3). How should production from a qualified facility with more than one person holding an ownership interest be allocated?

The allocation of production from a qualified facility with multiple owner interests should be based on the structure of such ownership agreements (e.g., a joint-venture or partnership agreement would dictate how credits are allocated) or other contractual agreements between such owners.

(b) Coordination with § 48.

(i) What factors should the Treasury Department and the IRS consider when providing guidance on the key definitions and procedures that will be used to administer the election to treat clean hydrogen production facilities as energy property for purposes of the § 48 credit?

IRS should allow a taxpayer to produce records demonstrating activity undertaken specifically to develop clean hydrogen production facilities, such as engineering design work, investment funding, land use approvals, applications for permits, and any other relevant documentation.

IRS should clarify that one entity with two or more separate facilities has the ability to apply different credits to different facilities. For example, a producer who owns or operates a separate facility which produces feedstock for use in the production of clean hydrogen at a qualified facility should qualify for the § 48 Investment Tax Credit and the § 45V Clean Hydrogen Production Credit, respectively.

(ii) What factors should the Treasury Department and the IRS consider when providing guidance on whether a facility is "designed and reasonably expected to produce qualified clean hydrogen?"

Criteria that should be considered by Treasury and the IRS regarding the § 48 Investment Tax Credit and whether a facility is "designed and reasonably expected to produce qualified clean hydrogen" include:

- Argonne GREET model lifecycle GHG emissions calculations, or lifecycle GHG emission calculations and methodology associated with a provisional emissions rate, and
- Engineering design work on the clean hydrogen production facility.

(c) Coordination with § 45Q. **Are there any circumstances in which a single facility with multiple unrelated process trains could qualify for both the § 45V credit and the § 45Q credit notwithstanding the prohibition in § 45V(d)(2) preventing any § 45V credit with respect to any qualified clean hydrogen produced at a facility that includes carbon capture equipment for which a § 45Q credit has been allowed to any taxpayer?**

Yes, there are circumstances in which a single facility, or multiple facilities at a single location, with multiple unrelated process trains could qualify for both the § 45V credit and the § 45Q credit, notwithstanding the prohibition in I.R.C. § 45V(d)(2).

For example, consider the production of clean hydrogen at a specified clean hydrogen production facility in a steam methane reformer (SMR) using a renewable gas feedstock (generating § 45V credits), which then captures the CO_2 emissions from the SMR via a "carbon capture industrial facility" for subsequent permanent geological sequestration (generating § 45Q credits). If the RNG-SMR process produces hydrogen that meets the 4 $kgCO_2e/kgH_2$ criteria without considering the CCS-related GHG emissions reductions, then the CCS-related GHG emission reductions are independent and should be eligible to generate § 45Q credits.

IRS should clarify that a taxpayer's mere eligibility to claim the § 45Q credit does not preclude such taxpayer from alternatively claiming the § 45V tax credit (i.e., the taxpayer should be able to choose which of the two eligible tax credits to claim).

.02 Clean Fuel Production Credit (§ 45Z).

(2) Establishment of Emissions Rate for Sustainable Aviation Fuel. Section 45Z(b)(1)(B)(iii) provides that the lifecycle greenhouse gas emissions of sustainable aviation fuel shall be determined in accordance with the Carbon Offsetting and Reduction Scheme for International Aviation or "any similar methodology which satisfies the criteria under § 211(o)(1)(H) of the Clean Air Act (42 U.S.C. 7545(o)(1)(H)), as in effect on the date of enactment of this section."

What methodologies should the Treasury Department and IRS consider for the lifecycle greenhouse gas emissions of sustainable aviation fuel for the purposes of § 45Z(b)(1)(B)(iii)(II)?

The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) lifecycle analysis methodology is not preferred for the purposes of § 45Z tax credits. The CORSIA model relies on induced land use change (ILUC) assumptions that heavily penalize the lifecycle GHG emission rates of sustainable aviation fuels (SAF) produced from crops and crop-based oils.

The Inflation Reduction Act (IRA) places emphasis and priority on supporting domestic resources, jobs, and opportunities; however, the adoption of the CORSIA methodology for the purposes of I.R.C. § 45Z(b)(1)(B)(iii)(II) would ultimately cause the opposite for the U.S. agriculture industry. For example, under the CORSIA methodology, SAF produced from domestically-grown soybean, rapeseed, and corn (for ethanol production) would suffer inflated lifecycle GHG emission rates and not be eligible for § 45Z tax credits.

Treasury and the IRS should consider adopting the Argonne GREET model for the purposes of I.R.C. § 45Z(b)(1)(B)(iii)(II) and I.R.C. § 40B(E)(2). Argonne GREET uses a "similar" methodology to that adopted in CORSIA and satisfies the criteria under § 211(o)(1)(H) of the Clean Air Act (42 U.S.C. 7545(o)(1)(H)). Furthermore, Argonne GREET is already the specified lifecycle analysis model to be used for non-aviation fuel under I.R.C. § 45Z(b)(1)(B)(ii) as well as clean hydrogen under I.R.C. § 45V(c)(1). Consistency in lifecycle analysis methodology is critical to establishing a level playing field for SAF versus other clean fuels – e.g., if IRS were to adopt the CORSIA methodology for calculating lifecycle GHG emissions under I.R.C. § 45Z(b)(1)(B)(iii), crop-based feedstocks used to produce SAF would be penalized with an inflated ILUC factor, while the same feedstocks used to produce other clean fuels would not. This would effectively disincentivize the production of SAF versus other clean fuels, counter to the intention of the IRA.

(3) Provisional Emissions Rates. Section 45Z(b)(1)(D) allows the taxpayer to file a petition with the Secretary for determination of the emissions rate for a transportation fuel which has not been established.

(a) At what stage in the production process should a taxpayer be able to file a petition for a provisional emissions rate?

The "provisional emissions rate" under I.R.C. § 45Z(b)(1)(D) is intended to be available for transportation fuels "for which an emissions rate has not been established" for the purposes of § 45Z. Taxpayers should have the ability to petition the Secretary for a provisional emissions rate in either of the following scenarios:

- Facility-specific conditions differ from those represented in the Argonne GREET model in a way that impacts lifecycle emissions (e.g., GHG emissions associated with renewable feedstocks are lower than the values incorporated into Argonne GREET); or
- The taxpayer uses a novel hydrogen production process that is not included in the Argonne GREET model.

In either scenario, the taxpayer should be able to engage with Treasury/IRS or its designee at any point in the project development process, from initial project design and investment decision through project commencement and production.

Allowing taxpayers to engage with the relevant entities responsible for making a determination regarding a provisional emissions rate at any stage in the project development process affords taxpayers a higher degree of certainty regarding project development and investment decisions than would be available under any other timing requirements.

A taxpayer should be able to file a formal petition to establish a provisional emissions rate at any stage in the project development process, as long as the petition includes verification by an unrelated party of the lifecycle analysis and proposed emissions rate. Upon receipt of a complete petition to establish a provisional emissions rate, the IRS should be obligated to issue a determination within 90 days.

Unless and until the lifecycle GHG emissions rate can be determined using the Argonne GREET model or it is published in the Secretary's annual table, the taxpayer and the taxpayer's verifier/auditor should be able to rely upon the provisional emissions rate and accepted methodology agreed to between the taxpayer and the relevant issuing entities for calculating the applicable § 45Z tax credit.

Valero's comments above are based on our interpretation of "provisional emissions rate" and an assumed process by which a provisional emissions rate is applied for and a determination made. In the event that Treasury and IRS interpret the meaning of "provisional emissions rate" or the accompanying procedure differently, Valero encourages the IRS to ensure that the process of petitioning for, receiving, and operating under a provisional path way include the following key items:

- Review, approval/rejection, and determination of provisional emissions rates should occur within 90 days of petitioning;
- In the event that actual operating data result in higher or lower emissions for a produced quantity of clean fuel, the taxpayer should be required to "true-up" the provisional

emissions rate to the actual emissions rate and subsequently update any tax filings for credits claimed by the taxpayer under § 45Z for the quantity of fuel affected without penalty. Additionally, if appropriate, the provisional emissions rate for the facility should be revised to the actual operating emissions rate;

- A provisional emissions rate should be specific to the facility for which the taxpayer engages with Treasury or the IRS, or relevant issuing entity, unless and until the lifecycle GHG emissions rate can be determined using the Argonne GREET model; and
- The taxpayer and the taxpayer's verifier/auditor should be able to rely upon the provisional emissions rate and accepted methodology agreed to between the taxpayer and the relevant issuing entities for calculating the applicable § 45Z tax credit.

Finally, Treasury and IRS should clarify that a taxpayer is not required to seek a provisional emissions rate for a clean fuel production process for which the emissions can be calculated utilizing the Argonne GREET model, which provides a rigorous methodology to calculate emissions using default values and user defined inputs allowed within the model.

(b) What criteria should be considered by the Secretary to determine the provisional emissions rate?

Criteria that should be considered by the Secretary, or its designee, in making a determination regarding the provisional emissions rate include:

- The scientific basis of the lifecycle methodology and robustness of underlying data submitted with a petition for a provisional emissions rate and/or
- Third-party auditing undertaken prior to the request for a provisional emissions rate.

(4) Special Rules. Section 45Z(f)(1) provides several requirements for a taxpayer to claim the § 45Z credit, including for sustainable aviation fuel a certification from an unrelated party demonstrating compliance with the general requirements of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) or in the case of any similar methodology, as defined in § 45Z(b)(1)(B)(iii)(II), requirements that are similar to CORSIA's requirements.

With respect to this certification requirement for sustainable aviation fuel, what certification options and parties should be considered to support supply chain traceability and information transmission requirements?

IRS should look to the types of certifications and licenses required by EPA for auditors authorized to perform QAP audits under 40 C.F.R Part 80, and the CARB for third-party verifiers under the California LCFS program.

Similarly, EPA and CARB have established auditor training, certifications, and rules which clearly address conflict of interest. IRS should allow for an auditor to address compliance across multiple programs (e.g., RFS, LCFS, CFR etc.), without such activities constituting a

conflict of interest. In line with EPA's QAP program, IRS should allow an auditor to perform auditing for a taxpayer across multiple programs and without requiring an arbitrary and frequent rotation of auditors, as required by CARB. Such rotation is unnecessary and places an unreasonable demand on the market availability of auditors with specialized skills and certifications to perform such services.

(5) Coordinating Rules. Section 45Z(f)(4) states that under regulations prescribed by the Secretary, rules similar to the rules of § 52(d) apply in the case of estates and trusts. Section 45Z(f)(5) states that rules similar to § 45Y(g)(6) apply to patrons of agricultural cooperatives. Section 45Z(f)(6)(A) states that rules similar to the rules of § 45(b)(7) apply for the prevailing wage requirement. Section 45Z(f)(7) states that rules similar to the rules of § 45(b)(8) apply for the apprenticeship requirement.

Is the application of the cross-referenced rules for purposes of the § 45Z credit adequately clear? What aspects of the cross-referenced rules should apply to the § 45Z credit without modification and what aspects should be modified?

Section 45Z requires only "similar" rules to those in place in other provisions of the code. Treasury and IRS should clarify whether they intend to adopt identical rules, and if Treasury and IRS intend to adopt only "similar" rules, as required, Treasury and IRS should request additional comments after clarifying the extent of modifications.

(6) Multiple Owners. **How should production from a qualifying facility with more than one person having an ownership interest in such facility be allocated to such persons for purposes of § 45Z(f)(2)?**

The allocation of production from a qualified facility with multiple owner interests should be based on the structure of such ownership agreements (e.g., a joint-venture or partnership agreements would dictate how credits are allocated) or other contractual agreements between such owners.

(7) Please provide comments on any other topics related to § 45Z credit that may require guidance.

A. Eligibility to Claim Credits under Different Provisions

IRS should clarify that a taxpayer's mere eligibility to claim the § 45Q credit does not preclude such taxpayer from alternatively claiming the § 45Z tax credit (i.e., the taxpayer should be able to choose between which of the eligible tax credits to claim).

IRS should also clarify that multiple qualified facilities may exist within a single fence line. Eligibility under § 45Q or § 45V should not preclude § 45Z within such a facility. Take, for example, a hypothetical fuel producer that has lowered the carbon intensity of the fuel produced to zero or close to zero, through non-CCS mechanisms, but then elects to install CCS within the same fence line. Without a definition of "qualified facility" that allows for multiple qualified

facilities within a single fence line, the hypothetical fuel producer might not be able to claim any § 45Z tax credits because of the presence of the CCS equipment and therefore may not proceed with the development of the clean fuel production facility. Clarifying that multiple qualified facilities may exist within a single fence line will help incentivize fuel producers to maximize GHG reductions.

B. Concentrating Environmental Attributes

Treasury and IRS should clarify that under § 45Z a qualified clean fuel production facility will have the ability to concentrate the environmental attributes of the low carbon feedstocks processed at a qualified facility to lower the emissions rate of a certain volume of fuel produced at such qualified facility.

Allowing for the concentration of environmental attributes is consistent with other domestic and international GHG and carbon reduction standards, including: the EPA RFS and United Kingdom's RTFO. To facilitate the concentration of environmental attributes, Treasury and IRS should recognize book-and-claim accounting for feedstocks and fuels and the use of PPAs for electricity used on site as allowable methodologies for concentration environmental attributes.

IRS should allow for the use of book-and-claim for the movement of low carbon intensity natural gas, RNG, and other renewable gases that are supported by commercial contracts and subject to annual third-party audit verification.

Book-and-claim accounting refers to the chain-of-custody model in which decoupled environmental attributes are used to represent the ownership and transfer of transportation fuel under low carbon fuel programs without regard to physical traceability. While physical supply chains are being built, the book-and-claim option drives demand via the sale and purchase of certificates or credits. While creating a critical mass of certified material, book-and-claim also provides market access to all within the industry, regardless of their global location or size. Allowing for book-and-claim use of low carbon natural gas and RNG in the production of clean fuel will facilitate meaningful investment in clean fuel production, while ensuring the projects meet the lifecycle GHG emissions requirements of the program.

PPAs are another example of a contractual relationship that should be allowed in characterizing the carbon intensity of electricity emissions used in the production of clean fuel under § 45Z. PPAs are direct or indirect contractual structures that can vary depending on whether the local electricity market is regulated or deregulated. PPAs are effective tools to match electricity producers and consumers within a regional market that are similar to the well-established "book-and-claim" accounting processes applied to natural gas and consistent with other domestic and international GHG and carbon reduction standards, including: the EPA RFS, California LCFS (Cal. Code Regs. Tit. 17 § 95488.8(i)(2)(B)), and European programs (RED II and RTFO). When contracts are established between generators and consumers within the same ISO or RTO, Treasury and IRS should allow the clean fuel producer to apply the environmental attributes of the low carbon electricity within the production process, as allowed for in the

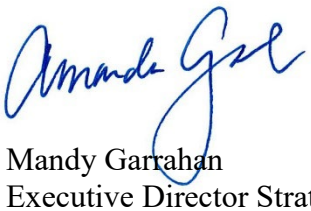
Argonne GREET model. IRS should not allow PPAs where a feasible grid interconnection does not exist between the electricity generator and consumer.

Similar to the other audit requirements referenced throughout these comments, IRS should require a third-party audit of any qualifying contractual commitments and low carbon supporting documents used by a producer to concentrate the environmental attributes in any volume of clean fuel produced at a qualifying facility.

* * *

Valero appreciates the opportunity to comment and would welcome the opportunity to have additional discussions on these issues. Please do not hesitate to contact me with any questions or if Valero or I can otherwise be of assistance.

Sincerely,



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