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Internal Revenue Service, Room 5203
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Electronically Submitted via https://www.regulations.gov.

Re: Comments on REG–117631–23, Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election To Treat Clean Hydrogen Production Facilities as Energy Property

The American Fuel & Petrochemical Manufacturers (AFPM) respectfully submits these comments to the Internal Revenue Service (IRS) on REG–117631–23,[1] Section 45V[2] Credit for Production of Clean Hydrogen. AFPM appreciates the opportunity to provide feedback on this guidance.

I. Background and Overview of AFPM

AFPM supports policies that strengthen U.S. energy security and promote competition and innovation. AFPM members are evaluating large-scale capital investments in replacing grey hydrogen with lower carbon hydrogen sources. Replacing grey hydrogen with blue hydrogen at a large petroleum refinery could result in permanent sequestration of one million tons per year or more of carbon dioxide (CO_2).[3] Additionally, these new low-carbon hydrogen facilities can be scaled-up beyond what is required to replace existing hydrogen demand, paving the way for production of an array of lower carbon-intensity (CI) fuels, petrochemicals, and fertilizers, including ammonia, methanol, sustainable aviation fuel (SAF), and renewable diesel.

Each of the seven regional clean hydrogen hubs (H2Hubs) contains ambitious projects aimed at fostering economic growth, advancing clean energy, and benefiting communities. According to the Department of Energy (DOE), the seven H2Hubs are anticipated to generate $40 billion in private investment in clean hydrogen and support up to 334,280 direct jobs in the United States.

AFPM member companies play important roles in the success of the H2Hubs. For instance, these companies are part of the Mid-Atlantic Clean Hydrogen Hub (MACH2), which aims to create a clean hydrogen economy in Southeastern Pennsylvania, Southern New Jersey, and Delaware through the

[1] Hereinafter referred to as the "Proposed Rule".
[2] Unless otherwise noted, all section references are to the Internal Revenue Code of 1986, as amended, and the regulations promulgated thereunder.
[3] See generally, 2022 Data Summary Spreadsheets, ENV'T PROT. AGENCY (last accessed Feb. 26, 2024), https://www.epa.gov/ghgreporting/data-sets.

production and use of green, pink, and orange hydrogen. The consortium seeks to reuse and revitalize dormant fossil fuel infrastructure in the region, combined with primarily new green hydrogen production, to create an estimated 20,000 jobs and transform the East Coast energy landscape. The consortium looks to spur over 270 metric tons of clean hydrogen production per day, while creating over 300 metric tons per day of clean hydrogen demand.

Likewise, on the Gulf Coast, in March 2022, ExxonMobil announced plans to construct a multi-billion-dollar hydrogen facility at its integrated refining and petrochemical site at Baytown, Texas. ExxonMobil's Baytown hydrogen facility is expected to produce one billion cubic feet of low carbon intensity (CI) hydrogen per day, making it the largest plant of its type anywhere in the world at planned startup in 2028.[4]

II. Executive Summary

Treasury should implement Section 45V to conform with the statutory language and intent, provide clarity for taxpayers, and maximize the benefits of the tax credit provisions through competition among technologies. AFPM's comments outline the following concerns and recommendations in more detail:

- The electricity input requirements of the energy attribute certificates (EACs) will result in significant delays in scaling the hydrogen economy. In many instances, it is impractical and costly to comply with these requirements.
- The 45VH2-GREET 2023 model unduly restricts taxpayer capabilities to pursue innovative clean hydrogen production opportunities. Changes to what constitutes background data as well as increased flexibility as to what GREET model version to employ are improvements that could better advance hydrogen production.
- Taxpayers should be allowed to use existing policies that are heavily audited and scrutinized through regulatory agencies to substantiate the CI of the renewable natural gas (RNG) used for hydrogen production. This would reduce administrative burdens and uncertainty. Likewise, Treasury should jettison the "first productive use" requirement to prevent value discrepancies.
- Taxpayers should have greater flexibility as to when they meet with the DOE during a project development process to seek conceptual alignment on calculating emissions from a hydrogen production pathway.
- The use of interdependent analysis in determining a qualified facility is helpful but additional clarity is needed for how Treasury will treat hydrogen plants located at renewable fuel (RF) production facilities.
- Treasury should modify and clarify existing facilities rules.
- The anti-abuse rule's vagueness should be reduced by revising the rule to disallow credits only in circumstances permitted by statute.

Successfully facilitating the developing and deployment of lower CI hydrogen will require flexible implementation of the Section 45V credit consistent with the statutory authority granted by Congress.

III. Feedback to Treasury

[4] The Baytown hydrogen project is pending a final investment decision expected by year-end 2024, subject to policy and stakeholder support, regulatory permitting, and market conditions.

AFPM is pleased to offer the following comments to Treasury as it implements the Section 45V tax credit.

A. The electricity input requirements of the EACs will result in significant delays in scaling the hydrogen economy.

Under the Proposed Rule, a taxpayer must document meeting certain electricity input requirements via newly created EACs. The issues in question are whether the electricity input meets requirements for incrementality, temporal matching, and deliverability. In general, AFPM notes that the statute does not contemplate a grant of authority to create these requirements and urges Treasury to reassess its statutory authorities to require them. However, if Treasury proceeds, AFPM offers the following recommended changes to minimize the adverse impacts in scaling the new hydrogen economy.

1. Incrementality

As it relates to incrementality, the Proposed Rule requires that an EAC show the "unit of electricity to which the EAC relates has a commercial operation date (COD)…that is no more than 36 months before the hydrogen production facility…was placed in service." The Administration has outlined their desire for a robust implementation of hydrogen technology, and while AFPM members are eager to engage in this space, we do not believe there are enough renewable facilities scheduled to come online to meet the additionality requirement; this issue is further exacerbated by interconnection process delays.

Independent System Operators (ISOs) and Regional Transmission Organizations (RTOs) have sought waivers at the Federal Energy Regulatory Commission (FERC) due to the inability to comply with their queue process. The existing mismatch between the timing it takes to bring a renewable facility online following an interconnect study and agreement (up to approximately five years) and the proposed additionality requirement further support our recommendation.

In the Proposed Rule, Treasury requests comments on whether the addition of carbon capture and storage (CCS) to existing fossil power generation resets the COD as it relates to the incrementality test. The addition of CCS to existing fossil generation results in new low-CI power that should be eligible under the Section 45V program. The resulting low-CI power should be considered incremental since it was neither generated nor capable of being generated prior to the addition of CCS and results in no induced grid emissions. Similarly, for the purpose of Section 45V eligibility, existing fossil generation retrofitted with CCS should not be subject to the 80/20 rule. The 80/20 rule provides guidance on the eligibility of retrofitted energy property to claim tax credits, whereas the proposed incrementality test is intended to prevent induced grid emissions. The magnitude of capital investment associated with CCS retrofits and existing fossil generation sites has no bearing on induced grid emissions.

Furthermore, including power generated from existing fossil power plants retrofitted with CCS would contribute towards Treasury's temporal matching and deliverability goals. Baseload fossil power plants do not share the intermittency concerns of renewable power generation, making hourly matching more achievable. And regions where wind and solar power are less favorable may have fossil power CCS opportunities that would enable hydrogen production.

Lastly, we support the concept that Treasury will treat 10% of installed renewables capacity as incremental to account for curtailments of existing renewables. The agencies acknowledge that periods of curtailment or zero or negative pricing present scenarios where there would be limited to no induced grid emissions. As a result, it is appropriate to account for this in any final rule.

2. Temporal Matching

The Proposed Rule provides that an EAC satisfies the temporal matching requirement if the electricity input is generated in the same hour that taxpayer's hydrogen production facility uses that electricity to produce hydrogen. The Proposed Rule allows for a transition rule that electricity generated before January 1, 2028 qualifies so long as it is generated in the same calendar year as the hydrogen production. AFPM and its members recommend that projects that begin construction before 2032 have annual time-matching requirements.

As currently written, the temporality requirement can have unintended consequences. For example, in months where there is greater cloud cover, solar may only produce 10% to 25% of its typical output, creating hydrogen project reliability concerns. Depending on the region, some hydrogen projects are required to purchase power from a regulated utility, which may or may not be bringing renewables on at this rate. Utilities are already procuring renewable energy certificates (RECs) to meet increasingly stringent renewable portfolio standard (RPS) guidelines, and this would shift the supply imbalance and drive-up costs for consumers. Also, if RECs are not forecasted to be available at scale, hydrogen facilities would need to be overbuilt by many orders of magnitude beyond energy needs (sometimes 10 times over) to meet hourly time-matching, which would further exacerbate grid reliability concerns and unnecessarily increase project size. As an example, a recent Boston Consulting Group study estimates that in Delaware and Pennsylvania, annual matching will drive up the cost of electrolysis 13%, while hourly matching will increase electrolysis costs roughly 40%. These costs could deem many hydrogen projects uneconomical and prevent them from even being built.

Further, there is no current battery capacity for 24/7 matching. Most commercial batteries are capable of discharging for two to four hours. There will be times when it is not sunny or windy, so batteries may not be charged at all during this time. Similarly, during cold temperatures, batteries may draw down and lose capacity. Per the DOE Long Duration Energy Storage survey from March 2023, certain long-term battery storage technologies will not be available until after 2030. The agencies should assess the technological and commercial readiness of long-term battery storage technology before placing this mandate on a nascent industry.[5]

Taken together, this requirement creates significant unpredictability for a hydrogen project's power and RECs needs. It also inadvertently encourages "load following," which means that facilities would only run when renewables are online. This is an extremely inefficient use of capital investment. Regarding costs of infrastructure, some REC tracking and accounting systems do not have the funding to change their systems to handle the configuration to manage hourly matching and/or would not be amenable to passing costs along.

3. Deliverability

Finally, the Proposed Rule requires that an energy input must meet a deliverability requirement. This

[5] https://liftoff.energy.gov/wp-content/uploads/2023/03/20230320-Liftoff-LDES-vPUB.pdf.

section requires that electricity presented by the EAC is generated by a source that is in the same region as the relevant hydrogen production facility. The deliverability requirement exceeds the requirements of the statute without any express grant of authority by Congress. Furthermore, this rule has been proposed after the Section 45V(f) deadline for the production of regulations, thereby disadvantaging investors who have relied upon existing statutory requirements when making investment decisions in the absence of regulatory guidance. For these reasons, we respectfully request that Treasury withdraw the proposed deliverability requirement.

Notwithstanding AFPM's outlined request that Treasury withdraw the proposed deliverability requirement, AFPM does have substantive comments on the proposed regulation. Treasury should provide that hydrogen projects that demonstrate physical connectivity should meet the deliverability requirement. Existing transmission infrastructure can transport electricity between regions. For example, California relies daily on both exports and imports of electricity to manage its grid. The regionality pillar would impact existing projects today with direct connection that crosses regions as outlined in the proposed map.

Trading systems already generally follow ISO regions, and it is a more realistic approach to utilize the entire ISO footprint versus limiting it to the regions proposed.[6] The deliverability rule should follow existing regional tracking systems to the extent possible (e.g., Western Electricity Coordinating Council (WECC)/ Western Renewable Energy Generation Information System (WREGIS)). For example, WREGIS is set up with regional transfer/trading of RECs in mind (Wyoming wind can qualify for California RPS requirements). If the tracking systems will not be used, then Treasury should implement a transition rule until 2032 to enable projects that have commercial agreements in place to utilize electricity outside of the proposed regions.

4. Treasury Must Ensure it Gives Proper Weight to its Statutory Requirements

AFPM urges Treasury to revisit its proposed legal justifications for its "incrementality, temporal matching, and deliverability" requirements for EACs and to ensure it gives proper weight to the entirety of the statutory text. In particular, Congress limited the scope of Section 45V(c)(1)(A) by subjecting it to Section 45V(c)(1)(B). Treasury supports its preliminary determination for induced grid emissions based on feedback from the Environmental Protection Agency (EPA)[7] and a paper published by the DOE.[8] Yet, Treasury relies on two documents with scopes that are limited only to lifecycle greenhouse gas emissions for purposes of section 211(o)(1)(H) of the Clean Air Act. Both documents fail to adequately analyze the limitations Section 45V(c)(1)(A)—(B) imposes on the scope of emission covered.[9] Each of these documents focuses its respective analysis on Section 45V(c)(1)(A) with only a

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[6] https://www.epa.gov/green-power-markets/renewable-energy-tracking-systems.

[7] *Id.*

[8] *Id.* at 89,229.

[9] *See* Letter from Janet McCabe to Lily Batchelder (Dec. 3, 2023), available at https://home.treasury.gov/system/files/136/45V-NPRM-EPA-letter.pdf ("EPA believes it would be reasonable for Treasury to determine that induced grid emissions. . . must be considered in lifecycle greenhouse-gas analyses . . . [and that] [s]uch interpretation would be consistent with [Clean Air Act] section 211(o)(1)(H) in the context of the RFS program.") (hereinafter *EPA Letter*); *see also*, DOE, *Assessing Lifecycle Greenhouse Gas Emissions Associated with Electricity Use for the Section 45V Clean Hydrogen Production Tax Credit*, 1 (2023) ("[T]he IRA cites to Clean Air Act 211(o)(1)(H), which requires inclusion of 'direct and significant indirect emissions.' . . . [U]nder § 45V, a lifecycle analysis would include induced grid emissions . . . consistent with the [EPA]'s long-standing interpretation and application of this Clean Air Act section.") (hereinafter *DOE Paper*).

cursory reference to the limitations on the lifecycle greenhouse gas emissions found in Section 45V(c)(1)(B).[10] At no point does EPA consider the application of Section 45V(c)(1)(B) (subjecting (A) to limitations in the latest GREET model) in its analysis. DOE's paper similarly fails to provide any substantive analysis of the statutory language and provides conclusory statements.[11] Because both of the documents Treasury relies on to justify its EAC rules fail to provide any meaningful analysis of the entire statutory language binding for purposes of Section 45V, Treasury's reliance on them without further analysis is inappropriate. Underscoring the issue, Treasury's proposed rule adopts the 45VH2-GREET model for use with the Section 45V tax credit.[12] But DOE's own analysis regarding induced grid emissions, which Treasury relies on to justify its EAC requirements, states that the induced grid emissions are not within "45VH2-GREET for purposes of § 45V."[13] Treasury must analyze and reconcile its proposed requirements for EACs with the limitations Congress enacted through direction to utilize the GREET model.

B. The 45VH2-GREET 2023 model places undue restrictions on taxpayer capabilities to pursue innovative clean hydrogen production opportunities.

As part of the Proposed Rule, Treasury announced the creation of a new GREET model designed for use with Section 45V. While AFPM appreciates the clarity on how to determine a project's CI, AFPM does have concerns with the rigidity of the proposed model. AFPM and its members have significant experience working with the GREET model, and one feature of GREET is its flexibility and ability to change as industry develops new, cleaner ways to produce energy. This flexibility encourages investment and innovation which leads to technological advancements that lower emissions.

Unfortunately, under the Proposed Rule many of the key parameters that measure the CI score of the hydrogen produced are locked as background data and this will not just disincentivize hydrogen production but more importantly it will disincentivize innovation that leads to lower GHG emissions.

1. Background Data

Limiting the ability to change the background data in the 45VH2-GREET model significantly hampers the ability of a facility to gain benefit from the investments it makes in the facility or along the value chain to reduce emissions. Additionally, a key tenet to lifecycle analysis is the ability to document specific operational parameters to quantify emissions at a given facility. These model limitations will impact project analyses and disincentivize investment.

Treasury should make all background data in the 45VH2-GREET model foreground data, so producers

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[10] *See EPA Letter* at 1 ("IRC section 45V(c)(1)(A) defines 'lifecycle greenhouse-gas emissions' as having the same meaning as CAA section 211(o)(1)(H), subject to section 45V(c)(1)(B).") (internal footnotes omitted); *see also id.* at 1, n1—n2 (restating the same and reciting the statutory definition); *see also*, *DOE Paper* at 1 ("[T]he IRA cites to Clean Air Act 211(o)(1)(H) . . . a lifecycle analysis would include indirect emissions, consistent with [EPA's application of CAA section 211(o)(1)(H).");*see also*, *id.* at 2, n1 (mentioning the entire statutory definition of lifecycle greenhouse gas emissions found in section 45V).

[11] *See, e.g., DOE Paper* at 1 ("[A] lifecycle analysis would include induced grid emissions as a source of indirect emissions . . . consistent with [EPA's] long-standing interpretation and application of [Clean Air Act section 211(o)(1)(H).");*see also*, *id.* at 6 ("Pursuant to the statute, to receive a § 45V credit, a clean hydrogen producer must appropriately document the lifecycle GHG emissions that result from its process of producing hydrogen.").

[12] *See Proposed Rule* at 89,223.

[13] *See DOE Paper* at 12.

of clean hydrogen are incentivized to find solutions and license technology that result in the lowest carbon intensity of the hydrogen produced.

We appreciate having default numbers to lessen the burden on the project applicant. However, locking certain key parameters as background data will disincentivize or prevent the production of hydrogen using pathways or systems that are significantly less carbon intensive than the defaults. Locking these key variables in the 45VH2-GREET model as background data will be detrimental to the goal of reducing overall emissions and will stifle the development of clean hydrogen production facilities. Some examples of background data that are currently locked in the 45VH2-GREET model and that should instead be treated as optional foreground data that can be adjusted in accordance with the facts of a given project include the distance of a natural gas pipeline, the emissions associated with renewable natural gas, the emissions associated with natural gas, methane leakage rates, etc.

Another area in which the Proposed Rule does not allow hydrogen produced from natural gas to recognize the emissions reductions achieved and the actual CI of the hydrogen produced is around steam. Hydrogen produced with natural gas creates steam, a usable coproduct, during the production process. The Proposed Rule and the updated 45VH2-GREET 2023 model assume that for hydrogen produced from natural gas with carbon capture, the steam created as part of the hydrogen production process is equal to the amount of steam needed to power the carbon capture equipment. Taxpayers are not allowed to change this assumption in the model. Thus, the updated 45VH2-GREET 2023 model does not allow a hydrogen production pathway to take credit for co-product steam created during the production process as a result of carbon capture technology being more efficient. There are, however, existing reforming production pathways using CCS that create co-product steam today, which the DOE User Manual expressly acknowledges excess steam can be measured by metering and thus is easily verifiable.

Taxpayers that are producing hydrogen with natural gas and carbon capture should be able to prove the efficiencies of their processes and take credit for co-product steam in the GREET model, just like grey hydrogen. Our ask is to simply level the playing field and not disadvantage hydrogen produced with natural gas with carbon capture by limiting the taxpayer's optionality regarding the best use for the co-product steam.

Specifically, Treasury and DOE should revisit the modeling by the DOE National Energy Technology Laboratory (NETL)[14] which concludes that excess steam would optimally power the CCS plant rather than be valorized. The regeneration steam requirements used by NETL are unreasonable and do not reflect optimally-designed CO_2-removal processes and currently-available solvents. Technology licensors report that modern Methyldiethanolamine (MDEA) solvent regeneration requires 15% or less of the steam requirement reported by NETL. Improved energy efficiency for solvent regeneration enables significant amounts of co-product steam that can be efficiently exported to decarbonize other industrial processes.

DOE should revisit the inaccuracies in the NETL modeling, adopt immediate error corrections, and enable pathways in the 45VH2-GREET that incorporate both CCS and steam valorization. DOE should

[14] National Energy Technology Laboratory. Comparison of Commercial, State-of-the-Art, Fossil-Based Hydrogen Production Technologies. DOE/NETL-2022/3241. Pittsburgh, PA: National Energy Technology Laboratory, 2022. Technical Report.

also allow consideration of steam co-product credits when evaluating the energy balances and lifecycle emissions of projects seeking provisional emission rates.

A final problematic example is that the 45VH2-GREET 2023 model assumes that methane leakage during the natural gas recovery process and subsequent gas processing and transmission sums to ~0.9% of methane consumed by the reformer.[15] Despite DOE's acknowledgement that "the landscape for methane emissions monitoring and mitigation is changing rapidly,"[16] methane leakage rates are fixed assumptions ("background data") in the 45VH2-GREET 2023 and cannot be changed by users.[17] It is also important that the methane leakage rate accurately represent the GHG emissions associated with the natural gas used to produce low CI hydrogen, and not include emissions that are associated with crude oil and natural gas liquids (NGLs) often co-produced with natural gas. Treasury has requested comments on methane loss rates becoming foreground data in future releases. We strongly support Treasury making the methane loss rate foreground data in the 45VH2-GREET 2024 release.

Treasury and IRS express concerns about the readiness of the verification mechanisms for natural gas leakage rates, but in parallel, the EPA released Proposed Rules for a Waste Emissions Charge for Petroleum and Natural Gas Systems.[18] Upstream emissions cannot, at the same time, be verifiable under EPA's rules and unverifiable under Treasury's rules. Restricting data input to specified averages or other amounts would significantly limit opportunities to optimize facility design, would increase costs, and would delay and limit the growth of the clean hydrogen economy. In addition, keeping certain parameters as background data will incentivize the use of less efficient technologies resulting in higher emissions, which is counterproductive to the legislative intent of Section 45V.

To continue encouraging CI reductions in the natural gas supply chain, companies should be able to show true reductions in methane and CO_2. EPA has several programs that currently or will soon require companies in the oil and natural gas sector to provide enhanced information regarding their emission portfolios. The Methane Waste Emissions Charge (WEC) program implemented as part of the IRA imposes a fee on methane emissions that exceed statutorily specified waste emissions thresholds based on emissions reported to the Mandatory Greenhouse Gas Reporting Program (GHGRP). Updates to the GHGRP Subpart W will move to incorporate empirical data that more accurately reflecting total methane emissions for which will then be used to demonstrate the extent to which a methane fee is owed under the WEC. The revisions to Subpart W will become effective on January 1, 2025, and thus verified data reported under Subpart W should be able to be used as a basis for the actual CI of the natural gas supply chain by 2028. Companies should be able to use this information to support numbers provided in the 45VH2-GREET 2023 model for the CI of their natural gas feedstock.

In order to input data into the GREET model, the GHG emissions data reported under EPA's GHGRP must be converted to emissions intensity. The emissions intensity should be based on an ISO specified methodology (e.g., ISO14067) to ensure consistency of approaches across producers for their individual feedstock supply.[19] For energy products associated with the production of oil and gas, it is most

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[15] DOE Guidelines to Determine Well-to-Gate Greenhouse Gas (GHG) Emissions of Hydrogen Production Pathways using 45VH2-GREET 2023 (December 2023), at 15-16, https://www.energy.gov/sites/default/files/2023-12/greet-manual_2023-12-20.pdf.

[16] *Id.* at 16.

[17] 88 Fed. Reg. 89225.

[18] Docket EPA-HQ-OAR-2023-0434), 89 Fed. Reg. 5318 (January 26, 2024), https://www.regulations.gov/document/EPA-HQ-OAR-2023-0434-0001.

[19] ISO 14067: 2018. Greenhouse gases – Carbon footprint of products – Requirements and guidelines for quantification.

appropriate to use the energy allocation methodology for the specific natural gas supply chains (production, gathering and boosting, processing, transmission, and storage) for input into the 45VH2-GREET model.

Treasury should allow all background data in the GREET model to be instead treated as foreground data, so producers would have the opportunity to substantiate the use of low-CI hydrogen production technologies, power sources, and feedstocks.

Treasury recognizes EACs as an established mechanism for substantiating the purchase of electricity from non- or low-emitting sources and proposes to allow taxpayers to utilize EACs from existing qualified registries, under certain conditions, in their production of hydrogen for the purpose of the Section 45V credit. In contrast, Treasury raises concerns about the verifiability and fidelity of current verification mechanisms for background data such as upstream methane loss rate. However, mechanisms exist today for the measurement, monitoring, reporting, and verification of some emissions along the natural gas supply chain for some commercial purposes. Treasury should evaluate the appropriateness of these existing programs and its proposed treatment of upstream methane loss rates in the Proposed Rule.

The 45VH2-GREET 2023 model functions similarly to the conservative "default" lifecycle emissions rates that are common amongst low-carbon fuel programs such as the EPA's Renewable Fuel Standard (RFS) and California's Low Carbon Fuel Standard (LCFS). However, these other low-carbon fuel programs enable the user to demonstrate emissions reductions beyond the default rates and realize value for those reduction efforts. Treasury's proposed implementation of Section 45V is disappointingly unique in its failure to recognize demonstrable GHG emissions reductions and its subsequent discouragement of innovation.

2. GREET Model Version Control

Treasury should provide taxpayers the option to use the GREET model in place at the time the investment decision is made or at the latest at the time that the facility is placed in service. Furthermore, taxpayers should be permitted to use the most recent GREET model at the time hydrogen is being produced but should not be required to do so.

Taxpayers that produce hydrogen from a qualified facility are generally entitled to claim tax credits under Section 45V for a 10-year period that begins on the date that the facility is placed in service. The Proposed Rule requires taxpayers (including taxpayers that have already placed in service a qualifying hydrogen facility) to calculate the amount of Section 45V tax credits generated in a given tax year by using the "most recent GREET model" to determine the lifecycle GHG emissions rate. The development of a hydrogen facility will take years and is costly. Taxpayers may not invest in the development of hydrogen facilities unless they are confident that future versions of the GREET model will not limit or prevent a hydrogen facility from qualifying for tax credits under Section 45V. Further, the process for model changes has not been explained and immediate model updates may significantly alter a project and its planned return.

If this rule requiring taxpayers to use the "most recent GREET model" is finalized in its current form, taxpayers will not have required certainty that the GREET model it uses to plan and build a facility will still be in place for the duration of the 10-year period.

This rule is punitive and likely will prevent taxpayers from having certainty needed when evaluating whether to construct clean hydrogen facilities. The requirement in the Proposed Rule that taxpayers always use the most recent GREET model (even for facilities that were placed in service in prior tax years) would introduce significant uncertainty in whether those facilities may be used to generate clean hydrogen in a way that qualifies for the tax credits under Section 45V. This requirement in the Proposed Rule is arbitrary and would introduce significant risk to the development of clean hydrogen production facilities and likely would significantly impede the growth of the production of clean hydrogen and could turn operational facilities into unsustainable assets.

3. Additional Recommendations

Treasury's Proposed Rule requires that for purposes of determining the lifecycle GHG emissions for qualified hydrogen, the taxpayer shall include "all hydrogen produced at a hydrogen production facility during the taxable year."[20] Treasury's proposal to require an annual average calculation procedure inclusive of all hydrogen produced within a taxable year, including hydrogen produced during the taxable year that does not meet the lifecycle emissions thresholds, risks unnecessarily penalizing hydrogen producers. AFPM strongly recommends that Treasury modify the Proposed Rule to instead require the taxpayer to include "all qualified hydrogen produced at a hydrogen production facility during the taxable year."

For purposes of a rule that quantifies emissions for only qualifying hydrogen, the lifecycle emissions of such hydrogen should be determined on an averaging basis of a calendar month, quarter, or year. Regardless of the period that a producer elects, that period must be maintained throughout the calendar year, such that the taxpayer cannot determine lifecycle emissions on a monthly and quarterly basis within the same year. Within the aforementioned data averaging periods, process data used for determining lifecycle emissions may be temporally matched to periods when renewable power and feedstocks are available. Hydrogen produced outside such data periods cannot be used for purposes of claiming the tax credit.

The proposed modification to Treasury's original language supports two important outcomes: first, it allows a hydrogen producer to exclude hydrogen production and emissions data for *force majeure* events that are beyond the producer's control but would otherwise have an outsized effect on the lifecycle emissions over an annual period. Second, and relatedly, the approach would provide flexibility for hydrogen producers that will be reliant on temporal matching, which may be unable to feasibly start and stop operations to coincide with those times when renewable electricity is available, by allowing them to continue producing hydrogen through periods in which temporal matching cannot be demonstrated, but exclude the produced hydrogen and associated emissions during such periods of non-qualifying production.

By modifying the Proposed Rule, Treasury would ensure that there is no damage to taxpayers, because only qualified hydrogen would be counted for purposes of the Section 45V tax credit, and Treasury would more fully support the development of nascent technology that Congress has sought to incentivize.

IV. Renewable Natural Gas (RNG)

[20] Proposed Rule at 89224-5.

1. Book and claim

Renewable natural gas (RNG) is the term used for upgraded biogas used as a replacement for fossil natural gas, which comes from a variety of sources including landfills, livestock farms, and waste treatment plants. As RNG provides a very low carbon intensity feedstock for clean hydrogen production, all feedstock types should be permitted for Section 45V consistent with the original intent of the statute which is to increase clean hydrogen deployment.

Hydrogen producers using RNG as feedstock would use the common carrier pipeline network for supply as RNG plants are not co-located with hydrogen production. The "book-and-claim" system is the industry standard indirect accounting process in place to bridge the environmental attributes related to the RNG to the hydrogen being produced, enabling the economic development of emissions abatement in the agriculture sector that is often far from demand centers and has few alternatives to decarbonize. EPA's RFS and California's LCFS allow for book-and-claim accounting treatment of biogas (RNG) in its rules. Treasury should allow taxpayers to use existing policies that are heavily audited and scrutinized through regulatory agencies (such as EPA and California Air Resources Board (CARB)) to substantiate the CI of the RNG used for hydrogen production. Conversely, Treasury should not develop a separate administratively burdensome process/requirement that would be inconsistent with the regulations and policies currently in place under the EPA and CARB or other state regulatory agencies. Further, the development of such system would take significant time and RNG producers would not have the benefit of knowing what rules may come in the future when planning projects or determining sales opportunities.

The hydrogen regulations should allow book-and-claim accounting for RNG without additional restrictions for the following reasons:

- The "book-and-claim" system in both the RFS and LCFS programs has robust substantiation through commercial agreements, attestations, and routine reconciliations, which are audited on an annual basis. These programs require approved third-party verifiers to confirm the validity of the attestations.
- The biogas regulatory reform provides even more stringent requirements for RNG production and distribution to ensure high-quality accounting to reduce any risk of double counting of Renewable Identification Numbers (RINs).
- RINs are closely tracked in the EPA Moderated Transaction System (EMTS) and LCFS credits in the LCFS Reporting Tool and Credit Bank & Transfer System (LRT-CBTS).
- The Q-RIN Quality Assurance Plans (QAP) under the RFS Program is a voluntary program where third-parties audit and verify that RINs have been properly generated and are valid for compliance purposes. The RFS QAP is an established industry standard for RNG that uses the chain of custody to substantiate RNG production and distribution. Protocols to implement third party QAP programs are approved by EPA staff and must meet program criteria to be allowed.

While there are various national tracking systems (e.g., M-RETS), these registries are all private and limited. Registries require significant resources and extended deployment time, which would limit or unduly delay the hydrogen industry. Regulators have not prioritized the build out of a registry because existing systems are working effectively to date. In lieu of a national registry, AFPM believes that the existing policies and procedures under EPA and CARB will provide adequate support for the use of RNG for hydrogen production.

2. First Productive Use

Natural gas markets are different from electricity markets by nature of the national, interstate common carrier pipeline value chain. The interstate pipeline system enables injected physical molecules to be accounted for and tied to equivalent molecules that can be dispensed elsewhere in the network carrying associated environmental attributes with assurance.

Treasury should not apply the restrictions under the three pillars for electricity to RNG because they are not relevant for RNG. Specifically:

- Incrementality: The idea that RNG needs to be production that is additional to existing production will delay projects and penalize early movers in the space. In addition, Treasury's future rule should recognize that no undesirable induced emissions arise that trigger incrementality concerns when renewable feedstocks, including RNG and other biomass-derived feedstocks that are already used in existing hydrogen production pathways, are replaced with new, lower-CI hydrogen technologies that use the same feedstock.
- Geographic matching: This element does not reflect the way that pipelines operate. RNG production and transportation is based on a national network of fungible pipeline systems, and there are no viable regional lines/zones for RNG production as facilities are not spread across the United States equally.
- Temporal matching: The element of time matching essentially is one of capability/capacity for storage and little else. If a producer can store RNG, then it can be delivered in time segmented volumes; if not, then the producer will have to deliver production when the system is able to deliver volumes directly.

The proposed "first productive use" requirement within the preamble would cause a significant value discrepancy for new projects creating a market distortion, greater risk of stranded gas for existing projects, added complexity, and higher prices for end-consumers. There should be no restrictions on RNG to ensure investor confidence in developing RNG supply. However, if "first productive use" is implemented, then it should be a look back of 36 months, not by taxable year but by when hydrogen is produced.

V. Provisional Emissions Rate

In accordance with the proposed Provisional Emissions Rate (PER) process, Treasury proposes that "an applicant may request an emissions value from the DOE only after a front-end engineering and design (FEED) study or similar indication of project maturity, such as project specification and cost estimation sufficient to inform a final investment decision, has been completed for the hydrogen production facility."[21] Treasury and DOE should reconsider this arbitrary project maturity threshold and instead focus on the design data that are necessary for DOE to evaluate emissions from a hydrogen production pathway. For example, heat and material balances and process flow diagrams should be sufficient for DOE's analysis.

Furthermore, a taxpayer should be able to engage with DOE at any point in the project development

[21] *See* Proposed Rule, 88 FR 89248.

process to seek conceptual alignment on calculating emissions from a hydrogen production pathway. Allowing taxpayers to engage with DOE prior to formally requesting a PER emissions value affords taxpayers a higher degree of certainty regarding project development and investment decisions than would be available under any other timing requirements. Engineering efforts for large scale industrial hydrogen projects can require tens of millions of investment dollars. AFPM's members would be reluctant to commit such resources when facing an uncertain PER outcome. AFPM strongly encourages DOE to allow interaction between its PER experts and our member companies in advance of the investment required to submit a formal PER request. A pre-consultation process such as this would provide certainty for investment, foster innovation in clean hydrogen production, and strengthen relationships between DOE and potential hydrogen producers.

VI. Qualified Facility

While AFPM is generally pleased with the decision to use the interdependent analysis in determining facility, there are several outstanding issues that raise concern or need further clarification.

There are still gray areas for how Treasury will treat hydrogen plants located at RF production facilities. The Section 45Z rules may help flesh this out, but a rigid use of the functional interdependent test may limit ability to utilize Section 45V at RF facilities.

Specifically, equipment that is separately owned and operated or that performs a discrete function within the production operation should be considered distinct from the production operation's owner or the production operation's output no matter its location.

Consider a RF facility, where the hydrogen plant is necessary to produce the fuel. Use of the functionally interdependent test (and extending the application to Section 45Z) may be problematic because placing an RF facility in service depends on the placing into service of a hydrogen plant. However, a hydrogen plant can/could produce hydrogen on its own or can/could deliver hydrogen to another facility or customer.

The "functionally interdependent" standard is an appropriate way to determine whether two units of equipment or components are part of a single facility. If components can only be placed in service together, they should constitute a single unit of property or facility. On the other hand, where units of property are capable of being independently placed and are performing discrete functions, they are not functionally interdependent and are not a single facility.

VII. Modification of an Existing Facility

The requirements for modifying an existing facility must adhere to the statutory requirements of Section 45V(d) and Treasury should not create new requirements which are not supported by the statutory text.

The Preamble provides that changing fuel inputs to the hydrogen production process, such as switching from conventional natural gas to renewable natural gas, would not qualify as a facility modification for purposes of Prop. Regs. Section 1.45V-6(a)(2).[22]

[22] Regulatory text of Proposed Reg. 1.45V-6(a)(2) "Modification requirements. For purposes of section 45V(d)(4) and paragraph (a)(1) of this section, an existing facility will not be deemed to have been originally placed in service as of the

The statutory text of section 45V(d)(4) does not exclude from "qualifying" modifications the changing of fuel inputs by the taxpayer so long as such modifications are for the purpose of producing "qualified clean hydrogen" and are properly chargeable to the taxpayer's capital account. In fact, the statutory text makes no mention of "qualifying" modifications at all – "qualifying" as a concept is applied only to the production of "qualifying clean hydrogen." Treasury should not impose requirements with respect to modifications under Section 45V(d)(4) beyond what is required by the statute, and the final regulations should strike the text included in the preamble of the Proposed Rule. Furthermore, the proposed regulatory text itself does not appear to specifically mention changing fuel inputs. The proposed regulatory text instead mentions a taxpayer who solely pays or incurs capital expenses to modify existing components of a hydrogen production facility that are not necessary for the production of hydrogen. It is unclear if this regulatory text is meant to encompass the preamble's reference to changing fuel stocks. The use of lower-CI feedstocks such as RNG for existing hydrogen production should be encouraged to support the cost-effective and rapid deployment of clean hydrogen. This will provide much needed emissions reductions sooner, reduce the potential environmental impacts of building new plants, and ultimately keep costs down for end-consumers.

The proposed regulatory text inclusion of language such as "solely pays or incurs" and "not necessary for the production of hydrogen" is confusing and unsupported by the statute. There is no requirement in the statute that modifications be exclusively or primarily undertaken for the production of hydrogen with a specific lifecycle GHG emissions rate. Instead, the statute provides that ANY modification (i) paid or incurred to produce qualified clean hydrogen and (ii) which is properly chargeable to a capital account is a modification for purposes of the new placed in-service date under Section 45V(d)(4). Creating additional regulatory qualifications applicable to modifications which are not present in the statute and doing so AFTER the statutory deadline for issuing regulations provided at Section 45V(f) has expired is likely to harm many taxpayers who have undertaken investment strategies based upon the statutory text. Furthermore, the exclusion of the adoption of RNG as a "qualifying" modification appears to be wholly unsupported by the statutory text and in opposition to the express intention of Congress to encourage the reliance on clean fuel sources. However, consistent with the requirement at Section 45V(d)(4)(B)(i) that the modifications result in the production of "qualifying clean hydrogen" and the Treasury's concerns regarding potential incremental emissions resulting from investment in clean hydrogen production, Treasury should require that the result of modifications should not result in a net increase to total GHG emissions.

Treasury should amend the Proposed Rule to remove any suggestion of a qualification requirement concerning the nature of modifications which is not supported by the statutory text; Treasury should only include those requirements imposed by the statute in Treasury's regulations under Section 45V.

VIII. Retrofit of an Existing Facility (80/20 Rule)

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date the property required to complete the modification is placed in service unless the modification is made for the purpose of enabling the facility to produce qualified clean hydrogen and the taxpayer pays or incurs an amount that is properly chargeable to the taxpayer's capital account with respect to the facility. A modification is made for the purpose of enabling the facility to produce qualified clean hydrogen if the facility could not produce hydrogen with a lifecycle greenhouse gas (GHG) emissions rate that is less than or equal to 4 kilograms of CO2e per kilogram of hydrogen but for the modification. For example, if a taxpayer solely pays or incurs capital expenses to modify existing components of a hydrogen production facility that are not necessary for the production of hydrogen with a lifecycle GHG emissions rate that is less than or equal to 4 kilograms of CO2e per kilogram of hydrogen, such modification does not entitle the facility to a new placed in service date."

As it relates to qualifying for the Section 45V credit the Proposed Rule provides that an existing facility may establish a new date on which it is considered placed in service. The proposal states that even if the facility contains used property, so long as the fair market value of the used property is not more than 20% of the total value, the taxpayer may establish a new placed in-service date.

The Proposed Rule's 80/20 rule applies to "any existing facility;" however, the term "existing facility" is not defined. It is clear from the text of the Proposed Rule that facilities that produce hydrogen or qualified clean hydrogen are defined as an "existing facility." It is unclear whether a non-hydrogen facility that is retrofitted to produce qualifying clean hydrogen is defined as an existing facility under Prop. Regs. Section 1.45V-6(b). Treasury should provide more clarification on this issue.

IX. Anti-Abuse Rule

Prop. Regs. Section 1.45V-2(b)(1) purports to eliminate the availability of the Section 45V credit unless recognizing such credit would be "consistent with the purposes of section 45V and the section 45V regulations." In particular, this "[a]nti-abuse rule" would render the Section 45V credit:

> not allowable if the primary purpose of the production and sale or use of qualified clean hydrogen is to obtain the benefit of the section 45V credit in a manner that is wasteful, such as the production of qualified clean hydrogen that the taxpayer knows or has reason to know will be vented, flared, or used to produce hydrogen."

This proposed rule exceeds Treasury's statutory authority. Section 45V authorizes regulations or other guidance to carry out the purposes of this section [that is, section 45V]."[23] The purposes of Section 45V are the purposes identified in the statute's text: namely, to provide tax credits in specified amounts to taxpayers who meet qualifications the statute delineates.

The proposed "anti-abuse rule" fails to "carry out the purposes" of Section 45V because it adds requirements for receiving the tax credit not found in the statute. First, the proposed "anti-abuse rule" adds a requirement that the taxpayer's primary purpose not be to obtain the credit "in a manner that is wasteful." Although the regulation provides an example of a primary purpose that will be deemed "wasteful," it does not prevent the IRS from deeming other primary purposes for producing and selling qualified clean hydrogen "wasteful" and denying credits on that ground. Nothing in the statute's text supports conditioning a credit on lack of a primary purpose that may be deemed wasteful by the IRS. The Proposed Rule's description of this proposed "anti-abuse rule" ties the new "wastefulness" requirement to "the requirement in section 45V(c)(2)(B)(i)(II) for hydrogen to be produced in the ordinary course of a trade or business of the taxpayer."[24] But Section 45V(c)(2)(B)(i)(II) cannot be reasonably interpreted to authorize a broad "anti-abuse rule" that even the NPRM characterizes as only aligning with Section 45V(c)(2)(B)(i)(II) "in certain circumstances."[25] The Secretary is free to issue specific guidance, consistent with related Tax Code provisions and caselaw, about the meaning of this specific provision.

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[23] Section 45V(f).
[24] Proposed Rule, Explanation of Provisions IV.
[25] *Id.*

Second, the proposed "anti-abuse rule" adds a requirement that the clean-hydrogen credit "be applied in a manner consistent with the purposes of section 45V," thereby apparently authorizing the IRS to deny the credit if it determines that allowing the credit would not serve the statute's purposes. There are at least two problems with this. One problem is that it appears to presume that the credit could be authorized under the terms of the statute and yet fail to be consistent with the statute's purposes—otherwise there would be no reason for this requirement. Nothing in the statute authorizes a regulation that permits the IRS to determine that qualified clean hydrogen that satisfies all the statutory conditions for the credit is nonetheless inconsistent with the statute's purposes. A second problem is that this proposed regulatory requirement purports to regulate away the Secretary's duty to regulate. Section 45V(f)'s requirement that the Secretary issue "regulations or other guidance to carry out [the statute's] purposes" contemplates written guidance that allows taxpayers to know in advance how the statute will be interpreted. By permitting the IRS to disallow the credit based on lack of "consisten[cy]" with congressional "purposes," the proposed "anti-abuse rule" replaces the advance guidance the statute requires with a threat of standardless post hoc denials.

Third, the proposed "anti-abuse rule" adds a requirement that the credit "be applied in a manner consistent with the purposes of . . . the section 45V regulations." The only regulations that are authorized are regulations that "carry out the purposes" of the statute. So, it is difficult to imagine how valid regulations could have purposes that differ from the purposes of the statute. But the practical impact of this consistency-with-regulatory-purposes requirement is to exacerbate uncertainty for taxpayers and broaden standardless discretion for the IRS. The requirement also extends the uncertainty far into the future by including all purposes that may motivate Treasury in passing any regulation relating to Section 45V at any time.

Finally, the specific instance of a "wasteful" primary purpose the proposed "anti-abuse rule" sets out highlights the problems with the rule itself. The Proposed Rule explains that the credit will not be allowed for "production of qualified clean hydrogen that the taxpayer knows or has reason to know will be vented, flared, or used to produce hydrogen." This rule has no foundation in the statute. Section 45V does not condition the credit to clean-hydrogen *producers* on the motivations of clean-hydrogen *buyers* who do business with those producers. The statute nowhere contemplates that a clean-hydrogen producer who meets the statutory requirements will lose its credit based on what the producer knows or merely "has reason to know" about clean-hydrogen buyers' intentions.

Treasury should reduce the rule's vagueness by revising the rule to disallow credits only in the following circumstance: the producer's *sole* purpose for production and sale or use of qualified clean hydrogen is to obtain the benefit of the Section 45V credit by producing and selling or using qualified clean hydrogen that the taxpayer knows will be vented, flared, or used to produce hydrogen.

At a minimum, Treasury must revise Prop. Regs. Section 1.45V-2(b)(2) to avoid further broadening and muddying an already expansive and opaque rule. Under the text of Prop. Regs. Section 1.45V-2(b)(1), a purpose motivating *both* production *and* sale or use disallows the credit. But under Prop. Regs. Section 1.45V-2(b)(2)'s example, it seems not to matter whether the producer had a disqualifying purpose at the time of production; having a disqualifying purpose at the time of sale appears sufficient to eliminate the credit. Under the text of Prop. Regs. Section 1.45V-2(b)(1), neither knowledge of a buyer's intentions nor a purpose to obtain a tax benefit is enough to disallow a credit. Instead, a credit is disallowed only if the producer has a primary purpose to obtain a tax benefit by selling to someone whom it knows or has reason to know will vent, flare, or produce hydrogen. But under Prop. Regs. Section 1.45V-2(b)(2)'s

example, the credit is disallowed notwithstanding the absence of evidence that the producer has as its purpose producing for and selling to a buyer committed to venting or flaring the clean hydrogen. All that the example seems to rely on is that, at the time of sale, the producer knows (or has reason to know) that the buyer will vent or flare a portion of the clean hydrogen. A known effect of a sale is not thereby a purpose of that sale, much less its primary purpose. By appearing to treat a known effect of a sale (or worse, a constructively known effect of a sale), rather than a *primary purpose* of *production and sale*, as sufficient to disallow Section 45V's clean-hydrogen credit, the Prop. Regs. Section 1.45V-2(b)(2) example seems to expand the credit-disqualification in Prop. Regs. Section 1.45V-2(b)(1). If Treasury moves forward with promulgating Prop. Regs. Section 1.45V-2(b)(1)—and for the reasons stated above, it should not—then it should reconcile the example in Prop. Regs. Section 1.45V-2(b)(2) to the rule in Prop. Regs. Section 1.45V-2(b)(1). Specifically, if Treasury keeps Prop. Regs. Section 1.45V-2(b), it should delete from Prop. Regs. Section 1.45V-2(b)(2):

> Taxpayer knows or reasonably expects that Customer will vent or flare a portion of the qualified clean hydrogen it purchased from Taxpayer. In addition, Taxpayer intends to obtain the benefit from the section 45V credit by claiming such credit itself or monetizing such credits through an election under section 6417 or 6418 of the code.

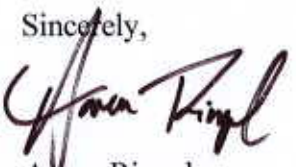
In that passage's place, Treasury should insert:

> Taxpayer primarily intends to obtain the benefit from the section 45V credit by (1) producing qualified clean hydrogen energy for, and selling it to, a customer that will vent or flare a portion of the qualified clean hydrogen it purchased from Taxpayer, and (2) claiming such credit itself or monetizing such credits through an election under section 6417 or 6418 of the code.

X. Conclusion

AFPM appreciates the opportunity to comment on REG-117631-23 and welcomes the opportunity to have additional discussions on these issues. Please do not hesitate to contact me with any questions or if AFPM or I can otherwise be of assistance.

Sincerely,



Aaron Ringel
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cc: The Honorable Aviva Aron-Dine, Acting Assistant Secretary for Tax Policy
Mr. William M. Paul, Principal Deputy Chief Counsel and Deputy Chief Counsel (Technical)