Scott L. Strazik
Chief Executive Officer
GE Vernova

1 River Road
Bldg. 40-559
Schenectady, NY 12345
USA

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SUBMITTED ELECTRONICALLY AND VIA USPS

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

The Honorable Lily L. Batchelder
Assistant Secretary for Tax Policy
Department of the Treasury
1500 Pennsylvania Ave., NW
Washington, D.C. 20220

Mr. William M. Paul
Principal Deputy Chief Counsel and Deputy Chief Counsel (Technical)
Internal Revenue Service
1111 Constitution Ave., NW
Washington, D.C. 20224

RE: Notice 2022-58

Dear Madame Secretary and Mr. Paul:

GE Vernova, our portfolio of energy businesses, appreciates the opportunity to submit the following comments to the U.S. Department of Treasury (Treasury) and the Internal Revenue Service (IRS) on the credit for production of clean hydrogen under Section 45V of the Internal Revenue Code (Code) pursuant to Notice 2022-58.

Currently in the United States, nearly all of the hydrogen consumed is used by industry for refining petroleum, treating metals, producing fertilizer, and processing foods. Looking forward, hydrogen has the potential to connect the entire energy system, maximizing resources and significantly reducing emissions. The Inflation Reduction Act of 2022 (IRA) serves as the catalyst for the development of the hydrogen economy and will make achieving net-zero by mid-century more affordable. However, swift, clear, and flexible guidance is needed to ensure the industry is able to deploy projects in a timely manner.

Background

As the nation's leading energy and technology innovation company, GE Vernova is committed to supporting the successful implementation of the IRA. GE Vernova believes the IRA will create the opportunity to reduce energy sector greenhouse gas emissions and build a more expansive and resilient domestic energy supply chain, infrastructure, and grid – all while strengthening the country's energy security. GE Vernova seeks to be an active participant in efforts to succeed in these goals.

GE Vernova has pioneered technologies that have spurred world-transforming changes and improved the lives of billions. We are a world leader in power generation, transmission, and distribution solutions. Our technology produces one-third of the world's electricity, and our power generation equipment is deployed in more than 140 countries. In addition, GE Vernova equips 90% of transmission utilities worldwide, and 40% of the world's electricity flows via our software. GE Vernova is actively involved in all segments of the energy sector and has long manufactured products designed to meet stringent government standards, while meeting customer requirements for efficient, reliable, resilient, and affordable energy.

GE Vernova is unique among U.S. companies in designing and manufacturing industry-leading wind, gas, steam, and hydro-powered turbines, nuclear power generation technologies, power quality equipment, and hybrid power solutions, while incorporating the latest digital innovation. GE Vernova leads grid modernization and resilience efforts with a defense-in-depth approach to the design, development, deployment, and service of the world's most critical power systems. We service the products we sell, and we offer equipment upgrades that increase our products' efficiency and availability. Finally, through our Global Research Center (GRC), our scientists and engineers are focused on developing and improving breakthrough technologies to accelerate the energy transition. Across GE Vernova, we will use the combination of our technologies and expertise to help accelerate decarbonization efforts across the United States, proudly carrying on the tradition of innovation and developing world-transforming technologies in the areas of hydrogen, carbon capture and sequestration, and small modular reactors.

GE Vernova supports Treasury's and the IRS's efforts to issue prompt and thoughtful direction through guidance on the IRA energy provisions that will enable companies to act in the near term and set the stage for longer-term success. We strongly believe swift action will accelerate the IRA's implementation and thus advance decarbonization in the United States, while supporting and growing domestic energy manufacturing and domestic jobs.

The overarching theme of GE Vernova's comments across the clean energy tax incentives is that Treasury and the IRS should leverage existing long-standing guidance, regulations, rules, and procedures in regard to tax credits generally and in providing guidance on the new tax credits. With respect to the new hydrogen production credit in particular, we encourage Treasury and IRS to provide flexible rules that will allow the industry to evolve and grow. This approach will give developers and investors needed comfort to proceed with projects, and will create more opportunities to deploy hydrogen technology, paving the way for much-needed investments.

Summary of Code Section 45V Comments

In the attached briefing paper, we explain in greater detail the guidance we are requesting on the application of Code Section 45V with respect to the production of clean hydrogen using renewable electricity sources, as well as the coordination of Code Section 45V with other credits. Our briefing paper addresses needed guidance regarding:

1) The definition of "qualified clean hydrogen production facility" and confirmation that it does not include a renewable electricity facility that supplies electricity to the hydrogen facility;
2) Confirmation that the renewable electricity facility supplying electricity to the hydrogen production facility is not required to be "co-located" with the hydrogen production facility and that renewable energy received across the grid through the use of power purchase agreements, virtual power purchase agreements, or renewable energy certificates is an appropriate energy input;
3) Confirmation that, if an additionality requirement is considered, a qualified clean hydrogen production facility may use electricity from new or repowered renewable electricity facilities;

4) The application of the Code Section 45V credit to the production of hydrogen that is not "qualified clean hydrogen" during parts of the taxable year;
5) The application of the GREET model;
6) Coordination with the Code Section 45Q credit to ensure that carbon capture equipment installed on any "upstream" electricity, feedstock, or fuel facilities is not part of the qualified clean hydrogen production facility and does not prevent any Code Section 45V credit with respect to any qualified clean hydrogen produced at the downstream hydrogen production facility; and
7) Clarification that the prevailing wage and apprenticeship requirements, and specifically the ability to multiply the applicable energy percentage by 5, applies to a Code Section 45V hydrogen production facility that elects the investment tax credit under Code Section 48.

We appreciate the opportunity to respond to this request for comments. GE Vernova is prepared to make its subject matter experts and its outside counsel available to Treasury and the IRS to discuss and explain each or any of these issues in detail.

Best regards,

Scott Strazik
Chief Executive Officer
GE Vernova
www.gevernova.com

Briefing Paper
Comments in Response to Notice 2022-58 Section 45V Credit for Production of Clean Hydrogen

GE VERNOVA
Our portfolio of energy businesses

Briefing Paper
Comments in Response to Notice 2022-58
Section 45V Credit for Production of Clean Hydrogen

December 2, 2022

The Inflation Reduction Act of 2022, Pub. L. No. 117-169 ("IRA"), provides a tax credit for production of qualified clean hydrogen under § 45V of the Internal Revenue Code ("Code").[1] The amount of the § 45V credit is dependent upon the "lifecycle greenhouse gas emissions rate" through the "point of production (well-to-gate)." This requires consideration of emissions from energy sources used in the production of clean hydrogen. In the case of "green hydrogen," the hydrogen production facility splits water into hydrogen and oxygen through electrolysis by using electricity from renewable energy (including wind, hydropower, solar, and geothermal, each of which results in zero emissions from producing power) or other low-carbon sources of energy such as nuclear. Taxpayers require guidance on the application of § 45V with respect to the production of clean hydrogen using renewable electricity, including (i) the definition of "qualified clean hydrogen production facility" and confirmation that it does not include any property associated with any renewable electricity source, (ii) confirmation that the renewable electricity facility is not required to be "co-located" with the qualified clean hydrogen production facility, but within reasonable geographical alignment, and that renewable energy received across the grid through the use of power purchase agreements ("PPAs"), virtual power purchase agreements ("VPPAs"), or renewable energy certificates ("RECs") is an appropriate energy input, (iii) confirmation that a qualified clean hydrogen production facility may use electricity from new or repowered renewable electricity facilities, (iv) the application of the § 45V credit to the production of hydrogen that is not qualified during parts of the taxable year, (v) the application of the GREET model (defined below) with respect to time matching of renewable electricity inputs and use of grid power, (vi) coordination with the § 45Q credit, and (vii) clarification of the prevailing wage and apprenticeship ("PWA") requirements and energy percentage for § 45V facilities that elect the § 48 investment tax credit ("ITC") (these issues are described together as the "Guidance").

Background

The § 45V credit for any taxable year is an amount equal to the product of—(1) the kilograms ("kg") of "qualified clean hydrogen" produced by the taxpayer during such taxable year at a qualified clean hydrogen production facility during the 10-year period beginning on the date such facility was originally placed in service, multiplied by (2) the applicable amount (as determined under § 45V(b)) with respect to such hydrogen. § 45V(a).

The term "qualified clean hydrogen" means hydrogen which is produced through a process that results in a lifecycle greenhouse gas emissions rate of not greater than 4 kg of

[1] All Section (§) references are to the Code as amended by the Inflation Reduction Act of 2022, Pub. L. No. 117-169.

CO_2e per kg of hydrogen. § 45V(c)(2)(A). The full value of the § 45V credit depends on whether the hydrogen facility meets the PWA requirements set forth in § 45V(e). If the PWA requirements are satisfied, then the applicable amount ranges from $0.60 to $3.00 (versus $0.12 to $0.60 if those requirements are not satisfied), as adjusted for inflation under § 45V(b)(3). The applicable amount is determined by an applicable percentage at four tiers (20%, 25%, 33.4%, 100%) under § 45V(b)(2), which is determined by reference to the amount of the lifecycle greenhouse gas emissions rate for the qualified clean hydrogen produced by the hydrogen facility.

The term "lifecycle greenhouse gas emissions" is defined by reference to the use of the same term in the Clean Air Act (42 USC 7545(o)(1)), as in effect on the date of enactment of the IRA (i.e., August 16, 2022). § 45V(c)(1)(A). Section 45V(c)(1)(B) provides that "[t]he term 'lifecycle greenhouse gas emissions' shall only include emissions through the point of production (well-to-gate), as determined under the most recent Greenhouse gases, Regulated Emissions, and Energy use in Transportation model (commonly referred to as the 'GREET model') developed by Argonne National Laboratory, or a successor model (as determined by the Secretary)." § 45V(c)(1)(B). Notice 2022-58, sec. 3.01(1)(a) n.3, provides:

> The well-to-gate system boundary for hydrogen production includes emissions associated with feedstock growth, gathering, and/or extraction; feedstock delivery to a hydrogen production facility; conversion of feedstock to hydrogen at a production facility; generation of electricity consumed by a hydrogen production facility (including feedstock extraction for electricity generation, feedstock delivery, and the electricity generation process itself); and sequestration of carbon dioxide generated by a hydrogen production facility.

Thus, for purposes of the § 45V credit, emissions analysis through the point of production (well-to-gate) includes energy sources, including renewable electricity sources, upstream from the hydrogen production facility, but does not include downstream emissions after the point of production. The GREET model incorporates those energy inputs, but does not provide further guidance on certain specific issues relating to the use of renewable electricity for green hydrogen production, as presented under § 45V.

The term "qualified clean hydrogen production facility" means a facility—(A) owned by the taxpayer, (B) which produces qualified clean hydrogen, and (C) the construction of which begins before January 1, 2033. § 45V(c)(3). No further guidance regarding the meaning of the term "qualified clean hydrogen production facility" is provided in the statute.

On November 15, 2021, the Infrastructure Investment and Jobs Act of 2021, Pub. L. No. 117-58, 135 Stat. 429 ("IIJA"), was signed by the President and enacted into law. The IIJA provides directives to the U.S. Department of Energy ("DOE") to develop an initial standard for the carbon intensity of clean hydrogen production. IIJA, sec. 40315 (42 USC 16166(a)). The statute requires that the standard developed to support clean hydrogen production from diverse energy sources, including renewable energy resources, define the term "clean hydrogen" to mean hydrogen produced with a carbon intensity equal to or less than 2 kg of CO_2e produced at the site of production per kg of hydrogen produced (with further

adjustment downward in the emissions rate to be considered not later than 5 years after development of this standard), and to take into consideration technological and economic feasibility. IIJA, sec. 40315 (42 USC 16166(b)). On September 22, 2022, as noted in Notice 2022-58, sec. 3.01(2), DOE released draft guidance for a Clean Hydrogen Production Standard ("CHPS") developed to meet the requirements of IIJA, section 40315.[2] The CHPS, among other things, establishes a target lifecycle greenhouse gas emissions rate for clean hydrogen of no greater than 4.0 kg CO_2e per kg of hydrogen, which is the same lifecycle greenhouse gas emissions limit required by the § 45V credit, through the point of production (well-to-gate), which the CHPS draft guidance also notes.

Discussion

A. Definition of "Qualified Clean Hydrogen Production Facility". The statute does not define the scope of the "qualified clean hydrogen production facility," but rather addresses the ownership, production, and begin-construction requirements.[3] Nonetheless, the § 45V credit is a production tax credit ("PTC") and should be defined consistent with longstanding authorities that define the "facility" narrowly for purposes of the PTC – as contrasted with the ITC, which is broader in scope. As the authorities below demonstrate, a PTC facility does not include feedstock and delivery systems and should not include a renewable electricity facility that supplies electricity to produce green hydrogen in a hydrogen facility, even where the renewable electricity facility may be co-located with the hydrogen facility or owned by the same taxpayer that owns the hydrogen facility.

The term "qualified facility" has a settled meaning in the case of PTCs under § 45, and in predecessor or related PTC provisions. The seminal ruling is Rev. Rul. 94-31, 1994-1 CB 16, which defined the term "facility" for purposes of a wind facility and defined the property within the boundaries of the "facility" to be quite narrow. Rev. Rul. 94-31 ruled that "each wind turbine together with its tower and supporting pad . . . is a separate facility" and "[e]ach of these facilities is a qualified facility. . . ." Rev. Rul. 94-31 explains:

> A wind turbine together with its tower and supporting pad comprise *the property on the windfarm necessary for the production of electricity from wind energy*. Moreover, each wind turbine on the windfarm can be separately operated and metered and can begin producing electricity when it is mounted atop a tower. Thus, the term "facility" under section 45(c)(3) means the wind turbine, together with the tower on which the wind turbine is mounted and the pad on which the tower is situated. [Emphasis added.]

Although Rev. Rul. 94-31 specifically lists balance of plant and other property, it determined that only the specific property above was part of the "facility."

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[2] https://www.hydrogen.energy.gov/pdfs/clean-hydrogen-production-standard.pdf.

[3] This briefing paper does not address the begin-construction requirements for the § 45V credit. We note that on November 30, 2022, Treasury and IRS issued Notice 2022-61 relating to the PWA requirements for energy credits and provides that with respect to § 45V, "principles similar to those under Notice 2013-29 regarding the Physical Work Test and Five Percent Safe Harbor apply [for purposes of determining when construction begins]. . . In addition, principles similar to those provided in the IRS Notices regarding the Continuity Requirement …apply."

The IRS reached a similar conclusion with respect to a biomass facility under § 45 in Notice 2006-88, 2006-2 CB 686. There, the IRS defined the "qualified facility" for production of electricity from open-loop biomass as follows:

> For purposes of § 45(d)(3), an open-loop biomass facility is a power plant consisting of *all components necessary for the production of electricity from open-loop biomass (and, if applicable, other energy sources)*. Thus, a qualified open-loop biomass facility includes all burners and boilers (whether or not burning open-loop biomass), *any handling and delivery equipment that supplies fuel directly to and is integrated with such burners and boilers*, steam headers, turbines, generators, and all other depreciable property necessary to the production of electricity. *The facility does not include (i) property used for the collection, processing, or storage of open-loop biomass before its use in the production of electricity,* (ii) transformers or other property used in the transmission of electricity after its production, or (iii) ancillary site improvements, such as roadways and fencing, that are not necessary to the production of electricity. Each power plant that is operated as a separate integrated unit is treated as a separate facility for purposes of § 45(d)(3).

Notice 2006-88, sec. 3.01 (emphasis added).

Finally, in ILM 200347024 (Jan. 21, 2003), the IRS Office of Chief Counsel followed the same narrow definition of the term "facility" as provided in Rev. Rul. 94-31 in the context of the production of synthetic fuel under former § 29. Chief Counsel explained:

> *The rationale of Rev. Rul. 94-31 excludes from a § 29 facility, preparation equipment, feedstock and product conveyors, and storage tanks*. This result is consistent with the separate definitions contained in §§ 1.48-9(c)(5) and (c)(9) of synthetic fuel production equipment and the handling and preparation equipment for purposes of the energy investment credit. Some components that qualified for purposes of the energy credit, a part of the general investment tax credit, are excluded from description of a facility that qualifies for the § 29 and § 45 production credits. *The storage tanks and feedstock and end-product site improvements, equipment, and conveyors, while designed for and necessary to the operation of a particular plant, represent ancillary and auxiliary equipment and not synthetic fuel production equipment*. [Emphasis added.]

Like the § 45V credit, the credit under § 29 in ILM 200347024 involves the production of an energy resource other than electricity.

The § 45V credit is a PTC. Similar to other PTCs, the definition of the "facility" under § 45V should be construed narrowly and should include only the property that is *necessary for the production of qualified clean hydrogen*. Specifically, the qualified clean hydrogen production facility should be construed narrowly to exclude any "upstream" property used in the generation, collection, processing, storage, and/or delivery of electricity, feedstock, or fuel before its use in the production of the clean hydrogen. Consistent with the authorities above, the qualified clean hydrogen production facility should include only handling and delivery equipment that supplies the electricity, feedstock, or fuel directly to and is integrated with the hydrogen facility. The qualified clean hydrogen production facility should not include any

renewable electricity facility that is used to supply electricity for the production of green hydrogen.

The separate nature of the hydrogen production facility is further supported by the provision of separate tax credits for certain electricity production facilities and energy storage technology. Section 13204(b) of the IRA provides for an amendment to § 45(e)(13) to provide a special rule for electricity used at a qualified clean hydrogen production facility. Under this provision, electricity produced by the taxpayer is treated as sold by such taxpayer to an unrelated person during the taxable year if—(A) such electricity is used during such taxable year by the taxpayer or a person related to the taxpayer *at a qualified clean hydrogen production facility (as defined in section 45V(c)(3))* to produce qualified clean hydrogen, and (B) such use and production is verified (in such form or manner as the Secretary may prescribe) by an unrelated third party. This language clearly indicates that the electric generating facility and the hydrogen production facility are separate facilities. Further, once the hydrogen is produced, a taxpayer may receive a separate ITC for any hydrogen storage property under § 48(a)(2)(A)(i)(VI) and (c)(6), likewise indicating that storage after the production facility is separate and distinct from the production facility.

It should be emphasized that a hydrogen production facility and any renewable electricity facility should be treated as separate facilities regardless of whether the renewable electricity facility and the qualified hydrogen production facility are co-located on the same site, constructed pursuant to the same development plan, or owned by the same taxpayer. This analysis should be applied without regard to whether the lifecycle greenhouse gas emissions from the renewable electricity facility or other "upstream" processes must be considered for purposes of determining qualification for the § 45V credit and calculation of the credit amount.

Requested Guidance: In determining the scope of the "facility" for purposes of the definition of a "qualified clean hydrogen production facility," the Guidance should confirm that the "facility" is defined narrowly and includes only that property that is necessary for the production of the clean hydrogen and does not include "upstream" electricity, feedstock, or fuel facilities, even if co-located with the hydrogen facility, under the same development plan, or owned by the same taxpayer. Similarly, the definition of a "qualified clean hydrogen production facility" should not extend past the point that hydrogen is produced and is ready to deliver or store.[4]

B. <u>No Co-Location Requirement</u>. As it is expected that renewable energy generally will be used to power a hydrogen production facility in order to achieve the required lifecycle greenhouse gas emissions rate, it will be necessary to determine how to verify the delivery of energy inputs as determined using the GREET model. Guidance should provide flexibility to determine and verify renewable energy inputs to a hydrogen production facility

[4] Note that the scope of the property that is included in a qualified clean hydrogen production facility may differ depending on whether the facility claims the PTC under § 45V or the ITC under § 48(a)(15). The definition of energy property under § 48 is much broader in scope and includes all property integral to the operation of the energy property. This briefing paper does not address this distinction in scope of such property. For a general discussion of the issue, see the GE Briefing Paper on the Domestic Content Bonus under Notice 2022-51 filed with Treasury and the IRS on November 4, 2022.

from renewable energy production at remote locations through the use of PPAs, VPPAs, or RECs. As explained below, there should be no requirement that the renewable energy facility supplying electricity to the hydrogen production facility be co-located and directly supplying electricity.

As clean hydrogen standards have been debated around the world, co-location or direct connection of the renewable electricity facility with the hydrogen facility has been suggested as a means to verify the renewable energy input. Consequently, we understand that current inputs to the GREET model require any electricity that passes through the electric grid to be input based on the ratio of green to brown energy on the grid for the location. While there may be some overlap between the clean hydrogen provisions under the IIJA and the § 45V credit, this overlap should be limited to the lifecycle greenhouse gas emissions rate and not with respect to general application of the § 45V credit.[5] Specifically, § 45V does not provide any requirement that the renewable electricity facility be co-located with the hydrogen facility. As discussed above, the "facility" for purposes of defining the "qualified clean hydrogen production facility" is narrow in scope and includes only the property necessary to produce the qualified clean hydrogen. This "facility" definition does not include the upstream electricity, feedstock, or fuel facilities. Thus, there is no common ownership requirement for purposes of § 45V, no requirement to align the begin-construction or placed-in-service dates, and no co-location requirement found anywhere in the IRA.

There are a number of practical and policy reasons why a co-location requirement may not be feasible and should not be imposed under the Guidance. For example, wind facilities and utility-scale solar facilities are often located in remote areas of the country, and not in proximity to the necessary infrastructure and end-use facilities for clean hydrogen. Likewise, hydropower and geothermal facilities are located where their respective resources exist, and not necessarily in a location that is convenient for the location of an electrolyzer system or hydrogen storage facilities. While some hydrogen production facilities may be feasible with a co-located renewable electricity facility, the imposition of a universal co-location requirement for all hydrogen production facilities may limit hydrogen development and effective utilization of the electrolyzer because of logistical, geographical, cost, or resource issues. A co-location requirement is not contemplated in law and imposing such a requirement would effectively convert the qualified clean hydrogen production facility into a closed-loop system, which in many cases is neither practical nor efficient. Moreover, such a requirement is not appropriate as a matter of policy and would undermine the law's fundamental objectives of achieving net zero emissions goals.

A co-location requirement should not be imposed under the IRA. Rather, taxpayers should be able to procure their renewable electricity from whatever source they choose, including from the grid, from specific facilities, or from verifiable renewable energy sources through the use of PPAs, VPPAs, and RECs. Moreover, taxpayers should have flexibility to

[5] The objectives of the IIJA clean hydrogen production program and the CHPS are generally aligned with the IRA, as noted, but there are differences. For example, the IIJA imposes additional requirements and considerations than are present under the IRA, including discretionary considerations such as technological and economic feasibility.

use a mix of onsite renewable electricity sources and verified renewable electricity from the grid in order to maximize utilization of the electrolyzer.

It is also worth discussing in this context the question in Notice 2022-58, sec. 3.01(1)(e), which inquires "[h]ow 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?" In the first instance, the GREET model and other credible sources, such as the Intergovernmental Panel on Climate Change report,[6] demonstrate that the emissions rate from renewable electricity sources such as wind, hydropower, solar, and geothermal is zero. Secondly, in the case of a co-located facility, simple metering of the production output of the renewable electricity facility and the electrical input of the electrolyzer should be sufficient to verify the upstream portion of the electricity load attributable to the co-located facility – without regard to other energy sources used by the hydrogen production facility. During debate over the IRA in the Senate, Finance Chairman Wyden made clear in a colloquy with Senator Carper that use of PPAs, VPPAs, RECs, and other book-and-claim methods are appropriate inputs into the GREET model for determining qualification of clean hydrogen for the credit. Senator Carper put the following question to Chairman Wyden:

> In Section 13204, the term "lifecycle greenhouse gas emissions" for a qualified hydrogen facility is determined by the aggregate quantity of greenhouse gas emissions through the point of production, as determined under the most recent Greenhouse gases, Regulated Emissions, and Energy use in Technologies—GREET—model. It is also my understanding of the intent of section 13204, is that in determining "lifecycle greenhouse gas emissions" for this section, the Secretary shall recognize and incorporate indirect book accounting factors, also known as a book and claim system, that reduce effective greenhouse gas emissions, which includes, but is not limited to, renewable energy credits, renewable thermal credits, renewable identification numbers, or biogas credits.
> Is that the chairman's understanding as well?
> Mr. WYDEN. Yes.

Congressional Record, Senate, August 6, 2022, S4166.

Verification of offsite renewable electricity facilities is discussed in more detail later in this briefing paper.

Requested Guidance: The Guidance should confirm that a qualified clean hydrogen production facility may use energy produced from any offsite renewable electricity facility or facilities and that co-location of such facility is not required for purposes of the § 45V credit.

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[6] Schlömer S., T. Bruckner, L. Fulton, E. Hertwich, A. McKinnon, D. Perczyk, J. Roy, R. Schaeffer, R. Sims, P. Smith, and R. Wiser, 2014: Annex III: Technology-specific cost and performance parameters. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, *available at* https://www.ipcc.ch/report/ar5/wg3/.

The Guidance also should confirm that metering of the production output of a co-located renewable electricity facility and electrical input of the electrolyzer is all that is required to verify upstream emissions rates for the facility – with the emissions rate from any wind, hydropower, solar, or geothermal facility being treated as zero. The Guidance also should provide flexibility to determine and verify renewable energy inputs from PPAs, VPPAs, and RECs.

C. Use of Repowered Renewable Electricity Facilities. We understand that there are recommendations that newly-built renewable electricity facilities must be used to power a clean hydrogen production facility – i.e., additionality. Section 45V does not impose any such additionality restriction on the use of renewable electricity. The § 45V credit also does not require that the qualified clean hydrogen production facility be new; the credit applies to hydrogen produced after December 31, 2022, and the IRA imposes no restriction on when the qualified hydrogen production facility is placed in service. *See* IRA section 13204(a)(5)(A). It would be inconsistent with the intent of the § 45V credit – and indeed with the fundamental objectives of the IRA – to allow hydrogen produced after 2022 from existing hydrogen production facilities to qualify for the credit, but then deny the credit because those existing facilities are powered by repowered renewable electricity facilities. Furthermore, additionality would be inconsistent with §§ 45(e)(13) and 45U(c)(2), under which PTCs are allowed for electricity produced at §§ 45 or 45U facilities (including existing facilities[7]) where such electricity is used at certain qualified clean hydrogen production facilities to produce qualified clean hydrogen.

If an additionality restriction is nevertheless adopted under the CHPS and then imported into § 45V, the Guidance should confirm that repowered facilities – i.e., those renewable energy facilities that have a new placed-in-service date under the 80/20 rule[8] – will be treated as newly-built renewable electricity facilities. The tax law has long recognized that repowered facilities should be treated the same as "new" facilities for tax law purposes because they have a similar useful life as a newly-built facility, as well as a similar capacity and production profile to match the state of current technology, but they also achieve efficiencies by re-utilizing and not wasting certain property and equipment from the "old" facility. While the tax law may treat "repowered" facilities the same as newly-built facilities, this treatment may not be clear under the future CHPS or other guidance on additionality from DOE. The Guidance should therefore confirm the established tax law treatment of repowered facilities in the context of the § 45V credit.

Consistent with the discussion of the definition of "qualified clean hydrogen production facility" in the sections above, the renewable electricity facility is separate from the hydrogen facility, and there is no co-location requirement under § 45V. If an additionality requirement were to be adopted, the qualification of the hydrogen facility for the § 45V credit should be made without regard to whether the renewable electricity comes from a new or repowered facility.

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[7] In fact, § 45U *only* applies to existing nuclear facilities placed in service before the date of enactment of the IRA (i.e., before August 16, 2022). § 45U(b)(1)(C).

[8] *See, e.g.,* Rev. Rul. 94-31, 1994-1 CB 16.

Requested Guidance: The Guidance should confirm that qualified clean hydrogen produced at a qualified clean hydrogen production facility is eligible for the § 45V credit without regard to whether the energy source for the clean hydrogen production facility is from a newly-built renewable electricity facility or a repowered facility. If an additionality requirement is imposed under CHPS and is explicitly or implicitly carried over to the Guidance by reference to the CHPS, a repowered facility – i.e., those renewable energy facilities that have a new placed-in-service date under the 80/20 rule – should be specifically recognized as a "new" facility in the Guidance for these purposes.

D. Exceeding Emissions Rate During Taxable Year. Notice 2022-58, sec. 3.01(1)(d), requests comments regarding a situation in which a facility produces 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 greater than 4 kg of CO_2e per kg of hydrogen). The Notice inquires whether the facility should 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. This issue arises because § 45V(c)(3) defines the term "qualified clean hydrogen production facility" as a facility which produces qualified clean hydrogen and § 45V(c)(2), in turn, defines the term "qualified clean hydrogen" as "hydrogen which is produced through a process that results in a lifecycle greenhouse gas emissions rate of not greater than 4 kilograms of CO_2e per kilogram of hydrogen." Section 45V does not provide any guidance with respect to periods in which the hydrogen facility does not produce qualified clean hydrogen, but otherwise satisfies the requirements for production of qualified clean hydrogen (during other periods within the taxable year) at a qualified clean hydrogen production facility.

There may be periods of time during the taxable year in which the hydrogen facility must use an energy source that has a higher emissions rate than the normal energy source used to supply electricity to the hydrogen facility. This situation might arise in circumstances where a dedicated energy source is or becomes unavailable or there is otherwise a disruption in the normal supply of renewable electricity. In these circumstances, the hydrogen facility should not be required to idle the electrolyzer but may use an alternative energy source that may not meet the emissions rate requirements. The production of non-qualifying hydrogen at certain points during the taxable year should not disqualify clean hydrogen produced at other points during the taxable year which meets the emissions rate requirements.

In the context of other PTCs that are dependent on specific feedstock or fuels as energy sources, the IRS has recognized that the use of a non-qualifying feedstock or fuel does not cause the facility to be not qualified. This issue arose in the context of open-loop biomass facilities, where facilities co-fired qualifying open-loop biomass with other feedstock or fuel sources. Notice 2006-88, 2006-2 CB 686, sec. 3.02(1), specifically recognized that "Electricity produced from open-loop biomass that is cofired with fuels other than fossil fuels may qualify for the § 45 credit." Further, although § 45(c)(3) specifically defined the term "open-loop biomass" to exclude "biomass burned in conjunction with fossil fuel (cofiring) beyond such fossil fuel required for startup and flame stabilization," Notice 2006-88, sec. 3.02(3), provided only that none of the co-fired biomass would qualify for the PTC under § 45 – in light of the statutory restriction. Even in circumstances where restricted fossil fuels were used, neither the

statute nor Notice 2006-88 required full disqualification of the facility for the taxable year and did not preclude biomass from qualifying for the § 45 credit during periods in which it did not use fossil fuels beyond the minimum requirements for startup and flame stabilization.

Like other PTCs, the § 45V credit is earned on the basis of the production of qualifying energy sources. If specific production does not satisfy the requirements for qualified clean hydrogen, then the § 45V credit has not been earned. However, the § 45V credit should apply to production of clean hydrogen at the same facility during other periods in which the hydrogen does qualify for the credit. Full disallowance on a facility or taxable year basis should not be applied. The Guidance should adopt some form of reasonable allocation or proportional disallowance to address any periods of hydrogen production that may exceed the statutory emissions rate. In particular, if the producer installs tracking programs that are capable of matching the input and output of the facility for specific times, the producing taxpayer should be able to claim the tax credit for any periods with respect to which it can establish production that meets the required levels of emissions. This should be true whether the records for any period indicate a full amount of credit, a reduced credit, or no credit, depending on the recorded and verifiable inputs.

Requested Guidance: The Guidance should confirm that a facility is <u>not</u> restricted from claiming the § 45V credit entirely for any taxable year in which the facility produces an amount of hydrogen that is not qualified clean hydrogen (because the emissions rate is exceeded for that hydrogen). This issue might arise if the facility is forced to use an alternative energy source in order to maintain continuous operations. The Guidance should confirm that the § 45V credit is available for the qualified clean hydrogen that is produced during the remaining part of the taxable year and/or adopt a reasonable allocation or proportional disallowance to address any period during which the emissions rate is exceeded or hydrogen production is not qualified. The Guidance should also provide that a taxpayer that is able to match inputs and output for any specific times shall be able to claim the appropriate amount of tax credit for any periods that can be matched and is verifiable.

E. <u>Flexible Application of Emissions Rate Standards</u>. It is important that the § 45V credit and the lifecycle greenhouse gas emissions requirements be interpreted in the Guidance in a manner that encourages the flexible use of renewable electricity and that achieves the full utilization of the electrolyzer without idling or inefficient production. The Guidance should not adopt unreasonable timing, matching, or geographical requirements.

Notice 2022-58, sec. 3.01(1)(e), requests comments on (i) "[h]ow might clean hydrogen production facilities verify the production of qualified clean hydrogen using other specific energy sources?" and (ii) "[w]hat granularity of time matching (that is, annual, hourly, or other) of energy inputs used in the qualified clean hydrogen production process should be required?"

As discussed earlier, the Guidance should confirm that the renewable electricity facility and any property associated with any renewable energy source is separate from the hydrogen facility and that there is no co-location or ownership requirement for purposes of the § 45V credit. The clean hydrogen production facility should have the flexibility to procure renewable

electricity from co-located renewable facilities, a combination of a co-located renewable facility and a verified source offsite, verified renewable electricity delivered entirely from the grid, or any mix or combination of power sources. The Guidance should specifically recognize that a clean hydrogen production facility may procure electricity from any renewable energy source or combination of sources provided that it is procured under a reliable verifiable system. Although the Guidance should provide flexibility in the procurement of renewable energy, we are also cognizant of the potential for system imbalances and negative pricing. Any verification system should ensure that the electricity generation is reasonably aligned to the electrical load of the hydrogen facility. Energy sources that are totally dislocated from the geographical location of the hydrogen facility should be restricted. Therefore, we would support limiting the renewable energy source to the same balancing zone or regional transmission organization ("RTO") as the location of the hydrogen facility – with accommodation made for renewable electricity facilities that may be outside of such zone or organization but are otherwise linked to such zone, organization, or hydrogen facility by a demonstrated transmission connection. Taxpayers should be able to establish compliance with the emissions rate by using renewable electricity through the use of specific PPAs, VPPAs, RECs,[9] or another verifiable system that ensures reasonable alignment of the location of the generation source and the location of the hydrogen facility.

With respect to time matching, the Guidance should take a flexible and balanced approach but guard against a standard that encourages inefficiencies. On one hand, time matching of the clean hydrogen production with the renewable electricity production on an hourly basis may be too restrictive, if applied generally, to the development of clean hydrogen production facilities in the initial stages of development of this industry and given existing and differing market conditions and requirements among the various independent grid operators. On the other hand, a standard that allows annual matching may enable inefficiencies in renewable electricity generation and emissions reduction. A standard should be adopted to ensure that there is a reasonable connection between the generation source and the hydrogen production.

Requested Guidance: The Guidance should confirm the following matters regarding the application of the lifecycle greenhouse gas emissions rate under § 45V:

- The Guidance should adopt flexible rules for applying the lifecycle greenhouse gas emissions standard with respect to renewable electricity sources. No co-location requirement should be adopted under § 45V, and any renewable electricity sources should be permitted without differentiation between newly-built and repowered facilities.

- The Guidance should confirm that qualified clean hydrogen production facilities may procure renewable electricity from any energy source or combination of energy sources, including specifically from the electricity grid, provided that the renewable source of the electricity is the product of a reliable verification system

[9] It is our understanding that time-stamped RECs do not currently exist in the electricity market. However, the establishment of time-stamped RECs or similar verifiable system should be adopted in the Guidance and/or in conjunction with the CHPS by DOE.

that ensures a reasonable connection between the generation source and the hydrogen production, and provided that the production of such renewable electricity and its input into the hydrogen facility are trackable on a reasonable temporal basis.

- The Guidance should confirm that the use of renewable electricity in a qualified clean hydrogen production facility may be established using PPAs, VPPAs, RECs, or other reliable verification system that provides a flexible pathway to maximize the use of green electricity to produce green hydrogen.

- Although the Guidance should not impose any co-location requirement, the Guidance should impose geographical restrictions on the procurement of renewable electricity – for example, a regional or locality requirement that restricts the use of totally dislocated and remotely distant energy sources (i.e., energy sources outside of the same balancing zone or RTO as the hydrogen facility or otherwise without any transmission connection to such zone, RTO, or facility).

- The Guidance should adopt a reasonable and flexible approach to match the timing of the production of renewable electricity with the production of the clean hydrogen at the qualified facility.

F. Coordination with § 45Q. Notice 2022-58, sec. 6(c), requests comments on whether there are 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. The answer to this question is found in the definition of a qualified clean hydrogen production facility. As discussed above, in determining the scope of the "facility" for purposes of the definition of a "qualified clean hydrogen production facility," the Guidance should confirm that the "facility" is defined narrowly and includes only that property that is necessary for the production of the clean hydrogen and does not include "upstream" electricity, feedstock, or fuel facilities. The restriction found in § 45V(d)(2) should be limited to carbon oxides that are captured as emissions from the narrowly defined hydrogen production facility. The restriction found in § 45V(d)(2) should not apply to restrict use of the § 45Q credit for carbon capture equipment installed upstream of the hydrogen production facility in connection with an electricity generation asset supplying power to the hydrogen production facility. For example, if a combined cycle gas turbine electric generating facility (which could run partially on hydrogen as a fuel) employs carbon capture and sequestration technology and supplies power to a hydrogen production facility, such generating facility could separately qualify for the § 45Q tax credit without implicating § 45V(d)(2).

Requested Guidance: The Guidance should confirm that carbon capture equipment installed on any "upstream" electricity, feedstock, or fuel facilities, even if co-located with the hydrogen facility or under the same development plan, are not part of the qualified clean

hydrogen production facility and do not prevent any § 45V credit with respect to any qualified clean hydrogen produced at the downstream hydrogen production facility.

G. Clarify the Application of PWA Requirements and the Energy Percentage for a § 45V Facility that Elects the § 48 ITC. Section 48(a)(15) allows a taxpayer to elect the § 48 ITC in lieu of the § 45V credit for a qualified clean hydrogen production facility. The energy percentage (i.e., credit amount) for such facility is then determined under § 48(a)(15)(A)(ii), which is capped at 6%. Section 48(a)(9), which includes the PWA requirements for energy projects, provides for when "the amount of the credit determined under this subsection (*determined after the application of paragraphs (1) through (8)* and without regard to this clause) shall be equal to such amount multiplied by 5" (emphasis added). This appears to be a technical drafting issue in the statute since a clean hydrogen production facility that meets the PWA requirements under § 45V(e) is entitled to the full value of the tax credit under § 45V; similar treatment must have been intended under § 48(a)(15). In addition, since § 48(a)(9) applies to "the credit determined under this subsection" (i.e., under § 48(a)), the reference to "application of paragraphs (1) through (8)" should not be read to preclude application of § 48(a)(9) to the credit determined under § 48(a)(15).

Requested Guidance: Guidance should clarify that the PWA requirements under § 48(a)(9), and specifically the ability to multiply the applicable energy percentage by 5, apply to qualified clean hydrogen production facilities making an election under § 48(a)(15). Guidance also should clarify that the grandfathering rules under § 48(a)(9)(B)(ii) apply to such hydrogen production facilities, notwithstanding that the grandfathering rules under § 45V(e)(2)(A) are different with respect to alterations and repairs.

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Prepared with the assistance of David S. Lowman and Timothy L. Jacobs, Hunton Andrews Kurth LLP