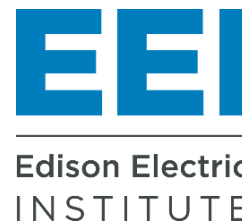


Comments Submitted Through
www.regulations.gov
IRS-2023-0066



February 23, 2024

The Honorable Lily Batchelder
Assistant Secretary for Tax Policy
Department of the Treasury
1500 Pennsylvania Avenue, NW
Washington, DC 20220

The Honorable Daniel Werfel
Commissioner
Internal Revenue Service
1111 Constitution Avenue, NW
Washington, DC 20224

Dear Ms. Batchelder and Mr. Werfel:

The Edison Electric Institute (EEI) submits these comments on behalf of its members in response to the Treasury Department’s Notice of Proposed Rulemaking on section 45V, Credit for Production of Clean Hydrogen (the Proposed Regulations). These comments identify issues that should be addressed in future guidance, including any final rules, with respect to the hydrogen credit provisions of section 45V, which was enacted in Public Law 117-169, 136 Stat. 1818 (August 16, 2022), commonly known as the Inflation Reduction Act of 2022 (IRA).

ABOUT THE EDISON ELECTRIC INSTITUTE AND ITS MEMBERS

EEI is the association that represents all regulated electric companies in the United States. Organized in 1933, EEI’s members represent over 70 percent of the U.S. electric power industry, provide electricity for roughly 250 million Americans and operate in all 50 states and the District of Columbia. The electric power industry also supports more than 7 million jobs in communities across the United States and contributes 5 percent to the nation’s gross domestic product. EEI members are committed to getting the energy they provide as clean as they can as fast as they can, without compromising on the reliability and the affordability that their customers value. In fact, carbon emissions from the U.S. power sector were 36 percent below 2005 levels at the end of 2022. These emission levels are as low as they were in 1984, while electricity use is up 73 percent since then.

EEI’s long-term strategy to continually reduce emissions relies in part on a robust hydrogen supply chain, which is why our companies supported the section 45V hydrogen production tax credit (PTC) and have a significant interest in its implementation. Our members are our Nation’s leading suppliers of electricity, which will be used to produce clean hydrogen through electrolysis, and provide the transmission and distribution services that are needed to deliver the electricity produced by low greenhouse gas (GHG) emitting resources to the points of hydrogen production.¹ In addition, our members intend to use clean hydrogen for energy storage and may

¹ This delivery system, which is critical to meeting the requirements of the section 45V credit, currently faces challenges that are anticipated to be exacerbated by growing electricity demand and the IRA does not include incentives to support the reforms necessary to help ensure continued reliability and affordability. It is estimated that the capacity of the existing grid must increase by as much as 60 percent by 2030, and it may need to triple in size by 2050 to meet the growing demand for clean electricity to support a carbon-free economy. See Eric Larson et al., *Net-Zero America by 2050: Potential Pathways, Infrastructure, and Impacts*, Final Report Summary, at 76 (Princeton University, Oct. 29, 2021).

be required to use clean hydrogen as a fuel to produce electricity in order to satisfy the U.S. Environmental Protection Agency’s (EPA) proposed rules under section 111 of the Clean Air Act (CAA).² Appropriate and reasonable implementation of the section 45V credit will be critical in the success or failure of the U.S. clean hydrogen economy, including the Department of Energy’s (DOE) Regional Clean Hydrogen Hub Program (H2Hubs) and the potential to use clean hydrogen as an energy source to reduce emissions across multiple business sectors.

I. Introduction

EI recognizes that the Proposed Regulations’ “three pillars” – temporal matching, incrementality, and deliverability – are a result of the Treasury Department’s objectives to (1) mitigate lifecycle GHG emissions in the production of qualified clean hydrogen (Prop. Reg. § 1.45V–4(d)(3)), (2) implement a verifiable system for recordkeeping and reporting, and (3) discourage wasteful taxpayer behavior. While EEI supports the intent of these goals, the Treasury Department’s proposals present several significant concerns and risk hampering, rather than supporting, U.S. clean hydrogen development, particularly in the near-term. As discussed in Section II below, the Treasury Department’s proposals on the three pillars (1) run counter to IRA statutory authority and congressional intent, other sections of the IRA, and the Infrastructure Investment and Jobs Act (IIJA); (2) are based on speculation about the electric generation fleet that is not borne out by current and ongoing electric sector efforts to reduce emissions; (3) are rooted in assumptions about when necessary supporting systems, such as hourly tracking systems, will be widely available and fully functioning; (4) fail to consider economic impacts that could have the perverse effect of incentivizing more emissions-intensive hydrogen production; (5) ignore challenges with the larger value chain necessary to support clean hydrogen production; and (6) do not consider state policy impacts.

In Section III below, EEI provides alternative proposals on the contours of each of the three pillars that can meet the Treasury Department’s aims while supporting development of a U.S. clean hydrogen economy and congressional intent. More specifically and as further discussed below, Treasury should:

- Allow annual matching for the full term of the section 45V credit for any hydrogen production facility that begins construction before January 1, 2028, and is placed in service within four years.
- Align the timing of the incrementality requirement with EEI’s proposal on the phase-in of hourly matching and allow facilities that meet the start of construction and in-service deadlines to be exempt from incrementality for the full term of the section 45V credit.
- Include the ability for existing low- and non-emitting electric generational facilities to be considered incremental. EEI supports a formulaic approach that would allow a minimum of 10 percent of existing low- and non-emitting electric generation capacity to qualify as incremental, as well as allow existing repowered, relicensed, and retrofit electric generation facilities to qualify as incremental.

² *New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions from Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule*, 88 Fed. Reg. 33,240, at 33,343 (May 23, 2023). EEI’s comments to EPA on the proposed CAA section 111 rules note the challenges to the agency’s low-GHG hydrogen proposal, including challenges across the supply chain necessary to support low-GHG hydrogen production, as well as questions regarding whether the proposal is consistent with the agency’s statutory authority.

- Undertake a study of the impacts of both hourly matching and incrementality on clean hydrogen development before imposing these requirements.
- Focus on how power actually flows in setting deliverability requirements, taking into account power pool boundaries and inter-regional transmission, rather than focusing on the DOE Transmission Needs Study regional boundaries.

In addition, Section IV of the comments below raise and address important considerations for electricity storage, behind-the-meter configurations, renewable natural gas (RNG) facilities, the definition of uprates, and the GREET model. EEI asks that the Treasury Department carefully consider these comments as it finalizes rules to achieve the potential benefits of the clean hydrogen economy.

II. Overarching Concerns with the Treasury Department's Proposals

The Treasury Department's Proposed Regulations raise several concerns, including consistency with statutory authority and congressional intent, the accuracy of the emissions and climate impacts that support the Treasury Department's proposals, economic and recordkeeping considerations, challenges with the broader value chain that will be critical to support clean hydrogen production and development, and state policy impacts. Each of these concerns, their impact on the reasonableness of the Proposed Regulations, and the negative effect that the Proposed Regulations would have on the development of a clean hydrogen industry are discussed below.

Statutory Authority and Congressional Intent

EEI recognizes that the Treasury Department has adopted the three pillars as an attempt to implement the statute, but in doing so, the Treasury Department would impose rules that would chill investment and significantly hamper the growth of the hydrogen production industry, which is contrary to statutory authority and congressional intent.

For example, the statute determines whether hydrogen qualifies for the tax credit by measuring the lifecycle GHG emissions rate for its production.³ Such GHG emissions are measured under the GREET model,⁴ which includes different types of hydrogen production, including hydrogen derived from existing energy sources. However, the statute is silent regarding the requirements for incrementality, temporal matching, and deliverability.

Furthermore, EEI reads the IRA provisions collectively to include electricity generated by all existing clean energy facilities to produce hydrogen. Yet, the Treasury Department's Proposed Regulations would restrict electricity from these facilities from qualifying for the credit. The mismatch between the Treasury Department's Proposed Regulations and congressional intent is exemplified by the ability to stack the section 45U and section 45V credits, which demonstrates that Congress specifically contemplated that existing nuclear facilities would supply electricity to qualified clean hydrogen production facilities. Under the general rule of section 45U(a)(1)(B)(ii), a taxpayer is required to sell the electricity produced at a nuclear facility to an

³ IRA section 45V(b).

⁴ IRA section 45V(c)(1).

unrelated person. Section 45(e)(13), which is incorporated by reference in section 45U(c)(2), provides an exception to this general rule. This exception allows electricity that a taxpayer produces to be treated as sold to an unrelated person if the electricity is used during the taxable year to produce hydrogen at a qualified clean hydrogen production facility (as long as the use or production is verified by an unrelated third party). In other words, in order for the exception under section 45(e)(13) to apply, the user of the electricity first must qualify for the credit under section 45V. Furthermore, the section 45U credit is only available for nuclear facilities that were placed in service before the enactment of the IRA (August 16, 2022), making it clear that Congress intended for electricity produced at an existing qualifying nuclear facility to be used for qualified clean hydrogen production under section 45V. Had Congress not wanted existing nuclear facilities to count as an electricity source for hydrogen production qualifying for credits under section 45V, it would not have provided this exception. Thus, the pillar of incrementality would render section 45(e)(13) meaningless if the use of electricity from an existing nuclear facility is not allowed for purposes of obtaining the section 45V credit.

The IRA does not have the legislative history that typically accompanies tax legislation for the Treasury Department to rely upon in drafting regulations. Regardless, the Treasury Department has the responsibility to promulgate regulations that are in accord with the statute and the underlying congressional intent. Consequently, in determining congressional intent, the Treasury Department should consider other credible sources of information. In this regard, on November 6, 2023, eleven senators who were intimately involved in the drafting of section 45V wrote to the Treasury Department expressing their concerns.

These senators included three members of the Senate Finance Committee majority (Senators Cantwell (D-WA), Brown (D-OH), and Casey (D-PA)) and two senators who were most pivotal to the passage of the IRA (Senator Manchin (D-WV), Chairman of the Senate Energy and Natural Resources Committee, and Senator Sinema (I-AZ)), all of whom worked closely with the Administration in crafting the IRA. The letter emphasized that stringent enforcement of the three pillars would “hamper the development of a robust clean hydrogen market, undermine volumetric production and price-parity goals, reduce the positive effects of scaling up electrolyzer investment, and prevent clean hydrogen from fulfilling vital roles in hard to decarbonize sectors in line with the Administration’s broader decarbonization efforts.”⁵ It further warned that “[o]verly prescriptive guidance could prevent the growth and certainty needed for clean hydrogen to provide meaningful alternatives for difficult to decarbonize sectors, reach competitive hydrogen market prices, and realize the more than 100,000 new jobs the Energy Department projects the clean hydrogen industry could create by 2030.”⁶ In addition, several energy industry organizations, along with Chairman Joe Manchin (D-WV), Senate Environment and Public Works (EPW) Committee Chairman Carper (D-DE) and other Members of Congress, have sharply criticized the Proposed Regulations and predicted that they will impede the growth of the U.S. clean hydrogen industry and overall decarbonization.⁷ While the letters and statements from senators and affected constituencies are not part of the formal legislative history, in the absence of the typical legislative history, the Treasury Department

⁵ Letter from Sens. Manchin, Sinema, Cantwell, Brown, Casey, *et al.* to Sec’y Janet Yellen, U.S. Dep’t of Treasury, Sec’y Jennifer Granholm, U.S. Dep’t of Energy, and John Podesta, White House (Nov. 6, 2023), <https://subscriber.politicopro.com/f/?id=0000018b-ab2e-d7df-abb-ef6fb5ca0000>.

⁶ *Id.*

⁷ *Id.*

should consider these predicted negative consequences in promulgating the regulations under section 45V out of concern that the objectives of the Congress and the Administration are at risk.

Emissions and Climate Impacts

EEI members are leaders in the expansion of renewable sources of electric energy, owning over 40 percent of the combined wind and solar capacity in the United States.⁸ Over the last five years, 69 percent of the new generation capacity added by EEI members was from renewable resources. As support for the Proposed Regulations, the Treasury Department relies on the assumption that use of existing generation necessarily will lead to increased GHG emissions.⁹ However, the Treasury Department does not account for ongoing, announced, and planned changes to electricity generation that will result in a lower-emitting generation fleet across the country, thereby reducing GHG emissions.

More specifically, the mix of resources used to generate electricity in the United States has changed dramatically over the last decade and is increasingly cleaner.¹⁰ In 2022, for the first time, renewable energy sources¹¹ surpassed coal as a fuel: 22.6 percent of total generation at utility-scale facilities in the United States came from renewable sources compared to 19 percent from coal-based generation.¹² In total, more than 40 percent of the Nation's electricity came from clean carbon-free resources in 2022, including nuclear energy, hydropower, solar, and wind,¹³ putting clean resources at parity with natural gas generation, which provided approximately 40 percent of the United States' total electricity generation at utility scale facilities in 2022.

As part of the move toward clean, resilient energy, electric companies are deploying more energy storage (including hydrogen), which is a key asset in helping the grid integrate increasing amounts of renewables and offering resilience and reliability. Electric companies are the largest users and operators of the approximately 34 gigawatts (GW) of operational storage in the country—representing 93 percent of active energy storage projects.¹⁴ Going forward, renewable and clean energy technology deployments will continue. The Energy Information Administration (EIA) predicts that declining capital costs for solar panels, wind turbines, and battery storage, along with government support such as the IRA, will make these technologies increasingly cost effective compared to the alternatives when building new power generating

⁸ Hitachi Energy, *The Velocity Suite*, EEI Energy Supply and Finance Department, July 2023.

⁹ See, e.g., 88 *Fed. Reg.* at 89,229 (“If hydrogen producers rely on EACs without attributes that meet these three criteria there is a significant risk that hydrogen production would significantly increase induced grid GHG emissions beyond the allowable levels required to qualify for the section 45V credit.”); and at 89,233 (“The DOE has advised that hourly matching is necessary to properly address significant indirect emissions from electricity use. . . .”).

¹⁰ See U.S. Energy Information Administration (EIA), *Today in Energy: Renewable generation surpassed coal and nuclear in the U.S. electric power sector in 2022* (Mar. 27, 2023), <https://www.eia.gov/todayinenergy/detail.php?id=55960&src=email>; See also EIA, *Electric Power Monthly: Data for February 2023—Table 1.1 Net Generation by Energy Source: Total (All Sectors), 2013-February 2023* (Mar. 24, 2023), https://www.eia.gov/electricity/monthly/xls/table_1_01.xlsx; and EIA, *Electric Power Monthly: Data for February 2023—Table 1.1.A. Net Generation from Renewable Sources: Total (All Sectors)* (Mar. 24, 2023), https://www.eia.gov/electricity/monthly/xls/table_1_01_a.xlsx.

¹¹ Renewables here include wood, black liquor, other wood waste, biogenic municipal solid waste, landfill gas, sludge waste, agriculture byproducts, other biomass, geothermal, hydroelectric conventional, solar thermal, photovoltaic energy, solar, and wind. See EIA, *Electric Power Monthly*, Table 1.1, *supra*, n. 3.

¹² See *id.*

¹³ See *id.*

¹⁴ Compiled from the following proprietary sources: *Wood Mackenzie Power & Renewables/ESA* (2022); *Dept. of Energy's Energy Storage Database* (2022); *Hitachi Energy, The Velocity Suite*; *EEI Business Analytics & Energy Supply* (Mar. 2023).

capacity.¹⁵ EIA projects that in the United States renewable generation will more than triple by 2050, with both wind and solar responsible for most of the growth.¹⁶

The changes in the mix of resources used to generate electricity have profoundly decreased the sector’s carbon dioxide (CO₂) emissions, the primary GHG emissions associated with electricity production. The electric power sector once again led the Nation in reducing CO₂ emissions, as EIA’s full-year estimates for 2022 were 36 percent below 2005 levels, as low as they were in 1984.¹⁷ These reductions will continue.¹⁸ Further, 50 EEI members have announced voluntary, forward-looking carbon reductions goals, 41 of which include a net-zero by 2050 or earlier equivalent goal. Members routinely increase the ambition or speed of their goals or altogether transform them into net-zero goals to reflect changing expectations about the cost and availability of renewable generation and other clean energy resources.

Moreover, EEI member companies are in the process of decommissioning or repowering existing coal-based electric generating units (EGU) to use lower emitting fuels. EPA recognized this fact in its proposed rules for regulating GHG emissions for the power sector under section 111 of the CAA), explaining “[retirement plans] are part of utilities with commitments to net zero power by certain dates, or are in States or localities with commitments to net zero power by certain dates.”¹⁹ Those proposed rules also would reduce power sector emissions by, for example, requiring existing natural gas EGUs in the base load subcategory to use 30 percent “low-GHG” hydrogen²⁰ beginning in 2032 and 96 percent “low-GHG” hydrogen by 2038 or to use carbon capture and storage with a 90 percent capture rate by 2035.

The Treasury Department does not appear to have considered these facts about the composition of the U.S. electricity generation fleet going forward. Instead, the Proposed Regulations rely on DOE’s companion whitepaper, which cites a study that examined marginal emissions rates from 2010 to 2019²¹ and therefore does not capture the anticipated future or even current state of the U.S. electric generation fleet. Notably, the study that DOE cites explains that “the promise of many electricity-shifting policies for reducing emissions depends, to a large extent, on how electricity generation will change in the future and [their success] is highly dependent on a transition to more low-emission sources of generation.”²² The study further provides that “the obvious approach to meeting this dual objective [of reducing both average and marginal emissions] is to eliminate coal-fired generation over the next decade.”²³ As noted above, EEI

¹⁵ EIA, Annual Energy Outlook 2023 (AEO 2023) 9 (Mar. 16, 2023), https://www.eia.gov/outlooks/aeo/pdf/AEO2023_Narrative.pdf.

¹⁶ See AEO 2023 at Table 16. Renewable Energy Generating Capacity and Generation: Electric Power Sector: Generation: Total (Mar. 16, 2023), <https://www.eia.gov/outlooks/aeo/data/browser/#/?id=16-AEO2023®ion=0-0&cases=ref2023&start=2021&end=2050&f=A&linechart=ref2023-d020623a.25-16-AEO2023-&ctype=linechart&sid=ref2023-d020623a.25-16-AEO2023~ref2023-d020623a.64-16-AEO2023&sourcekey=0>.

¹⁷ See EIA, Monthly Energy Review, Environment, Table 11.6—Electric Power Sector (Mar. 2023), <https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf>.

¹⁸ AEO 2023 at 4.

¹⁹ *New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions from Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule*, 88 Fed. Reg. 33,240, at 33,343 (May 23, 2023).

²⁰ EPA defines “low-GHG” hydrogen as hydrogen with a lifecycle emissions rate of less than 0.45 kilograms of CO₂ equivalent per kilogram of hydrogen “on a well-to-gate basis consistent with the system boundary established in IRC section 45V . . . of the IRA.” 88 Fed. Reg. at 33,304.

²¹ U.S. Dep’t of Energy, *Assessing Lifecycle Greenhouse Gas Emissions Associated with Electricity Use for the Section 45V Clean Hydrogen Production Tax Credit*, at 5 (2023) (citing Holland, S.P., M.J. Kotchen, E.T. Mansur and A.J. Yates, *Why marginal CO₂ emissions are not decreasing for US electricity*, Proceedings of the National Academy of Sciences, 119(8): e2116632119).

²² Holland, et. al. at 8.

²³ *Id.*

members already are in the process of retiring their coal-based EGUs and plan to continue to do so. Moreover, EEI members' broader plans for continuing the clean energy transition support the notion that more flexible approaches can be used to implement section 45V without significantly increasing GHG emissions.

Economic and Recordkeeping Considerations

One of the primary reasons that section 45V was included in the IRA was to reduce the cost of hydrogen to allow it to be more cost-competitive with more carbon-intensive fuels. The Administration has recognized that achieving this goal is critical to the Nation's ability to develop a clean hydrogen economy.²⁴ However, only allowing annual matching until 2028 and requiring incrementality significantly increases the cost burden of this technology, particularly in the nascent stages of hydrogen development. In fact, hourly matching is estimated to increase the cost of green hydrogen production by up to 170 percent²⁵ versus annual matching, eliminating the ability of the section 45V tax credit to make green hydrogen cost competitive with other forms of hydrogen. For example, based on engineering studies incorporating Henry Hub pricing and storage options from one of our members, hourly-matched hydrogen scenarios are estimated to cost three to seven times more than hydrogen produced from methane without carbon capture (grey hydrogen). It is unlikely that incumbent hydrogen consumers will be willing to pay up to seven times more than what they are paying today for widely available grey hydrogen, which means the emissions-reducing potential of green hydrogen is unlikely to be achieved.

The Treasury Department primarily supports its proposal for implementing hourly matching starting in 2028 based on the availability of electronic tracking systems able to accurately account for energy attribute certificates (EACs). EEI appreciates the Treasury Department's recognition that hourly tracking systems for EACs are not yet broadly available and that there is additional work and time needed for their development. Such systems will be key to ensuring that hourly tracking is feasible in real-world applications. However, the transition period from annual to hourly matching was proposed in recognition of the fact that only two of the nine EAC tracking systems recognized under the regulations, PJM-GATs and M-RETs, currently provide for hourly tracking, and functionality is still somewhat limited in those systems. It is unclear whether these systems will be sufficiently mature by 2028 to support hourly matching.

Challenges with the Broader Value Chain Necessary to Support Clean Hydrogen

The Treasury Department's reliance solely on the availability of hourly tracking systems to support its temporal matching proposal ignores other important considerations that are critical to ensuring that switching to hourly matching does not contravene congressional intent and hamper development of the clean hydrogen economy.

²⁴ For example, the DOE's "Hydrogen Shot" aims to reduce the cost of hydrogen by 80 percent to \$1.00 per kilogram (kg) in one decade U.S. Dep't of Energy, Hydrogen Shot, <https://www.energy.gov/eere/fuelcells/hydrogen-shot>. See also U.S. Dep't of Energy, Pathways to Commercial Liftoff: Clean Hydrogen (Mar. 2023), <https://liftoff.energy.gov/clean-hydrogen/>.

²⁵ Assumes 95 percent electrolyzer capacity for annual matching and 70, 60, and 50 percent capacity for hourly matching at high, mid, and low renewable resource, respectively.

Other important considerations include the maturity of the hydrogen market and the ability to meet an hourly matching requirement and incrementality in a cost-effective manner even after considering the credit.²⁶ In the near term, hydrogen production equipment remains expensive and requires high utilization to make hydrogen production facilities economic. If a hydrogen production facility can only produce during hours when wind and solar resources are available, the low utilization rate will dramatically increase the per unit price of the resulting hydrogen. Furthermore, applications requiring an uninterrupted flow of hydrogen represent substantially all existing hydrogen uses, and thus, requiring hourly matching too early would severely limit the adoption of electrolytic hydrogen produced using low- or non-emitting electricity.²⁷ This is particularly the case if there is not yet a significant build out of renewable electricity assets and if existing low- or non-emitting electric generation facilities are not deemed to meet the incrementality requirement, as discussed below. Such limitation runs counter to congressional intent and ultimately would undermine the electric sector's ability to meet EPA's proposed rules for EGUs, which would require certain EGUs to use 30 percent "low-GHG" hydrogen²⁸ beginning in 2032 and 96 percent "low-GHG" hydrogen by 2038.

Another important consideration is how the timing of phasing-in hourly matching could impact the Administration and DOE's goals for the H2Hubs. Based on DOE's anticipated timelines, the H2Hubs may only be entering operation in the early 2030s.²⁹ Under the Treasury Department's proposal to phase-in hourly matching starting January 1, 2028, many projects that are part of H2Hubs would be subject to hourly matching from the beginning. Moreover, DOE and the Administration view the H2Hubs as catalyzing a U.S. clean hydrogen economy—suggesting not only that the success of these projects is a critical component to building a clean hydrogen economy, but also that, in many instances, their completion will be a necessary precursor to more robust development. Implementing incrementality with an hourly matching requirement before the H2Hubs are able to begin commercial operation will significantly undermine their success and prevent the development that these credits were intended to spur.

State Policy Impacts

There are several regional considerations that the Treasury Department should take into account

²⁶ As a point of reference, the European Union (EU), which arguably is further along in its clean hydrogen development, will not require hourly matching until January 1, 2030. In setting this requirement, the EU rules explain that "[i]mplementation of temporal correlation is hampered in the short term by technological barriers to measure hourly matching, the challenging implications for electrolyzer designs, as well as the lack of hydrogen infrastructure enabling storage and transportation of renewable hydrogen to end users in need of constant hydrogen supply. In order to enable the ramp-up of the production ... the criteria on temporal correlation should therefore be more flexible in the initial phase, allowing market players to put in place the necessary technological solutions." European Commission Delegated Regulation 2023/1184 at preamble para. 16 (Feb. 10, 2023).

²⁷ EEI members already are receiving feedback from offtakers and developers who are looking to reduce the size of their H2 production facility by as much as one third or to move the projects entirely to geographies with better power prices based on this initial guidance. As such, the Proposed Regulations risk making the United States a much less competitive market for clean hydrogen, including related jobs.

²⁸ EPA defines "low-GHG" hydrogen as hydrogen with a lifecycle emissions rate of less than 0.45 kilograms of CO2 equivalent per kilogram of hydrogen "on a well-to-gate basis consistent with the system boundary established in IRC section 45V . . . of the IRA." 88 *Fed. Reg.* at 33,304.

²⁹ H2Hub awards were announced in October 2023. DOE plans to execute H2Hubs funding over four phases that could range from 8-12 years. Under DOE's plan, construction is not anticipated to begin for three to five years after the award and could take an additional two to four years to complete, with ramp-up to full operation occurring over the subsequent two to four years. U.S. Dep't of Energy, *Funding Opportunity Announcement: Regional Clean Hydrogen Hubs*, at 19-22 (Jan. 26, 2023), <https://oced-exchange.energy.gov/>. With awards announced in October 2023, H2Hub project construction would begin under DOE's plan in late 2026 on the early end and late 2028 on the later end. For projects that begin construction in late 2026, construction could be complete between late 2028 and late 2030 and operations would ramp up between 2030 and 2034. For projects that begin construction in late 2028, it could be complete between late 2030 and late 2032 with operations ramping up between 2032 and 2036. These timelines are based on DOE's projections for the H2Hubs and could be elongated by factors including permitting delays, supply chain challenges, and workforce shortages.

when implementing the Proposed Regulations to avoid raising costs, suppressing hydrogen production, and discouraging private-sector investment. A number of states have already begun to institute their own policies for hydrogen production. As one example, the Washington State Department of Commerce stated in their July 14, 2023 comment letter to the Internal Revenue Service (IRS), “[t]he suggested additionality restrictions are not only unnecessary in a statutory clean energy state such as Washington, they would also complicate the development of electrolytic hydrogen production in such states.”³⁰ Similarly, grid operators like the California Independent System Operator are looking for viable options, like hydrogen production, to mitigate increasing curtailments as more renewable resources and oversupply conditions increase in the region.³¹ Given this, the Treasury Department should also consider the impacts of implementing incrementality in regions that already have sufficiently clean grid systems, in utility service areas covered by robust electric sector GHG reduction policies, or in instances of high curtailment rates, particularly as the electric grid becomes increasingly reliable on low-emitting sources of energy.

III. Specific Requests on the Three Pillars

The Treasury Department proposed section 45V rules incorporate the three pillars – temporal matching, incrementality, and deliverability – and would impose requirements for each that invoke the issues discussed in Section II of these comments and hinder growth of clean hydrogen production. In this section, EEI provides alternative proposals that address the Treasury Department’s concerns while supporting Congress and the Administration’s goals of supporting development of a clean hydrogen economy.

Temporal Matching

Background

The Proposed Regulations provide for a phased-in temporal matching requirement. Before January 1, 2028, an EAC satisfies the temporal matching requirement if the electricity represented by the EAC is generated in the same calendar year that the taxpayer’s hydrogen production facility uses electricity to produce hydrogen (annual matching). Starting January 1, 2028, the Proposed Regulations provide a transition rule allowing an EAC to satisfy the temporal matching requirement only if the electricity represented by the EAC is generated in the same hour that the taxpayer’s hydrogen production facility uses electricity to produce hydrogen (hourly matching).³²

EEI members have substantial concerns that hourly tracking systems, even with a four-year delay, will not be widely available and operationally sound enough to ensure a hydrogen producer can confidently claim the section 45V credit after 2027, consequently dampening investor appetite and risking increased taxpayer uncertainty. In addition, EEI members are concerned that the Proposed Regulations did not include traditional beginning of construction rules or safe harbor guardrails, which are instrumental for taxpayers planning, building, and investing in energy projects. EEI members aim to assist the Treasury Department in its request

³⁰ Comment from Washington State Dep’t of Commerce, IRS-2022-00029 (July, 18, 2023), <https://www.regulations.gov/comment/IRS-2022-0029-0226>.

³¹ California ISO, Managing Oversupply, <https://www.caiso.com/informed/Pages/ManagingOversupply.aspx>.

³² Prop. Reg. § 1.45V-4(d)(3)(ii).

to find alternative pathways that will not stifle investment in a hydrogen economy or unintentionally make the credit requirements prohibitively expensive, while also taking into account the shared goal of reducing future GHG emissions.

Discussion of Issues

As noted above, EEI appreciates the Treasury Department’s recognition that hourly tracking systems for EACs are not yet broadly available and that these systems will take a substantial time to develop. However, at present there is considerable doubt that such systems will be available by 2028. The Proposed Regulations cite a single survey to support the conclusion that four years will be “sufficient” for hourly-matching markets to fully develop. Even if there is evidence today that four years is sufficient time, that evidence does not consider intervening events that may extend the period, and there is no assurance that all markets across the country will do what is necessary to implement the systems in time for a 2028 transition.³³ This general uncertainty for taxpayers and investors, based largely on the development of systems over which they have little control, will have a negative impact on the amount of investment in hydrogen production projects and risks decelerating the cost-competitiveness and scale-up of hydrogen as a substitute for higher carbon fuels, such as diesel fuel and gasoline. An even more environmentally problematic outgrowth of an overly restrictive section 45V credit would be the incentive to produce low-cost hydrogen using fossil fuels without carbon capture to meet demand in markets that are less sensitive to carbon intensity.

In addition to the risk that hourly tracking systems will not become available, investors face several other key risks that the Treasury Department does not appear to have considered in setting the timing of the transition rule, including facility design and other economic considerations. Without grandfathering annual matching for first mover facilities, as proposed below, these critical early market entrants will face challenges attracting investors because their facilities either will need to be built for hourly matching on day one, which is more costly and for which the necessary components of the larger value chain are not sufficiently built out at present,³⁴ or will need to assume the risk that they can be reconfigured midstream to accommodate a shift to hourly matching. Changing a production facility from annual to hourly matching impacts the production and demand-side value chains and will require substantial facility reconfiguration including: (1) doubling or tripling the electrolyzer capacity, (2) onsite storage for renewable electricity,³⁵ (3) onsite storage for clean hydrogen to ensure ratable output, and (4) changing the type of electrolyzer since electrolyzers have different “ramp rates” and certain electrolyzers are not able to modulate their capacity quickly enough to respond to intermittent renewable electricity. Each of the enumerated design differences adds to the levelized cost of hydrogen, undercutting the value of the credit, reducing investor appetite for the first-mover projects that will be important building blocks for a hydrogen economy, and putting the development of a clean hydrogen economy at risk. Unless potential investors in hydrogen production facilities are confident that the market price for clean hydrogen plus the section 45V

³³ For example, the Electric Reliability Council of Texas, which has significant potential for clean hydrogen production given its existing infrastructure, highly skilled energy workforce and localized demand from industrial facilities, has no plans to implement hourly tracking and has provided no timeline for the transition.

³⁴ See *supra* Economic and Recordkeeping Considerations discussion.

³⁵ EEI members have reported significant costs associated with electric storage, noting that battery electric storage system costs could increase by a factor of 2.8 to cover an hourly versus an annual matching scenario.

credit will produce a reasonable profit, they will not invest in clean hydrogen facilities. The Treasury Department needs to balance its concerns over the *potential impact* hydrogen production will have on GHG emissions against the imposition of a requirement that *will reduce* investment in a developing clean hydrogen economy.

The Administration has provided the federal government until 2030 to meet a 50 percent hourly matching requirement and a 50 percent annual matching requirement (Executive Order 14057).³⁶ The Executive Order does not explain the reasons for its timing, but the Treasury Department should consider that the federal government has allowed itself an additional two years to meet only half the hourly matching requirement that the Treasury Department is proposing for taxpayers. One factor that may have been considered is that the DOE H2Hubs are not anticipated to be complete until after 2030. One thing of which we are certain is that the Administration would not put off federal government hourly matching any longer than it thought necessary.

Proposal

EEI recommends the Treasury Department modify the temporal matching rule to allow annual matching for the full term of the section 45V credit for any hydrogen production facility the construction of which begins prior to January 1, 2028, as determined under existing IRS start of construction guidance, including a four-year continuity safe harbor. For hydrogen production facilities that start construction after December 31, 2027, 100 percent hourly matching would be required. This modification would more closely align the hourly matching requirement with Executive Order 14057 and the anticipated start of operation of the H2Hubs in the 2031 to 2035 time period, which is necessary to build out the required supporting infrastructure. Importantly, this recommendation will provide a level of confidence that the market requires for the investment in hydrogen production facilities because investors would not be faced with the additional costs and risks of switching from annual matching to hourly matching to earn the section 45V credit over its full term.

The Treasury Department should also commit to undertake a study, including the solicitation and consideration of public comment, the results of which would be issued at least six (6) months before imposing hourly matching (by no later than July 1, 2027) to examine its feasibility and its impact on the continued development of the Nation's clean hydrogen economy more proximate in time to its effect.³⁷ These modifications would balance the Treasury Department's concerns and goals with the congressional intent that the credit promote and not hinder development of a clean hydrogen economy.

Incrementality

Background

The Proposed Regulations provide that an EAC meets the incrementality requirement if the

³⁶ Exec. Order No. 14,057 at Sec. 102(a)(i).

³⁷ The European Union's hydrogen rules include a similar requirement that the European Commission submit a report to the European Parliament and the Council by July 1, 2028, which is 18 months before the hourly matching requirement begins, "assessing the impact of the requirements set out in this Regulation, including the impact of temporal correlation, on production costs...". European Commission Delegated Regulation 2023/1184 at Art. 10 (Feb. 10, 2023).

electricity generating facility that produced the unit of electricity to which the EAC relates has a commercial operations date (as defined in proposed § 1.45V–4(d)(2)(i)) that is no more than 36 months before the hydrogen production facility for which the EAC is retired was placed in service. Citing DOE’s accompanying technical whitepaper, the Treasury Department appears to be concerned that, unless newer clean energy facilities are placed in service to offset the additional demand from hydrogen production, the section 45V credit will increase GHG emissions.

EI’s comments aim to illustrate how this concern is misplaced by highlighting how electricity markets dispatch resources to meet variable load demand – these resources are often low- or non-emitting resources, such as wind and solar, which represent an increasing proportion of the U.S. power generation mix as higher emitting generation resources are being retired, repowered, or retrofitted to reduce emissions. In addition, EEI members have substantial concerns that the proposed incrementality requirement is not in line with the congressional intent, will undermine the economics of clean hydrogen by requiring taxpayers to buildout new clean energy facilities where current clean energy resources can meet the demand, and risk the Administration’s goals for the H2Hubs.

Discussion of Issues

There are regional differences in the order of dispatch across the United States, depending on factors such as fuel costs, availability of renewable energy resources, and the characteristics of local generating units. However, in general, system operators dispatch units at the lowest cost to allow the market to meet energy demand at the lowest possible price. According to the EIA, the type of generators with the lowest variable costs are nuclear, hydroelectric, and renewable power (wind and solar) – all non-emitting resources.³⁸ EIA data demonstrates that the electric sector is continuing to reduce emissions.³⁹ As this transition continues, the system operators will have a growing portfolio of lower-emissions resources to dispatch to serve incremental load, reducing the risk that deploying existing low- or non-emitting electric generation to produce hydrogen will significantly increase grid emissions. Furthermore, the Treasury Department does not consider hydrogen’s important downstream decarbonization impacts for various sectors including the industrial and transportation sectors. In conclusion, the proposed incrementality requirement appears to be overly focused on mitigating potential near-term emissions increases – which we do not expect to be significant, given the low and non-emitting generation currently available and its foreseen growth – at the expense of derailing the downstream decarbonization that the IRA seeks to derive from the significant investment in clean hydrogen that the IRA was intended to support.

Furthermore, if the proposed incrementality requirement were implemented, the price of electrolytic hydrogen production would materially increase on a per-kilogram basis. Electricity costs are the largest cost of producing hydrogen by electrolysis and high capital costs for new nuclear and other renewables would make it cost-prohibitive to produce economically viable

³⁸ U.S. Energy Info. Admin., Electric generator dispatch depends on system demand and the relative cost of operation (Aug. 17, 2012), <https://www.eia.gov/todayinenergy/detail.php?id=7590>.

³⁹ See *supra* Emissions and Climate Impacts discussion.

hydrogen.⁴⁰ This is particularly evident in California, northeastern states, and the mid-Atlantic region where the price of electricity is more expensive than in many other areas of the country. Additionally, the H2Hubs may be underutilized if the current Proposed Regulations are implemented, as at least two H2Hubs are expected to use existing nuclear power as a source for hydrogen production. The importance of nuclear energy is explicit in IJJA, which requires DOE, to the maximum extent possible, to select at least one H2Hub “to demonstrate the production of clean hydrogen from nuclear energy.”⁴¹ The inclusion of existing resources is necessary to support H2Hubs, which already have been selected for negotiation based on applications submitted in April 2023 for the Mid-Atlantic Clean Hydrogen Hub (MACH2) and the Midwest Alliance for Clean Hydrogen (Mach H2)). It is EEI’s understanding that the proposals made in those applications are expected to be honored in the negotiation process and that at least some of the proposals will be negatively impacted by restrictive section 45V requirements.

The Proposed Regulations ask for input on alternative circumstances under which an EAC may be deemed to satisfy the incrementality requirement, such as during periods in which low- and non-emitting generation would have otherwise been curtailed or in locations where grid-electricity is 100 percent generated by low-emitting generators. Although EEI members do not find the incrementality requirement necessary to meeting our shared emissions reduction goals, EEI appreciates the recognition that the formulaic proposal, based on curtailment data, is an opportunity to support the inclusion of existing resources for hydrogen production. In recognition that the use of electricity that otherwise would have been physically and/or economically curtailed is equivalent to additional capacity and does not require construction of new facilities, Treasury should include the opportunity for existing low- and non-emitting electricity generation (e.g., nuclear, hydroelectric, solar, and wind) to be treated as incremental generation.

In addition, as noted in the Proposed Regulations and discussed more fully above, curtailment rates have increased in recent years and are expected to continue increasing. According to the National Renewable Energy Laboratory, low-cost wind and solar are expected to pass 10 percent curtailment.⁴² This data does not take into account curtailment of other low-emitting resources. Moreover, there are regional disparities in low- and non-emitting electric generation that may yield higher curtailments in different regions. Consequently, in addition to a general curtailment percentage, Treasury should permit taxpayers to elect a curtailment percentage that accounts for these considerations, as set forth below.

Furthermore, it is not clear whether Congress intended that repowered facilities, license renewal for hydropower and nuclear facilities, and existing generation facilities that add carbon capture technologies be excluded from qualifying as incremental, but EEI sees no policy justification for excluding electricity from such facilities. Rather, excluding these facilities could lead to uneconomic decisions, such as favoring demolition and rebuilding of existing electricity generation facilities instead of a more cost-effective repowering or retrofitting.

⁴⁰ U.S. Dep’t of Energy, DOE Hydrogen and Fuel Cells Program Record, at 7 (Feb. 14, 2020), <https://www.hydrogen.energy.gov/docs/hydrogenprogramlibraries/pdfs/20006-production-cost-high-temperature-electrolysis.pdf>.

⁴¹ IJJA sec. 40314.

⁴² NREL Renewable Energy Lab., 2022 Standard Scenarios Report: A U.S. Electric Sector Outlook, (rev. Mar. 2023), <https://www.nrel.gov/docs/fy23osti/84327.pdf>.

Proposal

In the event the Treasury Department decides to impose incrementality, EEI recommends the following to reduce the negative impact incrementality will have on the development of a hydrogen economy:

- In order to allow the hydrogen economy to develop, phase in incrementality consistent with the recommendation for the phase in of hourly matching. Under this rule, incrementality would be required for hydrogen production facilities the construction of which begins after December 31, 2027, as determined under existing IRS start of construction guidance, including a four-year continuity safe harbor.

In the event that the Treasury Department retains an incrementality requirement then, when such incrementality requirement becomes effective (whether that be after 2027, as EEI recommends, or immediately), EEI recommends the following regarding existing electric generation:

- *Formulaic approach for existing facilities that are not repowered, relicensed, or retrofit to add carbon capture equipment.*
 1. At a minimum, Treasury should allow 10 percent of existing low- and non-emitting electric generation capacity to be treated as incremental generation in addition to low- and non-emitting electric generation added during the period. Such percentage should be based on an electric generator's total low- and non-emitting electric generation capacity in the prior calendar year at the portfolio level in a region. The taxpayer's determination would be made separately for all its low- and non-emitting electric generation capacity within each region.
 2. While (1) is EEI's priority, in recognition of the fact that curtailments may exceed 10 percent in certain regions, Treasury should consider including additional options. For example, the taxpayer should have the opportunity to use an electric generator's curtailment percentage of existing low- and non-emitting at the portfolio level in the relevant region. For each of taxpayer's hydrogen production facilities in the region, such curtailment percentage should be based on a prior three-year average, determined at the time the hydrogen facility begins construction.
 3. The taxpayer should make such election of either (1) or (2) above at the time of construction of its first hydrogen facility in the region. Once such election is made, it should apply to all of the taxpayer's hydrogen production facilities in the relevant region.
 4. Such generation or curtailment percentage for (1) or (2) above should be based on the taxpayer's reasonably verifiable facts and circumstances, which could include verifiable information from the electric generator, the regional transmission authority, or similar third party.
- *Inclusion as incremental for existing facilities that are repowered, relicensed, or retrofit to add carbon capture equipment.* The Treasury Department's section 45V regulations should treat existing facilities that are repowered, relicensed, or retrofit (e.g., to add carbon capture equipment) as providing incremental generation. Specifically, Treasury

should clarify that the commercial operations date (COD) for purposes of the incrementality requirement includes the COD under existing tax principles for an electric generation facility that is repowered under the 80/20 rule.

- *Uprates.* The Treasury Department’s section 45V regulations should maintain the proposal on uprates included in the Proposed Regulations, with the clarifications to the definition of uprates discussed further below.

In addition, the Treasury Department should commit to undertake a study, in coordination with the study on temporal matching, the results of which would be issued and made available for public comment at least six (6) months before imposing incrementality to examine its feasibility and its impact on the continued development of the Nation’s clean hydrogen economy more proximate in time to its effect. Specifically, the Treasury Department should also review regional differences and state policies that may allow for an exemption from the incrementality requirement at such time because the generation portfolio is sufficiently clean, which we would define as at least 90 percent of the region’s electricity is generated from low- and non-emitting resources, and review on an annual basis whether an increase to the minimum curtailment threshold (i.e., 10 percent, as recommended) should be considered based on the upward trend in curtailment numbers.

Deliverability

Background

Prop. Reg. § 1.45V–4(d)(3)(iii) would provide that an EAC meets the deliverability requirements if the electricity represented by the EAC is generated by a source that is in the same region (as defined in Prop. Reg. § 1.45V–4(d)(2)(vi)) as the relevant hydrogen production facility. The Proposed Regulations also acknowledge that transmission limitations exist within these specified regions and have asked for comments on readily administrable options to reflect those grid constraints.

Discussion of Issues

The DOE’s National Transmission Needs Study map is not representative of how power flows in all regions. For example, a power pool that includes part of Mississippi (included in the Delta Region) should instead be part of the Southeast Region. Furthermore, parts of Florida that are included in the Southeast Region should be in the Florida Region instead. To address this, EEI suggests that in those cases where an interconnected power pool spans DOE regions, deliverability should be based on the power pool boundary rather than the DOE Transmission Needs Study Region boundary. EEI also requests additional ways to establish deliverability, such as circumstances indicating that electricity is actually deliverable from an electricity generating facility to a hydrogen production facility, even if the two are not located in the same region or if the clean electricity generator should be allowed in circumstances where the two are directly connected.

EEI agrees that deliverability incentivizes a more balanced citing of renewable energy projects and infrastructure, including storage, contributing to grid stability and lower market volatility. Further, this approach ensures that the emissions that are physically associated with electricity

consumption are properly offset by the clean energy produced in that same region by the local utility.

Proposal

EEI has assessed the significance of using the Transmission Needs Study regions with members, and has the following suggestions to establish deliverability:

- In the situation where an interconnected power pool spans DOE regions, deference regarding deliverability should be given to the power pool boundary rather than the DOE Transmission Needs Study region boundary.
- The regional map should consider inter-regional transmission. To address this, in addition to presuming deliverability if a generator is in the same region, assume deliverability is met if transmission service agreements (or comparable legal right, such as New York’s Unforced Deliverability Rights) are in place with the transmission providers over which the power must flow, with a path from the generator to the region where the hydrogen production facility exists. This should also apply in the case of an interconnection agreement between two regions if that agreement is for purposes of flowing low carbon energy from one region to another.

IV. Additional Comments

In addition to the three pillars, the Proposed Regulations also raise important considerations for electricity storage, behind-the-meter configurations, RNG, the definition of updates, and the GREET model, which are addressed below.

Electricity Storage

Background

The Proposed Regulations do not address the treatment of electricity storage for purposes of applying the temporal matching requirement. Furthermore, the preamble provides that “[a]mong the issues that require resolution as EAC tracking systems move to hourly resolution is the treatment of electricity storage.”⁴³

Discussion of Issues

In an hourly matching regime, electricity storage will be critical to ensure that low- or non-emitting renewable electricity can be used to power the electrolyzer in an efficient manner. Grid-tied electrolyzers are typically most economic when operating continuously at full capacity, which means in order to meet a true green standard, they typically need to utilize power around the clock directly from wind, solar, and indirectly from wind and solar through storage resources—allowing the electrolyzers to run at high-capacity. However, to be commercially feasible, the electricity taken from storage must be treated as produced in the same time period

⁴³ 88 Fed. Reg. at 89,233.

that such electricity is used by the hydrogen production facility. Otherwise, the storage device serves no benefit for the purpose of allowing the electrolyzer to run at full capacity on renewable electricity.

Proposal

Treasury and the IRS should clarify that stored electricity has a time stamp that correlates to the time such electricity is withdrawn from storage for use in the production of clean hydrogen rather than when the electricity was initially generated or stored.

Behind-the-Meter Configurations

Background

EI requests that the Treasury Department clarify that electricity from generating facilities that are directly connected to the hydrogen production facility (behind-the-meter or BTM) be taken into account for purposes of determining the lifecycle GHG emissions rate without the need to retire an EAC. Currently, a BTM project can only certify a renewable energy certificate and create an EAC from power that flows to the grid. If that would change in the future, the Treasury Department could require the taxpayer to certify that no renewable energy certificate was created with respect to the BTM configuration, and the IRS could confirm the taxpayer's representation with the renewable energy certificate market. This provides BTM projects certainty that they will be able to generate a section 45V credit irrespective of whether hourly tracking will be available nationwide by 2028. The preamble to the Proposed Regulations suggests that the qualified EAC retirement requirements were adopted because the Treasury Department is concerned with the potential double counting of EACs.⁴⁴ However, in circumstances where directly connected electricity generating facilities do not create tradable EACs that can be retired, there is no potential for double counting because there is no EAC to be traded. Furthermore, it would be unreasonable to treat a BTM configuration differently than a grid connected facility for purposes of determining lifecycle GHG emissions, especially where the electricity of the BTM configuration can be easily traced to the hydrogen production facility. EI supports including safeguards to address the Treasury Department's double counting concerns, but requests that future guidance clarify that electricity generated by a BTM configuration be counted in determining the lifecycle GHG emissions rate even if an EAC is not created or separately retired.

Furthermore, the Treasury Department should confirm that the 4.9% Line Loss Assumption does not apply to BTM electricity generating facilities. The 4.9% Line Loss Assumption is based on 2018 estimates from the EIA regarding nationwide electricity losses relative to electricity disposition.⁴⁵ This assumption is not applicable to BTM configurations because the generated electricity is travelling a short distance to the hydrogen production facility and not subject to significant line loss. Accordingly, a directly connected electricity generating facility should not be burdened with an assumed line loss.

⁴⁴ See 88 Fed. Reg. at 89,227 (“Uniformly requiring claims of using electricity generated from specific sources to be evidence by EACs that meet the requirements of proposed § 1.45V-4(d)(1) would mitigate the risk of double counting.”).

⁴⁵ DOE 45VH2-GREET Guidelines, § 2.4.1 (Emissions of Electricity Generation) at n. 18.

Proposal

The Treasury Department should:

- Clarify that electricity from BTM generating facilities may be taken into account for purposes of determining the lifecycle GHG emissions rate regardless of whether such electricity generation creates an EAC that is retired.
- Clarify that the 4.9% Line Loss Assumption does not apply to BTM electricity generating facilities.

Renewable Natural Gas (RNG) Facilities

Background

According to the EPA, methane is the second most abundant anthropogenic GHG after CO₂, accounting for about 16 percent of global emissions. Methane is more than 28 times as potent as CO₂ at trapping heat in the atmosphere. Over the last two centuries, methane concentrations in the atmosphere have more than doubled, largely due to human-related activities. Because methane is both a powerful GHG gas and short-lived compared to CO₂, achieving significant fugitive methane reductions would have a rapid and significant effect on atmospheric warming. The collection of fugitive methane from necessary human activities, such as landfill waste disposal and agricultural farming practices, provides a cost effective and viable pathway for the reduction of potent GHG emissions. Promoting economic incentives for the collection of methane in the form of raw biogas, which is then upgraded to become commercially salable RNG will help to further the Administration’s goals to combat climate change.⁴⁶ Promulgating rules that enable RNG to qualify for section 45V credits will promote the increased collection and commercial use of fugitive methane. The Proposed Regulations do not provide any meaningful guidance on RNG emissions but provide that the Treasury Department anticipates final regulations will address RNG.

Discussion of Issues

The preamble to the Proposed Regulations notes that the Treasury Department and IRS anticipate requiring that, for biogas or biogas-based RNG to receive an emissions value consistent with that gas (and not standard natural gas), the RNG used during the hydrogen production process must originate from the first productive use of the relevant methane. Productive use is generally defined as any valuable application of biogas, including to provide heat or cooling, generate electricity or upgrade to RNG and not venting or flaring. In the use of RNG for hydrogen production, the Treasury Department and IRS propose to define “first productive use” of methane as the time when a producer of that gas first begins using or selling it for productive use in the same taxable year as (or after) the relevant hydrogen production facility was placed in service. Instituting a requirement that the use of RNG for hydrogen production be the “first productive use” of the relevant methane would severely limit the pool of eligible projects for the section 45V PTC. For example, as written, the first productive use requirement

⁴⁶ U.S. Env’t Protection Agency, Importance of Methane, <https://www.epa.gov/gmi/importance-methane>.

would not be satisfied if an existing biogas-to-electricity plant is upgraded to produce RNG, and accordingly, the RNG would not be taken into account for purposes of determining the lifecycle GHG emissions of the hydrogen produced.

The Proposed Regulations do not provide guidance on how RNG can be applied to the production of hydrogen via traditional and emerging hydrogen methods, such as steam methane reforming (SMR), autothermal reforming (ATR), gasification, and chemical looping to produce low carbon clean hydrogen. Some RNG production pathways can achieve negative carbon intensity (CI) scores, which can help to reduce the carbon impact of hydrogen production, especially when paired with carbon capture and sequestration. However, the high cost of RNG makes it economically unviable to use as a pure feedstock for hydrogen paired with carbon sequestration. For the RNG pathway for section 45V to be viable, hydrogen producers must be able to utilize a blended stream of fossil fuel and RNG, or other biogenic feedstock, as a feedstock to synthesize hydrogen. Currently, 45VH2-GREET treats fossil fuels and landfill gas as a binary choice for feedstock to produce hydrogen.

The Treasury Department should allow landfill gas (LFG), RNG, and other forms of biogenic fuels to be feedstock inputs in the “User Defined Mix” under “Enter Process Details.” This would allow the GREET model to account for the fractional use of RNG and other biogenic fuels. Enabling custom feedstock inputs to allow for fossil-based fuels to be blended with RNG and other biogenic feedstocks would encourage adoption of renewables by incentivizing hydrogen production projects utilizing a hydrogen production process, in conjunction with carbon capture and sequestration, to utilize renewable power in the process. Absent this change, projects of this configuration are likely to elect 45Q, which is measured by carbon captured as compared to section 45V which measures carbon intensity of the hydrogen. By allowing for custom feedstock inputs, hydrogen projects utilizing carbon capture and sequestration will be incented to achieve the lowest possible carbon intensity score through the combination of high rates of CO₂ capture combined with utilizing zero or negative CI renewables to meet the power needs for these projects.

Section 45V regulations, with respect to RNG, should include the implementation of a viable Book-and-Claim system.⁴⁷ RNG is currently produced across the United States but is concentrated in the Midwest, Northeast, and West. Even within these regions, RNG may not be produced near the final consumer using it as a prospective hydrogen feedstock. By using a Book-and-Claim system, RNG consumers can contract for the RNG virtually, allowing the Environmental Attributes (EA) connected to the carbon emission reduction to be purchased and reassigned to hydrogen production occurring in an entirely different location.

Proposal

EEI requests that:

- The first productive use requirement limits existing RNG facilities being used for hydrogen production to qualify. The Treasury Department should drop this requirement

⁴⁷ A Book-and-Claim system allows the RNG purchaser to “unbundle” the RNG from the environmental attributes (e.g., RINs). The purchaser can either use the RNG and the certificates or sell the certificates.

to incent raw biogas to be upgraded to RNG, which ensures that harmful air pollutants are not released into the atmosphere by burning raw biogas.

- RNG producers and hydrogen producers should be allowed to pursue a Blended Pathway approach to self-select the proportion of fossil fuels and RNG used as feedstock to produce 45V eligible hydrogen.
- A viable Book-and-Claim system should be applied for hydrogen producers utilizing RNG as a feedstock, something similar to the California Low Carbon Fuel Standard framework.

Definition of Uprates

Background

Prop. Reg. § 1.45V-4(d)(3)(i)(B) provides that an EAC meets the requirements of incrementality if the electricity represented by the EAC is produced by an electricity generating facility that had an uprate no more than 36 months before the hydrogen production facility with respect to which the EAC is retired was placed in service and such electricity is part of such electricity generating facility's uprated production. The term *uprate* means an increase in an electricity generating facility's rated nameplate capacity (in nameplate megawatts).

Discussion of Issue

Uprates in capacity potentially have implications beyond determining incrementality under section 45V and nameplate capacity may not be the appropriate measure. EEI requests that the Treasury Department explicitly state in the final regulations that the term *uprate* as defined in Prop. Reg. § 1.45V-4(d)(3)(i)(B) be solely for the purpose of that provision.

Proposal

The second sentence in Prop. Reg. § 1.45V-4(d)(3)(i)(B) should be amended to read: “Solely for purposes of this paragraph, the term uprate means an increase in an electricity generating facility's rated nameplate capacity (in nameplate megawatts).”

GREET Model

Background

The Proposed Regulations direct taxpayers to utilize the most recent GREET model to determine “lifecycle greenhouse gas emissions” under section 45V(c)(1)(A) and (B). Prop. Reg. § 1.45V-1(a)(8)(ii) would provide that the term “most recent GREET model” means the latest version of 45VH2-GREET developed by Argonne National Laboratory (ANL) that is publicly available on the first day of the taxpayers’ taxable year in which the qualified clean hydrogen for which the taxpayer is claiming the section 45V credit was produced.

Discussion of Issues

Introducing new GREET models without an appropriate safe harbor for a prior GREET model on which a taxpayer had relied will create unnecessary controversy and taxpayer uncertainty. In addition, EEI is concerned that there are instances where the GREET model does not accurately capture the taxpayers' true emissions. The GREET model currently includes background data, which is determined on an annual basis and input from the federal government, whereas foreground data may be input by the taxpayer. EEI members have observed that certain background data of the 45VH2-GREET model should be moved to foreground data, including methane emissions, efficiency/type of electrolysis and methane leakage rates. This will help taxpayers get more accurate information on the carbon intensity of the hydrogen by tying it to actual foreground data.

Proposal

EEI proposes a safe harbor for taxpayers to use the GREET model. To support market certainty, Treasury should allow taxpayers to elect for the life of the credit to use the latest version of 45VH2-GREET model that was in effect at the time the taxpayer began construction of the hydrogen facility.

To be consistent, if the Treasury Department maintains the transition to hourly matching, the GREET model should also be updated at that transition date to offer that grid emissions be determined on an hourly basis (rather than on an annual basis) to ensure the highest level of accuracy, incentivize the use of electrolysis during periods of low grid emissions and better tie hydrogen production to periods of operations. In addition, EEI recommends that methane emissions, on the other hand, be moved to the foreground, enabling taxpayers to input this data themselves. Methane emissions may be verifiably lowered by the use of differentiated gas products and thus should be in the foreground data. Typically, methane emissions will not vary hourly, as the electricity emissions might vary, but optionality in the foreground data would improve model accuracy.

Additionally, the use of power should be tied to the efficiency of the electrolyzer. It is well-established that electrolysis is more efficient at lower loads, thus providing taxpayers an opportunity to in fact reduce emissions by optimization of electrolysis operation. These system efficiency curves are typically available from the original equipment manufacturer and could be tied to the type of electrolysis, if not the specific electrolysis model.

Finally, the identified gap with high-temperature electrolysis (HTE) can be closed by offering HTE as a process option with the option to select the heat source. Presuming that non-nuclear heat sources may be co-products of industrial processes, the model should offer the opportunity to allocate the emissions between the waste heat and the industrial product(s). This allocation is already contemplated in other aspects of the model, such as hydrogen derived from chlor-alkali processes, and thus should not pose a technical challenge. This modification should be in addition to rule modification which would allow for existing nuclear energy to be considered as an additional (incremental) resource as previously discussed.

CONCLUSION

Thank you for considering these comments. If you have any questions or need further clarifications, please contact Alex Zakupowsky of Miller & Chevalier (202-626-5950), or Kristen Siegele (202-508-5774), Sandi Safro Osborn (202-508-5129), or Mark Agnew (202-508-5049) of EEI.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard F. McMahon, Jr.", written in a cursive style.

Richard F. McMahon, Jr.
Senior Vice President, Energy Supply & Finance, and
Chief ESG Officer
Edison Electric Institute