idemitsu

February 26, 2024

Submitted via www.regulations.gov; REG-117631-23

Internal Revenue Service
CC:PA:LPD:PR (REG-117631-23)
Room 5203, P.O. Box 7604, Ben Franklin Station
Washington, DC 20044

Re: Request for Comments Regarding the Notice of Proposed Rulemaking for Section 45V Credit for Production of Clean Hydrogen (REG-117631-23)

Idemitsu Renewables America ("Idemitsu Renewables") appreciates the opportunity to comment on the Internal Revenue Service's request for comments pursuant to REG-117631-23, regarding the notice of proposed rulemaking related to the credit for production of clean hydrogen and the hydrogen energy credit, as established and amended by the Inflation Reduction Act of 2022.

Idemitsu Renewables is a San Francisco-based solar and energy storage developer and independent power producer. The company acquires, develops, owns, and operates utility-scale solar and storage facilities throughout North America and has offices in California and Nevada. Idemitsu Renewables is a subsidiary of Idemitsu Kosan Co., Ltd. ("Idemitsu Kosan"), a multinational petroleum refining and chemicals company headquartered in Tokyo, Japan. Idemitsu Kosan has set ambitious goals to achieve net-zero emissions in alignment with the Paris Agreement and global efforts to combat climate change. Key aspects of Idemitsu Kosan's plans for net zero emissions include:

1. **Carbon Neutrality Targets:** Idemitsu Kosan aims to achieve carbon neutrality by 2050 and a 46% reduction in Scope 1 and 2 emissions by 2030 vs. the Group's 2013 baseline level.
2. **Renewable Energy:** Idemitsu Kosan is actively expanding its renewable energy business, particularly in the areas of solar power generation and energy storage.
3. **Sustainable Fuels:** Idemitsu Kosan is exploring and investing in the development of sustainable fuels, such as clean hydrogen and derivative products such as ammonia.

As part of its net zero emissions goals, Idemitsu Kosan plans to import clean ammonia from international projects into Japan starting in the late 2020s. The company has committed to supply over 1 million metric tons per year of clean ammonia fuel to decarbonize coal-fired power generation in Japan by 2030. To achieve this, Idemitsu Kosan will leverage its existing facilities, including a petrochemical plant in the Chugoku region of Japan, as a strategic platform to establish a centralized ammonia supply base. This presents an ideal opportunity for Idemitsu Kosan to serve as a supplier of this clean ammonia from the United States.

The tax credits for clean hydrogen production under Section 45V of the Inflation Reduction Act have the potential to immediately establish the United States as one of the leading clean hydrogen production and exportation regions in the world. However, by setting the requirements to obtain the full 45V tax credits too strict on day one, the U.S. Treasury places the United States' hydrogen leadership position at risk. As such, Idemitsu Renewables recommends the following items that can be implemented to secure the Unites States' role as a leading global clean molecule supplier:

1. **Allow for the usage of the latest version of the 45V GREET Model that is publicly available on the first day of the first taxable year a taxpayer claims the 45V credit over the full 10-year 45V crediting period, with the option but not obligation to use a more recent 45V GREET model if available.**

   With a clean ammonia supply target of over 1 million metric tons per year by 2030, Idemitsu Kosan's clean ammonia targets are unprecedented and will require large scale investments across wind and solar generation assets, electrolyzers, ammonia production equipment, and connective infrastructure in the magnitude of billions of dollars. Due to the scale of these investments, investment capital from third party financing institutions will be required. As a result, in order to attract third party capital, these clean ammonia infrastructure projects need be structured as "investment-grade" investment vehicles with stable and predictable cash flows.

   According to the IRS's notice of proposed rulemaking regarding the 45V hydrogen production tax credit, the value of the 45V tax credits will be determined by the 45V GREET Model, which is subject to update at any time. Idemitsu Renewables is concerned about the uncertainty regarding potential 45V GREET Model updates during the operational term of a clean hydrogen infrastructure project. Based on initial conversations with potential financing counterparties and leveraging lessons from Idemitsu Renewables' extensive project financing experience, Idemitsu Renewables believes it will be extremely challenging, if not impossible, to finance a clean hydrogen project if critical assumptions within the 45V GREET model are subject to ongoing revisions which could adversely affect the amount of tax credits generated by the hydrogen project. Therefore, Idemitsu Renewables is recommending the IRS to adjust the language in its 45V draft guidance to allow for the usage of the latest version of the 45V GREET model that is publicly available on the first day of the first taxable year a taxpayer claims the 45V credit over the full 10-year crediting period of the 45V credit, with the option but not obligation to use a more recent 45V GREET model if available.

2. **Allow qualified clean hydrogen projects that start construction before January 1, 2029, to be eligible to utilize an annual temporal matching approach over the full 10-year crediting period of the 45V production tax credit.**

   With less than 20MW of total installed electrolysis capacity in the United States as of the end of 2023,[4] the electrolysis market in the United States is still very much in a nascent phase. Total installed electrolyzer costs for end-of-decade project deployments, estimated between $1,200/kW to $1,500/kW,[5] are much more expensive than the costs anticipated by the U.S. Department of Energy, which forecasts the installed costs for alkaline and PEM electrolyzers at $400/kW to $600/kW by the end of the decade.[6] Electrolysis system costs are anticipated to improve from industrial scaling, including benefits from manufacturing economics of scale and R&D improvements. However, unless the industry can successfully deploy an initial wave of

[4] Figure includes megawatt-scale electrolyzer deployments that have completed commissioning and are currently operating in a commercial setting. Underlying data obtained from the International Energy Agency and the US Department of Energy.
[5] Hydrogen Council. *Hydrogen Insights 2023*. December 2023.
[6] Department of Energy. *Pathways to Commercial Liftoff: Clean Hydrogen.* March 2023.

electrolyzer projects, the benefits from industrial scaling will not be realized and electrolyzers will continue to remain expensive.

An “hourly temporal matching” approach will effectively restrict electrolyzers to operate only when renewable generation sources are available. This restriction can significantly increase the levelized cost of hydrogen for initial projects, reducing off-take viability and consequently reducing the likelihood of a meaningful wave of initial project deployments.

Furthermore, large-scale hydrogen off-take opportunities require a consistent and predictable supply of hydrogen. This is not feasible if the hydrogen supply is coupled directly to the production profile of a renewable generator, which is subject to intermittency, seasonal variations, and frequent startups and shutdowns. For example, Idemitsu Kosan is evaluating opportunities to convert hydrogen to ammonia for international transport. Although R&D efforts are underway by several technology companies to improve the flexibility of ammonia production facilities, it has not been proven nor is it commercially sound to assume that ammonia production facilities can operate with hydrogen feedstock produced from an electrolyzer operated under an “hourly” approach. Although hydrogen production variations may be addressed with large-scale geological storage sites, requiring a geological storage site for each hydrogen project will significantly restrict hydrogen project development to select regions of the U.S. and may delay initial project deployments until the beginning of next decade due to the long development cycle of these geologic storage facilities.

By allowing projects that start construction before January 1, 2029, to be eligible to engage in an “annual temporal matching” approach for the full 10 years of the 45V tax crediting period, the U.S. Treasury will significantly increase the likelihood of a larger initial wave of electrolyzer project deployments, accelerating cost reductions that will improve the economic viability of electrolyzers operated under an “hourly temporal matching” approach in subsequent deployment waves.

3. **Institute a formulaic approach, such as a “10-percent allowance,” that exempts a percentage of hydrogen production from having to meet hourly temporal matching and incrementality requirements.**

Idemitsu Renewables encourages the U.S Treasury to allow, at a minimum, exempting a percentage of hydrogen production from having to meet hourly temporal matching requirements. Under the IRS’s notice of proposed rulemaking for the 45V credit, even a small amount of grid-charging without the purchase and retirement of EACs can result in a hydrogen facility changing its emissions tier.[7] This change in emissions tier can have a drastic impact on the value of the section 45V tax credit generated for large-scale hydrogen facilities, which could be in the order of hundreds of millions of dollars for individual projects for each taxable year. Due to the limited operating history of large-scale renewable-energy-powered electrolyzers, Idemitsu Renewables’

[7] Calculations indicate that charging from the grid with a representative emissions factor of 370 kg-CO2/MWh for approximately 2% of all annual hours will increase an electrolyzer’s emission factor above the 0.45 kg-CO2/kg-H2 emission tier.

counterparties at major financial institutions are viewing a move from “annual” to “hourly” temporal matching as a key qualification risk for the section 45V credit. Additionally, clean hydrogen policy should prioritize safety as a key focus during the industry’s formative years. Establishing an allowance for grid-charging for electrolyzer startups and shutdowns will provide additional flexibility to better ensure electrolyzer systems are operated within safe parameters.

An “allowance approach” for temporal matching could work in a similar manner to the U.S. Treasury’s proposed “allowance approach” for incrementality, which would allow hydrogen production facilities to charge from low-carbon generators placed in service before January 1, 2023, up to a defined percentage of hours during each taxable year. In fact, expanding the U.S. Treasury’s proposed “allowance approach” to be flexible and inclusive of both incrementality and temporal “annual” matching could be a simple and straightforward solution to account for each pathway.

Although Idemitsu Renewables believes electrolyzers will play an extremely important role in helping to integrate low-carbon resources to the grid, Idemitsu Renewables also acknowledges the challenges outlined in the IRS’s notice of proposed 45V rulemaking in accounting for prevented clean generator curtailments and forced retirements. Because Idemitsu Renewables believes that effective guidance must be clear, stable, and simple to implement, Idemitsu Renewables recommends adopting an easy-to-follow “allowance approach” as introduced by the U.S. Treasury Department under the 45V proposed rulemaking as a proxy to account for curtailments and forced retirements. Idemitsu Renewables also recommends that the U.S. Treasury assign a single percentage value for all regions of the United States that is either stable or at least not subject to downward revisions over the entire timeline of the section 45V credit program. Idemitsu Renewables believes a forward-looking value must be utilized if a single “percentage figure” is to be adopted. Renewable curtailments are expected to increase over time as more renewable energy is added to the U.S. grid. For example, according to the U.S. Energy Information Administration (EIA), 5% of total available wind generation and 9% of total available solar generation was curtailed in ERCOT in 2022. By 2035, the EIA anticipates wind curtailments in ERCOT could increase to 13% and solar curtailments can increase to 19%.[8] Idemitsu Renewables believes a “percentage allowance” of 10% of annual hours is reasonable given the expected increase in future renewable generation curtailments.

The incentives under the Inflation Reduction Act have the potential to accelerate the United States into a leading producer and exporter of clean hydrogen. This would have a myriad of positive benefits for the United States, including new high-paying next generation jobs, federal and local tax benefits from new energy infrastructure investments, and would position the United States as a first mover with know-how and expertise to succeed as a global supplier of clean molecules. However, by setting high initial restrictions to obtain the full 45V credit, the United States will severely limit the first wave of clean hydrogen investments and will place its global leadership position at risk.

[8] US Energy Information Administration. *As Texas Wind and Solar Capacity Increase, Energy Curtailments are Also Likely to Rise.* July 13, 2023.

However, by instituting the three recommended items in this letter, the U.S. Treasury can ensure the United States' global leadership position as a leading supplier of clean molecules.

Sincerely,

Cary Vandenberg

CEO, Idemitsu Renewables America Development LLC