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Internal Revenue Service
CC :PA: LPD:PR (REG-132569-17)
Room 5203
P.O. Box 7604, Ben Franklin Station
Washington, DC 20044

Re: REG-117631-23: Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election to Treat Clean Hydrogen Production Facilities as Energy Property

Dear Ladies and Gentlemen,

Nugen Clean Energies, LLC ("Nugen") appreciates the opportunity to submit the following comments on the Internal Revenue Service's (IRS) and the U.S. Department of Treasury's (Treasury) Notice of Proposed Rulemaking (NPRM) regarding the rules for the Production Tax Credit (PTC) under Section 45V (the Clean Hydrogen PTC).

Nugen is headquartered in Houston, Texas and is currently developing waste to hydrogen projects in Texas, California, Oregon, and Washington. Nugen is part of the Skeiron Group (the "Skeiron Group"), a diversified group of companies with a focus on sustainability and a track record of end-to-end delivery - including design & engineering, manufacturing, commissioning, operating & maintenance - of 25 GW of renewable energy assets in 6 continents for IPP's and utility companies on a turn-key basis. With respect to the United States, the Group has an installed capacity of 4 GW of renewable energy assets. All members of the Skeiron Group share a common philosophy of sustainability and a commitment to do business responsibly.

Nugen's primary focus area is developing projects that process "landfill diverted municipal solid waste" (hereafter mentioned as "Landfill MSW") to produce clean hydrogen. Leveraging gasification techniques along with carbon capture, Nugen aims not only to produce clean hydrogen but also to mitigate the harmful greenhouse gas emissions associated with traditional landfill practices. These projects necessitate substantial investments up to $400 million each project.

We firmly believe that municipal solid waste (MSW) currently destined for landfill disposal is a valuable, untapped source of sustainable, and renewable energy. Landfills are also the third-largest source of U.S. anthropogenic methane (CH_4) emissions. CH_4 emissions from MSW in the landfills accounted for 103.7 million tons of net equivalent CO_2 emissions as per US EPA inventory data for 2021.[1] Nugen's potential investments in the Landfill NSW sector are intended to reduce the country's landfill associated greenhouse gas (GHG) emissions.

[1] Reference- EPA (2023) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021. U.S. Environmental Protection Agency, EPA 430-R-23-002. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2021

We want to first express our strong appreciation for the difficult work the Treasury and IRS have had to undertake in drafting the NPRM. We recognize the difficulty in covering a topic as complicated as hydrogen, particularly in terms of addressing direct and indirect impacts any such rules may have on reducing GHG emissions. We support the hydrogen friendly framework introduced by the Infrastructure Investment and Jobs Act and the Inflation Reduction Act (IRA) as recognizing the critically important role hydrogen can play in meeting our nation's decarbonization and economic goals.

We want the IRA's hydrogen related provisions to be a great success in reducing GHG emissions. Our comments set forth below provide our view to Landfill MSW and our view of how final Clean Hydrogen PTC regulations need to reflect commercial and technological realities to enable clean hydrogen's commercial success in the United States. Most significantly, projects need to provide minimum levels of legal certainty to achieve sufficient financing.

We are concerned that some positions outlined in the NPRM may have a significantly negative impact both on the valuable Landfill MSW market and the broader potential US clean hydrogen economy the IRA is intended to foster. We have set out our primary concerns with respect to such positions in the letter below:

1. Prop. Treas. Reg. § 1.45V–4(b) Biomass Feedstocks for Hydrogen Production

We believe the Section 45V GREET model (45VH2-GREET) needs to include Landfill MSW as an approved feedstock for gasification pathway. While the proposed 45VH2-GREET model includes gasification as an approved pathway for producing hydrogen, only corn stover and forest residue are approved feedstocks. The requirement to apply to Department of Energy (DOE) for a provisional emissions rate (PER) will delay project development, increase costs, and add financial risk due to uncertainty about the application process.

Additionally, given the annual verification requirement, there is added risk that the carbon intensity and related credit calculations may vary from the PER once landfill bound MSW is added to the model, depending upon assumptions and emissions factors used. This uncertainty will significantly impact the project viability due to expensive project financing and insurance costs.

Landfill MSW gasification with carbon capture is a valuable and untapped resource for sustainable and clean hydrogen production. The process has the potential to produce qualified clean hydrogen as per the permissible limits given by proposed Treas. Reg. § 1.45V–1(a)(3). Similar to corn and logging residue, Landfill MSW does not require additional ecological footprint for cultivation or production. Landfill diverted waste streams contain biogenic and non-biogenic components, both of which are prime candidates for gasification feedstock and produce clean hydrogen. Even after consideration for waste sorting and recycling, 48% of landfill composition is non-biogenic as confirmed by data published in 2023 R&D GREET model and 20% of the total is plastic.

Proposal: Nugen strongly proposes the addition of Landfill MSW as an approved feedstock for gasification pathway in the 45VH2-GREET model.

2. GHG Emission Estimates in Terms of Landfill Avoidance Credits and Counterfactual Scenarios

The NPRM asks "*What counterfactual assumptions and data should be used to assess the lifecycle GHG emissions of hydrogen production pathways that rely on RNG? Is venting an appropriate counterfactual assumption for some pathways? If not, what other factors should be considered?*"

Venting is the correct counterfactual for landfill gas in some instances, such as jurisdictions without flaring regulations in place. Landfill MSW as a feedstock used in a gasifier would otherwise emit CH_4 and other non-CO_2 emissions. Therefore, we believe venting is the appropriate counterfactual for this feedstock in certain regions.

In case of flaring, degradable organic waste in landfills decomposes into both CO_2 and CH_4 over time. As per IPCC, CH_4 (having higher global warming potential than CO_2) gets flared under zero oxidation factor and only a small portion of methane is incompletely combusted. Combusted methane adds further CO_2 emissions.

Using Landfill MSW as a feedstock for gasification along with carbon capture would result in net improvement in overall carbon emissions on account of avoiding CH_4 and CO_2 emissions from the landfills. Appropriate accounting for landfill diversion needs to capture the difference between CO_2 emissions resulting from the Landfill MSW gasification versus the combined CO_2 and fugitive methane from landfill emissions.

Proposal: Nugen suggests adding above counterfactual scenarios for Landfill MSW when calculating GHG emissions for associated hydrogen production.

3. Prop. Treas. Reg. § 1.45V–4(b) Most Recent GREET Model for determining GHG Emissions

We believe the 45VH2-GREET model applicable to a project needs to at least remain constant for projects over that project's Clean Hydrogen PTC eligibility period. Prop. Treas. Reg. § 1.45V–4(b) requires taxpayers to use the model in effect for each taxable year and thus a project cannot have certainty that it will continue to qualify for the same amount of Clean Hydrogen PTC (or any amount of PTC) due to this variable outside of their control.

Potential variability in the 45VH2-GREET model will prove economically fatal to many otherwise promising projects. Our waste to hydrogen projects typically requires long-term offtake contracts with the purchasers. The uncertainty a project may no longer qualify or drop in a tier in the tax credit amount would have serious implications on long term offtake contracts and would jeopardize the financial viability due to higher financing and insurance costs.

Proposal: Nugen strongly urges the final regulations to provide projects with the necessary legal stability by allowing taxpayers to rely upon the 45VH2-GREET model (or applicable approved PER) in effect either at the final investment decision (FID) stage or at the time of the DOE Emissions Value Request Process, whichever earlier, to be considered as the applicable model for the lifetime of a project.

If there are any material alterations to the qualified hydrogen facility after approval of emission value request by DOE or after the facility is placed in service, in that case, we believe the requirement of most recent 45VH2-GREET Model at the beginning of construction of such alterations would be appropriate.

4. Prop. Treas. Reg. § 1.45V–4(c)(5) Application for Provisional Emission Rate (PER) to DOE

The draft Regulations state that an applicant may only request an emissions value from the DOE after a front-end engineering and design (FEED) study or similar indication of project maturity as determined by the DOE has been completed, such as project specification and cost estimation sufficient to inform an FID. We note that:

(1) A FEED study can cost a substantial amount, up to $15 million and delay project development by 6-8 months.
(2) The information required for approval can easily be delivered through FEL-2.
(3) FEL-2 Scope of services includes site specific basis design & engineering which is sufficient information to allocate provisional emissions rate.

Proposal: Nugen urges Treasury to consider FEL-2 stage of the project development to be eligible stage for the application of PER.

5. Prop. Treas. Reg. § 1.45V–4(3) Temporal Matching, Regionality, and Incrementality (the "3 Pillars")

We agree with the NPRM that incrementality, temporal matching, and deliverability requirements are important guardrails to ensure that hydrogen producers' electricity use can be reasonably deemed to reflect the emissions associated with the specific generators from which the EACs were purchased and retired. However, electric power requirements per kg of hydrogen produced for gasification pathway, including power required for balance of plant are substantially less, than electricity requirements for other pathways. Additionally, the capacity of a gasification facility is not dependent on the availability of renewable power, unlike most other clean hydrogen production pathways. Out of total process energy demand, the majority of the energy comes from Landfill MSW feedstock itself.

We agree that GHG emissions associated with grid energy input should be included in the applicable 45VH2 GREET model, however in our opinion the Three Pillars approach does not work with Landfill MSW to hydrogen (or similar) production pathways. The NPRM recognizes that there are differences between renewable electricity and renewable natural gas and we strongly believe that the GHG emissions concerns for electrolytic hydrogen pathways (both direct and indirect) are materially different from those of MSW to hydrogen production. Primary concerns with induced emissions applicable to other clean hydrogen pathways, are not present for Landfill MSW to hydrogen.

Proposal: Nugen urges Treasury not to consider 'Three Pillars' for gasification technology with Landfill MSW as a feedstock.

Conclusion:

By sourcing renewable energy from Landfill MSW, we create a solution to the waste problem, and we create value where there was none previously. This will facilitate Nugen and catalyze many more companies like us to invest sustainably over the life cycle of the projects, thus contributing to the attractiveness of the green hydrogen sector and increasing its investment potential.

Climate change solutions are as varied as the sources of GHGs that created the problem. Nugen strongly urges the Treasury to consider new and innovative sources of renewable energy. By tapping municipal solid waste, we create a two-birds-one-stone type solution with the potential to solve the waste problem and open one more door for renewable energy development.

Thank you again for the opportunity to share these critical perspectives with you. We are eager to collaborate with policymakers and regulators on hydrogen-focused tax policies incentives and welcome the opportunity to continue such collaboration with the Treasury and IRS on the issues and solutions outlined herein. Please contact me Abraham.Mooney@skeiron.com at with any questions or comments.

Thank you for your consideration,

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