February 26, 2024

Department of Treasury
Internal Revenue Service

RE: Section 45V of the Internal Revenue Code

NLC Energy LLC (NLC Energy) is submitting the following comments and recommendations related to the proposed regulations implementing section 45V of the IRS Code entitled "Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election to Treat Clean Hydrogen Production Facilities as Energy Property," published at 88 Fed. Reg. 89220 (referred to as "45V Proposed Rule).

NLC Energy is a developer, owner, and operator of renewable natural gas ("RNG") facilities which create pipeline quality biomethane for use in the transportation sector and to supply natural gas utilities and industrial facilities. NLC Energy's facilities use manure and food production waste to create biomethane. [NLC Energy is also developing hydrogen production facilities using innovative gasification technology.] With proper implementation, Section 45V will accelerate hydrogen production in the U.S. including from new processes such as NLC Energy is pioneering. We appreciate the careful work the Department of Treasury ("Treasury") and the Internal Revenue Service ("IRS") have put into the 45V Proposed Rule and appreciate this opportunity to provide comments.

How Renewable Natural Gas Can Help Accelerate Hydrogen Production

As EPA has recognized, RNG (referring to biomethane purified to natural gas pipeline specifications) can be used as a feedstock to produce renewable hydrogen, providing another pathway to produce this climate friendly fuel for the transportation and industrial sectors.[1] Steam methane reforming (SMR) accounts for the majority of hydrogen produced globally. The

[1] 87 Fed. Reg. 80,582, 80,687 (Dec. 30, 2022) (U.S. Environmental Protection Agency); U.S. Department of Energy (DOE), *U.S. Department of Energy Clean Hydrogen Production Standard (CHPS) Guidance*, at 3 (2023), *available at* https://www.hydrogen.energy.gov/docs/hydrogenprogramlibraries/pdfs/clean-hydrogen-production-standard-guidance.pdf.

process treats methane with high-temperature steam to create a mixture of hydrogen, carbon monoxide, and a small amount of carbon dioxide. Carbon monoxide can be reacted with water to produce additional hydrogen. According to DOE, SMR is the cheapest, most efficient, and most common method of hydrogen production in the U.S. today.[2] Because RNG is indistinguishable from fossil Natural Gas, RNG is a feedstock that can be used with existing SMR technology, allowing the production of low carbon, carbon neutral, or even carbon negative hydrogen based on existing, proven, commercialized processes. While early stage zero carbon hydrogen technologies may be commercialized over the next 5 years, RNG can create climate-friendly hydrogen via the SMR process today.

For these reasons, RNG producers like NLC Energy have a material interest in this rulemaking to ensure that the proposal recognizes and encourages this important opportunity to accelerate hydrogen production.

"First Productive Use" Restrictions

In the 45V Proposed Rule, Treasury did not include any proposed regulations addressing RNG as a feedstock. Instead, Treasury indicated that "[t]he Treasury Department and the IRS intend [in the future] to provide rules addressing hydrogen production pathways that use renewable natural gas … for purposes of the section 45V credit." 88 F.R. 89238. Besides suggesting restrictions borrowed from renewable power (see next section), Treasury indicates that it "anticipates" creating a unique constraint for the RNG to Hydrogen pathway: "For biogas or biogas based RNG to receive an emissions value consistent with … {RNG] and not standard natural gas, the RNG used during the hydrogen production process must originate from the **first productive use of the relevant methane**." 88 F.R. 89238 (emphasis added). "First productive use" of the relevant methane is proposed to mean "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." 88 F.R. 89239.

[2] See Alternative Fuels Data Center | Hydrogen Production and Distribution

While Treasury provides almost no explanation of the purpose of this burdensome restriction solely imposed on the RNG to hydrogen pathway, it appears that the constraint is intended to address potential indirect greenhouse gas emissions triggered when an existing RNG supply is shifted to hydrogen production. However, Treasury has provided no evidence to support their implied assumption that the existing RNG use would be replaced by fossil natural gas resulting in indirect emissions increasess if that RNG is directed to hydrogen production. Currently much of the RNG in the U.S. is used in the transportation sector for compliance with the Renewable Fuel Standard and/or state clean fuel programs like the California Low Carbon Fuel Standard. If an existing RNG supplier leaves this program to send its RNG to new hydrogen production, the requirements of these programs will ensure that the lost RNG is backfilled with other compliant fuels.

Moreover, to the extent that individual cases could result in indirect emissions, that can be addressed when the project's lifecycle carbon intensity is calculated. This approach would allow a case-by-case assessment that would guard against indirect emissions increases.

Applying Renewable Electricity Restrictions (Additionality, Temporality, and Regionality) to RNG

As noted, in the 45V Proposed Rule, Treasury did not include any proposed regulations addressing RNG. In discussing what Treasury intends to propose (beyond its first beneficial use restriction), Treasury stated that it intends to impose conditions on the use of RNG certificates "logically consistent with but not identical to the **incrementality, temporal matching, and deliverability** requirements for electricity derived renewable electricity certificates." 88 F.R. 89238 (emphasis added). In explaining how RNG restrictions would vary, Treasury stated that the rules "would be designed to reflect the ways in which additional RNG … can impact lifecycle GHG emissions and also to address the differences between electricity and methane, including but not limited to the different sources of emissions, markets, available tracking and verification methods, and potential for perverse incentives." 88 F.R. at 89239.

NLC Energy does not believe that there is or can be the necessary factual predicates established to justify the transfer of these electricity concepts to RNG. The situations are very different and the restrictions are not needed.

Incrementality: In theory, renewable power diverted from its current end use to a hydrogen facility could be replaced by grid power with a higher carbon intensity. Because of this, Treasury is limiting renewable power sources for hydrogen facilities to recent renewable power facilities; that is renewable power completed within three years of the start of the hydrogen facility production. As discussed, this is not a significant issue for RNG which is principally being used as a compliance fuel in clean and low carbon transportation fuel programs that, by their structure, will prevent fossil backfilling. For these reasons, NLC Energy opposes blanket requirements limiting hydrogen facilities to purchases from only new sources of RNG.

Temporal Matching: Electricity must be instantaneously consumed meaning that power from intermittent renewable sources (like wind or solar) are not actually matching power consumption by a 24/7 hydrogen production facility. Electricity storage can and will create more capacity to firm up renewable power but the U.S has only modest electrical storage capacity.[3] Some temporal matching of renewable power with claimed renewable power purchases may be justified – for electric power purchases under section 45V.

In contrast, RNG production is not intermittent so there is not a concern that RNG production is not matching temporally the demand of a hydrogen facility off taker. In addition, the natural gas system in North America has extensive storage capacity. Natural gas storage capacity in the US is around 5 trillion cubic feet (Tcf), and it is capable of delivery up to 118 billion cubic feet per day, a rate that exceeds the highest historical average demand documented on the system[4]. Feedstocks, like RNG, could be produced in the summer, for example, stored for several months,

[3] US electricity capacity is about 1.3 million MWs while storage assets are expected to grow to 30,000 MWs by the end of this year. (https://www.eia.gov/todayinenergy/detail.php?id=61202#:~:text=The%20remaining%20states%20have%20a,at%20the%20end%20of%202023).

[4] United States Department of Energy, US Natural Ga Storage Capacity and Utilization Outlook (2016), available at https://www.energy.gov/sites/prod/files/2017/01/f34/U.S.%20Natural%20Gas%20Storage%20Capacity%20and%20Utilization%20Outlook_0.pdf

then transported via a nationwide system to a hydrogen production site. Temporal matching is not an issue for RNG and no restrictions are needed or justified.

Regionality: Regional transmission bottlenecks limit the practical movement of electricity in and out of regions in the county, as noted in the DOE study cited by Treasury as the basis for its proposed regional restrictions. RNG delivery does not raise the same concerns. The natural gas grid in the US is not segregated by regions, as it is on the electric grid. There is no analogy to a Regional Transmission operator (RTO) for gas infrastructure, and no unique emission profile associated with specific regions on the gas grid. Therefore, there is no need to impose regional geographic restrictions for RNG.

Greenhouse Gas (GHG) emission accounting and the GREET Model

We appreciate the work that Argonne National Laboratories has done to provide a GREET model that directly supports the 45V tax credit and have long supported use of GREET as a transparent and well-respected lifecycle emission model that relies on the science of greenhouse gas (GHG) emissions, including the recognition of unique global warming impacts of specific GHG emissions.

The 45VH-GREET model should include additional pathways for RNG to hydrogen beyond landfill gas, including, at a minimum, RNG derived from anaerobic digestion of animal waste, food production waste, and from other organic wastes diverted from landfills. The lifecycle GHG emissions must include avoided emissions associated with the production of feedstocks, like RNG, where the biogas would likely have been flared as carbon dioxide or released into the atmosphere as methane prior to feedstock production. Avoided emissions are scientifically defensible, and critical to recognizing the unique global warming impacts associated with different greenhouse gas emissions, like methane.

In addition, Treasury should only require that a project establish its carbon intensity once based on a GREET model evaluation and that carbon intensity can be utilized by the facility on an ongoing basis unless there are material changes in operations or inputs.

Modification and 80/20 Rule

Treasury should not bar existing hydrogen facilities from switching to RNG and producing qualifying clean hydrogen so long as it meets the Carbon Intensity requirements. Neither the 80/20 rule nor a modification definition should preclude recognition of investments and fuel changes that deliver clean hydrogen. If an existing hydrogen facility makes new substantial investments and/or changes fuel imputs to access RNG, its clean hydrogen should be allowed to secure the 45Z credit at its full value and for the full term.

RNG can be deployed today to jumpstart clean hydrogen production. NLC Energy respectfully requests that the Treasury Department reconsider its threatened and unwarranted restrictions on the use of current and future RNG as a feedstock for hydrogen. We also urge Treasury to make use of the existing GREET modeling precedents including recognition of methane abatement inherent in most RNG production pathways.

Sincerely,

Jay Riker

COO

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