February 22, 2024

Douglas W. O'Donnell
Deputy Commissioner for Services and Enforcement
CC:PA:LPD:PR (REG–117631–23)
Room 5203
Internal Revenue Service
P.O. Box 7604
Ben Franklin Station
Washington, DC 20044

RE: Comments to the Internal Revenue Service (IRS) on REG–117631–23, Section 45V Credit for Production of Clean Hydrogen

Mr. O'Donnell,

NovoHydrogen Holdings LLC ("Novo") appreciates the opportunity to provide our comments on the Section 45V Credit for Production of Clean Hydrogen of the Inflation Reduction Act ("IRA"). Below, we provide comments and proposed language for relevant areas of IRS REG–117631–23.

Novo is a Colorado-based green electrolytic hydrogen project developer whose team has decades of combined renewable energy development and oil and gas experience throughout North America. Novo specializes in the origination, procurement, project development, financial structuring, construction, and operations of green hydrogen projects to serve a wide base of customers in the hard-to-abate industrial, transportation, and power sectors. Novo is part of both the Pacific Northwest Hub (PNWH2) and California Hub (ARCHES) as part of the DOE Hydrogen Hubs program.

Attachment (1) details requested revisions to the Proposed Regulations.

In Attachment (2), we share responses to items specifically requested by the Department of Treasury ("Treasury") and the Internal Revenue Service ("IRS") for comment.

We appreciate your consideration and are eager to work with Treasury and the IRS to address these concerns.

Sincerely,

Mark Purser
Head of Finance
NovoHydrogen Holdings LLC
mark.purser@novohydrogen.com

NOVO HYDROGEN

February 22, 2024

ATTACHMENT 1) REVISIONS TO PROPOSED REGULATIONS

This attachment details requested revisions to the Proposed Regulations. We reproduce text from the proposed guidance and indicate our requested additions and ~~deletions~~ in red. We include justifications in support of our proposed revisions.

Proposed Revision 1 of 4: Hourly matching of lifecycle GHG emissions rate

§1.45V-1 Credit for production of qualified clean hydrogen

(a)(8)(iii) Emissions through the point of production (well-to-gate). The term emissions through the point of production (well-to-gate) means the aggregate lifecycle GHG emissions related to (i) hydrogen produced at a hydrogen production facility during the taxable year through the point of production for taxable years ending prior to January 1, 2028 through the point of production and (ii) qualified clean hydrogen produced at a hydrogen production facility during each hour of the taxable year ending after December 31, 2027 through the point of production.

§1.45V-4 Procedures for determining lifecycle greenhouse gas emissions rates for qualified clean hydrogen.

(a) In general. The amount of the section 45V credit is determined under section 45V(a) of the Code and §1.45V-1(b) according to the lifecycle GHG emissions rate of (i) all hydrogen produced at a hydrogen production facility during the taxable year for taxable years ending prior to January 1, 2028 through the point of production and (ii) qualified clean hydrogen produced at a hydrogen production facility during each hour of the taxable year ending after December 31, 2027 through the point of production. The lifecycle GHG emissions rate of such hydrogen is determined under the most recent GREET model.

Justification:

Proposed §1.45V-1 aggregates all lifecycle GHG emissions related to hydrogen production at a hydrogen production facility throughout an entire year. In practice, this means that a hydrogen production facility cannot produce grey hydrogen during some hours and green hydrogen during others and maintain its eligibility for the Hydrogen Credit. While this annual "calculation period" is backwards looking, it will require hydrogen producers to attempt to ramp their production up and down in real time with renewable generation and EAC availability because relatively little grid electricity can increase the lifecycle greenhouse gas emission rate of electrolytic hydrogen above 0.45 kgCO2e/kgH2. While EAC registries and accounting systems are rapidly developing the ability to track hourly-matched EACs, the annual calculation period would functionally require them to develop the ability to track hourly-matched EACs in real time as they are produced, purchased, and retired. Without real-time EAC tracking,

electrolytic hydrogen producers will likely under-use their electrolyzers because electrolytic hydrogen producers will bear the risk that, in hindsight, EACs were not actually available when they produced hydrogen.

Even if real-time EAC tracking can be developed, the annual calculation period substantially reduces industrial applications for hydrogen. Many industrial processes require roughly constant supplies of feedstock and energy or require on-demand feedstocks and energy. The annual calculation period means that an electrolyzer cannot provide constant or on-demand hydrogen to an industrial process and reliably qualify for the Hydrogen Credit. While battery storage might theoretically allow electrolyzers to operate 24/7, they are cost-prohibitive. Hydrogen storage might also allow electrolyzers to serve an industrial process 24/7, but it also often proves too expensive.

Novo proposes an hourly-calculation period such that the lifecycle GHG emission rate of a unit of hydrogen better reflects the carbon intensity of the electricity actually used to produce such hydrogen. The temporal matching attribute of EACs will enable the administration of hourly calculations of lifecycle greenhouse gas emission rates emissions. Additionally, an hourly-calculation period gives hydrogen producers the flexibility to reliably serve their customers while maintaining a strong incentive to minimize emissions, furthering the overarching intent of the Hydrogen Credit.

Proposed Revision 2 of 4: Venting and flaring exception for safety and routine maintenance purposes (anti-abuse rule)

§1.45V-2 Special rules

(b)(1) […] Accordingly, the section 45V credit is not allowable if the primary purpose of the production and sale or use of qualified clean hydrogen is to obtain the benefit of the section 45V credit in a manner that is wasteful, such as the production of qualified clean hydrogen that the taxpayer knows or has reason to know will be vented, flared, or used to produce hydrogen. If qualified clean hydrogen is vented or flared after the point of production when required for safety, testing, or routine maintenance, it will be considered produced for sale or use in a manner that is not wasteful.

§1.45V-5 Procedures for verification of qualified clean hydrogen production and sale or use.

(d)(2) […] However, a verifiable use does not include—

(i) Use of hydrogen to generate electricity that is then directly or indirectly used in the production of more hydrogen; or

(ii) Venting or flaring of hydrogen except when required for safety, testing, or routine maintenance.

Justification:

Venting and flaring is often required for safety, testing or routine maintenance purposes. If a buyer is paying market price for hydrogen that is ordinarily being put to productive use and otherwise complying with anti-abuse rules, venting and flaring of hydrogen should be permitted for these limited purposes, and such hydrogen should be considered qualified clean hydrogen. Hydrogen producers should not be responsible for the operational decisions of the buyers of hydrogen (except in cases of fraud, waste, and abuse), and Treasury should not penalize hydrogen producers and buyers for safe, responsible operations.

Proposed Revision 3 of 4: Establish GREET model for hydrogen production facility at start of construction

§1.45V-4 Procedures for determining lifecycle greenhouse gas emissions rates for qualified clean hydrogen.

(a) In general. The amount of the section 45V credit is determined under section 45V(a) of the Code and §1.45V-1(b) according to the lifecycle GHG emissions rate of all hydrogen produced at a hydrogen production facility during the taxable year. The lifecycle GHG emissions rate of such hydrogen is determined under the most recent GREET model as of the beginning of construction of a hydrogen production facility. The taxpayer will have the right to elect in any period to use the then most recent GREET model.

Justification:

The Proposed Regulations, in particular §1.45V-4(a), would place hydrogen producers at the mercy of periodic updates to the 45VH2-GREET model. In the Proposed Regulations, there are no limits on the amount of changes the Department of Energy and Treasury may make to the 45VH2-GREET model over time. This creates substantial uncertainty for a hydrogen producer's eligibility for and amount of section 45V credit. While many of the challenges for hydrogen producers may be resolved through careful planning, REC procurement strategies, insurance products, and hedge agreements, this uncertainty cannot be mitigated. Unpredictable GREET model releases post a substantial risk to project investors and create a commercial barrier to securing project financing. Novo proposes that the most recent GREET model as of the beginning of construction for a hydrogen production facility be in effect for that facility for the ten-year duration of the clean hydrogen production credit. Taxpayers should then have the right (but not the obligation) to elect to adopt future versions of the 45VH2-GREET model for the remainder of the credit period. Eliminating this source of uncertainty will encourage investment in clean hydrogen production facilities. We note that beginning of construction is a more suitable milestone than placed in service since construction periods can span tax years, which could result in a new GREET model taking effect during construction, posing a risk to investors who have committed capital prior to beginning of construction.

February 22, 2024

Proposed Revision 4 of 4: Incrementality should be determined based on the placed in service date of an electrical generation facility and not its commercial operations date.

§1.45V-4(d)(3)(i)(A) Procedures for determining lifecycle greenhouse gas emissions rates for qualified clean hydrogen.

(d)(3) […] (i) Incrementality. An EAC meets the requirements of this paragraph (d)(3)(i) if it meets the requirements of paragraph (d)(3)(i)(A) or (B) of this section. Paragraph (d)(3)(i)(C) of this section provides an example that illustrates the application of paragraph (d)(3)(i)(B) of this section.

(A) An EAC meets the requirements of this paragraph (d)(3)(i)(A) if the electricity generation facility that produced the unit of electricity to which the EAC relates has a ~~COD~~ placed in service date that is no more than 36 months before the hydrogen production facility for which the EAC is retired was placed in service.

Justification:

Using a placed in service date rather than a commercial operations date would align section 45V with other credits related to the energy transition including the production tax credit for electricity produced from certain renewable resources under section 45 and the clean electricity production credit under section 45Y. Eligibility for these credits turns in part on the placed in service date of certain categories of electricity generation facilities. Under the "80-20 rule"—applicable to electricity generation facilities and to property subject to depreciation generally—taxpayers may "repower" a facility and receive a new placed in service date for such facility. They may thereby restart the credit period under sections 45 and 45Y for such facility. Under the Proposed Regulations, a wind facility may undergo an 80/20 rule-compliant repowering and qualify for the section 45 or 45Y credit for all power generated at such facility, but may only generate qualifying EACs for a small fraction of such power. An incrementality requirement based on a facility's placed in service date would align section 45V with other energy transition credit regimes and ease the administration of such credits. Taxpayers, and the IRS, will need to make one determination on the placed in service date rather than two, based on placed in service for one set of credits and COD for another.

Furthermore, incrementality based on placed in service dates prevents unintended handicaps for regions and states with large existing renewable generation fleets. States like Texas, Florida, and Hawaii (in Florida, this fleet is predominantly nuclear-based) have large existing renewable generation fleets and are essentially their own "regions" under the Proposed Regulations. Because there is already substantial renewable penetration in these states, renewable generation facilities with recent CODs make up a relatively small share of renewable generation. Hydrogen producers in these states will likely face a highly distorted EAC market, but, because of the regionality requirement in the Proposed Regulation, they will not be able to purchase EACs from neighboring states with young, developing renewable generation fleets.

February 22, 2024

ATTACHMENT 2) RESPONSES TO REQUESTS FOR COMMENT

This attachment details responses to specific items that Treasury and the IRS requested for comment.

Explanation of Provisions Part V.C – Treatment of T&D losses

"The Treasury Department and the IRS seek comments on whether a different treatment would be more appropriate to account for transmission and distribution line losses."

Novo recommends removing transmission and distribution line ("T&D") loss criteria from the determination of lifecycle GHG emissions for hydrogen produced at a hydrogen production facility due to both the complexity of tracking and the lack of significant impact on emissions. The deliverability requirements in the Proposed Regulations are sufficient to reflect general transmission constraints and congestion and match power-systems operation. As Treasury and the IRS point out elsewhere in the Explanation of Provisions: "transmission limitations […] exist within these specified regions but [Treasury and the IRS] are not aware of readily administrable options to reflect those grid constraints. The DOE has generally found that inter-regional transmission constraints tend to be greater than within-region constraints." However, if Treasury decides to include T&D loss criteria, taxpayers must be entitled to purchase EACs or other instruments to mitigate the impact of such T&D losses on the lifecycle GHG emission rate of their hydrogen.

Explanation of Provisions Part V.C.2.A.I – Avoided Retirements Approach

"The Treasury Department and the IRS seek comments on whether to recognize an avoided retirements approach that would treat EACs from an existing electricity generating facility as satisfying the incrementality requirement if the facility is likely to avoid retirement because of its relationship with a hydrogen production facility. With respect to this potential approach, the Treasury Department and the IRS request comments on the following:

i) the appropriate criteria that should be considered to assess retirement risk;"

Novo recommends that the retirement risk approach should be clear and administrable. Hydrogen producers should be able to enter binding long-term arrangements for the sale of EACs with the owner or operator of a generating facility and rely on a certificate executed under penalty of perjury from such owner or operator that, but for such long-term arrangement for the sale of EACs, the facility would be retired, the owner or operator of the facility would go into default under a financing agreement, or that, because of the long-term arrangement for the sale of EACs, the owner or operator of the facility was able to obtain financing for the improvement and/or critical repair of the generating facility.

February 22, 2024

Explanation of Provisions Part V.C.2.A.II – Zero or Minimal Induced Grid Emissions Through Modeling or Other Evidence

"The Treasury Department and the IRS request comments on this demonstrated or modeled minimal-emission approach, including:

i) the circumstances in which it should be available and the criteria that are appropriate to evaluate and determine whether those circumstances occur;"

Novo recommends that incrementality requirements should be deemed satisfied via the demonstrated minimal-emissions approach if the hydrogen production facility is:

1) Located in a Balancing Authority that generated and imported, if applicable, electricity that was at least 90% generated by minimal-emitting electricity generators during the three years prior to the year in which construction of the hydrogen production facility began, or
2) Located in a state or U.S. territory that generated and imported, if applicable, electricity that was at least 90% generated by minimal-emitting electricity generators during the three years prior to the year in which construction of the hydrogen production facility began.

In areas where power is 100% generated by minimal-emitting electricity generators, incrementality and hourly-matching should be considered satisfied because there is no danger of hydrogen production inducing emissions elsewhere on the grid. However, if Treasury is seeking to develop a demonstrated or modeled minimal-emission approach that can both be administered and have a material impact on hydrogen producers, it must use a threshold lower than 100%. Novo recommends a threshold of 90% because it aligns with the 10% allowance (discussed below) and because it is consistent with the EU's Delegated Reg. 2023/1184, which treats electricity procured from a grid with over 90% clean energy penetration as clean for certain clean fuels requirements.

Furthermore, Novo recommends that minimal-emitting generators should satisfy the incrementality requirement if they are located in a state and U.S. territory that has committed to providing electricity that is 100% generated by minimal-emitting generators prior to January 1, 2045, or that have adopted policies under which new load will not increase grid emissions.

Purchasing EACs from existing minimal-emitting electricity generators under these conditions would have limited or no induced grid emissions.

ii) who should apply under this approach, the electricity generation facility, the hydrogen producer, or both.

Under the approach described above, taxpayers should not be required to apply to Treasury. Instead, Treasury, in collaboration with DOE and the EIA should annually publish a map of Balancing Authorities, States and U.S. Territories that satisfy the above requirements. This would be akin to the map published by the DOE showing "energy communities" for purposes of several energy transition credits, including sections 45, 45Y, 48, and 48E.

February 22, 2024

Explanation of Provisions Part V.C.2.A.III – Formulaic approaches to addressing incrementality from existing clean generators

"The Treasury Department and the IRS also seek comments on whether 5 percent is the appropriate magnitude for an allowance. In particular, as noted earlier, data show that curtailment rates have increased in recent years, and NREL's Cambium model predicts additional increases going forward. In light of these data and projections, the Treasury Department and the IRS seek comments on whether a higher amount, such as up to 10 percent, would be appropriate, either in general or in certain cases or circumstances."

We strongly support a 10% allowance rather than a 5% allowance because it more accurately reflects the expected share of periods with negative prices in grids with high renewable penetration. As the Treasury Department and the IRS point out, negative wholesale prices have increased from 2.3% of hours in 2018 to 6.3% of hours in 2022—a nearly 30% average annual increase. As intermittent solar and wind production grow, we expect this figure to grow in tandem. At this recent rate of growth, negative wholesale prices will likely reach over 10% of hours in 2024.

The Treasury Department and the IRS also seek comments on:

i) how a five-percent allowance should be tracked, allocated, and administered and how feasible it is for EAC tracking systems to incorporate data on such an allowance;

Novo recommends that administration of the ten-percent allowance should only satisfy the incrementality requirement and that EACs issued under such allowance should be subject to applicable temporal matching and deliverability requirements. In other words, prior to January 1, 2028, under the transition rule described in Proposed Regulation § 1.45V–4(d)(3)(ii)(B), EACs issued under the 10% allowance should be subject to annual- rather than hourly-temporal matching requirements.

The 10% allowance has the potential to ease power procurement challenges and bottlenecks for hydrogen producers across regions. However, minimal-emitting generators and hydrogen producers will not be able to effectively plan or contract under the 10% allowance because generators do not know *what* ten percent of their annual generation will be at the start of the year. For example, hydroelectric generation is highly dependent on large-scale weather patterns. Long droughts and periods of heavy rain can substantially reduce or increase the amount of electricity produced by a given hydroelectric facility. To address this, Novo proposes a three-year lookback wherein an existing generator is eligible to produce a quantity of incrementality-compliant EACs in a given calendar year equal to ten percent of average annual generation in the previous three calendar years. A three-year look back period is appropriate because any facility with less than three years of operational data should otherwise qualify under the proposed incrementality requirement.

While the incrementality requirement is necessary for EACs to be considered for purposes of the hydrogen credit, it is not generally seen as necessary for organizations and entities that purchase EACs to meet sustainability requirements. It is important that minimal-emitting generators be entitled to decide

which of the EACs they produce will be treated as incrementality-compliant to allow them to effectively contract with hydrogen producing customers and voluntary EAC purchasers.

This can be accomplished by administering the 10% allowance through qualified registries or accounting systems and confirming the allowance in the annual verification report described in Proposed Regulation § 1.45V–5(a). A qualified registry or accounting system could provide minimal-emitting generators with 10% allowance certificates that could be appended to eligible EACs that would otherwise not be qualifying EACs because of the incrementality requirement.

ii) whether the five percent should apply to all existing minimal-emitting electricity generators in all locations or a subset and for what reasons;

Novo recommends that the ten percent rule should apply to existing minimal-emitting electricity generators in all locations due to the growing penetration of these resources in practically all regions, and to ensure that regions with large existing minimal-emitting electricity generators and regions with long interconnection queues and delayed minimal-emitting electricity generator deployment are not unfairly disadvantaged by the incrementality requirement.

iii) whether such an allowance should be assessed at the individual plant level or across an operator's fleet within the same deliverability region.

Novo recommends that such an allowance should be assessed at the individual plant level, consistent with the expected attributes of EACs.