



LyondellBasell Tower
1221 McKinney, Suite 300
Houston, TX 77010
LYB.com

February 26, 2024

Submitted through REGULATIONS.GOV

Internal Revenue Service
CC:PA:LPD:PR
Room 5203
P.O. Box 7604
Ben Franklin Station
Washington, DC 20044

Re: Notice of Proposed Rulemaking – Section 45V
REG-117631-23

To Whom It May Concern:

LyondellBasell is a leader in the global chemical industry creating solutions for everyday sustainable living. Through advanced technology and focused investments, LyondellBasell is enabling a circular and low carbon economy. In alignment with this purpose and focus, we are collaborating with Air Liquide and Chevron to evaluate and potentially advance the development of a clean hydrogen and ammonia production facility along the U.S. Gulf Coast. This project is a part of the HyVelocity Gulf Coast Hydrogen Hub, which was selected by the U.S. Department of Energy (DOE) Office of Clean Energy Demonstrations to begin award negotiations.

Hydrogen is one of the few decarbonization levers available to the chemicals sector, as a hard-to-abate industry, and LyondellBasell welcomes the opportunity to adopt it as a potential alternative fuel source at scale as part of our NetZero initiative to reduce our greenhouse gas emissions. In addition to the production facility referenced above, LyondellBasell plans to retrofit several furnaces in our Gulf Coast manufacturing facilities to utilize clean hydrogen as fuel before 2030. The Hydrogen Production Tax Credit, found at Section 45V of the Internal Revenue Code is a key consideration in moving ahead with these plans.

LyondellBasell anxiously awaited initial guidance under Section 45V, and while we appreciate the efforts of the U.S. Department of Treasury (Treasury) and the Internal Revenue Service (IRS) in issuing the Section 45V notice of proposed rulemaking (NPRM), LyondellBasell, as both a potential clean hydrogen producer and end user, urges that modifications be made to ensure that Section 45V jumpstarts clean hydrogen production capacity in furtherance of the Administration's stated goal of reducing U.S. emissions 50-52 percent by 2030. Specifically, we recommend the following modifications to provide certainty at the point of investment decisions:

- Provide flexibility on each of the Three Pillars that reflects economic, market and technological realities.
- Permit taxpayers to use the 45VH2-GREET model in effect at the time construction of the clean hydrogen facility begins.
- Allow 45VH2-GREET model background data adjustments to incentivize technology innovation, operational improvements, and responsible sourcing of low carbon intensity feed and energy sources.
- Align Renewable Natural Gas (RNG) certification with existing book-and-claim protocols, such as Renewable Fuel Standards (RFS) and Low Carbon Fuel Standards (LCFS) programs, and eliminate the First Productive Use requirement.

I. Background

Section 45V provides a tax credit for the production of qualified clean hydrogen beginning January 1, 2023. Assuming the prevailing wage and apprenticeship requirements are met, the amount of the credit under Section 45V is calculated by multiplying \$3.00 by the number of kilograms of clean hydrogen produced. The amount of the Section 45V credit is reduced where the lifecycle greenhouse gas (GHG) emissions rate of the clean hydrogen is greater than or equal to 0.45 kilograms of CO₂e per kilogram of hydrogen. Section 45V(c)(1)(B) specifies that lifecycle GHG emissions "only include emissions through the point of production (well-to-gate)" as determined under the most recent Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) model, developed by Argonne National Laboratory. Accordingly, it is critical for a producer to determine the well-to-gate lifecycle GHG emissions rate of hydrogen that is produced to determine the available amount of Section 45V credit, if any.

II. Requested Revisions to the 45VH2-GREET Model

As detailed above, the calculation of the Section 45V credit depends, in large part, on the lifecycle GHG emissions of the hydrogen as determined by the GREET model. LyondellBasell commends the collaboration between Treasury and the DOE, and the

work of DOE to create a new GREET model specifically for the purpose of calculating the lifecycle GHG emissions needed for the Section 45V tax credit. LyondellBasell urges, however, that the model be updated to provide greater accuracy in calculating the lifecycle GHG emissions for hydrogen by allowing taxpayers to input actual data when available rather than relying on values and assumptions built into background data of the model, many of which may bear no resemblance to the actual factors for a given project.

Indeed, allowing for greater accuracy of the data input into the model helps ensure that the projects with the greatest carbon reduction benefits are encouraged, and avoids bias that could be built into the model toward a particular technology. For example, we have reviewed the carbon intensity (CI) scores of inputs for feed and electricity currently being sourced at existing facilities or being planned for future projects and have discovered the CI scores of these inputs are lower than the background assumptions currently included in the 45VH2-GREET model. LyondellBasell requests the 45VH2-GREET model be modified to allow for a taxpayer that has actual background data, that can be verified by a third party, to be permitted to input such data into the model. This flexibility would allow a taxpayer, such as LyondellBasell, to evidence a lower CI score than the model provides, using actual, verified values. To require otherwise deprives taxpayers, including LyondellBasell, of a credit amount to which it is entitled and eliminates the incentive to source lower scoring inputs.

Similarly, taxpayers should be able to enter into the model actual data that reflects their operations and technology. For example, LyondellBasell expects to deploy CO₂ recovery that is more effective than currently accounted for in the 45VH2-GREET model. However, a different taxpayer could deploy CO₂ recovery technology that is less effective than contemplated in the model. In either case, the 45VH2-GREET model produces a CI score that does not accurately value the capability of the technology deployed. Again, maximum accuracy should be encouraged in the 45VH2-GREET model such that its resulting calculation reflects actual lifecycle GHG emissions of the hydrogen produced at the particular facility, as statutorily provided in Section 45V, rather than simplified estimations that could be built on generalized assumptions and do not encourage development and adoption of new technologies. Similar to accuracy background data, a GREET model that allows the use of taxpayer-specific operations and technology would further incentivize taxpayers to undertake additional CI reduction practices as such practices would be accurately reflected in the model results thereby accelerating market adoption.

Finally, LyondellBasell requests that the 45VH2-GREET model be as transparent as possible, with the source of data points made clear and all assumptions or calculations

made available for evaluation. Transparency is important not only from a taxpayer standpoint, but from an administrability standpoint as well.

If such flexibility cannot be provided or is limited through the standardized 45VH2-GREET model, Treasury and the IRS should provide a broader path to seeking a provisional emissions rate (PER). Currently, the proposed regulations only permit a taxpayer to request a PER where the lifecycle GHG emissions rate has not been determined under the most recent 45VH2-GREET model with respect to hydrogen produced by the taxpayer at a hydrogen production facility. Specifically, the proposed regulations provide that the lifecycle GHG emissions rate is not determined if either the feedstock used by the facility or the facility's hydrogen production technology is not included in the most recent 45VH2-GREET model. As described above, the ability to adjust the data in the model to reflect reality is critical to accurately evaluate facility lifecycle GHG emissions rates. Thus, LyondellBasell requests that PERs be allowed not just when the 45VH2-GREET model does not account for the feedstock or technology, but more generally when the model does not account for the lifecycle GHG emission rate of the taxpayer's hydrogen production facility. LyondellBasell does not anticipate a more flexible approach to PERs would overwhelm DOE given the burdens on a taxpayer associated with seeking a PER; only taxpayers who believe that the 45VH2-GREET model produces values well below reality will pursue a PER.

III. Comments to the Proposed Regulations

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

While we advocate for a 45VH2-GREET model that properly reflects the actual lifecycle GHG emissions with respect to a particular facility, we also appreciate and are concerned that an ever-changing model creates uncertainty over the course of the ten-year credit period. Significant time and investments are required to stand-up hydrogen production facilities and the decision to make such investments is made well before the taxable year in which any credits are available.

The NPRM ties a taxpayer's Section 45V credit for the taxable year to the 45VH2-GREET model that is publicly available on the first day of the taxable year during which the clean hydrogen is produced. To provide certainty and prevent penalizing first movers, LyondellBasell urges that the final rules provide a safe harbor under which a taxpayer may use the most recent 45VH2-GREET model available at the time at which construction of the facility begins (as has been defined for federal income tax purposes generally for energy tax credits) in lieu of the model available on the first day of the taxable year during which the clean hydrogen is produced. For many taxpayers, the availability and value of

the Section 45V credit is the economic driver of a hydrogen production project and often critical to the ability to obtain financing. The ability of taxpayers to predict the availability and value of the credit at the beginning of construction would provide some certainty in an environment where significant capital is required to stand up a clean hydrogen production facility and decisions are made years before the facility will be placed in service.

Separately, Section 45V(c)(2)(B) provides that the term “qualified clean hydrogen” does not include any hydrogen unless, *inter alia*, the production and sale or use of such hydrogen is verified by an unrelated party. Proposed § 1.45V-1(c) provides that the Section 45V credit for any taxable year is determined with respect to the clean hydrogen produced by the taxpayer during that taxable year although the verification of the production and sale or use of such hydrogen may occur in a later taxable year. Under the NPRM, a taxpayer would not be eligible to claim the Section 45V credit until all relevant verification requirements, and the verification itself, have been completed. Therefore, despite such verification occurring in a later taxable year, under the NPRM, the Section 45V credit would be properly claimed with respect to the taxable year of hydrogen production and subject to the general period of limitations for filing a claim for credit or refund.

Treasury and the IRS were correct to seek comments on the practicality of such a proposal. Given the robust requirements surrounding verification, it is very likely that verification will be completed after the extended date for tax return filing, particularly in the early years as taxpayers, and those who verify, are becoming familiar with the process. There is a real cost to delaying the availability of the credit on a time value of money basis, including the cost of interim financing during the period until the credit can be claimed, which would unnecessarily and substantially drive up the cost of producing clean hydrogen. This timing is made impossible for those taxpayers who will seek to monetize Section 45V through elective direct pay or transferability because under the rules provided for Sections 6417 and 6418, taxpayers would be unable to use those very important credit monetization options. This is the case because, as proposed, an election under either monetization option must be made on an original return. Taken together with the rules regarding verification, this would require that the verification reports be completed by the extended return filing of the original return in all cases where taxpayer intends to monetize the credit.

As a solution, LyondellBasell suggests that, at a minimum, for elective direct pay and transferability, taxpayers should be allowed to make a claim and election prior to formal completion of the verification report. Should a verification report necessitate a change in

the Section 45V claim, taxpayers would file an amended return or be required to make an adjustment through an abbreviated process.

B. Proposed § 1.45V-4. Procedures for determining lifecycle GHG rates (Three Pillars).

(i) Incrementality.

LyondellBasell recognizes the need to establish systems that prevent significant grid emissions from clean hydrogen production, and appreciates the consideration of mechanisms to qualify EACs for existing sources of minimally emitting generation. LyondellBasell supports the use of formulaic approaches to incrementality from existing generation and requests that these approaches align to deliverability. For example, Treasury and IRS note in the NPRM that curtailment rates vary widely across ISO/RTO regions and suggests that it would be appropriate to recognize some percentage of curtailments as qualifying for EACs because they are unlikely to induce grid emissions. Treasury and IRS propose the use of a national average basis as allowance. However, LyondellBasell requests the use of curtailments rates that are aligned with deliverability to closest contractual hub. Regions with high rates of curtailment of clean energy generation would be better served by focusing investments on storage and transmission capacity to enable increased utilization of existing assets where areas with lower curtailment rates likely need new sources of generation. Utilizing curtailment rates that reflect deliverability will support supply/demand balance and more efficient deployment of capital to meet the specific needs of the deliverability region.

As DOE notes in its report “On the Path to 100% Clean Electricity”, continued investment in a diverse set of clean energy generation technologies that provide firm capacity lowers cost of deployment and ensures high levels of clean energy generation capacity. Sections 45Y and 48E of the Inflation Reduction Act (IRA) reflect this need by providing a tax incentive for facilities on the basis of the GHG rate associated with the lifecycle emissions of the electricity produced rather than a specific technology pathway.

Additionally, Section 45Y establishes provisions for qualified incremental production through expansion of a facility, electricity produced by combustion or gasification, and that GHG emissions captured or used by the taxpayer are not included in the facility’s emissions rate. Lastly, Section 45Y defines a pathway for obtaining a PER for facilities for which an emissions rate has not been established. Taken together, any electricity production pathway, including natural gas combustion with or without CCS, can potentially qualify for a credit.

LyondellBasell believes that many of the facilities incentivized through Section 45Y or 48E will supply hydrogen production facilities. For all of these reasons, LyondellBasell suggests that the final rules adopt a provision under which electricity produced at Section 45Y or 48E facilities would be deemed to meet the three pillars of Section 45V.

Such a rule would resolve two key issues in Section 45V implementation: (1) the process to determine Section 45Y eligibility for fossil based clean energy production with the addition of CCS could be used to determine whether facility capture rates are sufficient for an existing fossil generation facility with new CCS to for Section 45Y, and (2) facility emissions rates, PERs and other verifiable data utilized in the administration of Section 45Y should inform inputs into the 45VH2-GREET model, resolving emissions validation issues associated with power generation cited in the NPRM.

In sum, we believe that failing to reflect the diverse set of technologies available for low carbon electricity generation in Section 45V rulemaking, directly or indirectly through the 45VH2-GREET model and EAC qualification, will not foster an equitable energy transition while promoting domestic energy security.

(ii) Temporal matching.

LyondellBasell joins many other stakeholders who are concerned about the transition from annual to hourly matching in 2028. The NPRM justifies this date based on the prediction and expectation that hourly matching will be feasible at such a time. LyondellBasell and others do not have such confidence, even in the best of scenarios; unfortunately, investments in these facilities must be made in the short-term and the threat of being required to adopt hourly matching without confidence in the future feasibility of hourly matching makes it difficult for investment decisions that must be made today.

It should also be highlighted that hourly matching of renewable output and hydrogen production adds significant cost and complexity for projects targeting greater than 50% of electricity procured using renewable. This provision also provides minimal to no measurable environment benefit for non-electrolytic H2 production pathways that present no measurable risk of induced grid emissions. Over time, the output of the renewable resource has a zero marginal cost (if not a negative marginal cost, if the resource itself qualifies for tax credits), so it will displace output from a thermal unit the vast majority of the time. Because power is bought and sold in a pool over time, even if the renewable resource is producing more or less energy than the hydrogen facility requires at a given moment, the times when there is a mismatch, the additional output from the renewable resource will displace the emissions from a thermal, carbon-emitting

resource on the power grid, so the intent of the match is met over time, if not moment by moment.

For those rare times when transmission congestion does cause one renewable resource to displace another, it will not matter if the output of the renewable resource and hydrogen facility are matched hourly or annually.

In addition, the NPRM centers the 2028 transition date around the readiness of systems to support hourly tracking without fully addressing the challenge of meeting 24-7 incremental clean energy generation. Between current rulemaking, limitations in GREET capabilities, and project development timelines, incremental capacity is a de facto limit to renewable generation. In a scenario where a project developer expands its renewable energy portfolio with incremental wind and solar generation in an attempt to achieve hourly match, in some U.S. areas, there is likely at least five (5) hours per day that may be a challenge to match with existing battery storage technology. As DOE notes in its Commercial Liftoff Report for Long Duration Energy Storage, inter-day storage technologies that can support 24-7 hourly matching through hardening of PPAs are still being piloted and will not be demonstrated at scale until the year 2028 or beyond.

If hourly matching is required, the date on which it should be required should be tied to market and technology readiness, both in terms of clean 24-7 generation capacity and tracking capabilities, and EAC market maturity. As DOE notes in its whitepaper, there are significant market, regulatory and state-based policy hurdles to overcome to enable system deployment and development of an efficient EAC market. To provide certainty for investment decisions that need to be made today, the final rules should not only confirm that the transition date will be tied to feasibility but also that such date be no earlier than 2032.

LyondellBasell also suggests that, going forward, the IRS work closely with the appropriate Federal Energy Regulatory Commission (FERC) staff to develop rules associated with power that reflect the commercial and reliability realities of power grids to ensure the Section 45V credit is available, cost-effective, and works with the commercial and reliability realities of organized power markets that power regulators have long recognized.

(iii) Deliverability.

LyondellBasell shares the concerns of many other commenters on the deliverability requirement, recognizing that creating artificial geographic boundaries disadvantages certain regions and hinders the development of clean hydrogen production facilities. For example, the regulations propose subdividing the SERC region and creating a smaller Delta region, which encompasses our facility in Lake Charles. While the region could benefit from clean hydrogen production, the location has relatively poor wind resource with very few wind projects operational or planned, and that will make it difficult for any hydrogen production facility to source an adequate supply of qualifying EACS as currently defined in the NPRM. More specifically, breaking out MISO into different regions will make the non-daylight hours very challenging to obtain adequate supply. We request that cross regional EACs that have direct connection to hydrogen production facilities be deemed to meet the deliverability requirement.

IV. Comments Regarding the Use of Renewable Natural Gas (RNG) in Clean Hydrogen Production

RNG provides a low CI feedstock and input for the production of clean hydrogen and its use should be encouraged and incentivized. In the preamble to the NPRM, Treasury and IRS expressed a desire to create a type of parity between RNG and electricity acquired and retired under an energy attribute certificate (EAC). However, the reality is that the RNG is produced and delivered very differently from the electricity market and the policy considerations of each must be separately evaluated. We therefore recommend that the three pillars should not apply to RNG.

For example, the NPRM suggests that to create parity with the incrementality requirements for EACs, it is anticipated future rules will require that RNG must originate from the "First Productive Use" for the lifecycle GHG emissions calculation of the hydrogen produced with the RNG to benefit from its particular attributes. This proposal is not feasible, as RNG is delivered through national and interstate common carrier pipelines from multiple sources.

LyondellBasell further supports a book-and-claim system as it relates to RNG. Book-and-claim is an industry standard allowed by EPA's Renewable Fuel Standard (RFS) and California's Low Carbon Fuel Standard (LCFS) and appropriately addresses the logistical constraints with having RNG development located physically near waste biomass sites rather than in a centralized location. Under these well-established book-and-claim protocols, RNG can be collected from dispersed locations, stored when necessary, and transported easily. Taking a similar book-and-claim approach for clean hydrogen,



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taxpayers would be able to claim the Section 45V credit using the attributes of purchased RNG in the calculation of the lifecycle GHG emissions rate, even if there is no direct connection between the RNG development site and the hydrogen facility.

Thank you in advance for your consideration on these important topics. LyondellBasell believes in the future of U.S. hydrogen production and hopes that final rules under Section 45V provide the necessary incentives to support this nascent industry.

Sincerely,

A handwritten signature in black ink that reads 'Tracey Campbell'.

Tracey Campbell
Executive Vice President, Sustainability & Corporate Affairs