December 3, 2022

Internal Revenue Service,
CC:PA:LPD:PR (Notice 2022-58),
Room 5203, P.O. Box 7604,
Ben Franklin Station,
Washington, DC 20044.

Re: World Energy comments in response to Notice 2022-58 (filed electronically via the Federal eRulemaking Portal at www.regulations.gov).

World Energy applauds the Biden administration for its leadership in enacting meaningful incentives to spur the production of clean hydrogen and sustainable aviation fuel (SAF).

What follows are World Energy's comments regarding implementation of the §45V credit for the production of clean hydrogen (§45V credit) and the §45Z clean fuel production credit (§45Z credit) provided for under §§ 13204 and 13704 of the *Inflation Reduction Act of 2022* (IRA)(P.L. 117-169).

Timely guidance and implementation are necessary to provide the clarity and the certainty needed to maximize the investment opportunity created by the IRA. World Energy is actively building new facilities that will produce approximately 500 million gallons of new SAF and dramatically expand the production and use of clean domestic hydrogen. The §§45V and 45Z credits, in tandem with the §40B sustainable aviation tax credit (§40B credit), are critical to our success.

About World Energy:

World Energy is a low-carbon solutions provider focused on helping the world's leading companies make their carbon net-zero commitments real. The company is delivering ever-better solutions at an ever-greater scale to efficiently cut, accurately account, and transparently report carbon emissions reductions in operations based in air and on water, rail, and road. Founded on Earth Day in Boston in 1998, the company has been commercializing, producing, and distributing low-carbon fuels for more than two decades.

Sustainable Aviation Fuel:

World Energy operates the world's first and still North America's only Sustainable Aviation Fuel (SAF) commercial production facility. World Energy's SAF is used today by global sustainability leaders in aviation, including Amazon Air, United, JetBlue, Rolls-Royce, Boeing, and Etihad to reduce airline emissions by up to 85 percent.

The company currently produces 6 million gallons annually of neat (unblended) SAF at our facility in Paramount, CA. The low carbon fuel is delivered to Los Angeles International Airport and used in commercial aircraft. World Energy's Paramount, CA facility received permits[1] in 2022 to convert a

[1] World Energy April 22, 2022 press release "*World Energy Secures Permits; Will Completely Convert Its Southern Calif. Refinery to Create North America's Largest, World's Most Advanced Sustainable Aviation Fuel Hub*."

former petroleum refinery into a 100 percent renewable fuels operation. This will increase the facility's SAF output to 250 million gallons annually.

In addition to expanded SAF production in Paramount, CA, World Energy is converting existing assets in Houston, TX to a new SAF hub that will allow the company to produce another 250 million gallons of SAF annually.[2] By 2026, World Energy plans to deliver 500 million gallons of SAF annually into the U.S. marketplace.

These 500 gallons will contribute the first significant volumes toward meeting the SAF Grand Challenge, and in the process, significantly reduce greenhouse gas (GHG) emissions associated with the use of aviation fuel. World Energy has committed to producing 1 billion gallons annually by 2030, a third of the Challenge's annual target.

Clean Hydrogen:

World Energy is a leader in the effort to expand the production and use of clean hydrogen. On August 23, 2022, World Energy CEO and Founder Gene Gebolys was joined by Canadian Prime Minster Justin Trudeau and German Chancellor Olaf Scholz to announce the company's new green hydrogen facility in Canada. At the event, the two leaders announced an agreement between Canada and Germany that will stimulate the development of World Energy's green hydrogen production.

When complete, the site in Stephenville, Newfoundland will supply 250,000 metric tons of green hydrogen annually to global markets becoming Canada's first large-scale green hydrogen facility. This is a massive strategic imperative for Europe giving them access to clean hydrogen and ammonia, fundamental building blocks of manufacturing, that will provide a real alternative for Russian natural gas. This green hydrogen eventually can also be used for SAF production creating a fuel solution that starts green and ends green and therefore further driving down the carbon emissions in the aviation sector.

§45V Credit for the Production of Clean Hydrogen:

The §45V credit is calculated by multiplying the kilograms (kg) of clean hydrogen produced at a qualifying facility by the applicable credit amount. The base maximum credit level is $.60 per kg. An increased maximum credit level of $3 per kg can be claimed by taxpayers meeting IRA's prevailing wage and apprenticeship requirements. The percentage of the allowable credit that can be claimed is based on the lifecycle well-to-gate emissions associated with the production of the hydrogen. Hydrogen produced via a process resulting in a lifecycle GHG emissions rate exceeding 4 kg of CO_2-e per kg of hydrogen cannot utilize the §45V credit.

CO_2-e per kg of Hydrogen	**Credit Percent**
Btwn 4kg – 2.5kg	20%
Less than 2.5kg – 1.5kg	25%
Less than 1.5 kg - .45 kg	33.4%
Less than .45kg	100%

[2] Word Energy August 18, 2022 press release *"World Energy to Build Its Second SAF Facility at Its Current Houston Ship Channel Production and Distribution Hub."*

World Energy Perspective on Implementation of the §45V Credit:

- Notice 2022-58 seeks comment on which specific steps and emissions should be included within the well-to-gate system boundary for clean hydrogen production from various resources.

For purposes of the §45V credit, lifecycle GHG emissions are defined in §211(o)(1)(H) of the Clean Air Act (42 U.S.C. 7545(o)(1)(H)).[3]

§211(o)(1)(H) of the Clean Air Act defines lifecycle GHG emissions as:

> *"(H) Lifecycle greenhouse gas emissions*
>
> *The term "lifecycle greenhouse gas emissions" means the aggregate quantity of greenhouse gas emissions (including direct emissions and significant indirect emissions such as significant emissions from land use changes), as determined by the Administrator, related to the full fuel lifecycle, including all stages of fuel and feedstock production and distribution, from feedstock generation or extraction through the distribution and delivery and use of the finished fuel to the ultimate consumer, where the mass values for all greenhouse gases are adjusted to account for their relative global warming potential."*

In determining CO_2-e emissions, the IRA provides that the lifecycle GHG emissions shall include only emissions through the point of production (well-to-gate), as determined using the Greenhouse gases, Regulated Emissions, and Energy use in Transportation (GREET) model.

Consistent with the letter and spirit of the statute, World Energy encourages Treasury to hue closely to the definition of lifecycle GHG emissions provided when determining the lifecycle CO_2-e emissions associated with the various feedstocks that are used to produce hydrogen. Consistent with the GREET model and the lifecycle modeling used for purposes of the California Low Carbon Fuel Standard (LCFS), it is important that lifecycle CO_2-e emissions modeling fully and accurately account for upstream emissions associated with feedstock extraction and production. This will ensure that §45V credits reward hydrogen production facilities that have a maximum climate mitigation benefit.

- Notice 2022-58 seeks comment on what stage in the production process a taxpayer should be able to file for a provisional lifecycle GHG emissions rate.

A clean hydrogen facility's well-to-gate lifecycle CO_2-e emissions determines the percentage of §45V credits that can be claimed by a taxpayer. In addition, the ability to utilize §45V credits will in many cases play a key role in determining the economic viability of a clean hydrogen production facility.

This in mind, World Energy asks the U.S. Department of the Treasury (Treasury) to allow taxpayers to apply for a provisional lifecycle GHG emissions rate during a project's design phase and at any subsequent phase of a facility's development. This will promote business certainty and allow taxpayers to make informed economic decisions when considering the construction of a clean hydrogen facility. This will in turn help promote additional clean hydrogen production, which Congress clearly intended when it enacted the IRA.

[3] §45V(c)(1)

California's LCFS provides a process that allows stakeholders to apply for a provisional carbon intensity score at a fuel project's design phase. In the interest of implementing the §45V credit in an efficient manner that avoids unneeded duplication, World Energy asks Treasury to the degree practicable to utilize a process akin to the one provided under the California's LCFS to grant provisional lifecycle GHG emissions rates during the project's design phase.

- Notice 2022-58 seeks comment on whether indirect book accounting factors that reduce a taxpayer's effective GHG emissions (also known as book and claim system), including, but not limited to, renewable energy credits, power purchase agreements, renewable thermal credits, or biogas credits, should be considered when calculating the §45V credit.

World Energy supports accounting for the environmental attributes of feedstock and energy inputs used in the production of hydrogen for purposes of determining a clean hydrogen facility's GHG emissions rate. This can be readily accommodated through the utilization of book and claim accounting, which is commonly used for compliance purposes under both the California LCFS and the federal Renewable Fuel Standard (RFS).

This approach is clearly consistent with the will of Congress. During consideration of the IRA in the U.S. Senate,[4] Senator Ron Wyden (D-OR), the Chairman of the U.S. Senate Committee on Finance, and Senator Tom Carper (D-DE) engaged in a colloquy on this issue. Below is the relevant excerpt from the exchange:

> *"Mr. Carper: It is also my understanding of the intent of section 13204, is that in determining 'lifecycle greenhouse gas emissions' for this section, the Secretary shall recognize and incorporate indirect book accounting factors, also known as a book and claim system, that reduce effective greenhouse gas emissions, which includes, but is not limited to, renewable energy credits, renewable thermal credits, renewable identification numbers, or biogas credits.*
>
> *"Is that the chairman's understanding as well?*
>
> *"Mr. Wyden: Yes."*

World Energy asks Treasury to incorporate the environmental attributes of hydrogen production inputs in the well-to-gate lifecycle GHG emissions analysis it uses for purposes of the §45V credit.

§45Z Clean Fuel Production Credit (CFPC):

- Notice 2022-58 seeks comment on what methodologies Treasury should consider when assessing the lifecycle GHG emissions of SAF for the purposes of §45Z(b)(1)(B)(iii)(II).

Both the §45Z credit and §40B credit require reductions in lifecycle GHG emissions in order to claim the credit. World Energy encourages Treasury to utilize science-based lifecycle methodologies that incentivize all methods and approaches for reducing GHG emissions from SAF. The methods should be

[4] *Congressional Record*, August 6, 2022, Pages S4165-S4166.

transparent, incorporate well-accepted scientific research on lifecycle emissions, and allow for third-party verification.

In addition to the method provided in statute,[5] World Energy encourages Treasury to accept the GREET model. The GREET model is a state-of-the-art model developed and regularly updated by the U.S. Department of Energy's (DOE) Argonne National Laboratory. It provides the basis for the lifecycle GHG emissions analysis used by the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) to administer the RFS and California LCFS programs respectively. The GREET model will be used by Treasury to assess lifecycle GHG emissions for purposes of the §§45V and 45Z credits. As provided in statute, it is a methodology that satisfies the criteria under §211(o)(1)(H) of the Clean Air Act, and is a credible tool to assess the lifecycle GHG emissions of SAF. The GREET model should be accepted by Treasury as a suitable lifecycle methodology for SAF under both the §§40B and 45Z credits. The GREET model is the primary model familiar to U.S. based producers and is currently in use.

- Notice 2022-58 seeks comment on §45Z(b)(1)(D), which allows a taxpayer to file a petition for a provisional emissions rate in scenarios where an emissions rate for a transportation fuel has not been established.

The ability to utilize §§40B and 45Z credits will play a key role in determining a SAF facility's economic viability. World Energy encourages Treasury to develop a clear and efficient process for providing provisional emissions rates for both the §§40B and 45Z credits. In addition, taxpayers should be allowed to apply for a provisional lifecycle GHG emissions rate during a project's design phase and at any subsequent phase of a facility's development. This will promote business certainty and allow taxpayers to make informed economic decisions when considering the construction of a SAF facility, which will in turn help promote additional SAF production as intended by Congress.

When granting provisional emissions rates, Treasury should broadly recognize producer-specific values determined by third parties, including third-party certified values determined under CORSIA or GREET, as well as any value already approved under EPA's RFS program, California's LCFS program, or any other methodology that Treasury determines is similar to that agreed under CORSIA and meets the Clean Air Act criteria. If the SAF has been approved for use and has qualified emissions rates in any of the other jurisdictions listed previously, Treasury should provide a comparable provisional emission rate for the SAF facility until an emissions rate consistent with §45Z(b)(1)(B) is established.

California's LCFS provides a process that allows stakeholders to apply for a provisional carbon intensity score at a fuel project's design phase. In the interest of implementing the §§40B and 45V credits in an efficient manner that avoids unneeded duplication, World Energy asks Treasury to the degree practicable to utilize a process akin to the one provided under the California's LCFS to grant provisional lifecycle GHG emissions rates.

- Notice 2022-58 seeks comment on what certification options and parties should be considered to support supply chain traceability and information transmission requirements for purposes of §45Z(f)(1).

[5] §45Z(b)(1)(B)(iii) provides that the lifecycle GHG emissions for SAF shall be determined in accordance with the most recent Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) or a similar methodology which satisfies the criteria under §211(o)(1)(H) of the Clean Air Act.

For certification of SAF under §§40B or 45Z, Congress enacted a structure that parallels the lifecycle GHG methodology discussed herein. Already, the marketplace has approved a number of third-party entities in the business of "standards certification," "quality assurance certification," "life-cycle certification," and many other auditing related verification services. In order to be efficient and consistent with intent of the statute, Treasury should allow the use of many of these service providers and specifically those already approved through EPA's Quality Assurance Program under the federal Renewable Fuels Program (RFS); and similarly approved verification bodies under the California Low Carbon Fuel Standard (LCFS).

As an example, when SAF producers choose to use the CORSIA methodology for determining lifecycle GHG emissions, already, they must ensure their fuel is certified by an unrelated party demonstrating compliance with requirements established under CORSIA. If that same producer chooses to demonstrate lifecycle GHG reductions pursuant to a "similar methodology" meeting the criteria under the Clean Air Act definition, then similar third-party certifications should be allowed to demonstrate compliance.

- Notice 2022-58 seeks comment related any other topics related to §45Z credit that may require guidance.

1. Treasury should recognize and reward net zero and below zero emission SAF:

Using low carbon feedstocks, like clean hydrogen and other feedstocks acquired through processes that would capture carbon and sequestration (CCS), will push lifecycle GHG emissions from SAF to well below zero. When we use renewable energy, and innovative farming practices, that too will push carbon emissions below zero. In using the formula provided by Congress under the §45Z credit will result in a credit value greater than $1.75/gallon. Treasury should encourage below zero SAF.

The plain language, context, and history of the CFPC clearly demonstrates that Congress intended to encourage production of carbon negative fuels. §45Z(a) requires calculation of the credit based on the "emissions factor" of the fuel multiplied by the "applicable amount," which for SAF facilities meeting prevailing wage and apprenticeship requirements is $1.75 per gallon. The "emissions factor" is in turn calculated by subtracting the "emissions rate" from 50 Kg CO_2-e /mmBTU and dividing that number by 50 kg CO_2-e /mmBTU. As this formula is consistent with negative emission rates for SAF, Treasury should simply confirm that negative emissions will be credited. An ascending tax credit beyond $1.75 for negative emissions also aligns with the underlying policy approach in both §§40B and 45Z, which provide higher credit values for lower-GHG fuels to incentivize production of the least emitting fuels.

The provisions on rounding of emissions rates are also properly interpreted to provide for negative emissions rates. §45Z(b)(C)(ii) states that in the case of an emissions rate between 2.5 kg CO_2-e /mmBTU and -2.5 kg CO_2-e /mmBTU, the Secretary may round the rate to zero. As an initial matter, this provision demonstrates that Congress clearly envisioned crediting fuel with negative emissions rates, though in the case of rates near zero it granted Treasury discretion to round to zero. By comparison, if the range is between -12.5 kg CO_2-e /mmBTU and -28 kg CO_2-e /mmBTU, the Secretary should round down to at least -20 kg CO_2-e /mmBTU, rather than up to zero, as Congress did not extend the discretion to round to zero for emissions rates below -2.5 kg CO_2-e /mmBTU.

This demonstrates Congressional intent to credit fuels with more than marginally negative emissions fully.

2. Under 45Z, Treasury Should Confirm that Domestic Production is Required Rather Than Simply "Fractionation":

45Z(f)(1)(A) requires that any transportation fuel, including SAF, be produced in the United States in order to be eligible to claim the tax credit. We encourage Treasury to clarify that feedstocks, including intermediate feedstocks for the production of SAF, can be sourced from outside the United States but that the SAF production must convert the feedstock molecule into a finished transportation fuel within the United States." We suggest that Treasury review the relevant ASTM provisions at ASTM 7566 and 1655 to determine what production steps are relevant to SAF. In other words, it is necessary that in order to qualify for the CFPC a SAF producer must produce a finished SAF product in the United States. It is the act of chemically converting a feedstock (e.g. used cooking oil, undenatured alcohol feedstocks, pyrolysis oil) to finished hydrocarbon molecules that is necessary for production. Mere separation of an imported hydrocarbon via distillation/fractionation into jet range molecules should not be considered domestic production.

3. Treasury should clarify that any SAF blended and uplifted in the U.S. qualifies for the §40B credit and the §6426 blenders excise tax credit for SAF (§6426 SAF credit):

To qualify for the §§40B and 6426 SAF credits, a "qualified mixture" must be: produced in the U.S., used or sold for use in an aircraft as part of the ordinary course of business of the taxpayer, and transferred to the fuel tank of an aircraft in the U.S. Thus, as is the case for the existing blender's tax credit for biodiesel and renewable diesel under §6426, only the blending of the qualified mixture needs to occur in the United States and imported SAF is an eligible component of the mixture. §40B differs from the §6426 blender's tax credit for biodiesel and renewable diesel in that the resulting qualified mixture must be used in an aircraft in the United States. Treasury guidance should affirm that any qualified mixture uplifted in the United States is eligible, regardless of whether the flight is domestic or international.

4. Implementation of §§40B and 6426 SAF credits:

The §40B credit is a blenders tax credit and is valued at $1.25 per credit; together with a supplemental credit of $.01 per gallon for each percentage point by which the lifecycle greenhouse gas emissions reduction percentage with respect to such fuel exceeds 50 percent. The supplementary amount shall not exceed $0.50 for a total credit opportunity of $1.75 per gallon.

By statute, the §40B credit is scheduled to begin on January 1, 2023. World Energy expects to qualify for the tax credit and looks forward to working with Climate Counselor to the Secretary of the Treasury John Morton and Assistant Secretary for Tax Policy Lily Batchelder and the entire team at Treasury and the Internal Revenue Service (IRS) on the implementation of the §40B credit.

Given the timing of the new §40B credit, which begins on January 1, 2023, we encourage the IRS to use the same system and tax forms (8864, 720, 4136, and 8849) that are in place today for biodiesel and renewable diesel tax credits as follows:

- biodiesel credit,
- renewable diesel credit,
- biodiesel mixture credit,
- renewable diesel mixture credit, and
- small agri-biodiesel producer credit.

5. Coordination of §45Z credit with §45V credit and §45Q credit for carbon oxide sequestration (§45Q credit):

Under the section of Notice 2022-58 relating to clean hydrogen, Treasury sought comment on circumstances where a single facility with multiple unrelated process trains could qualify for both §§45V and 45Q credits. This question is equally relevant to the §45Z credit, which excludes from the definition of "qualified facility" any facility that has taken the §45V credit, elected to take the §48 energy credit in lieu of the §45V credit, or the §45Q credit.

We highly encourage Treasury to interpret the definition of qualified facility narrowly to allow fuel developers to develop clean energy facilities in the most capital and environmentally efficient way possible and not perversely incentivize segmentation of projects into separate clean fuel, hydrogen production, and CCS facilities (or encourage exports of fuel at SAF facilities with carbon sequestration or hydrogen production).

One potential approach would be to interpret "qualified facility" as referring only to the SAF production unit and not to adjacent production facilities that are not required for the production of SAF but are co-located to provide efficiencies. Thus, if a 45Z credit would be allowed for hydrogen produced elsewhere and brought to the SAF facility to be used as process input, Treasury should not preclude efficiently locating the hydrogen production at or adjacent to the SAF facility.

Conclusion:

World Energy appreciates having the opportunity to provide feedback on this forthcoming guidance. We look forward to working with both Treasury and the IRS to implement these important provisions that will allow for the use of SAF and clean hydrogen technology to sustainably meet the nation's climate goals.

Sincerely,

Scott Lewis
President
World Energy (WE) Supply Zero