Project Canary, PBC
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December 1, 2022
Submitted via the Federal eRulemaking Portal at www.regulations.gov, IRS-2022-0058

The Honorable Doug O'Donnell
Acting Commissioner
Internal Revenue Service
1111 Constitution Ave., NW
Washington, DC 20224

RE: Department of the Treasury and the Internal Revenue Service Request for Comment on Notice 2022-58, related to the Credit for Clean Hydrogen Production credit, § 45V of the Internal Revenue Code, as amended by Public Law 117-169, 136 Stat. 1818 (August 16, 2022), commonly known as the Inflation Reduction Act of 2022

Dear Commissioner O'Donnell,

Project Canary is pleased to respond to the Treasury Department and the Internal Revenue Service request for general comments on the amendments to the clean hydrogen production credit under § 45V of the Internal Revenue Code.

Project Canary, based in Denver, Colorado, is a mission-driven B-Corporation accountable to a triple bottom line of people, planet, and profit. We believe it is possible to create a financially successful, self-sustaining business that "does well and does good." Our goal is to mitigate climate change by assisting the oil and natural gas industry to operate on a cleaner, more efficient, more sustainable basis. Our proven solutions provide real-time emissions monitoring and rigorous independent certifiable data of oil and natural gas well sites for responsible operations. Project Canary solutions help energy companies collect, manage, operationalize, and benefit from real-time environmental data.

As a measurement entity, Project Canary collaborates frequently with hydrogen producers to collect and provide verifiable data associated with these projects through Measurement, Reporting, Verification ("MRV") methodologies. This gives producers insight into the overall emissions footprint of these projects. We support widespread deployment of clean hydrogen projects: green, blue, and gray, and believe the 45V tax credit should be broadly available to a

range of projects to promote development of the hydrogen economy and clean carbon energy sources.

Project Canary would like to provide the following general comments related to the 45V tax credit that will ensure the goals and objectives of the Inflation Reduction Act (IRA) are achieved and ensure credits are awarded to taxpayers that utilize high frequency emissions monitors (i.e., ~1,000s data points/month) that will improve accuracy and achieve true emission reductions.

We believe that the Department should ensure that these credits are awarded to taxpayers that that hold themselves to the highest standards and utilize the most accurate measurement technologies. The IRA has outlined a new framework that relies on measurement-based performance metrics and eliminates past practices within the EPA Greenhouse Gas Reporting Program (GHGRP) that has historically allowed for emissions estimates.

There are three important themes to note in developing the policies and protocols for 45V:

1. **Emission Estimates Are Not Accurate:** Research and scientific literature has proven that estimates are vastly underreported across the country. Notable research and citations below:

    - "*This value is ~60% higher than the U.S. Environmental Protection Agency inventory estimate, likely because existing inventory methods miss emissions released during abnormal operating conditions*"[1]
    - "*In the United States, recent synthesis studies of field measurements of CH4 emissions at different spatial scales are ~1.5–2× greater compared to official greenhouse gas inventory (GHGI) estimates*"[2]
    - "*We estimate emissions to be 9.4% (+3.5%/–3.3%) of the gross gas production for the region" compared to a 1.18% assumed methane intensity across the entire value chain in GREET*"[3]

    Additionally, components rarely function according to emission factors:

[1] Alvarez et al 2018, Assessment of methane emissions from the U.S. oil and gas supply chain, https://www.science.org/doi/10.1126/science.aar7204?cookieSet=1

[2] Rutherford et al 2021, Closing the methane gap in US oil and natural gas production emissions inventories, https://www.nature.com/articles/s41467-021-25017-4

[3] Chen et al 2022, Quantifying Regional Methane Emissions in the New Mexico Permian Basin with a Comprehensive Aerial Survey, https://pubs.acs.org/doi/full/10.1021/acs.est.1c06458

- "*Abnormal emissions behavior in nearly half of measured devices… operating PCs showed average emission rates of 16.1 standard ft3 h–1 (scfh, whole gas) versus 2.82 scfh for normally operating PCs*"[4]

2. **Emission Estimates Can Be Misleading:** Current methodologies yield broad interpretation leading to inconsistent reporting.

3. **Intermittency of Emissions Requires Real-time and High-Fidelity Continuous Monitoring:** Maximizing sampling frequency and continuously measuring emissions at the facility level is essential to accurately measure and quantify emissions. Aerial flyovers have reported nominal detection thresholds as low as 1.6 kg/hr but are limited to the duration of the sample and tend to miss intermittent emission events from components and other sources.

    - *"We quantify the persistence of strong point sources across the Permian through multiple overflights and find many sources to be highly intermittent (average 26% persistence)"*[5]

High frequency measurements versus estimates, along with a regulatory pathway for technological advancements, are important to ensure the integrity of the tax credits awarded and the benefits realized. Taxpayers cannot definitively demonstrate emissions reductions without empirically derived data and quantifiable measurements. Accuracy is paramount to ensure credits are being allocated effectively and limiting future liability risk to taxpayers whose estimates could significantly underrepresent actual emissions.

We believe that taxpayers should be incentivized to demonstrate quantifiable reductions in emissions and carbon intensity across the energy value chain. Continuous emissions monitoring technologies at the site level yield the highest levels of accuracy and certainty regarding upstream methane intensity. In time, similar technology and capabilities will exist within midstream that will need to be included in projects documentation and overall emissions footprint.

Project Canary is pleased to provide the following specific comments:

1(e) How should qualified clean hydrogen production processes be required to verify the delivery of energy inputs that would be required to meet the estimated lifecycle greenhouse gas emissions rate as determined using the GREET model or other tools if used to supplement GREET?

[4] Luck et al 2019, Multiday Measurements of Pneumatic Controller Emissions Reveal the Frequency of Abnormal Emissions Behavior at Natural Gas Gathering Stations, https://pubs.acs.org/doi/pdf/10.1021/acs.estlett.9b00158
[5] Cusworth et al 2021, Intermittency of Large Methane Emitters in the Permian Basin, https://pubs.acs.org/doi/10.1021/acs.estlett.1c00173

We recommend that lifecycle GHG emissions calculations allow and incentivize empirical measurement-based methodologies (sampled at a sufficient frequency to accurately depict total greenhouse gas emissions). The need for frequent sampling is due to the intermittent nature of emissions across the energy supply chain. Such data should be allowed to override any assumption-based model such as GREET.

At a minimum, measurement-based data (outlined above) should allow more discreet categorization of feedstocks and their associated carbon intensities. Such consideration should be given to feedstocks commonly referred to as certified gas or responsibly sourced gas, that which is certified by an independent third party to have a methane intensity level of 0.2% or lower. This will incentivize the adoption of practices and technologies that minimize and eliminate greenhouse gas emissions in the upstream segment. This will also spur innovation by creating additional incentives for technological development of, and competition for, measurement-based data gathering techniques.

1(e)(ii) What granularity of time matching (that is, annual, hourly, or other) of energy inputs used in the qualified clean hydrogen production process should be required?

Frequent measurement (hourly or better) enables the highest level of granularity and accuracy. In our experience, time does not necessarily directly correlate with accuracy. Determining the appropriate measurement methodology for GHG emissions associated with hydrogen projects including facility-level sensors needs to include a certain level of accuracy based on several inputs. A 90% confidence interval is considered an industry standard and should be considered the benchmark for the 45V credit.

3(a) At what stage in the production process should a taxpayer be able to file such a petition for a provisional emissions rate?

We recommend that taxpayers be able to file such a petition as soon as they have available frequently sampled measurement-based data.

3(b) What criteria should be considered by the Secretary in making a determination regarding the provisional emissions rate?

We recognize the need for provisional emissions rates for categories of facilities; however, we do not believe the use of provisional emissions rates for feedstock or energy inputs used in the production process should be permissible. Our concerns with applying assumed emissions rates for feedstocks or energy inputs stems from 1) the previously cited inaccuracies of estimate-based emissions inventories, and 2) the lack of incentivizing adoption of emissions reducing practices and technologies in the energy supply chain.

4(a) What documentation or substantiation do taxpayers maintain or could they create to demonstrate the lifecycle greenhouse gas emissions rate resulting from a clean hydrogen production process?

We believe that taxpayers should utilize the best technology and methodologies to quantify the lifecycle GHG emissions where applicable in the value chain. Static rules that require IRS approval of methodologies for lifecycle assessment of every technology advancement will stymie the ability of tax credits to fulfill their promise of GHG emissions reductions.

Taxpayers should be provided with clear guidance that outlines acceptable emissions documentation to demonstrate their GHG footprint. This guidance should include flexibility that allows for taxpayers to provide real measurement and site-level empirical data to advance transparency and accuracy of emissions reporting. Measurement-based data is the most accurate portrayal of the emissions profile and thus will provide the best substantiation for claims made by taxpayers. The Department should encourage taxpayers to avoid emission estimates as they tend to miss intermittent fugitive emissions and may assume ideal operating conditions rather than actual operational performance.

4(b) What technologies or methodologies should be required for monitoring the lifecycle greenhouse gas emissions rate resulting from the clean hydrogen production process?

There is a need for measurement over estimation and a need for the regulations to accommodate the inevitable advances that will occur in the technology of measurement over the life of the tax credit.

Accurately monitoring lifecycle GHG emissions from clean hydrogen production processes is best achieved through site level measurement using a variety of technologies including, but not limited to, ground-based continuous emissions monitoring, aerial, and satellite data. These technologies may vary in their nominal detection threshold, spatial resolution, and sampling frequency, leading to uncertainty in measurement. Therefore, it is critical to understand the uncertainty bounds associated with each applicable technology, and it is recommended that the 45 V credit incentivize achieving high certainty (i.e., 90%) in emissions measurement. The certainty can be (and should be) improved by investing in high-fidelity, cost-effective sensing technologies as well as by layering in various technologies in a reconciled top-down/bottom-up approach. Such technologies are cost effective, widely deployed, and available.

4(d) What procedures or standards should be required to verify the production (including lifecycle greenhouse gas emissions), sale and/or use of clean hydrogen for the § 45V credit, § 45 credit, and § 48 credit?

All qualified hydrogen production processes should be required to verify the delivery of the energy inputs from third parties with either publicly verified environmental attributes on a registry or another publicly available forum. This will give transparency and accountability to

the procurement process to accurately reward 45V recipients for actual (and proven) environmental improvements.

5(a) What certifications, professional licenses, or other qualifications, if any, should be required for an unrelated party to verify the production and sale or use of clean hydrogen for the § 45V credit, § 45 credit, and § 48 credit

Individuals with technical, professional, and academic qualifications must have objectively contributed to the development of certification standards and GHG analytics and they must be reviewed by the Department. Certifiers must be void of any conflicts of interest to ensure adherence to standards set by the Department. This will ensure that methodologies are rigorous and accurate for emission verification and reviewed by the Department for public transparency.

5(b) What criteria or procedures, if any, should the Treasury Department and the IRS establish to avoid conflicts of interest and ensure the independence and rigor of verification by unrelated parties?

The Department should limit activities conducted by any entity such that any entity can only perform measurement and reporting functions or verification activities.

We sincerely appreciate your consideration of our comments. Should you have any questions, please feel free to reach out to John Westerheide, Senior Director of Carbon Management. We look forward to continuing to work with you and your staff on this important guidance.

Sincerely,

John Westerheide
Senior Director, Carbon Management
Project Canary, PBC