February 26, 2024

Internal Revenue Service
P.O. Box 7604, Ben Franklin Station
Washington, D.C. 20044

Filed electronically at www.regulations.gov (REG-117631-23)

Re: Response to Request for Comment on Section 45V Credit for Production of Clean Hydrogen

To whom it may concern:

PureWest Energy, Honeywell, Spirit Environmental, and EarnDLT (collectively referred to as "we") appreciate the opportunity to submit the following comments in response to the Department of Treasury Internal Revenue Service (IRS) proposed rulemaking on Section 45V Credit for Production of Clean Hydrogen and specifically with respect to differentiated low methane leak rate natural gas, referred to in this rulemaking as Responsibly Sourced Natural Gas (RSG).

Collectively, we include an array of companies that produce, measure, verify, and register RSG and together can address the IRS request for comment concerning RSG.

If you have any questions, please contact Kelly Bott at (303) 645-9809.

Sincerely,

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About Us:

PureWest Energy: PureWest is the largest producer of natural gas in Wyoming, with aggregate gross production of approximately 640 MMcfe/d as of December 2023, from approximately 3,400 operated wells. PureWest is an industry leader in responsible energy production, delivering measurement-informed, 100% certified RSG to western markets via the greater Opal hub and environmental attributes to global markets via the EarnDLT blockchain platform. Despite already best-in-class methane performance, PureWest continues to prioritize further emission reductions and environmental performance improvement as we strive for near-zero emissions and top-tier safety metrics.

Honeywell: Honeywell is a premier manufacturer of fixed, portable, and continuous gas leak detection systems at oil and gas and industrial facilities, including in the petrochemicals, chemicals, mining, and power generation industries. Our broad gas detection portfolio includes open path, continuous point detection devices, as well as continuous gas cloud imaging (GCI) systems. We have installed over one million fixed and portable gas detection solutions and over one hundred GCI systems across the oil and gas industry, including at well sites, compressor stations, gas processing plants, and at industrial facilities.

Spirit Environmental: Spirit Environmental is an air quality, compliance, natural resources and sustainability consulting firm that provides auditing, 3rd party assurance, and validation of GHG and ESG projects and inventories. Spirit supports traditional energy clients in reducing methane emissions credibly and brings expertise in emissions and technology to bear in affirming the validity of technologies, processes, methods, and calculations for certifying RSG and demonstrating compliance with best practices and leading standards.

EarnDLT: Earn DLT, Inc. is a cloud-based enterprise software company headquartered in New York City, specializing in providing the Responsibly Sourced Natural Gas sector with comprehensive EAC (Energy Attribute Certificate) registry and tracking solutions. The EarnDLT digital registry assigns unique identification numbers to each EAC, ensuring the verification of a one-to-one association between an EAC and a unit (MMBtu) of RSG. With robust features like third-party ISO 14064-3 compliant validation of carbon intensity, verification of single-use retirement, owner identification, and publicly accessible views of registered pads and wells, The EarnDLT platform sets the standard for transparency and efficiency in the renewable energy marketplace. As a trusted leader in EAC tracking technology, we are dedicated to promoting integrity and sustainability across the energy landscape.

I. IRS Request for Comment:

Section V.A. GREET Model - The Treasury Department and the IRS seek comment on the readiness of verification mechanisms that could be utilized for certain background data in 45VH2– GREET if it were reverted to foreground data in future releases. For example, the upstream methane loss rate is background data in 45VH2–GREET, and the Treasury Department and the IRS seek comment on conditions, if any, under which the methane loss rate may in future releases become foreground data (such as certificates that verifiably demonstrate different methane loss rates for natural gas feedstocks, sometimes described as responsibly sourced natural gas)

Response to Comment:

A. The Inflation Reduction Act (IRA) specifically authorized the GREET model - not a handcuffed version of GREET.

Congress approved the IRA for 45V to specifically rely upon the GREET model. The IRA states, in the 45V definition section, the requisite version of GREET that must be used for purposes of calculating hydrogen's lifecycle greenhouse emissions:

> **"**The term 'lifecycle greenhouse gas emissions' shall 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 model (commonly referred to as the 'GREET model') developed by Argonne National Laboratory, or a successor model (as determined by the Secretary)"**[1].

The most recent version of GREET at the time the IRA was enacted was not 45VH2-GREET 2023[2]. The model in effect at the time the IRA was enacted included functionality that allowed for user defined inputs for natural gas methane emission factors. (See Table 1). Furthermore, and as an alternative to the user defined inputs, the GREET model that Congress specified included optionality for "default" natural gas emission factors, whereby, the user could choose either the Bottom-Up/Top-Down Hybrid or the lower EPA factor. The hybrid factor for total methane leakage rate (vol. % of CH4 over NG throughput) is 0.94%, whereas the EPA factor is much lower at 0.68% for conventional natural gas. The 45VH2-GREET 2023 model required in this rulemaking locks in the methane leakage value at the hybrid default value of 0.94%, much higher than RSG.

[1] 26 USC §45V(c)(1)(B), emphasis added
[2] www.energy.gov/eere/greet

Table 1: R&D Greet User defined methane leakage functionality (https://www.energy.gov/eere/greet,R&D GREET, Tab INPUT, Cells V128:W135)

4.3) CH4 leakage rate for each stage in conventional NG and shale gas pathways

1			
		User defined	
	Unit	Conventional NG	Shale gas
Recovery - CH4 Leakage and Venting	g CH4/mmBtu NG	34.9	35.9
Recovery - Completion CH4 Venting	g CH4/mmBtu NG	0.6	1.5
Recovery - Workover CH4 Venting	g CH4/mmBtu NG	0.0	0.1
Recovery - Liquid Unloading CH4 Venting	g CH4/mmBtu NG	4.3	4.3
Well Equipment - CH4 Venting and Leakage	g CH4/mmBtu NG	20.0	20.0
Gathering and Boosting - CH4 Venting and Leakage	g CH4/mmBtu NG	10.0	10.0
Processing - CH4 Venting and Leakage	g CH4/mmBtu NG	6.2	6.2
Transmission and Storage - CH4 Venting and Leakage	g CH4/mmBtu NG/680 miles	20.0	20.0
Distribution - CH4 Venting and Leakage	g CH4/mmBtu NG	18.8	18.8

Notwithstanding Congress' adoption of a flexible approach for methane leak rate values, the IRS has locked down the model by forcing the hydrogen lifecycle calculation to apply the overly inflated hybrid methane leak values which is inconsistent with the spirit of the law to maximize incentives to reduce greenhouse gas emissions. Requiring use of these fixed values removes the incentive to further reduce methane emissions from natural gas because a reduction in emissions cannot improve the 45V tax credit outcome for taxpayers.

We respectfully request that the 45VH2-GREET graphical-user interface (GUI) Argonne National Lab created be re-designed and administered in a manner that maximizes incentives to reduce greenhouse gas emissions, in alignment with the core goal of Section 45V and the clean energy provisions of the IRA.

B. Methane Leakage Measurement Technology for the Natural Gas Supply Chain is Readily Available and Verifiable.

After several years, 2 proposals, and nearly 1 million comments, the EPA issued the final New Source Performance Standard (NSPS) rule[3] governing methane emissions from oil and natural gas facilities on December 2, 2023. This rule addresses and resolves several issues the IRS may be grappling with as it considers user defined RSG methane loss rates. For example, the rule recognizes and encourages advanced methane detection technology like satellite monitoring, aerial surveys, and continuous monitors. The rule includes key aspects that must be included in a monitoring plan including averaging, downtime, and detection limits. (See page 1388 of 1690 of the prepublication version). Existing sources, defined in NSPS OOOOc as sources constructed, modified, or reconstructed *before* December 6, 2022, do not have to comply for another 5 years (States have a 2-year deadline to submit their plan and facilities have 3 more years after that to comply). This is a long time to wait for industry average emission factors to slowly decrease and subsequently be incorporated into the 45VH2-GREET model, especially when RSG producers, such as PureWest, are already well below the existing default values represented in background data. Instead, we respectfully request the IRS modify the 45VH2-GREET GUI in this current rulemaking to provide for verified RSG emission factor user defined inputs to incentivize early

[3] www.epa.gov/controlling-air-pollution-oil-and-natural-gas-operations/epas-final-rule-oil-and-natural-gas

adoption and the expanded use of advanced methane detection technologies, well ahead of a NSPS OOOOc applicability trigger for existing sources.

As recognized by EPA in their recent NSPS rulemaking, advanced methane detection methods are readily available to accurately measure methane mass emission rates from the natural gas supply chain including well equipment, gathering & boosting, and transmission & storage. The methane emissions data measured with advanced methane detection methods could be used to calculate the required user defined inputs to the GREET model.

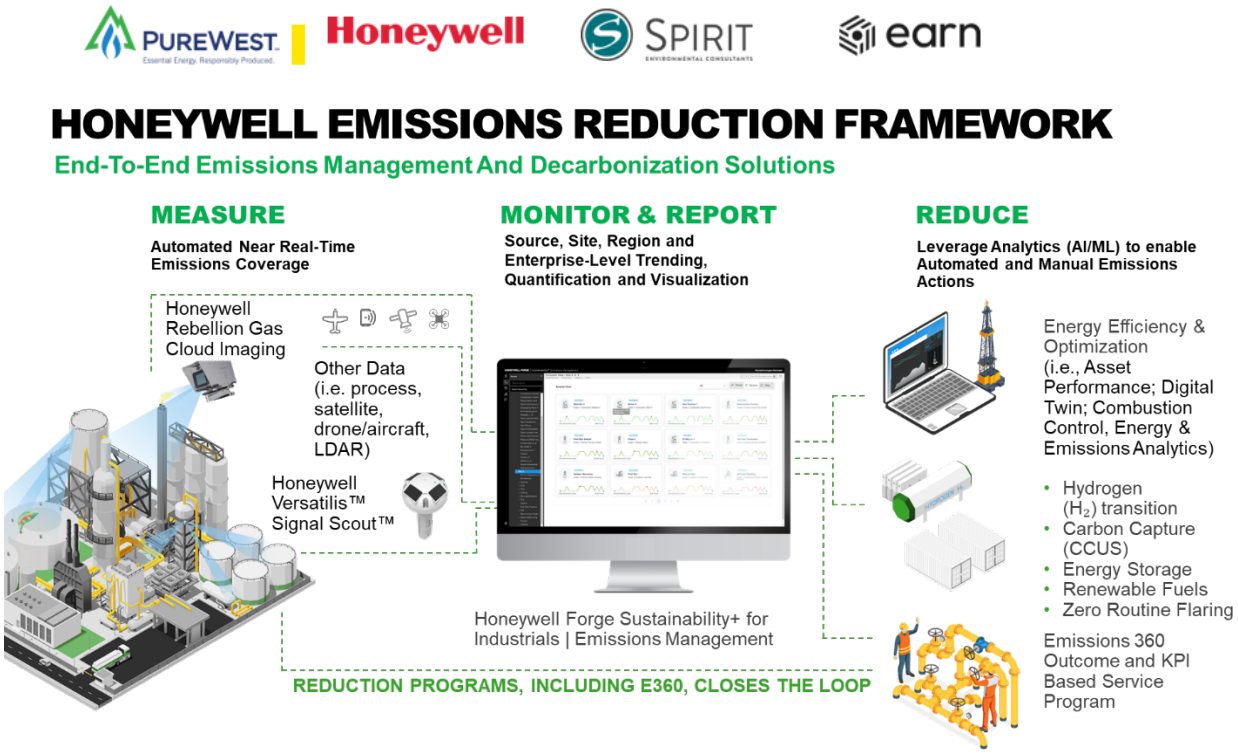
For example, Honeywell's system integrates technology, software, and services for supporting accelerated methane reductions through early detection and quantification. Honeywell's Versatilis™ Signal Scout™ is a compact, aerodynamic, and wireless gas leak-detection technology that allows operators to continuously monitor emissions in near real time to support pinpointing and quantifying emissions for early detection and repair responses. Honeywell's innovative gas leak detection for methane across industries communicates based on LoRaWAN® protocol for large area coverage. The compact and aerodynamic design is coupled with easy installation and commissioning for quick deployment in the field and has HAZLOC Area Certification which allows placement of the sensors near the potential emitting sources within the facility. When coupled with an anemometer to measure wind speed and direction, quantification is determined through Honeywell's plume modeling analytics.

Additionally, our Honeywell Rebellion GCI cameras use advanced proprietary hyperspectral imaging technology to capture infrared spectrum and visible video, allowing operators to monitor, quantify, and display gas leaks as they occur. These cameras operate 24/7 and are designed to provide operators with customizable and real-time detection, identification, and quantification of gas leaks at large sites and extended areas.

Both systems' performance were independently tested using blind controlled releases through the Colorado State University's Methane Emissions Technology Evaluation Center (METEC) or their Advancing Development of Emissions Detection (ADED) protocol[4].

Honeywell's emission reduction framework (see graphic below) is technology-neutral, and their Software-as-a-Service enables a digital platform to collect and compare other data (e.g., process, aerial, satellite, LDAR etc.) that can be used for reconciliation of independent measurements. Further instilling confidence in the methane loss profile and drivers of a system, the Honeywell's continuous monitoring helps correlate emission events to process conditions. Honeywell's Rebellion and Signal Scout technologies can provide component to site-wide level emission measurements in near real time for following process events to quickly diagnose root causes or malfunctions mitigating recurrences to drive methane reductions.

[4] https://energy.colostate.edu/metec/aded/



From a GREET input perspective, the advanced methane detection methods described above could be incorporated into a methane monitor technology plan to measure and determine the mass emission rate of methane from well equipment venting and leakage and other pathways. For purposes of 45V, an annual methane mass emission rate could then be calculated and matched to the corresponding annual NG production from the designated pathway source such as well equipment. The methane mass emission rate divided by the NG production in mmBtu would equate to the methane emission factor input required for GREET.

Both the methane mass emission rate and the NG throughput data associated with the pathway could be validated by a third-party verifier. Such verifications methods already exist such as those offered by Spirit Environmental. Verifications are performed according to leading protocols, frameworks and regulations (Veritas, OGMP 2.0, NSPS OOOOb standards as examples) and there is currently an ecosystem of service providers that follow best practices in assurance and auditing to provide independent third-party evaluations of any claims put forth by operators and technology providers regarding emissions. Whether adhering to international guidance on assessing greenhouse gas emissions such as the ISO 14064 series of standards, relying on direct experience from implementing and evaluating solutions, or some combination, these validation providers attest to the validity of the measurements above and beyond those provided by companies and provide a high degree of confidence in these values. The attestation statements that these companies provide at the conclusion of their engagements serve as the non-financial equivalent of third-party attestations of company financial statements and are often undertaken for business-critical metrics tied to executive compensation and public reporting. Applying this level of rigor to the determination of a methane intensity value can be evidenced with that attestation and further supports the readiness and integrity of the values leading edge companies are achieving. In sum, there is a myriad of data verification resources that could be relied upon to ensure emission data accuracy.

Furthermore, the methane emission technology itself could also be validated by a third-party verifier. The emergence and development of methane detection technology and the ability to quantify methane emissions with ever higher degrees of accuracy has created a robust array of vetting standards, protocols, third-party testing bodies, and procedures for ensuring accuracy that could be relied upon for verification purposes. The IRS could also look to the forthcoming performance requirements of NSPS OOOOb and then to third-party test results from independent testing facilities to align and serve as one basis for verifying a particular technology. Alternatively, or in concert, the IRS could look to regulatory bodies that have already approved technologies for use in their respective stringent programs such as Colorado's Alternative AIMM for Regulation 7 or other regulatory approvals that indicate compliance with strict standards. In typical assurance engagements looking at emissions quantifications, assurance providers also validate the deployed emissions quantification by supplementing the initial validation by third parties with additional validation of technologies in the field. This type of assurance provides an additional qualification of technologies and provides an additional level of surety for these quantified values. In sum, approved and verified emission measurement technologies are readily available for purposes of measure methane leak rates from natural gas pathways.

Pursuant to an issued attestation statement from the verifier, a RSG renewable energy certification (EAC) could be generated corresponding to 1mmBtu of RSG. Both the EAC, attestation statement, and the corresponding methane emission factor and pathway identification information would be uploaded to a qualifying EAC registry or accounting system. Such systems already exist including one offered by EarnDLT, which utilizes distributed ledger technology to underpin its functionality, enabling secure and transparent management of EACs and their associated data, including incrementality, temporal matching, and physical deliverability. Through the implementation of a proprietary private blockchain, EarnDLT ensures the integrity and immutability of data, facilitating the verification of a one-to-one association between each EAC and each unit (MMBtu) of RSG. This technology offers robust features, including EAC transfer, verification of single-use retirement, authentication of ownership, and provision of publicly accessible views of registered pads and wells. By using such a system, blue hydrogen producers could then purchase RSG EACs for purposes of calculating their 45V GHG emission intensity.

To incentivize the early adoption of low methane emission practices for RSG, all RSG not yet subject to NSPS OOOOb or OOOOc should be deemed incremental for purposes of EAC pillar application. This would provide a 5-year window for RSG user defined inputs to be recognized by 45VH2-GREET, after which the model default values should be amended to represent RSG emission levels.

In sum, there is no need to delay recognizing RSG as foreground data in the current rulemaking because the technology and verification methods already exist.

C. User Defined RSG Emission Factors Would Incentivize Lower Methane Emissions

Hydrogen reforming units are the most predominate source of hydrogen in the U.S. Therefore, blue hydrogen, hydrogen produced from natural gas reforming equipped with carbon capture equipment, could become the most readily available and cost-effective source of clean hydrogen. Unfortunately, absent the recognition of RSG, blue hydrogen is at risk of not qualify for or maximizing its 45V credit realization. On the other hand, recognizing the low RSG methane

emission rate could decrease the emission intensity of blue hydrogen by as much as 1.5 kgCO2e/kgH2, a significant incentive for maximizing GHG emission reductions in alignment with statutory intent. Thus, by recognizing RSG user defined inputs in this rulemaking, the demand for RSG would increase and thereby promptly incentivize low methane emission practices.

Therefore, we respectfully request the IRS recognize RSG in the current rulemaking to incentivize near-term methane emission reductions.

II. IRS Request for Comment

Section IX. (3) Renewable Natural Gas and Fugitive Sources of Methane - How broadly available and reliable are existing electronic tracking systems for RNG certificates in book and claim systems? What developments may be required, if any, before such systems are appropriate for use with RNG certificates used to claim the section 45V credit?

Response to Comment:

A. Book and Claim

Book and claim is critically important to RSG as well as RNG, as it is the most cost-effective low carbon emission form of delivery to the end-user. Employing market-based carbon accounting is the most efficient means of proliferating the generation and use of low carbon feedstocks for hydrogen production because it provides the ability to procure RSG even if there are geographical limitations.

Book and claim is a proven carbon accounting mechanism currently used for Scope 2 renewable energy credit transfers, as well as established regulatory schemes such as the CA low carbon fuel standard (LCFS). Aligning supply locations with demand locations via physical connectively is expensive, impractical, and would increase carbon emissions.

Book and claim is further supported by a colloquy between Senator Ron Wyden (D-OR) and Senator Tom Carper (D-DE) as part of the U.S. Senate Congressional Record dated August 6, 2022. Senator Carper states "*it is also my understanding of the intent of section 13204 [production and investment tax credit for the production of clean hydrogen], is that in determining the "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*" to which Senator Wyden replied "***yes***".[5](emphasis added).

Book and claim certificates and registries are readily available, including the one offered by EarnDLT, and are a proven means to prevent double counting of the environmental attributes. We respectfully request the IRS employ book and claim market-based accounting for all low carbon feedstocks, including RSG

[5] Congess.gov. "H.R. 5376 – 117th Congress (2021-2022): Inflation Reduction Act of 2022" August 6, 2022.

III. Summary

In summary, we strongly urge Treasury to revise the proposed rules and applicable models as follows:

1) Re-design and administer the 45VH2-GREET graphical-user interface (GUI) in a manner that maximizes incentives to reduce greenhouse gas emissions, in alignment with the core goal of Section 45V and the clean energy provisions of the IRA.

2) Do not delay recognizing RSG as foreground data in the current rulemaking because the technology and verification methods already exist.

3) Recognize RSG in the current rulemaking to incentivize near-term methane emission reductions.

4) Employ book and claim market-based accounting for all low carbon feedstocks, including RSG.