FERVO ENERGY

Internal Revenue Service
Room 5203
P.O. Box 7604, Ben Franklin Station
Washington, DC 20044

February 26, 2024

Re: Docket No. REG-117631-23 Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election to Treat Clean Hydrogen Production Facilities as Energy Property, 88 FR 89220 (December 26, 2023)

On behalf of Fervo Energy, I respectfully submit the attached comments to the Department of the Treasury and the Internal Revenue Service request for Comments on Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election to Treat Clean Hydrogen Production Facilities as Energy Property (REG-117631-23).

We appreciate the opportunity to respond and would welcome the opportunity to participate in any stakeholder engagement as the agency further crafts this important rule. Thank you for your time and your consideration.

Sincerely,

Mary Dhillon

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Background on Fervo Energy

Fervo Energy leverages innovation in geoscience to develop next-generation geothermal power to accelerate the world's transition to sustainable energy. Fervo innovates on traditional geothermal development by applying a full suite of modern technology – including computational modeling, horizontal drilling, advanced components and distributed fiber optic sensing – to make geothermal projects modular, cost effective, and scalable. Fervo has raised over $400 million of public and private capital including the largest demonstration grant ever given for geothermal by the Department of Energy.[1]

Fervo has an industry-leading development pipeline and has signed commercial agreements with customers including Google, Southern California Edison, East Bay Community Energy, Clean Power Alliance, and a group of nine community choice aggregators in Southern California. Fervo's investors and financiers include venture capital and industry leaders Capricorn, DCVC, Congruent Ventures, Breakthrough Energy Ventures, Helmerich and Payne, Devon Energy, and BHP.

Summary of Code Section 45V Comments

Implementing the 45V tax credit with the proposed rule will require a robust effort from renewable energy providers, hydrogen producers, EAC registries, and government agencies. Fervo is excited to work with all members of this important value chain to ensure that the clean hydrogen industry can achieve its promise as an economic driver and low-carbon energy solution.

Fervo supports the proposed rule as it bolsters the market for clean, firm electricity generation capacity and support infrastructure and will ensure the validity of the green hydrogen market. The geothermal industry is ready to deploy clean, firm generation capacity at the gigawatt scale this decade. Since the release of the proposed rule, Fervo has already observed increased levels of interest regarding off-site and behind-the-meter (BTM) projects to serve clean hydrogen production. Pairing hydrogen electrolysis BTM with geothermal generators minimizes hydrogen lifecycle emissions. The proposed rule is critical to ensure a pathway for off-site clean energy to achieve equally stringent emissions benefits and earn the full tax credit value.

In this comment letter, we would like to share three main points. First, the three-pillar framework established by the proposed rule will help promote additional clean energy to the grid while allowing the growth of the green hydrogen industry. Second, using third party hourly energy attribute certificates (EACs) in the clean hydrogen production industry will help catalyze the necessary change to how governments and companies measure and procure electricity and track environmental goals. And third, the DOE's GREET model must be updated to reflect the zero-emission operation of modern binary cycle geothermal generators and develop a pathway for regular updates to keep pace with technological innovation.

1. ***The three-pillar framework laid out in the rule will help promote additional clean energy to the grid while allowing the growth of the clean hydrogen industry.***

[1] .S. Department of Energy. (2024, February 13). Funding notice: Enhanced geothermal systems (EGS) pilot demonstrations. Office of Energy Efficiency & Renewable Energy. https://www.energy.gov/eere/geothermal/funding-notice-enhanced-geothermal-systems-egs-pilot-demonstrations

In order to reliably serve surging demand for electricity, including from new hydrogen producers, gigawatts of clean firm capacity must be deployed over the next decade. Fervo has the capability and mission to deploy geothermal projects to meet this need. Already, Fervo is on track to deliver the first 400 megawatts of next-generation geothermal power by 2028. The proposed three pillar framework for ensuring clean electrolysis will help drive demand for commercializing critically important clean, firm technologies:

- **Incrementality**: New clean energy must be placed in service less than 36 months prior to the hydrogen facility start up.
- **Deliverability**: Clean electricity must be generated in the same DOE grid congestion zone as the hydrogen production.
- **Hourly Matching**: The clean electricity must be produced in the same hour as the hydrogen.

Incrementality, or additionality, will help ensure no current grid connected clean, firm energy will be displaced for use in the clean hydrogen industry. This will drive additional market demand for new projects and accelerate grid decarbonization. Deliverability will create an additional market driver for expanding the transmission system to economically support new generation and load. Hourly matching ensures a robust carbon accounting of clean hydrogen production and will help nascent clean firm resources such as geothermal compete with traditional, variable renewable sources such as solar and wind. To earn the full 45V tax credit value under the three pillars, green hydrogen developers have two main options:

1. Offset load during hours intermittent resources are not available with high carbon intensity, grid connected peaking energy resources and loose 45V production incentive.
2. Turn down facilities during periods where intermittent resources are not available and reduce production, in effect decreasing the capacity factor of the equipment.
3. Procure clean, firm energy resources.

Geothermal energy can provide no emissions energy like more mature clean energy resources, such as wind and solar. The benefit of geothermal energy is that it is a clean, firm resource that can provide zero emission energy 24/7. This would allow for maximum capacity factors for hydrogen producers at a emissions intensity level low enough to meet the most stringent requirements of the proposed rule. Next generation geothermal energy is currently in early stages and has significant cost reduction as it is deployed, like the cost curve reductions of solar of the last two decades[2]. To date, Fervo has reduced drilling costs by 70% across 4 wells and project sustainable cost improvements across the project lifecycle[3]. Additionally, there have been concerns from industry that the proposed incentive advantages geographies that have strong wind and solar performance like the south and Midwest. Geothermal energy can tap into a clean, firm energy supply across the U.S. as it comes down the cost curve. **Expanding geothermal energy to serve clean hydrogen production will acclerate geothermal towards providing cost-competitive power across all applications and geographies – benefitting widespread grid decarbonization, reliability and affordability.**

2. ***Using third party hourly EACs will help catalyze the necessary change to how private and public entities value emissions attributes, buy electricity, and track environmental goals.***

[2] Fervo Energy Is Quickly Making Geothermal Cheaper - Heatmap News
[3] Fervo Energy Drilling Results Show Rapid Advancement of Geothermal Performance - Fervo Energy

Fervo is actively engaged in supporting the EAC market because it will help catalyze progress towards a fully decarbonization grid. As companies and government set ambitious climate goals, it is vital to have a mature tracking system for clean energy generation. The EAC registry system prevents double counting or other abuse. Without a robust regulatory infrastructure, double counting and other market abuse could undercut trust in 24/7 clean power claims and reverse the recent progress made advancing 24/7 clean goals. **The proposed guidance will help mature the developing EAC industry to accommodate the increase in demand for hourly-tracked environmental assets which is vital to grid decarbonization.**

3. ***The GREET model for life cycle emissions accounting of clean hydrogen production must reflect the zero-carbon operation of modern binary cycle geothermal projects and develop a payway for regular updates that keep pace with industry innovation.***

Fervo supports accurate accounting of cradle to grave life cycle emissions for all power-to-X applications. The GREET model is one of the ways to ensure accurate, accountable tracking of emissions for clean hydrogen production. Per the 45VH2-GREET 2023 User Manual, there is one primary energy source denoted as geothermal.[4] In the geothermal industry, there are several technologies used to generate power from geothermal brine. These generation technologies include dry steam, flashed steam, and binary power plant systems. Depending on the technology, at the same power production rate, these systems range in GHG emissions. Binary cycle plants have zero carbon emissions and constitute the overwhelming majority of both new hydrothermal and next-generation geothermal projects. GREET unfairly penalizes advanced, binary cycle technologies by failing to differentiate between geothermal technology types. **The GREET model must be updated to account for the different emissions intensity across geothermal technologies and provide a reliable pathway for the industry to propose new pathway analyses to align emissions calculations (and therefore tax credit awards) with advances in lower-carbon generation technology.**

In summary, Fervo is supportive of the proposed rules as they bolster the market for additional build out of clean, firm electricity generation capacity and support infrastructure. These rules will increase the development of next-generation geothermal projects, accelerate the rate at which geothermal becomes cost competitive across all energy sources and accelerate grid decarbonization while creating a strong foundation of environmental integrity and growth for clean hydrogen.

We look forward to working with the Department of the Treasury and the IRS to support the growth of the clean hydrogen industry in an environmentally sustainable manner.

[4] greet-manual_2023-12-20.pdf (energy.gov)