

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

## **Re: Request for Comments on Section 45V Credit for Production of Clean Hydrogen**

Submitted by:  
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Zach Jones, CEO, zach.jones@czero.energy

### **Background on C-Zero**

C-Zero has developed a process for producing low-cost, low-emission “turquoise” hydrogen from natural gas. The company’s technology can be used to decarbonize a wide array of industries including electrical generation, process heating, and commodity hydrogen production. Our pilot plant is scheduled to start up in Texas at the end of 2023 and be fully commissioned by the end of Q1 2024.

#### Problem

Nearly 75% of worldwide greenhouse gas (GHG) emissions come from the transportation, electricity, and industrial sectors. Today, these industries rely heavily on natural gas to deliver reliable, on-demand energy, but they emit copious amounts of CO<sub>2</sub>. Decarbonizing these industries is essential to progressing the global energy transition.

#### Solution

C-Zero has developed a form of methane pyrolysis to convert natural gas into hydrogen and solid carbon with near zero direct emissions and low electrical energy input requirements. This turquoise hydrogen provides clean, low-cost energy on demand, while the solid carbon can be easily permanently sequestered or beneficially used in existing products.

#### Innovation

C-Zero's process uses natural gas for both the process feedstock and the process energy, with low electricity consumption. This allows for the decarbonization of natural gas in geographies with low renewable capacity factors, like Japan, Korea, and higher latitudes in Europe and North America.

### **Comment**

#### §1.45V-4(b) Upstream methane loss

C-Zero appreciates Treasury’s recognition that technologies exist and are improving to better track upstream methane loss. Producers and third-party verifiers are working to reduce methane leakage and verify these reductions, and 45V should reward producers that are able to do so with an accurate carbon intensity that reflects their improvements.

Importantly, however, Treasury already recognizes that different stages of natural gas extraction and delivery are associated with different greenhouse gas emissions. 45VH2-GREET 2023 differentiates assumed upstream and midstream emissions into three distinct stages: recovery, processing, and transmission. Emissions from these stages include methane leakage, combustion products from running equipment, and gases released during processing. While most current facilities are sited after several hundred miles of pipeline transmission (GREET assumes 680 miles), new technologies like geologic hydrogen and methane pyrolysis can be sited upstream of processing and transmission, thereby avoiding associated emissions. Given that the emissions are already disaggregated between these stages, **C-Zero requests that Treasury split upstream natural gas emissions into the categories of recovery, processing, and transmission and allow facilities sited at upstream locations to only include the categories actually upstream of the facility.** In practice this involves bringing a drop-down list for the upstream emissions categories included in the analysis to be added to the foreground. Since DOE has already specified the emissions associated with each upstream and midstream stage within 45VH2-GREET 2023, it is a relatively minor change to allow facilities located upstream of processing and/or transmission to accurately reflect their upstream carbon intensity by only including the emissions from the parts of the upstream process that facilities actually encounter.

Additionally, there are producers and verifiers working to reduce and improve emissions tracking along the full upstream and midstream chain. Project Canary, MiQ, and others have already begun to develop the infrastructure for responsibly sourced methane. For example, Project Canary leverages high-fidelity sensors as part of a continuous monitoring system that detect emissions more frequently and with higher fidelity than traditional optical gas imaging approaches, data from other technologies and sources like remote sensing technologies using satellite- or ariel-based sensors, and advanced physics-based AI-powered models to identify leaks and quantify emissions. These capabilities allow for the measurement of both single emission events (including expected emissions from things like pneumatic controllers to unexpected emissions like an unlit flare) as well as total site emissions. C-Zero strongly supports fully bringing the methane loss rate into foreground data as soon as possible and allowing projects that are using these technologies to immediately apply through the PER process to use the data they collect in place of the generic background data.

We appreciate your careful consideration of these comments and look forward to working together to build the clean hydrogen economy.

Sincerely,

Zach Jones  
CEO  
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