Honeywell

February 26, 2024

Submitted To:

Internal Revenue Service (IRS), Treasury

https://www.regulations.gov/commenton/IRS-2023-0066-0001

Re: Stakeholder Feedback on IRS's Proposed Section 45V Credit for Production of Clean Hydrogen

Honeywell and the Hydrogen Ecosystem

Honeywell has a diverse portfolio of technologies that can support the development of the hydrogen ecosystem across production, purification, conversion, transmission, storage, distribution, and end use. Honeywell solutions can help operators and Original Equipment Manufacturers (OEM's) establish the hydrogen economy safely, economically and at industrial scale.

Hydrogen Production & Conversion

Honeywell is a leading process technology licensor and solutions provider to the hydrogen industry with ready now and commercially demonstrated hydrogen production and purification technologies such as catalyst coated membranes and pressure swing adsorption. Honeywell also has technologies such as chemical solvents, physical solvents, adsorbents, cryogenics, and membranes used in the cleanup of natural gas prior to use in hydrogen production. These same technologies can also be leveraged during the hydrogen production process to capture carbon dioxide (CO_2) which can help demonstrate DOE's proposed clean hydrogen production standard.

Response for Input

Honeywell's responses are critical to improving the guidance and are aligned with the expertise that Honeywell brings from industry.

Carbon Capture within Hydrogen Production

For methane reformer hydrogen production technologies utilizing carbon dioxide capture and sequestration (CCS), the proposed 45VH2-GREET 2023 model does not allow users to account for steam co-products because it assumes that excess steam would be used to power the CCS plant. The proposed 45VH2 GREET 2023 model does not recognize any technology beside amine-based carbon capture when integrating with a methane reformer for CCS. Cryogenic fractionation technology should be a recognizable pathway for CO_2 capture and has been utilized in the gas processing industry since the 1970's. Cryogenic fractionation uses refrigeration to liquify a gas mixture so that CO2 can be distilled out and ready for sequestration. 45VH2-GREET 2023 does not allow an input for the quantity of co-product steam to exceed 17.6% of the total energy content (LHV) of all steam and hydrogen produced. The 45VH2 GREET model assumes that steam generated from the methane reforming and downstream shift reactions is consumed within the CO_2 capture section, which may be valid for an amine solvent based system for CO_2 capture but is not valid for a cryogenic fractionation system that is powered by electricity. Honeywell proposes two ways to account for this:

1. Allow the existing 45 VH2 GREET model to provide decarbonization credits where it can be shown that the steam generated from any methane reforming that is used external to the hydrogen production with CCS system offsets natural gas consumption to generate steam via system expansion methodology. This framework is in place within the model, however the default value for the steam produced from "ATR+CCS" is zero. If that can be modified so that the steam generation can be greater than zero, it would provide the credit as appropriate for the extent of the decarbonization.
2. Provide cryogenic CO_2 capture as a recognized technology pathway within the GREET model, which would inherently include (1) as a part of that updated model.

Honeywell advocates that not having an updated 45VH2 GREET model that is representative of robust ready now technologies, including cryogenic fractionation as a carbon capture pathway, has the potential to delay investment decisions and growth of the hydrogen economy.

Upstream Methane Loss as 45VH2-GREET Background Data
The new 45VH2-GREET model has some inputs that are in the "foreground" that hydrogen producers can adjust in accordance with their facility, while other data is only in the "background" with no ability to adjust. Current background data types include emissions associated with power generation from specific generator types, emissions associated with regional electricity grids, and upstream methane loss rates. It is critical for industry development to include upstream methane loss rates as foreground data in the GREET model. Keeping this in the background at a high fixed rate of 0.9% of the methane consumed by the Hydrogen Production unit:

1. reduces the incentive to move forward with projects producing Hydrogen from natural gas
2. reduces the incentive for projects that do move forward to actively minimize methane emissions loss upstream of the consumption of natural gas by the hydrogen production unit

Honeywell advocates that Treasury should include the use of certified lower-carbon intensity natural gas certificates as a viable pathway for hydrogen producers using natural gas as a feedstock to meet the carbon intensity requirements. The certification of lower-carbon intensity natural gas should be viable through emissions monitoring, reporting, verification, and auditing capabilities that industry, including Honeywell, can support. For example, recent changes to EPA regulations in their New Source Performance Standards and Emissions Guidelines under rules have enabled advanced monitoring systems that can continuously provide accurate quantification and detection of methane emissions for use in determining loss rates in the GREET model.

45VH2-GREET and Co-Products
Honeywell agrees that Treasury should adopt a system in which taxpayers producing multiple products (including hydrogen) should be permitted to utilize a reasonable allocation method for the purposes of determining the lifecycle greenhouse gas emissions among co-products.

Holistic decarbonization benefits can be recognized if the 45VH2-GREET model can allow for the co-production of steam generated from any methane reforming technology to be used external to the hydrogen production with CCS system if it can be demonstrated that this steam offsets steam generated from natural gas consumption. The framework to allow for this co-production is in place within the model while evaluating the production of "Grey" hydrogen, however the default value for the steam producing "Blue" hydrogen from an ATR+CCS design is zero. Modifying the model so that the steam generation can be greater than zero would provide the appropriate benefit to the producer.

The proposed guidance notes that the reason for the default value of zero for the steam generation is to ensure that producers are not incentivized to operate their methane reforming system in an inefficient manner to intentionally produce excess steam. While this concern is valid, it should be mitigated through a mechanism that ensures that the system expansion to steam is properly accounted for rather than simply incentivizing technology selections that will consume any of the produced steam within the methane reforming + CCS scope. Alternative co-product accounting methods that accurately measure and allow for the appropriate allocation of the holistic carbon intensity of the hydrogen production is critical to enabling producers to recognize efficiencies in overall system. An alternative co-product accounting method that enables the producer to offset steam produced from a natural gas boiler with steam co-produced from low carbon hydrogen production should be adopted.

We appreciate the opportunity to submit these comments and look forward to working with the agency on the implementation of the 45V tax credit.