

Independence Hydrogen (IH) appreciates the opportunity to provide feedback to the Department of Treasury on the Hydrogen Production Tax Credit (45V). IH is a veteran-owned small business that currently recycles vented hydrogen from industrial processes (what we call waste gas recycling (WGR)) and has 10 projects in development to create a network of these plants in the Eastern United States. At scale, these plants represent over 70 tons per day of clean hydrogen created from gas currently being vented into the atmosphere—truly creating fuel from waste—with opportunities to expand to well over 100 tons per day.

IH would like Treasury to consider two points in the 45V Guidance:

- Hydrogen recycled from industrial off-gas, including chlor-alkali and chlorate, is not included as a pathway in the '45VH2-GREET'.
 - Recommendation: Industrial off-gas should be included as a defined production pathway in 45V. Consistent with previous Argonne National Labs GREET models it should be treated as a zero-greenhouse gas (GHG) emissions feedstock.
- The PTC 5x multiplier requirements, especially the apprenticeship program, create an administrative burden on small businesses that will likely prevent them from receiving the multiplier.
 - Recommendation: Treasury relieves qualified small businesses from some apprenticeship program, reporting, and recordkeeping program requirements to make it possible for small businesses to receive the PTC and the multiplier.

Industrial Off-gas in the GREET Model: The GREET 2023 model released from Argonne National Labs includes a fully defined pathway for calculating GHG emissions from a chlor-alkali process. The model includes four 'H2 handling methods', and it recommended that the first option, being 'H2 diverted from vented emissions (carrying no energy/emissions burdens)', is used when calculating Provisional Emissions Rates (PERs) for hydrogen recycling facilities utilizing a chlor-alkali feedstock.

The four available options within GREET for classifying hydrogen produced by a chlor-alkali process are:

1. H2 diverted from vented emissions (carrying no energy/emissions burdens)
2. H2 divered [sic] from internal combustion (NG substituing [sic] H2)
3. H2 as co-products allocated by mass
4. H2 as coproducts allocated by market value

The first option attributes no emissions to the hydrogen stream based on the supposition that the stream is vented into the atmosphere, and since hydrogen does not have direct GHG impacts,¹ the feedstock is considered to carry to no emissions burdens. This method is quantifiable and consistent.

The second option supposes that the hydrogen stream is used for internal combustion and is being diverted and therefore replaced with natural gas. This option is valid and should be used where this situation occurs.

¹ Sand, M., Skeie, R.B., Sandstad, M. *et al.* A multi-model assessment of the Global Warming Potential of hydrogen. *Commun Earth Environ* **4**, 203 (2023). <https://doi.org/10.1038/s43247-023-00857-8>

The third and fourth options allocate a portion of the GHG emissions from the chlor-alkali plant to the hydrogen on either a mass or market basis. While the method of allocating by mass is both quantifiable and consistent, it is arbitrary, as molecular size does not have a direct relation to how much energy is required to produce the product. Market value allocation is arbitrary for the same reason, but it is also not consistent, as market prices fluctuate and are not necessarily readily available due to opaque market conditions in the chemical industry.

While the guidance does allow for companies to apply for a Provisional Emission Rate (PER) for industrial off-gas, the lack of its specification as an approved production pathway places financial risk on small businesses like IH. IH assumes that our WGR processes will qualify for 45V under the PER, given previous GREET model's treatment of this pathway. However, as an early-stage company raising project-level financing, investors see risk in not having a defined pathway. This risk results in difficulty raising the capital to forward these projects.

Administrative Requirements: The proposed 45V guidance (in addition to language in §1.45-8 and §1.45-12) require apprenticeship, recordkeeping, and reporting requirements that are onerous for small businesses. A small business carve-out for some of these requirements would allow small businesses to compete for the PTC and incentivize build-out. There is precedent for this relief in small business carve outs in government contracting. Small businesses will still have to meet Davis-Bacon requirements for prevailing wages, and other elements of the multiplier, but would be greatly incentivized with some administrative carve-outs. This small business incentive is in accordance with the Small Business Administration goals to ensure a level-playing field for early-stage companies like IH.