Independence Hydrogen

INDEPENDENCE HYDROGEN RESPONSE TO DOE CHPS FEEDBACK REQUEST

Impact of Changes to GREET Classification of Chloralkali Off-gas Feedstock

Situation:
With the release of the 2022 GREET model, all chloralkali off-gas is treated as a co-product by mass, and the off-gas assumes a mass-weighted portion of the emissions from the chloralkali operation when used as a feedstock. This is a change from the 2021 GREET model in which there was an option for "H2 diverted from vented emissions (carrying no energy/emissions burdens)," which was classified as an emission-free feedstock.

Issue:
This materially impacts the CI score of processes using chloralkali off-gas as a feestock, increasing the CI score of the final product by approximately 0.7 kg CO_2 /kg H_2 produced*. Furthermore, this change does not capture the value of using an otherwise wasted resource that is currently being vented (hydrogen). Lastly, this change does not appropriately credit the producers of the off-gas hydrogen based on the impact vented hydrogen has on greenhouse gas emissions.[1]

Recommendation:

1. Allow for projects that utilize a feedstock from a process that is currently venting hydrogen to retain the emission-free feedstock designation that existed in previous GREET models for the purposes of calculating the Carbon Intensity for the Production Tax Credit
   -OR-
2. Authorize a credit to be applied to processes that use a feedstock of hydrogen where it is a co-product being produced at 3% or less of the total product mass. Two proposed options for determining the credit:
   a. A credit of at least 0.7 kg CO_2/kg H_2 produced should be applied to the final CI score, to directly account for the change to the GREET model
   b. A credit determined based on the quantified impact of vented hydrogen, as defined by Argonne National Labs or another reputable source

*Calculated using the GREET 2021 Excel model with default assumptions:

- Emission-free feed = 7,321 g CO_2/mmBtu (0.8327 kg CO_2/kg H_2)
- Co-product feed = 13,382 g CO_2/mmBtu (1.5220 kg CO_2/kg H_2)
- This results in a difference of 6,061 g CO_2/mmBtu, or 0.6894 kg CO_2/kg H_2

[1] Ocko, I. B., & Hamburg, S. P. (2022, July 20). *Climate consequences of hydrogen emissions*. Atmospheric Chemistry and Physics. Retrieved November 14, 2022, from https://acp.copernicus.org/articles/22/9349/2022/