Hydrogen Risks Are Not Fully Addressed by the Draft 45V Rule Guidance

Policy Summary

To jumpstart clean hydrogen buildout as part of the U.S's energy transition, the Inflation Reduction Act established the 45V tax credit for clean hydrogen production. Treasury has now issued a draft rule, outlining which hydrogen production processes are eligible for the different tax credit levels. To ensure that the hydrogen incentivized by this tax credit is truly clean and sustainable – and that billions of taxpayer dollars are not wasted on increasing emissions and air pollution from fossil-fuel pathways – the following provisions must be included:

Upstream emissions from blue hydrogen must be accurately accounted for.

- More than 90% of dedicated hydrogen produced today in the U.S. comes from unabated fossil fuels. Meanwhile, blue hydrogen, which uses natural gas along with carbon capture, is now set to become a major hydrogen pathway. More than half of DOE's planned clean hydrogen hubs include blue hydrogen production, and more than two thirds of new hydrogen capacity by 2035 in the U.S. is projected to be blue hydrogen.[1]
- However, upstream methane emissions can greatly reduce the climate benefits of blue hydrogen. Methane is the main component of natural gas and is vented and leaked into the atmosphere throughout the natural gas supply chain. When combined with the warming impact of hydrogen emissions (from leaking, venting and purging), this can make some forms of blue hydrogen worse for the climate in the near term than the fossil fuel alternatives it is replacing.[2]
- The 45VH2-GREET model, which is used to determine tax credit eligibility, assumes a 0.9% national average leak rate of methane, which is not representative of actual emissions. Leak rates can vary substantially by basin, which can strongly affect the total emissions from blue hydrogen. For example, the total methane leakage rates for the Permian basin and the Uinta basin have been measured at around 3-4% and 6-8%, respectively.[3]
- To accurately capture the climate impact of blue hydrogen production and discourage investments in dirty solutions, GREET's upstream methane numbers must be based on measured data and include basin-

[1] EDF analysis of Rystad data
[2] Ocko and Hamburg 2022
[3] Lu et al. 2023; Zhang et al. 2020; Lin et al. 2021; Note that for basins that produce oil as well as gas (Permian, Uinta), these leakage rates are not directly comparable to the 0.9% leakage rate currently used in GREET since the total leakage rate in each basin must be allocated between oil, gas, and co-producing wells.

specific values. With authority over these GREET updates, Treasury should kick-start a joint agency process to update the model and ultimately require basin-specific inputs for GREET users.

Carbon-negative offsets should not be allowed.

- Some forms of biomethane (or renewable natural gas), like biomethane from dairy farms, can receive negative emissions intensity scores in certain models, because in places without regulations or policy incentives, the methane would have otherwise been released into the atmosphere.[4]
- Blue hydrogen producers could use this type of biomethane as a loophole to receive higher tax credit levels by offsetting their own on-site emissions. Estimates suggest that blue hydrogen producers could achieve the top $3 tax credit tier by blending (or purchasing credits for) only 6% of biomethane.[5] This scheme could make even a coal-fired power plant eligible for 45V, completely defeating its purpose of cleaning up hydrogen production.
- Hydrogen producers must be responsible for their own on-site and upstream emissions; if this is not the case, 45V will unintentionally subsidize fundamentally dirty facilities. This would undermine the spirit of the IRA and sacrifice local communities in the process. Treasury must definitively close this accounting loophole and disallow carbon-negative offsets.

All climate-warming emissions – including hydrogen itself – must be factored in.

- Hydrogen is an indirect greenhouse gas, or GHG, and it contributes to global warming along with other GHGs like carbon dioxide and methane. In fact, hydrogen has 30-40 times the warming power of carbon dioxide over the first 20 years.[6] It is also a small molecule that easily leaks into the atmosphere throughout the hydrogen production lifecycle – and in many cases, large volumes are intentionally vented, purged, or flared.
- Treasury has taken the right step to prevent producers from claiming the tax credit for vented or flared hydrogen. However, leaked or otherwise unintentional hydrogen emissions have a significant warming impact, which erodes the value of hydrogen as a climate solution and should therefore be more strongly disincentivized.
- The climate impact of these fugitive and intentional hydrogen emissions should be factored into tax credit eligibility for all hydrogen pathways. Treasury should also require producers to develop a hydrogen emissions management plan that includes expected and actual loss volumes and mitigation actions taken.

Fundamental to getting hydrogen right is ensuring that the full scope of emissions is reigned in, not rewarded. If not, 45V could steer investment in the wrong direction – setting us back from our climate targets, worsening local air pollution and wasting valuable public resources. The safeguards outlined above will help ensure hydrogen is a credible climate solution.

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[4] Renewable Natural Gas | US EPA
[5] EDF estimates, assuming a carbon intensity score of –372 gCO2e/MJ (or –61 kgCO2e/kgH2) for biomethane and 4.6 kgCO2e/kgH2 for fossil methane
[6] Warwick et al. 2023; Sand et al. 2023; Hauglustaine et al. 2022

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