

December 2, 2022

Secretary Yellen  
Department of Treasury  
1500 Pennsylvania Avenue NW  
Washington DC, 20005

RE: Notice 2022-58, 45V Hydrogen Production Tax Credit

Dear Secretary Yellen,

The production tax credit (PTC) for hydrogen is one of the most consequential—and potentially dangerous—provisions of the Inflation Reduction Act. If the new policy is not implemented carefully, it could easily increase emissions, boost counterproductive subsidies for Big Oil, and concentrate harm in historically marginalized communities. These unintended consequences would undermine President Biden's climate goals as well as his commitment to center Environmental Justice throughout the executive branch.

The new PTC is uniquely vulnerable to becoming a Trojan horse for polluting industries. Whether it is "green" from electrolysis utilizing renewables or "blue" from steam reformation of fossil gas paired with carbon capture, there is ample reason to be skeptical of both the climate and the justice benefits of hydrogen. Inflated hype around the idea of hydrogen as a decarbonization 'swiss army knife' amounts to political cover for fossil fuel interests eager to continue business as usual. The onus is on Treasury to support an implementation plan that advances, rather than impedes, the climate goals of the Biden Administration.

In theory, the credit works on a sliding scale, awarding higher payments for lower emissions. But when it comes to how emissions are measured and verified, the Treasury has all of the authority it needs to develop a strict set of guardrails to stop polluters from gaming the system. We encourage the Treasury to work with the DOE and other agencies where necessary to ensure GREET or a successor model fully captures the lifecycle emissions created from hydrogen production.

To prevent abuse, protect communities, and lower emissions, we suggest the following principles be put in place as the credit is designed:

**Do not support the diversion of existing renewable energy towards hydrogen.**

President Biden's goal for a carbon-free power sector by 2035 requires ambitious investment in new renewable capacity. It is crucial for our climate and communities that the Treasury does not allow implementation of the hydrogen PTC to undermine this goal. Hydrogen production is incredibly energy intensive, and will always result in net energy loss. Siphoning existing renewables into hydrogen will undermine efforts to decrease power sector carbon intensity - creating a no win scenario where increased demand on the grid from hydrogen and ongoing

electrification efforts is met by fossil powered facilities rather than new dedicated renewable capacity.

Unless hydrogen production is paired with new dedicated renewable capacity, the increased energy demand will result in increased production, and emissions, from dirtier fossil-based facilities across the grid. This relationship must be captured in the Secretary's emission rate calculations. If hydrogen producers are permitted to siphon existing renewable capacity into hydrogen production, with no consideration of the overall effect on marginal emissions across the power grid, then this tax credit would rapidly devolve into a government subsidized driver of emissions and point source pollution in frontline communities.

**Do not allow carbon accounting gimmicks to concentrate pollution in frontline communities.**

Strict guardrails are needed to ensure that qualified hydrogen is actually achieving the claimed emissions rate. Unchecked 'book and claim' accounting tactics will allow producers to play a shell game with greenhouse gas emissions, shifting pollution into frontline communities rather than achieving meaningfully lower emissions rates. Hydrogen producers must be prohibited from using offsets or renewable energy credits (RECs) not tied to a power purchasing agreement to demonstrate compliance.

To the extent hydrogen producers are generating renewable energy credits, Treasury should require producers to retire these RECs. Unbundling these RECs and selling them on a tradable market would allow further gaming of the system by hydrogen producers. The underlying assumptions used to originally calculate emissions intensity of hydrogen would shift under such transactions and allow multiple entities to claim the same renewable energy attributes.

Treasury should not consider the purchase of unbundled RECs in their analysis of emissions intensity of hydrogen. Allowing purchases of unbundled RECs will sap existing renewable resources, increasing the demand for dirty fossil fuels to meet energy needs and increasing otherwise avoidable emissions. The use of carbon offsets to demonstrate the emissions intensity of hydrogen should be similarly prohibited. Offset markets have been shown to increase pollution in disadvantaged communities and offer at best dubious and difficult to verify climate benefits.

**Do not allow fugitive emissions from fossil gas to be misrepresented.**

Properly measured, hydrogen produced from steam reformation with carbon capture should be ineligible for even the lowest tier of the tax credit. The lifecycle emissions of hydrogen from fossil fuel production is worse for the climate than burning coal per unit of energy.<sup>1</sup> Although accounting for both upstream methane leakage and the electricity needed to power carbon capture equipment is required by law, the Treasury cannot rely on model defaults that misrepresent the realities of fossil gas. The IEA recently found that countries underestimate

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<sup>1</sup> Howarth, RW, Jacobson, MZ. How green is blue hydrogen? Energy Sci Eng. 2021; 9: 1676– 1687. <https://doi.org/10.1002/ese3.956>

methane emissions by at least 1.7 fold.<sup>2</sup> In the US, the Department of Energy GREET model contributes to this undercounting by assuming a standard methane emissions rate of 1.1%, which is well below the majority of scientific literature on the topic, which puts the figure at more than twice this rate.<sup>3</sup> These are not mere rounding errors and point to significant flaws in the underlying model. If the Treasury applies GREET defaults, without any consideration of the unique lifecycle emissions from hydrogen production as it exists now, this will unleash a stream of emissions that will invariably harm the climate. We urge the Treasury to follow the science on emissions leakage rates and ensure that the global warming potential of methane is estimated in a climate relevant timeframe – if necessary, by using a successor model to GREET.

### **Do not allow loopholes for biomass feedstocks.**

When determining hydrogen emissions rates, Treasury should follow the best available science on measuring the carbon intensity of all energy feedstocks used in hydrogen production. Too often, feedstocks such as methane biogas and woody biomass are bundled with renewable energy without a full accounting of emissions on a climate relevant timespan.

Methane biogas produced from landfills and livestock manure digesters has a long history of qualifying for subsidies based on misrepresented climate impacts, with little regard for the impact this production has on surrounding (often BIPOC) communities. Producers of this methane often make outsized claims on their emissions impact based on narrow comparisons that ignore best practice alternatives that would actually reduce overall methane emissions. In practice, the perverse incentive of monetizing rather than minimizing this methane often increases greenhouse gas emissions, as well as co-pollutants in surrounding communities.

Woody biomass raises similar concerns - all methods to use wood in hydrogen production, including gasification and pyrolysis, will produce high lifecycle emissions that should rightly exclude the hydrogen from qualifying for this PTC. Gasifying woody biomass simultaneously releases all stored carbon immediately and ends any future carbon sequestration potential. Pyrolysis creates a bio-oil coproduct that emits CO<sub>2</sub> when burned. Additionally there are significant upstream emissions from logging, transportation, drying, chipping, and storage.<sup>4</sup> Proponents of woody biomass argue that it is 'carbon neutral' due to future forest regrowth - a misleading position that has been thoroughly refuted by the scientific literature. There is no guarantee that the forestland will be allowed to regrow, and even if it does it can take over a century to sequester carbon that is released in an instant by gasifying woody biomass.<sup>5</sup>

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<sup>2</sup> IEA Global Methane Tracker <https://www.iea.org/reports/global-methane-tracker-2022>

<sup>3</sup> Howarth, RW, Jacobson, MZ. How green is blue hydrogen? Energy Sci Eng. 2021; 9: 1676– 1687. <https://doi.org/10.1002/ese3.956>

Bruce Buckheit, Deconstructing the Hype on Hydrogen Hubs (2022) <https://1bps6437gg8c169i0y1drtgz-wpengine.netdna-ssl.com/wp-content/uploads/2022/07/Deconstructing-the-Hype-on-Hydrogen-Hubs-FINAL-.pdf>

<sup>4</sup> Roder, Mirjam et al., How certain are greenhouse gas reductions from bioenergy? Life cycle assessment and uncertainty analysis of wood pellet-to-electricity supply chains from forest residues, 79 Biomass and Bioenergy 50 (2015), <https://doi.org/10.1016/j.biombioe.2015.03.030>.

<sup>5</sup> Manomet Center for Conservation Sciences, Massachusetts Biomass Sustainability and Carbon Policy Study: Report to the Commonwealth of Massachusetts Department of Energy Resources (2010), <https://www.mass.gov/doc/manometbiomassreportfullhirezpdf/download>; Hudiburg, T.W. et al., Regional carbon dioxide implications of forest bioenergy production, 1 Nature Climate Change 419 (2011),

The Secretary must not allow hydrogen producers to create a massive loophole in the emissions rate requirement of this PTC with dubious claims of offsetting fossil hydrogen emissions with woody biomass or methane biogas. The greenhouse emissions of these feedstocks must be fully calculated and included in hydrogen emissions rates.

### **Big Picture Impacts of Hydrogen on the Climate.**

It is important for Treasury to recognize that the direct and indirect well-to-gate emissions of hydrogen can be unique, as this element is an energy consumer rather than energy source. Whether it is produced from new or existing renewables, a kilowatt of green electricity will always more effectively displace a kilowatt of fossil electricity if directed onto the grid rather than used in hydrogen production. If GREET is unable to capture these novel lifecycle considerations, this should strongly indicate that a successor model is needed for this PTC.

It is unfortunate that the IRA prohibits the consideration of emissions after hydrogen production, despite hydrogen having a global warming potential of 33. This restriction heightens the need for Treasury to ensure modeling accurately captures the full picture of emissions within its purview. After it is produced, hydrogen will be stored, transported, and eventually refined or burned. All of these steps will result in hydrogen leakage that will go unreported and unregulated since there is no tracking of hydrogen leakage now, nor plans at any federal agency to evaluate them. The leakage rates will likely be significant given hydrogen is much smaller than the notoriously leaky methane molecules in our existing gas system.

Because it is a practical inevitability that leakage after production will worsen the climate impacts of hydrogen, the Treasury should use all of its available authority to ensure strict guardrails and to minimize emissions wherever possible. Fully and accurately measuring well-to-gate production on a climate-relevant timeline is the least Treasury can do to prevent any climate benefits of hydrogen from being erased by downstream leakage.

### **Conclusion**

Treasury has an immense responsibility to create a methodology for emission rate calculations that is accurate, responsive to unique hydrogen considerations, and in alignment with the Biden Administration's commitment to environmental justice. Because hydrogen is energy storage rather than a source of energy, there are some unique considerations that must be included in emission calculations. We urge the Treasury to adopt our recommendations above and, if

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<https://doi.org/10.1038/nclimate1264>; Law, B.E. and M.E. Harmon, Forest sector carbon management, measurement and verification, and discussion of policy related to climate change, 2 Carbon Management 73 (2011), <https://doi.org/10.4155/cmt.10.40>; Holtsmark, Bjart, The outcome is in the assumptions: Analyzing the effects on atmospheric CO2 levels of increased use of bioenergy from forest biomass, 5 GCB Bioenergy 467 (2012), <https://doi.org/10.1111/gcbb.12015>; Mitchell, S.R. et al., Carbon debt and carbon sequestration parity in forest bioenergy production, 4 Global Change Biology Bioenergy 818 (2012), <https://doi.org/10.1111/j.1757-1707.2012.01173.x>; Schulze, E.-D. et al., Large-scale bioenergy from additional harvest of forest biomass is neither sustainable nor greenhouse gas neutral, 4 Global Change Biology Bioenergy 611 (2012), DOI:10.1111/j.1757-1707.2012.01169.x; Serman, John D. et al., Does replacing coal with wood lower CO2 emissions? Dynamic lifecycle analysis of wood bioenergy, 13 Environmental Research Letters 015007 (2018), <https://doi.org/10.1088/1748-9326/aaa512>.

necessary, work with DOE and other agencies on a GREET successor model that can best capture full lifecycle hydrogen emissions. The Treasury has both the authority and capability to implement the PTC in a way that decreases emissions and does not exacerbate environmental racism, and we urge the Secretary to do so.

Respectfully,

Center for Biological Diversity  
Center for International Environmental Law  
Food & Water Watch  
Friends of the Earth  
Institute for Policy Studies Climate Policy Program

Berks Gas Truth  
Better Path Coalition  
Climate Code Blue  
Global Witness  
Great Plains Action Society

Healthy Gulf  
Indigenous Lifeways  
Partnership for Policy Integrity  
Physicians for Social Responsibility  
Public Employees for Environmental Responsibility, Inc.

Public Goods Institute  
Science and Environmental Health Network  
Youth United For Climate Crisis Action