February 26, 2024

Mr. John Podesta
Senior Advisor to the President for Clean Energy Innovation and Implementation
White House

The Honorable Wally Adeyemo
Deputy Secretary of the Treasury
Department of the Treasury

The Honorable Lily L. Batchelder
Assistant Secretary for Tax Policy
Department of the Treasury

Mr. Seth Hanlon
Deputy Assistant Secretary for Tax and Climate Policy
Department of the Treasury

Re: Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election To Treat Clean Hydrogen Production Facilities as Energy Property

These comments on the section 45(v) and 48(a)(15) Internal Revenue Code[1] tax credit proposed rules are submitted by the New Jersey Environmental Justice Alliance; Center for Earth, Energy and Democracy; Tishman Environment and Design Center at The New School; and the Center for the Urban Environment of the John S. Watson Institute for Urban Policy and Research at Kean University. The proposed rule, which is intended to set conditions under which the production of hydrogen can claim tax credits, fails to address, or even contemplate, critical environmental justice (EJ) issues.

For years a significant part of the grassroots EJ community has advocated that, in addition to combating climate change, climate change mitigation policy should be used to address EJ issues. More specifically, EJ advocates have called for the reduction of greenhouse gas (GHG) co-pollutants by forcing polluting facilities to reduce their toxic air pollution emissions, if they are subject to a climate change mitigation policy, and are located in an environmental justice (EJ) community or detrimentally impact such a community due to their emissions. In these

[1] Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election To Treat Clean Hydrogen Production Facilities as Energy Property, 88 Fed. Reg. 89220 (proposed Dec. 26, 2023) (to be codified at 26 C.F.R. pt.

comments, EJ community refers to indigenous communities, communities Of Color and communities with low-income, while co-pollutants of concern include fine particulate matter, nitrogen oxides, sulfur dioxide, and hazardous air pollutants, all of which have detrimental local health impacts.[2] Reducing emissions of these air pollutants would improve the health of communities located near polluting facilities, particularly overburdened EJ communities.

To date, climate change mitigation policy has typically been carbon-centric and focused solely on reducing carbon emissions. We urge the 45(v) tax credit proposed rule to move away from carbon centrism by addressing EJ issues that include limiting the emissions of GHG co-pollutants in general as much as possible.

A carbon centric approach and focus on solely using the lifecycle GHG emissions rate of hydrogen production as the metric to determine whether the hydrogen produced is "clean", is a significant EJ concern. This approach ignores the emissions of GHG co-pollutants along the life cycle of not just hydrogen production but storage, delivery and end uses (such as the burning of hydrogen-blended natural gas at power plants[3]). Additionally, when a life cycle GHG emissions rate is the sole metric to determine whether the hydrogen produced is clean, a myriad of environmental and health impacts along the hydrogen production chain remain insufficiently addressed.

Currently, most hydrogen is produced from fossil fuels (specifically natural gas) via steam methane reforming[4]. The emissions of toxic air pollutants including VOCs, SO2, CO, NOx, PM2.5, PM10, ammonia, and lead is one of the most concerning impacts associated with production of fossil fuel-based hydrogen.[5] Even when the production of fossil fuel-based hydrogen is paired

---

[2] For the detrimental health effects of fine particulate matter *see Integrated Science Assessment (ISA) for Particulate Matter* (Washington, DC: U.S. EPA, Office of Research and Development, National Center for Environmental Assessment, 2019, EPA/600/R–19/188). For information on nitrogen oxides *see* "Basic Information about NO2 | US EPA," EPA, July 25, 2023, https://www.epa.gov/no2-pollution/basic-information-about-no2. For information on sulfur dioxide *see* "Sulfur Dioxide Basics | US EPA," EPA, Jan. 31, 2024, https://www.epa.gov/so2-pollution/sulfur-dioxide-basics. For information on hazardous air pollutants *see* "Hazardous Air Pollutants | US EPA," EPA, Jan. 31, 2024, https://www.epa.gov/haps.

[3] Cellek, Mehmet Salih, and Ali Pınarbaşı. 2018. "Investigations on Performance and Emission Characteristics of an Industrial Low Swirl Burner While Burning Natural Gas, Methane, Hydrogen-Enriched Natural Gas and Hydrogen as Fuels." *International Journal of Hydrogen Energy* 43 (2): 1194–1207. https://doi.org/10.1016/j.ijhydene.2017.05.107.

[4] "Hydrogen Fuel Basics | US DOE," DOE, Office of Energy Efficiency and Renewable Energy, accessed on Feb. 26, 2024, https://www.energy.gov/eere/fuelcells/hydrogen-fuel-basics#:~:text=Today%2C%20about%2095%25%20of%20all, Coal%20 gasification.

[5] Cho, Hannah Hyunah, Strezov, Vladimir, & Evans, Tim J. "Environmental Impact Assessment of Hydrogen Production via Steam Methane Reforming Based on Emissions Data," *Energy Reports* 8 (2022): 13585–95, https://doi.org/10.1016/j.egyr.2022.10.053; Sun, Fu, Qin, Jingshan, Wang, Zhiyu, Yu, Mengzhou, Wu, Xianhong, Sun, Xiaoming & Qiu, Jieshan "Energy-Saving Hydrogen Production by Chlorine-Free Hybrid Seawater Splitting

with carbon capture, numerous health and environmental impacts associated with fossil fuel extraction, production, and transport remain. There are pollution burdens associated with CO2 capture, compression, transport, and sequestration, as well.[6] Even with the production of "clean" hydrogen via electrolysis, a significant amount of freshwater is used directly (i.e., in the conversion process itself) and indirectly (by equipment and energy) in the hydrogen production process.[7] There are also significant safety risks in transporting hydrogen or hydrogen blends due to the specific physical properties of hydrogen, and an insufficient regulatory environment to address these risks from leaks and explosions.[8] Given the pattern of siting polluting infrastructure and other locally unwanted land uses in environmental justice communities,[9] it is unfortunately likely that the environmental and health hazards described above will fall on these communities.

We realize that some of the above concerns may be outside of the jurisdiction of the US Department of Treasury to address. However, we name the above concerns to bring attention to the importance of creating the strictest guidelines possible for the 45 (v) tax credit to ensure that the proposed guidelines do not exacerbate public health risks in EJ communities. The 45 (v) hydrogen production tax credit is set to unlock billions of dollars for hydrogen projects and will set the parameters under which the hydrogen fuel industry will operate for years to come. We urge the federal government:

Coupling Hydrazine Degradation," *Nature Communications* 12, no. 1 (2021): 4182, https://doi.org/10.1038/s41467-021-24529-3.

[6] Tishman Enviroment and Design Center et al., *Comment on the US EPA's proposed New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel–Fired Electric Generating Units; Emissions Guidelines for Greenhouse Gas Emissions From Existing Fossil Fuel–Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule* (August 2023), http://tinyurl.com/Comment-CEED-Tish-NJEJA-Watson

[7] Shi, Xunpeng, Xun Liao and Yanfei Li, "Quantification of fresh water consumption and scarcity footprints of hydrogen from water electrolysis: A methodology framework," *Renewable Energy* 154 (2020): 786-796; Simoes, Sofia G. et al., "Water availability and water usage solutions for electrolysis in hydrogen production," *Journal of Cleaner Production* 315 (2021): 128124.

[8] Kuprewicz, Richard B., *Safety of Hydrogen Transportation by Gas Pipelines* (2022), https://pstrust.org/wp-content/uploads/2022/11/11-28-22-Final-Accufacts-Hydrogen-Pipeline-Report.pdf

[9] *See, e.g.,* Emanuel, Ryan E., Caretta, Martina A. Rivers III, Louie, & Vasudevan, Pavithra, "Natural Gas Gathering and Transmission Pipelines and Social Vulnerability in the United States," GeoHealth 5, no. 6 (2021): e2021GH000442. https://doi.org/10.1029/2021GH000442; Strube, J., Thiede, B., & Auch, W. "Proposed Pipelines and Environmental Justice: Exploring the Association between Race, Socioeconomic Status, and Pipeline Proposals in the United States," Rural Sociology 86, no. 4 (2021): 647–72. https://doi.org/10.1111/ruso.12367; Weller, Zachary D., Im, Seongwon, Palacios, Virginia, Stuchiner, Emily & von Fischer, Joseph C. "Environmental Injustices of Leaks from Urban Natural Gas Distribution Systems: Patterns among and within 13 U.S. Metro Areas," Environmental Science & Technology 56, no.12 (2022): 8599–8609. https://doi.org/10.1021/acs.est.2c00097; Tessum, Christopher W. et al., "PM2.5 polluters disproportionately and systemically affect people of color in the United States," Science Advances, 7, no. 18 (2021); Pastor Jr, Manuel, James L. Sadd, and Rachel Morello-Frosch, "Waiting to inhale: the demographics of toxic air release facilities in 21st-century California," Social Science Quarterly 85, no. 2 (2004): 420-440.

- To maintain strict public health and equity standards in providing tax credits to hydrogen projects (restricting tax credits for fossil fuel derived hydrogen projects, requiring models to accurately account for upstream methane leakage involved in fossil fuel-derived hydrogen projects, establishing strict guidelines to confirm that the electricity used in hydrogen production is sourced from renewable or zero-emission sources).
- To conduct a thorough analysis of the public health impacts at the local scale of greater deployment of hydrogen projects as a result of the 45 (v) tax credits. As recent research studies have noted, information on the full environmental and specifically air pollution impacts of hydrogen production is lacking.[10]
- To strictly avoid incentivizing hydrogen production, the sale of hydrogen, and hydrogen end uses that lead to emissions of toxic GHG co-pollutants in environmental justice communities.
- To uphold the Executive Order (EO) 14096, the commitment to protect overburdened communities from the disproportionate impacts of pollution and the overall environmental justice goals of the Administration[11].

Sincerely,

Center for Earth Energy & Democracy
Center for the Urban Environment at Kean University
New Jersey Environmental Justice Alliance
Tishman Environment and Design Center at The New School

[10] Sun, Pingping, Young, Ben, Elgowainy, Amgad, Lu, Zifeng, Wang, Michael, Morelli, Ben, & Hawkins, Troy "Criteria Air Pollutants and Greenhouse Gas Emissions from Hydrogen Production in U.S. Steam Methane Reforming Facilities" Environmental Science & Technology 53, no. 12 (2019), 7103-7113, DOI: 10.1021/acs.est.8b06197.
[11] Exec. Order No. 14096, 88 FR 25251 (Apr. 21, 2023).