

November 14, 2022

RE: Comments to the U.S. Department of Energy Clean Hydrogen Production Standard Draft Guidance

To Whom It May Concern,

Mainstream Renewable Power (Mainstream) is pleased to provide the following comments regarding the Department of Energy's (DOE) Draft Guidance for a Clean Hydrogen Production Standard (CHPS). We commend DOE for the expeditious distribution of this guidance to inform industry's preparation for participating in DOE hydrogen programs.

Introduction:

Mainstream Renewable Power ("Mainstream") is a leading pure-play renewable energy company, with wind and solar assets across global markets, including in Europe, Africa, Asia-Pacific, and the Americas. We have successfully delivered 6.5 GW of wind and solar generation assets to financial close-ready and have a global portfolio of more than 27 GW. The company is currently bringing forward multi-gigawatt scale developments of offshore wind assets in markets including Vietnam, South Korea, Japan, Norway, Ireland, the UK, and Sweden, and have a pre-development pipeline of opportunities in the US.

Hydrogen presents an unparalleled economic opportunity, with global production expected to increase by over 300% by 2050, or up to 500 million metric tonnes per year¹. The projected growth is driven in large part by global decarbonisation trends, as hydrogen will play an essential role to decarbonise sectors that cannot be electrified. The hydrogen programs and incentives included in both the Infrastructure Investment and Jobs Act (IIJA) and Inflation Reduction Act (IRA) will be important drivers to create thousands of new jobs in the hydrogen economy and position the US as a leader in the global clean energy market. However, key to maximizing this opportunity will be a commitment to achieving a fully decarbonised product that the market will increasingly demand. To that end, Mainstream strongly supports the goal of DOE's hydrogen programs, as well as the hydrogen Production Tax Credit (PTC), as enacted in the IIJA and IRA, to reduce the carbon intensity of standard hydrogen production. This ensures that the country achieves full lifecycle decarbonisation, and deconflicts the US supply to unlock the full economic potential of hydrogen required for global competitiveness.

Comments:

1. Implement localized, hourly temporal matching of clean energy supply and electrolyzer demand

Achieving DOE's Hydrogen Shot goal of a reduction in the cost of clean hydrogen to \$1 per kilogram within the next decade will require significant electrolyzer deployment, and in turn, an increase in electricity load. This load growth will require new, proximal generation to meet deliverability needs as well as supply adequate localized voltage support to sustain the grid. In accordance with the intent of the IIJA to produce hydrogen with near zero emissions, it is essential

¹ DNV, *Hydrogen Forecast to 2050*, 14 June 2022 <https://www.dnv.com/focus-areas/hydrogen/forecast-to-2050.html>

that local generation additions be renewable resources and be available on a time-matched basis to align with hydrogen production. Mainstream recommends that this requirement be included in the CHPS as well as the corresponding regulatory guidance to avoid the need for carbon-emitting generation to serve local load, and to achieve a truly carbon-free hydrogen production lifecycle. Further, Mainstream encourages DOE to initiate a stakeholder process to evaluate the tools and technologies best suited to perform and verify localized hourly matching of hydrogen production and renewable generation, as existing bundled and unbundled REC products are insufficient to capture the granularity of location and temporal accounting.

This recommendation of hourly matching is supported by Princeton University, as noted in their analysis of multiple implementation measures for the recently enacted hydrogen PTC. The analysis found that, “requiring 100% Hourly Matching leads to near-zero additional emissions from hydrogen production, as long as hydrogen production and time-matched clean electricity resources are located in the same grid region.”² The analysis also highlights the variances in grid conditions and the implication that has on determining what should constitute as a grid region. “[T]he [...] grid is not divided neatly into well-connected zones, and transmission bottlenecks of varying severity exist at all spatial scales.” For this reason, Mainstream recommends that in order to determine the threshold for how proximate generation must be to the hydrogen production load, DOE should conduct an evaluation on a subregional basis in partnership with the National Renewable Energy Lab, ultimately to be published in the initial IRS guidance for 45V tax credit qualification guidelines.

2. Establish a clear phase-in timeline to maximize regulatory certainty and a pathway to full decarbonization

To make meaningful strides towards a fully scaled green hydrogen production fleet, industry must promptly begin deployment while new energy infrastructure is being developed in parallel. As localized renewable energy generation may not be available to the degree necessary in the near term, Mainstream supports a phase-in approach where facilities placed in service in 2027 must procure a percentage of its renewable electricity locally, with the proportion of localized electricity reaching 100% for any facility placed in service from 2030 onward. With clear dates and guideposts to provide certainty to industry, the industry can begin to take shape in short order, creating a runway for a fully decarbonised hydrogen economy.

Conclusion:

Mainstream Renewable Power thanks DOE for the consideration of these comments and recommendations. We are eager to contribute to the growth of this new industry and participate in DOE’s efforts to support its success.

Sincerely,

² Princeton University Zero Lab, 20 Sept 2022, “Policy Memo: Cost and Emissions Impacts of Hydrogen Production Tax Credit Implementations” <https://repeatproject.org/>

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