BayoTech Hydrogen
Andrew Leedom, General Counsel & Head of Policy
www.bayotech.us
Andrew.Leedom@bayotech.us
1.202.288.4009

RE: Clean Hydrogen Production Standard (87 FR 58776; Document Number: 2022-21016)

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BayoTech Hydrogen is very pleased to provide feedback on the Department of Energy's draft guidance for the Clean Hydrogen Production Standard (87 FR 58776; Document Number: 2022-21016).

BayoTech is a full-service hydrogen production, delivery, and storage technology company, headquartered in Albuquerque, New Mexico. We are focused on building a new, highly efficient model of local hydrogen production units. Producing on a small scale with our unique technology, BayoTech is making reliable, cost-effective, low-carbon hydrogen accessible today. BayoTech's technology provides flexible, market-ready solutions to immediately reduce carbon and particulate matter emissions through hydrogen deployment and help grow the hydrogen economy.

We have provided answers below that reflect selected topics of interest, both to us as a company, and that we feel provide benefit and support for the growth of the larger hydrogen economy and the success of the Clean Hydrogen Hubs Program. We greatly appreciate the work that the Department of Energy is doing to consider the best approach to the development of the Clean Hydrogen Hub Program, based on the requirements established in the Infrastructure Investment and Jobs Act (PL 117-58). We look forward to continuing to participate in the development process.

3) Implementation

c) Should renewable energy credits, power purchase agreements, or other market structures be allowable in characterizing the intensity of electricity emissions for hydrogen production? Should any requirements be placed on these instruments if they are allowed to be accounted for as a source of clean electricity (e.g. restrictions on time of generation, time of use, or regional considerations)? What are the pros and cons of allowing different schemes? How should these instruments be structured (e.g. time of generation, time of use, or regional considerations) if they are allowed for use?

Regional hydrogen hubs should incorporate a variety of different renewable energy procurement arrangements – including on-site generation, collocation, off-site renewable natural gas (RNG), power purchase agreements (PPAs), or other arrangements. The hubs should ensure verifiable procurement and use of energy and care must be taken to ensure that real time use of feedstock is taken into consideration based on the availability of resources to prevent mismatches between supply and demand, which could lead to increased emissions.

4) Additional Information

a) Please provide any other information that DOE should consider related to this BIL provision if not already covered above.

Preference for projects blending fossil fuels with renewable natural gas or low-carbon biomass

The draft guidance states that while DOE-funded projects may not necessarilly require achievement of the CHPS target or the "site of production" emissions target set in the Infrastructure Investment and Jobs Act (IIJA), DOE "may give preference to projects that [. . .] blend fossil fuels with renewable natural gas [RNG]." While not fully captured in the IIJA's site of production target, RNG blending has the potential to drive lifecycle carbon intensity values below zero. DOE's recognition of RNG values will help incentivize the development of RNG pathways, including dairy and landfill gas that would otherwise be emitted into the atmosphere.

Lifecycle emissions boundary

The draft guidance proposes a "well-to-gate" emissions boundary analysis that includes upstream emissions associated with hydrogen production through the point of hydrogen production, as well as downstream emissions associated with the transport and sequestration of CO2. Footnote 11 of the draft guidance states that the emissions boundary "does not include other post-hydrogen production steps such as potential liquefaction, compression, dispensing into vehicle, etc."

We urge DOE to instead adopt an emissions boundary analysis that considers the full lifecycle carbon intensity value. The Department should focus on technology neutral policy and incentive structure that utilizes well established carbon Intensity models such as CARB GREET3. To accurately assess the full carbon impact of a given hydrogen pathway, it is necessary to include downstream emissions resulting from liquefaction, compression, storage, transportation, and end-use. This will enable comparisons to be made between a) large central plants which transport hydrogen over long distances; and b) smaller local plants which transport hydrogen to local and regional users.

Incentivizing hubs to supplement central plants with smaller, distributed production sites to meet local and regional needs will allow a more adaptive approach to supplying the growing, but variable demand in different markets. Encouraging the inclusion of smaller production sites will help ensure the ability to scale each of the hubs to meet increased demand over time, for

different end uses and economic growth scenarios across the various markets. Should hub development focus only on centralized production and distribution models, there is a risk of technology stagnation and market glut. A small number of large production centers may inadvertently produce a market surplus in the early years, which will inevitably lead to suppressed investment in innovation and carbon reduction. Local, on-site hydrogen generation to scale production according to the needs of specific end-users shold be incentivized to find a balance of scale of economy and avoid wasteful liquefication, storage, and transport in distribution of H2 product.

Encouraging alternatives to liquefaction:

Hydrogen hub development should leverage existing high pressure natural gas pipelines as a national distribution network, that when coupled with regional SMR production, RNG supplies, and existing storage and local utility delivery infrastructure, can provide the quickest, most comprehensive access to H2 across the nation. By including gas grid operators, who play an existing role in maintaining high pressure and local distribution networks, the program can encourage industry wide participation in driving new end uses as well. Where local delivery infrastructure is not available, a “virtual pipeline” approach can be employed, utilizing high pressure tube trailers that can bridge the last mile of delivery, while providing a lower carbon alternative to liquefaction. We urge DOE to clarify that it will consider such approaches and the emissions they will avoid under the CHPS.