Dr. Sunita Satyapal
Director of the U.S. Department of Energy
Hydrogen and Fuel Cell Technologies Office
Forrestal Building
1000 Independence Avenue SW
Washington, DC 20585

Dear Dr. Satyapal

Re: Request for Comments on Clean Hydrogen Production Standard

Ørsted P2X US Holding LLC ("Ørsted") is pleased to provide these comments to the Department of Energy ("DOE") in response to draft guidance for a Clean Hydrogen Production Standard ("CHPS"). The CHPS will be developed to meet the requirements of the Bipartisan Infrastructure Law ("BIL"), Section 40315. This initial proposal establishes a target of 4.0 kgCO2e/kgH2 for lifecycle (i.e., "well-to-gate") greenhouse gas emissions ("GHG") associated with hydrogen production, accounting for multiple requirements within the BIL provision as well as incentives in the Inflation Reduction Act ("IRA").

As a global leader in renewable energy, including the world's largest portfolio of offshore wind farms and a growing portfolio of land-based wind, solar, and green hydrogen, Ørsted applauds DOE for providing stakeholders the opportunity to comment on this important standard. The CHPS impact on future decisions by DOE, and in turn its effect on the growing hydrogen economy, cannot be overstated. Providing certainty in the market will not only support the country's climate goals but will lead to greater private sector investment and create good paying American jobs that cannot be offshored.

Ørsted is committed to providing green hydrogen produced solely from renewable energy. A CHPS that takes into account the Biden-Harris Administration's ambitious climate goals, and the need to rapidly decarbonize the U.S. economy, should recognize the role renewable energy must play in producing hydrogen. If the CHPS is not aggressive enough, our domestic hydrogen policy runs the risk of locking in fossil fuel infrastructure for decades, with associated lifecycle emissions.

Ørsted requests that DOE consider the following issues and recommendations in response to select questions provided in DOE's request for comment:

1.c. *Are any key emission sources missing from Figure 1? If so, what are those sources? What are the carbon intensities for those sources? Please provide any available data, uncertainty estimates, and how data/measurements were taken or calculated.*

Ørsted is supportive of the key emission sources included in Figure 1. However, it is important to fully account for the upstream and downstream emissions associated with all forms of steam reforming, as well as in the production process itself. There are increasing numbers of studies suggesting an underestimation of fugitive methane emissions during natural gas extraction, transportation, and storage. Carbon capture technology is still widely unproven at large scale and has not been deployed extensively at scale.[1] Downstream, the effectiveness of long-term CO2 transportation and sequestration is also largely unproven and raises the possibility that significant captured CO2 could escape, undoing any intended decarbonization.

3.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?*

Ørsted strongly recommends that DOE allow for virtual power purchase agreements ("VPPA") within the same balancing area to be an acceptable means of renewable power supply to an electrolyzer. Supplying power via a dedicated line, such as in a behind-the-meter configuration, is no different than using the public grid to move those electrons, except that using the grid is a more efficient use of resources that will allow for more renewable power and renewable hydrogen deployment at a lower cost. Additionally, building renewable generation co-located with electrolyzers is challenging from a practical standpoint. Green hydrogen and derivative e-fuels will be utilized in areas of existing industrial infrastructure. The end users of the fuel will need to get the product to their systems. These areas generally have limited availability to construct utility scale renewable generation due to limited land availability, permitting constraints and less optimal renewable resource. This separation of the renewable generation and the end use delivery point will need to be solved to get the end use product to customers. It is critical, however, that the electrolyzer asset is purchasing the renewable attributes (the Renewable Energy Certificates, or ("RECs")) of the renewable power generation and retiring them upon consumption by the electrolyzer such that they are not being double counted, and thus renewable power generation capacity is dedicated to the electrolyzer load even if the actual electrons are flowing out over the grid.

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

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[1] Meredith, Sam "Carbon capture is expected to play a pivotal role in the race to net zero emissions. But not everyone agrees", July 20, 2021, CNBC (C*enter for International Environmental Law: Why Carbon Capture Is Not a Climate Solution*). "The peer-reviewed study found that carbon capture and storage technologies still face numerous barriers to short-term deployment and, even if these could be overcome, the technology "would only start to deliver too late." Researchers also found that it was incapable of operating with zero emissions, constituted a distraction from the rapid growth of renewable energy "and has a history of over-promising and under-delivering."

The CHPS should help the market ramp-up in the US and ensure international market compatibility in order to expand the investment case for hydrogen and e-fuels at the same time. Ørsted recommends that DOE adopt a straightforward lifecycle CO2 value of no more than 3.24 kg CO2e per kg H2. This is within the range of lifecycle CO2 thresholds being set in Europe (less than 3.38 kg CO2e per kg H2) and will ensure that products produced in the US would be compatible in other markets. This lower threshold value still enables support for hydrogen production from diverse low-carbon energy sources while maintaining technical and economic feasibility. Established green and blue hydrogen production technologies are both able to meet a lower than 3.25 kg CO2 threshold in many cases while remaining price competitive with higher emitting H2 production due to the passage of the IRA.

Ørsted appreciates DOE providing an opportunity for stakeholders to comment on this important topic. We look forward to continued engagement as DOE seeks input on the regulatory regime governing the hydrogen economy. For any questions or comments, please contact Melissa Peterson, Head of P2X Americas at melpe@Ørsted.com.

Sincerely,

Melissa Peterson

Melissa Peterson
Head of P2X Americas
Ørsted P2X US Holding LLC