COMMENTS FROM THE EDISON ELECTRIC INSTITUTE
ON U.S. DEPARTMENT OF ENERGY
CLEAN HYDROGEN PRODUCTION STANDARD (CHPS) DRAFT GUIDANCE

November 14, 2022

The Edison Electric Institute (EEI) appreciates the opportunity to submit comments in response to the U.S. Department of Energy's (DOE) Clean Hydrogen Production Standard (CHPS) Draft Guidance. DOE seeks to obtain feedback on the proposed CHPS and information on data that will inform the value of the CHPS. Please contact Alex Bond at abond@eei.org (202-508-5523) or Eric Holdsworth at eholdsworth@eei.org (202-508-5103) if you have any questions regarding EEI's comments. EEI's address is 701 Pennsylvania Avenue, N.W., Washington, D.C. 20004.

EEI is the association that represents all U.S. investor-owned electric companies. EEI members provide electricity for more than 235 million Americans and operate in all 50 states and the District of Columbia. The electric power industry supports more than seven million jobs in communities across the United States. EEI members are united in their commitment to get the energy they provide as clean as they can, as fast as they can, while keeping reliability and affordability front and center, as always, for the customers and communities they serve.

EEI members are in the middle of a profound, long-term transformation in how electricity is generated, transmitted, and used. This transformation is being driven by a wide range of factors, including declining costs for natural gas and renewable energy resources; energy efficiency and demand-side management; technological improvements; changing customer expectations, as well as changing investor and owner expectations; federal and state regulations and policies; and the increasing use of distributed energy resources.

EEI worked with industry leaders, leading environmental groups and other stakeholders to launch the Carbon-Free Technology Initiative (CFTI). Through CFTI, we are working to help ensure the commercial availability of key technologies, so that they can be deployed in a timely manner to achieve net-zero emissions in the U.S. electricity sector and to ensure electricity remains affordable and reliable. CFTI areas of focus include hydrogen and other zero-carbon fuels. A number of EEI member companies are also pursuing hydrogen initiatives, nuclear-to-hydrogen projects, renewable power-to-gas projects, use of hydrogen in dual fuel combined cycle power plants, renewable hydrogen blending, and use of hydrogen as long duration energy storage. EEI appreciates DOE's work to advance the U.S. hydrogen economy and to help continue the clean energy transformation.

I. Responses to DOE Questions

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

EEI cautions against the use of a lifecycle analysis for hydrogen without specific parameters around how the data from such an analysis will be used. For most other fuels, analyses focus on direct emissions only and therefore the data from hydrogen lifecycle analyses will not be fundamentally comparable to the information available for other fuels. Consequently, data from hydrogen lifecycle analyses should not, for example, be used to assess relative emissions across potential fuel options given these comparability challenges. To the extent DOE utilizes a lifecycle analysis for hydrogen in the CHPS, it should specify that the information derived is to be used for its intended analytical purposes—namely, it is solely for use in qualifying for the incentives available under the Inflation Reduction Act, in assessing Regional Clean Hydrogen

Hub applications under the BIL, and in making comparisons to another fuel only where a comparable lifecycle analysis has been performed for that fuel.

Furthermore, as discussed in greater detail in the response to Question 2.a, there are significant challenges to quantifying Scope 3 emissions. For this reason, DOE should only require inclusion of Scope 3 GHG emissions for entities that have set a Scope 3 emissions goal or target and should include, at a minimum, reasonable boundaries on the extent of the value chain that would be relevant for purposes of Scope 3 calculations.

<u>Question 1.a.</u> Many parameters that can influence the lifecycle emissions of hydrogen production may vary in real-world deployments. Assumptions that were made regarding key parameters with high variability have been described in footnotes in this document and are also itemized in the attached spreadsheet "Hydrogen Production Pathway Assumptions." Given your experience, please use the attached spreadsheet to provide your estimates for values these parameters could achieve in the next 5-10 years, along with justification.

Aspirational targets are important to drive technological advancements that will help continue the clean energy transformation. However, the assumptions for standards that will apply over the next five years should be based on rates that are achievable given the current state of technology. This includes the rates for carbon capture and leak rates associated with sequestration, which should be set for the near-term period (within the next five years) based on currently achievable rates. These rates can be adjusted as technology advances but should be set appropriately to ensure projects are able to advance from demonstration to deployment while remaining cost-effective.

DOE also should clarify that "clean energy," as used in the assumptions for the share of clean energy within electricity consumption, includes nuclear and hydropower since these resources are essential carbon-free resources. In addition, DOE should ensure that its analysis reflects the current and near-term energy mix, and allows for the input of facility-specific generation data or utility-specific grid mixes, which are likely to continue to change as the clean energy transformation continues and as the U.S. economy progresses towards net-zero emissions. This mix likely will continue to vary by region, depending on the available resources and related infrastructure.

Question 1.b. Lifecycle analysis to develop the targets in this draft CHPS were developed using GREET. GREET contains default estimates of carbon intensity for parameters that are not likely to vary widely by deployments in the same region of the country (e.g., carbon intensity of regional grids, net emissions for biomass growth and production, avoided emissions from the use of waste-stream materials). In your experience, how accurate are these estimates, what are other reasonable values for these estimates and what is your justification, and/or what are the uncertainty ranges associated with these estimates?

Two federal entities already are well-equipped to assist DOE with developing targets for emissions for use in the CHPS. The U.S. Environmental Protection Agency (EPA) has principal authority over emissions and significant experience with greenhouse gas (GHG) reporting. The U.S. Energy Information Administration (EIA), is a principal agency for collecting, analyzing, and disseminating energy information. EIA has the skillset to help provide the necessary data and estimates, over 40 years of experience, and is well-respected in the industry.[1] Instead of relying on the GREET model, DOE should work with these agencies to help ensure accurate assessment of emissions impacts and consistent analysis across the government the possibility of revising the proposed target in the future.

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[1] EIA "conducts a comprehensive data collection program that covers the full spectrum of energy sources, end uses, and energy flows. EIA also prepares informative energy analyses, monthly short-term forecasts of energy market trends, and long-term U.S. and international energy outlooks." About EIA: Mission and Overview, Energy Information Administration, https://www.eia.gov/about/mission_overview.php.

To the extent DOE relies on the GREET model, it should work with these expert agencies for the reasons noted above and to continue to improve the GREET model. In addition, DOE should allow applicants to provide user defined inputs when the information is available and is more specific than the default regional grid mixes. Grid carbon intensity can vary significantly within NERC regions, which are utilized in the GREET model.

<u>Question 1.e.</u> **Atmospheric modeling simulations have estimated hydrogen's indirect climate warming impact (for example, see Paulot 2021). The estimating methods used are still in development, and efforts to improve data collection and better characterize leaks, releases, and mitigation options are ongoing. What types of data, modeling or verification methods could be employed to improve effective management of this indirect impact?**

Zero-carbon fuels, like clean hydrogen, present significant opportunities to aid in continuing to reduce emissions for the U.S. electric power industry. For example, the electric power industry could generate clean hydrogen using the electricity and/or heat supplied by large-scale renewable or nuclear power plants and either could distribute clean hydrogen for customer use in a range of sectors or store and/or use the clean hydrogen themselves. Even if not the producer of clean hydrogen, the electric power industry could supply the zero-carbon electricity for others to produce clean hydrogen. The electric power industry also could use clean hydrogen produced by others to fuel dispatchable thermal power generation.

EEI supports DOE and others' ongoing efforts to improve leak detection and mitigation options for this important, developing energy resource and, as noted in the response to Question 3.b, supports efforts to reduce and mitigate upstream methane emissions. DOE also should conduct a study of how indirect impacts from hydrogen will change as methane concentration is decreased over time, for example, as a result of replacement with emerging fuels like hydrogen. The initial research on the indirect global warming potential of hydrogen focuses on hydrogen's interaction with methane to potentially prolong the lifetime of methane in the atmosphere. State and federal regulation is expected to significantly reduce methane emissions from industrial sources in the coming years which will reduce the atmospheric concentration of methane. DOE should partner with the National Oceanic and Atmospheric Association or other climate science authority to study how indirect impacts from hydrogen will change as methane concentration is decreased over time as a result of state and federal regulation as well as voluntary measures adopted by industry to significantly mitigate methane emissions.

Question 2.a. The IPHE HPTF Working Paper identifies various generally accepted ISO frameworks for LCA (14067, 14040, 14044, 14064, and 14064) and recommends inclusion of Scope 1, Scope 2 and partial Scope 3 emissions for GHG accounting of lifecycle emissions. What are the benefits and drawbacks to using these recommended frameworks in support of the CHPS? What other frameworks or accounting methods may prove useful?

Scope 3 emissions are difficult to quantify and generally can only be an estimate based on available emissions reporting methodologies and capabilities. Nonetheless, inclusion of some Scope 3 emissions can be valuable even if the emissions data is not perfectly accurate. Consequently, DOE should not require inclusion of Scope 3 emissions in GHG accounting of lifecycle emissions in all instances. Instead, DOE should only require inclusion of Scope 3 emissions to the extent that an entity has set a Scope 3 emissions goal or target and should include, at a minimum, reasonable boundaries on the extent of the value chain that would be relevant for purposes of Scope 3 calculations.

Question 2.b. Use of some biogenic resources in hydrogen production, including waste products that would otherwise have been disposed of (e.g., municipal solid waste, animal waste), may under certain circumstances be calculated as having net zero or negative CO2 emissions, especially given scenarios wherein biogenic waste stream-derived materials and/or processes would have likely resulted in large GHG emissions if not used for hydrogen production. What frameworks, analytic tools, or data sources can be used to

quantify emissions and sequestration associated with these resources in a way that is consistent with the lifecycle definition in the IRA?

<u>Question 3.a.</u> **How should the GHG emissions of hydrogen commercial-scale deployments be verified in practice? What data and/or analysis tools should be used to assess whether a deployment demonstrably aids achievement of the CHPS?**

In seeking to quantify emissions, DOE should look to leverage existing, generally accepted tools, tailored, as appropriate, for the hydrogen industry. For example, methods of verifying GHG emissions have been developed and are used in other sectors of the energy economy. This includes third-party verifiers for the biogas industry, as well as for programs like the Low Carbon Fuel Standards adopted in several states and to obtain renewable energy credits.

<u>Question 3.b.</u> **DOE-funded analyses routinely estimate regional fugitive emission rates from natural gas recovery and delivery. However, to utilize regional data, stakeholders would need to know the source of natural gas (i.e., region of the country) being used for each specific commercial-scale deployment. How can developers access information regarding the sources of natural gas being utilized in their deployments, to ascertain fugitive emission rates specific to their commercial-scale deployment?**

Natural gas is a fungible molecule. As a result, it is challenging to determine the precise origin of a specific natural gas molecule if it is comingled in transport, as is the case with most pipeline transportation. However, existing industry efforts can help provide information about the natural gas that a developer purchased. For example, there are programs though which producers can obtain a third-party certification of the emissions associated with their production processes that can be used by others in the supply chain. As with Questions 2b and 3.a, DOE should look to leverage existing, generally accepted tools and tailor as appropriate for the hydrogen industry.

Further, EEI broadly supports efforts to reduce and mitigate upstream methane emissions—ensuring that methane emissions are appropriately mitigated is essential to the industry's ongoing transformation. EEI's members were instrumental in organizing the Natural Gas Sustainability Initiative ("NGSI"), a voluntary, industry-led effort to advance best practices and to encourage continuous improvement in methane emissions reductions through company-level disclosure. NGSI is intended to complement and work in concert with regulatory standards from the EPA, which are critical to reducing emissions and providing certainty to both the regulated industry and its customers in the supply chain. As a result, EEI supports the EPA's proposed federal regulations on methane emissions for new and existing sources, and ensuring methane emissions from the entire natural gas supply chain are reduced is essential to the industry's ability to continue to use natural gas.

<u>Question 3.c.</u> 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?

EEI supports allowing instruments like renewable energy credits (RECs) and power purchase agreements in characterizing the intensity of electricity emissions for hydrogen production. DOE should also broaden its consideration to include other market structures and instruments, including those that may emerge as the hydrogen economy continues to develop.

Regional considerations in hydrogen production are important. With respect to RECs generally, to help ensure meaningful accounting, DOE should include a requirement for electrolytic hydrogen that the electricity used in hydrogen production is generated in the same balancing authority or is delivered to the interconnected grid where the hydrogen is being produced. Such a requirement will provide a sensible nexus between electric generation and hydrogen production that is also flexible enough to allow for various hydrogen production models. In addition to regional availability of carbon-free resources to serve electrolyzers, load serving entities will require sufficient time to plan for load increases from electrolyzers and contract for carbon-free generation to serve these loads.

Time of generation and time of use restrictions may be more challenging to implement but technology to support this may develop in the future and the guidance could be revisited, particularly depending on how the broader energy economy evolves. For example, significant build out and use of long duration energy storage (LDES) may alter when electricity is generated and used. If DOE includes time of generation or time of use restrictions, it should take these potential changes to the energy economy into account to ensure instruments are flexible enough to include electricity stored in LDES, where that electricity conforms to the geographic restrictions recommended above.

II. Conclusion

EEI appreciates the opportunity to provide comments on the CHPS.