December 3, 2022

Via Electronic Submission

To: **Internal Revenue Service**
Department of the Treasury
Washington, DC

From: **Bloom Energy Corporation**
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Re: **Notice 2022-58: Request for Comments on Credits for Clean Hydrogen and Clean Fuel Production**

Bloom Energy Corporation ("Bloom Energy") respectfully submits these comments in response to Notice 2022-58: Request for Comments on Credits for Clean Hydrogen and Clean Fuel Production (the "Notice").

Bloom Energy applauds passage of the Inflation Reduction Act of 2022 (the "IRA") and the commitment the IRA represents to support the growth and expansion of clean energy solutions. Bloom Energy sincerely appreciates the opportunity to respond to the Notice and looks forward to working with the Treasury Department and the IRS on these issues.

Bloom Energy was founded in 2001 with a mission to make clean, reliable, and affordable energy available for everyone in the world. Bloom manufactures solid oxide fuel cells (SOFC), which is the base technology for Bloom's Energy Server™, which constitutes a "qualified fuel cell property" within the meaning of Section 48(c)(1) of the Code.[1] The SOFC delivers highly reliable and resilient, AlwaysOn® clean electric baseload power. Bloom's Energy Server is a stationary generation platform for clean and sustainable electricity. Among the most efficient energy producers on the planet, it dramatically reduces cost and emissions. Bloom has deployed over 750 MWs of Energy Servers at over 700 installations, including 140 microgrids. Our systems power everything from hospitals to data centers to grocery stores with 24x7x365 on-site, uninterruptable power. At Bloom Energy, we help create sustainable communities by reducing carbon emissions and criteria air pollutants that disproportionately burden disadvantaged communities. In 2021 alone our systems reduced CO2e, NOx, and SO2 emissions for our customers by 636,266 Metric Tons, 2,467,309 lbs and 550,651 lbs, respectively.

Using the same solid oxide technology and manufacturing equipment and tooling as used for the SOFC, Bloom Energy also manufactures solid oxide electrolyzer cells (SOEC) which are the basis of the Bloom

[1] References to the "Code" are to the Internal Revenue Code of 1986, as amended.

Electrolyzer™. The Bloom Electrolyzer has been widely recognized as the leader in efficient, clean hydrogen production, and recently demonstrated its potential for pairing with zero-carbon energy production through its partnership with the Department of Energy's Idaho National Laboratory, which found that the Bloom Energy solid oxide electrolyzer was the most efficient it had tested to date. The Bloom Electrolyzer is exceptionally efficient in any application, but particularly excels when paired with both renewable power and steam.

The modular nature of Bloom Energy's SOFC and SOEC products (deployed in increments of 300KW with no maximum installation size) have a very small footprint and are easily dispatchable, making them ideal for either quickly adding low- to zero-carbon capacity, resilience and stability to a grid or behind the meter commercial or industrial application in urban or rural areas, or producing hydrogen in quantities as needed now and into the future. The SOFCs are also fuel flexible and can operate using natural gas, natural gas blended with up to 50% hydrogen, 100% hydrogen or biogas, and are capable of capturing carbon emissions for sequestration or utilization (if powered using natural gas or biogas) as well as delivering up to 30% additional efficiency by harnessing and reusing their heat as part of a combined heat and power (CHP) system.

I. Notice Section 3.01(1)(e)

How should qualified clean hydrogen production processes be required to verify the delivery of energy inputs that would be required to meet the estimated lifecycle greenhouse gas emissions rate as determined using the GREET model or other tools if used to supplement GREET? How might clean hydrogen production facilities verify the production of qualified clean hydrogen using other specific energy sources?

The GREET model uses EPA's eGRID emission factors to determine the carbon intensity of regional electricity grids. The World Resource Institute's (WRI) Greenhouse Gas Protocol (GHG) Scope 2 Guidance lists location-based emission factor hierarchies and lists the eGRID total output emission rates as an indicative emission factor to use. Published eGRID subregional rates are the most accurate, standardized, and transparent method for reporting emissions from purchased electricity. The eGRID subregion emission rates most accurately represent the actual electricity used by consumers by limiting the import and export of electricity within an aggregated area.

The subregions were defined by the U.S. Environmental Protection Agency (EPA) as a compromise between NERC regions (which EPA felt were too big) and balancing authorities (which EPA felt were generally too small). These emission rates are heavily utilized for voluntary greenhouse gas reporting and are expected to be adopted by the SEC, as stated in the Proposed Rule to Enhance and Standardize Climate-Related Disclosures for Investors. The SEC ruling would require companies to disclose Scope 1 and 2 greenhouse gas emissions, along with an abundance of additional ESG metrics. Aligning the calculation requirements of the carbon intensity of regional grids with the GHG Protocol Scope 2 Guidance and SEC Proposed Rule on Climate-Related Disclosures will provide a standard approach for companies while allowing them to reference pre-existing guidance documents for their lifecycle analyses.

Bloom suggests that the Treasury Department use the most recent version of eGRID total output emission rates to represent the carbon intensity of regional grids.

What granularity of time matching (that is, annual, hourly, or other) of energy inputs used in the qualified clean hydrogen production process should be required?

Time matching of energy inputs used in the qualified clean hydrogen production process should be limited to annual matching. Concern has been raised by some parties that the energy need for electrolyzers may not match the generation provided by wind and solar, and could cause increased emissions- at least in some hours, and at least when electrolyzer load increases to a significant proportion of grid energy usage; these parties are likely to argue for environmental attribute certificates (EACs) that have been "time-stamped" to match production and consumption. It is notable, however, that no broadly-accepted EAC system, either in the United States or elsewhere, has yet to match the time at which energy is used to the time at which it was generated- in part, perhaps, due to the complexity of storage which can shift that time, adding complexity that has not yet been evaluated through stakeholder processes underpinning EAC systems in broad use. The bodies responsible for developing, implementing and operating EAC systems, whether pursuant to state law, regional agreements, or voluntary understandings, are best situated to work with their stakeholders to enhance them, balancing the cost, complexity, environmental, social and market fluidity, credibility and administration considerations that have gone into establishing them. Since electrolyzers will comprise a very small percentage of the overall EAC-qualifying energy produced for many years to come, there is ample time for those state, regional and voluntary bodies to work through their stakeholder processes and make any changes as needed to adjust those systems so as to avoid unintended outcomes.

II. Section 3.01(2) Alignment with the Clean Hydrogen Production Standard

On September 22, 2022, the Department of Energy (DOE) released draft guidance for a Clean Hydrogen Production Standard (CHPS) developed to meet the requirements of § 40315 of the Infrastructure Investment and Jobs Act (IIJA), Public Law 117-58, 135 Stat. 429 (November 15, 2021). The CHPS draft guidance establishes a target lifecycle greenhouse gas emissions rate for clean hydrogen of no greater than 4.0 kilograms CO_2-e per kilogram of hydrogen, which is the same lifecycle greenhouse gas emissions limit required by the § 45V credit. For purposes of the § 45V credit, what should be the definition or specific boundaries of the well-to-gate analysis?

The Treasury Department should continue to coordinate with the DOE to ensure that there are no differences that could, by creating confusion in the market and thereby chilling financing, undermine the joint intent of the IRA and the IIJA to stimulate a robust clean hydrogen economy.

The statutory definitions of the CHPS and of qualified clean hydrogen in § 45V both focus on emissions up to production, with CHPS referring to emissions "produced at the site of production" and the § 45V credit referring to emissions up to the "point of production." Cf. 42 U.S.C. § 822(b)(1)(B) & 26 U.S.C. § 45V(c)(1)(B). While the GREET lifecycle analyses through to the point of production are specifically identified for use in determining the § 45V credit, and consistent with the requirements for the CHPS, consideration of downstream emissions after the point at which the hydrogen is produced is clearly precluded by both statutory provisions. Policy concerns and regulatory requirements regarding any downstream emissions associated with hydrogen distribution may well be appropriate for other authorities, but they must be addressed pursuant to those authorities, and are not permissible for either the Clean Hydrogen Production Standard or the 45V hydrogen tax credits. Emissions associated with the distribution of hydrogen after the point of production are not only well beyond the statutory authority, but are generally beyond the control of the entities producing hydrogen (unlike upstream emissions, which hydrogen producers have some control over through their energy and feedstock choices). Downstream emissions beyond the point of production should be addressed through policy and regulatory mechanisms focused on the entities responsible for distribution and utilization of hydrogen beyond the point of production.

III. Section 4.01(4) Recordkeeping and Reporting

What documentation or substantiation do taxpayers maintain or could they create to demonstrate the lifecycle greenhouse gas emissions rate resulting from a clean hydrogen production process?

Bloom recommends a third-party verification standard be established, similar to those present in the project development environment of most EAC standards. The best practice is for new standards to align with ISO 14064-3:2019 "Greenhouse Gases — Part 3: Specification with Guidance for the Validation and Verification of Greenhouse Gas Assertions." We recommend both validation of future claims and verification of past activity by a competent, independent, International Organization for Standardization (ISO) 14065-accredited third party. Annual time intervals for desk audits with limited assurance, and every 5 years for field validation with reasonable assurance, would be appropriate

What technologies or methodologies should be required for monitoring the lifecycle greenhouse gas emissions rate resulting from the clean hydrogen production process?

See response to previous question.

What technologies or accounting systems should be required for taxpayers to demonstrate sources of electricity supply?

See response to previous question.

Should indirect book accounting factors that reduce a taxpayer's effective greenhouse gas emissions (also known as a book and claim system), including, but not limited to, renewable energy credits, power purchase agreements, renewable thermal credits, or biogas credits be considered when calculating the § 45V credit?

Yes, renewable energy credits, power purchase agreements and other voluntary market structures, which have proven to be a significant driver for deploying clean energy, should be an allowable means of assessing electricity emissions for the power used in grid-connected electrolytic hydrogen projects. Numerous state, regional and voluntary programs have been developed, deployed and have had demonstrated success in contributing to the build-out of a greenhouse-gas reducing, renewable electricity system, using increasingly sophisticated market mechanisms. The use of these mechanisms is essential to achieving the goals of the IRA, including the development of a clean hydrogen production industry. By relying on established, broadly accepted voluntary market structures that meet reasonable threshold standards, the Treasury Department can take advantage of the momentum and achievements in deploying renewable and clean energy that has resulted from their use. As these standards are improved to reflect the dynamically-changing energy system, through the jurisdictions and complex stakeholder processes that established them and have created their success, it would be appropriate to subsequently apply those improved standards to new hydrogen production facilities. Furthermore, the legislative history of the IRA specifically supports incorporating indirect book accounting factors, including renewable energy credits, renewable thermal credits, renewable identification numbers, and biogas credits.[2]

From 2000 through 2019, voluntary green power markets have grown to produce approximately 150 TWh/year of renewable power, nearly 80% of the additional 189 TWh/year required by state renewable portfolio standards and clean energy standards (collectively, "RPS"). There can be no question that these markets have significantly contributed to greening the electric power supply; as the U. S. DOE's Lawrence Berkeley National Labs has shown, the growth of those markets which form the bulk of non-RPS procurement has increasingly outpaced the minimum thresholds for state clean and renewable energy requirements, with the share of new renewable energy capacity attributable to legally-required RPS mechanisms shrinking to 23% in 2019.

Voluntary market mechanisms, including EAC standards, share many things in common, including the intent to reduce greenhouse gas emissions from energy production as well as other environmental, economic, and social benefits. Existing, widely deployed and accepted regional, state and voluntary market systems all resulted from complex, multi-stakeholder processes that required balancing myriad concerns and considerations. EAC systems generally start from the premise that a credit represents energy that otherwise would have been generated by non-qualifying resources, and therefore produces greenhouse gas benefits at a minimum (since generally speaking, electricity delivered to the grid must be constantly balanced with energy consumed, and as greenhouse gas has global impacts, rather than local or regional impacts, the location of the reduction is immaterial with respect to global warming). There is no doubt that the varying EAC systems could be improved to achieve their underlying objectives, including more optimally driving carbon emissions from energy generation than can be accomplished through simple annual displacement by qualifying energy. Many EAC and RPS systems have developed significant restrictions over time to better align their use with the state, regional and corporate objectives of their underlying program, such as limiting qualifying generation to that "deliverable" to the end user.

Overall, in addition to increasing costs, failing to have access to developed EAC markets offers the worst combination of outcomes for the nation's energy infrastructure. Such an approach would: (i) lower demand (i. e. prices) in those EAC markets, dis-incentivizing new clean generation; (ii) limit the ability to leverage/balance excess renewables; and (iii) potentially force hydrogen production to the edges of the system. Given the track record of voluntary green power market mechanisms, it is both reasonable and appropriate for the Treasury Department to rely on those systems, providing that they meet minimum standards to assure continued reduction of greenhouse gas emissions. This course of action is also consistent with federal precedent, which often relies on state or regional programs that meet threshold federal requirements, and as a matter of comity, particularly in light of continued development of EAC programs through complex stakeholder processes.

The appropriate standard for any hydrogen electrolyzer project is that which applies in the jurisdiction in which it is located, again presuming that standard meets minimum thresholds. If there is no such standard in the jurisdiction in which the electrolyzer is located or if the standard fails to meet threshold

[2] *See* colloquy between Sens. Carper & Wyden with respect to "H.R. 5376 – 117th Congress (2021-2022): Inflation Reduction Act of 2022" (Aug. 6, 2022), available at https://www.congress.gov/congressional-record/volume-168/issue-133/senate-section/article/S4165-3.

requirements (such as requirements to prevent double-counting the EAC for an RPS or any other purpose, or that qualifying generation contributes to supplying electricity to relevant load by injecting power into the same regional interconnect), then the use of voluntary standards such as the well-established and regarded Green-e certification program provided by the Center for Resource Solutions would be reasonable.

In summary, the intent of the § 45V credit is to stimulate the development of the nation's clean hydrogen production. The § 45V credit should take into account state-approved or widely accepted commercially available means of characterizing carbon intensity of electricity emissions that meet reasonable threshold standards and that reflect the best practices currently in broad use today. As EAC standards evolve, new projects should adhere to them and be required to follow those standards in place in the jurisdiction in which they are located as of the date such projects are placed in service.

Sincerely,

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