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VIA The Federal eRulemaking Portal at www.regulations.gov

Encl.

RE: Comments on IRS Notice 2022-58

Hy Stor Energy LP and its subsidiary Mississippi Clean Hydrogen Hub LP (collectively "Hy Stor Energy") appreciate the opportunity to comment on the U.S. Department of Treasury's Request for comments regarding the Inflation Reduction Act ("IRA") pursuant to IRS Notice 2022-58 ("Notice 22-58").

Hy Stor Energy

Hy Stor Energy, a company headquartered in Jackson, Mississippi was formed for the purpose of developing and advancing renewable hydrogen production, storage, and delivery at commercial scale in the United States. Hy Stor Energy's first major project, the Mississippi Clean Hydrogen Hub, is under active development and will be a first-of-its-kind renewable hydrogen hub. It will be as much as ten times larger than any other green hydrogen project under consideration in the United States and would be one of the largest in the world. On November 7, 2022, Hy Stor Energy submitted a Concept Paper to the Department of Energy ("DOE") to begin the process to have the Mississippi Clean Hydrogen Hub designated as a "Regional Clean Hydrogen Hub" under Section 40314 of the Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Law ("BIL").

The Mississippi Clean Hydrogen Hub will produce green hydrogen through an electrolysis process powered by onsite solar or other renewable energy resources that will result in no carbon emissions. The green hydrogen will then be stored in salt domes for later delivery to industrial, transportation and utility customers via rail, truck, ship or pipelines. Pending regulatory approvals and equipment availability, the construction of the hub's first phase is planned to begin in late 2022 or early 2023. Assuming this schedule is maintained, the hub would be in commercial service by 2025. Further information about Hy Stor Energy and its plans is available at https://hystorenergy.com/.

Hy Stor Energy appreciates the opportunity to comment on Notice 22-58. Hy Stor Energy is a member of trade organizations that will submit comments regarding Notice 22-58 and Hy Stor Energy will not duplicate these trade organizations' comments herein. Hy Stor's comments on the Notice contained herein are its own views on the issues raised by Notice 22-58.

Hydrogen Background

We believe hydrogen is uniquely positioned to advance any government's clean energy goals. Hydrogen will play a key role in smoothing out intermittent renewable energy sources. However, its sector-spanning potential extends well beyond its ability to generate clean electricity.

Hydrogen is the key ingredient in reducing emissions where electrification is not a practical solution, including for certain machinery, long-haul transportation and industrial processes such as "green" concrete, glass and steel.

Congressional action relating to hydrogen reflects its importance as a unique energy carrier. The IRA's many hydrogen related provisions reflect Congressional intent to accelerate hydrogen's role in the United States and global economies. These tax provisions build upon the BIL's multiple provisions that provide a significant framework to promote hydrogen's adoption and expansion.

Hy Stor Energy believes that the government's goals are best served by encouraging "green hydrogen", *i.e.*, generated using zero emissions. The IRA provides the most significant tax incentives for such hydrogen. We believe guidance regarding identification/tracking of true green hydrogen as part of the supply chain facilitates the government's goals of encouraging adoption and use of any type of technology that can deliver clean electricity.

Comments on Notice 2022-58

Clean Hydrogen Generally

Hy Stor Energy believes that properly defining "clean hydrogen" is critical to providing a usable framework for hydrogen under the Internal Revenue Code.[1] The IRA introduced significant hydrogen-based tax incentives many effective as of 2023. We believe clear and early guidance on Section 45V is necessary to drive material investment into the sector.

Section 45V categorizes hydrogen based upon the relative carbon intensity of the production process. It effectively creates four tiers of "clean hydrogen" in defining the applicable percentage of available production tax credits. The tiers are determined by measuring the lifecycle greenhouse gas emissions rate of kilograms of CO2e per kilogram of hydrogen in the production process (the "Emissions Rate"). Section 45V's cleanest tier has an Emissions Rate of less than 0.45 kilograms of CO2e per kilogram of hydrogen.[2]

Hy Stor Energy believes the regulatory regime applicable to hydrogen production, storage and use should give special consideration to the cleanest tier of hydrogen production. We believe the government's goals are best served by encouraging the cleanest hydrogen, *i.e.*, generated using zero emissions. The IRA provides the most significant tax incentives for such hydrogen. We believe guidance regarding identification/tracking of true green hydrogen as part of the supply

[1] References to "Section" are references to sections of the Internal Revenue Code of 1986, unless otherwise indicated.

[2] Section 45V(b)(2)(D). The four tiers of permissible kilograms of CO2e emissions per kilogram of hydrogen are: 1) less than 0.45 kg of CO2e, 2) less than 1.5 and down to 0.45 kg of CO2e, 3) less than 2.5 and down to 1.5 kg of CO2e, and 4) less than 4 and down to 2.5 kg of CO2e.

chain facilitates the government's goals of encouraging adoption and use of any type of technology that can deliver clean electricity.

Identifying and tracking the lowest emissions hydrogen ("Tier One hydrogen") facilitates a number of goals. For example, under Section 45Y, clean electricity must be produced at a facility with a greenhouse gas emissions rate not greater than zero. Hy Stor Energy believes the carbon intensity of inputs should be included in this calculation and tracking Tier One hydrogen furthers this important goal. This could be accomplished in the guidance for Section 45Y that Tier One hydrogen is deemed to have an emissions rate of not greater than zero.

Need to Clearly Define "Facility"

Section 45V's operative provisions revolve around the definition of a clean hydrogen production facility. Hy Stor Energy believes that the term "facility" needs to be defined in a consistent manner for purposes of all of the energy tax credit provisions of the IRA to take into account the policy underlying those provisions as well as practical realities that may characterize the contexts surrounding them. That is particularly important regarding hydrogen.

We believe creating clearer boundaries for each step of the hydrogen supply chain is in everyone's interests. These boundaries would be especially useful for the IRS and taxpayers with respect to identifying eligible expenditures for each step of the hydrogen creation, storage and deployment chain. Additionally, clear boundaries will help in determining when activities either co-located or commonly owned may have an impact on each other. Clear boundaries are also useful for the IRS in determining when a facility is placed in service or begins construction and would ease the administrative burden associated with determining eligible expenditures on a case-by-case basis.

We also believe the definition of hydrogen production facilities should follow the wind farm precedent where each "pad" with its supported structure is a separate facility. For example, assume a wind farm produces electricity that is directly drawn by an electrolyzer to produce hydrogen. Based on the GREET model (discussed below) this should generate Tier One hydrogen. Hy Stor Energy believes that each electrolyzer should be a clean hydrogen production facility. Storage receiving the hydrogen should also be a separate facility. As we noted in our comments on IRS Notice 22-49, tax benefits offered by Section 45V should not be contingent on any downstream actions. This definitional framework would include any property necessary to produce hydrogen fit for sale or use.[3]

Hy Stor Energy believes it is critical to draw clear boundaries around a clean hydrogen facility. This concept should benefit both taxpayers and the IRS by giving needed clarity. For example, in the context of claiming Section 45Q credits, carbon capture upstream of the hydrogen

[3] Hydrogen produced by some methods may need processing in order to reach the required usability metrics. Our proposed definitional framework would include any equipment necessary to place the hydrogen in suitable format for sale or use up to, but not including, associated hydrogen storage equipment receiving such hydrogen.

production facility should be caught by the limitations of Section 45V(d)(2), but subsequent use of the clean hydrogen in any process that may otherwise be eligible for the Section 45Q tax credit would be viewed as occurring in a separate facility and not impact the Section 45V tax credit for producing the hydrogen feedstock.

Emissions Rate Standard

Hy Stor Energy believes that the well to gate standard should account for the carbon intensity of the inputs and appropriately label the output, particularly for the varying tiers of clean hydrogen as discussed above with the goal of promoting not only the production of Tier One hydrogen as per Section 45V but also the use of Tier One hydrogen.

Hy Stor Energy generally supports alignment between the DOE's Clean Hydrogen Production Standard ("CHPS") and Section 45V. However, as discussed above and in our comments submitted to the DOE regarding the CHPS, we are concerned that the currently proposed CHPS could confer an unfair advantage upon hydrogen produced by fossil fuels ("blue" hydrogen). Hy Stor Energy does not support a CHPS that allows blue hydrogen to be considered the functional equivalent for decarbonization purposes to genuine Tier One hydrogen that in fact is produced without any associated carbon emissions. Hy Stor Energy has committed to meet the "Green Hydrogen Standard" developed by the Green Hydrogen Organization, which includes a more stringent initial target for lifecycle greenhouse gas emissions than the proposed CHPS would target. Please refer to the enclosed copy of our comments on CHPS.

Hy Stor Energy supports the use of Renewable Energy Certificates ("RECs"), Power Purchase Agreements ("PPAs"), and other market structures as an important tool in the United States' path to decarbonization. However, recent modeling suggests that unbundled RECs and annual electricity matching do not drive "effective emissions reductions," and can even increase emissions compared to the status quo. Thus, Hy Stor Energy believes parameters must be placed on the use of RECs, PPAs, and other market structures when determining the intensity of electricity emissions for hydrogen production. Accordingly, we believe that the Treasury/IRS should consider the following:

1. Additionality

The power a hydrogen producer is utilizing, whether through a PPA or on-site generation, must represent additional clean electricity that would not have been otherwise generated without the investment of the producer. Additionality must be considered to ensure that electrolyzer loads are contracting new clean generation that would not otherwise exist to offset the grid emissions induced by the new load.

2. Regionality

Regionality refers to the geographic boundary within which the electrolyzer and the clean power being used to power the electrolyzer are located. We believe the Treasury/IRS should define

narrow regional boundaries to provide for greater emissions reductions. Hy Stor Energy supports adopting a requirement that the electrolyzer be in the same region as the renewable project that it claims as the source of electricity. Hydrogen producers should not be able to purchase clean energy in one community while increasing pollution in another community.

3. Temporal Matching

The more granular the time period that is required for hydrogen producers to offset their energy usage with renewable energy, the greater the likelihood that hydrogen producers are truly offsetting induced emissions from grid-powered electrolyzers with clean energy operating at the same time. Recent studies have shown that temporal matching on an annual basis is ineffective at reducing electrolyzer emissions and enables hydrogen sources with very high consequential emissions. Therefore, Hy Stor Energy supports hourly matching of electrolyzer load and renewable generation.

Some of the proposals discussed above are not achievable currently due to existing technology, however, Hy Stor Energy urges the Treasury/IRS to continue to assess the feasibility of the proposals to advance the goal of reducing emissions and supporting a clean hydrogen economy. Hy Stor Energy encourages continued collaboration by the Treasury/IRS with the DOE in engaging with stakeholders to evaluate the approach to RECs, PPAs, and other market structures.

Hy Stor Energy believes that the Treasury/IRS have more flexibility than the DOE in setting emissions standards and for differentiating among the various tiers of clean hydrogen. As we noted in our comments to the CHPS, we recognize the statutory limitations imposed by the BIL. No similar constraint is imposed on the Treasury/IRS. While general conformity with CHPS is a good idea, this does not preclude the Treasury/IRS from making use of the tax credit differentiation for the various tiers of clean hydrogen already present in Section 45V. As noted above,

Verification

The IRA introduced several provisions requiring production verification. Section 45V requires verification by an unrelated party for the production and sale or use of clean hydrogen. Section 45 deems electricity used by a related clean hydrogen production facility in the production of hydrogen as being sold to an unrelated party for production tax credit purposes. The production and use of the electricity must be verified by an unrelated third party under rules to be promulgated by the Treasury/IRS. More significantly, Section 45Y requires that in the case of a facility where electricity is not sold to an unrelated person, electricity production must be verified by a metering device owned and operated by an unrelated person.

Hy Stor Energy believes that the Treasury/IRS should adopt a technology agnostic approach to verification that places the certification and record keeping burden on the third-party provider. If this qualified third party certifies production of electricity and/or hydrogen that should

be sufficient of the taxpayer claiming the associated tax credits. Independence and rigor can be vetted as part of the certification process. Existing audit and consulting firms may already possess adequate industry standards and qualifications to provide verification audit trails that meet or exceed any standards required by the Treasury/IRS. Hy Stor Energy urges the Treasury/IRS to adopt verification standards that are as consistent as possible across the IRA's energy provisions.

Hy Stor Energy does not believe that unrelated party verification is necessary to evaluate which clean hydrogen production tier a facility falls within. Record keeping standards for evaluating the Emissions Rate should be based upon the evolving standards developed in conjunction with the DOE. Significantly, we believe that straight forward scenarios, such as those involving an electrolyzer fed by production tax credit eligible facilities, should not be subject to additional record keeping obligations due to the unrelated party verification requirements discussed above.

Hy Stor Energy appreciates this opportunity to comment on the hydrogen related provisions of the IRA. We are dedicated to supporting the Administration's goals to accelerate the adoption of hydrogen as a key component of our global energy supply. Please feel free to contact our VP Finance and Accounting, JT Blalock, at jt.blalock@hystorenergy.com with any comments or questions you may have regarding this submission or any other hydrogen related issue.

Enclosure

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November 14, 2022

Submitted electronically via: Cleanh2standard@ee.doe.gov

RE: U.S. Department of Energy Clean Hydrogen Production Standard (CHPS) Draft Guidance

Hy Stor Energy LP and its subsidiary Mississippi Clean Hydrogen Hub LP (collectively referred to as "Hy Stor Energy") hereby provide comments on the U.S. Department of Energy ("DOE") Clean Hydrogen Production Standard ("CHPS") Draft Guidance issued on September 22, 2022 ("Draft Guidance"). As detailed below, Hy Stor Energy supports some of the Draft Guidance, but Hy Stor Energy has some significant concerns with the Draft Guidance as well.

Hy Stor Energy and its Interest in the CHPS

Hy Stor Energy, a company headquartered in Jackson, MS, was formed for the purpose of developing and advancing renewable hydrogen production, storage, and delivery at commercial scale in the United States. Hy Stor Energy's first major project, the Mississippi Clean Hydrogen Hub, is under active development with over 60,000 acres of land in sixteen (16) Mississippi counties and two Louisiana parishes under Hy Stor Energy's control, and four salt domes fully permitted for underground hydrogen storage. The Mississippi Clean Hydrogen Hub will produce green hydrogen through an electrolysis process powered by onsite solar or other renewable energy resources that will result in no carbon emissions. The green hydrogen will then be stored in salt domes for later delivery to industrial, transportation and utility customers via rail, truck, ship or pipelines. Further information about Hy Stor Energy and its plans is available at https://hystorenergy.com/.

The Mississippi Clean Hydrogen Hub will be a first-of-its-kind renewable hydrogen hub. It will be as much as ten times larger than any other green hydrogen project under consideration in the United States and would be one of the largest in the world. On November 7, 2022, Hy Stor Energy submitted a Concept Paper to the DOE to begin the process to have the Mississippi Clean Hydrogen Hub designated as a "Regional Clean Hydrogen Hub" under Section 40314 of the recently-enacted Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Law ("BIL"). Pending regulatory approvals and equipment availability, the construction of the hub's first phase is planned to begin in 2023. Assuming this schedule is maintained, the hub would be in commercial service by late 2025 or early 2026.

Comments on the Proposed CHPS

Hy Stor Energy appreciates the opportunity to comment on the Draft Guidance. Hy Stor Energy supports some components of the Draft Guidance. Hy Stor Energy is a member of trade organizations that will submit comments in support of the Draft Guidance, including the Fuel Cell & Hydrogen Energy Association, American Clean Power Association, Clean Energy Buyers Association, and the Green Hydrogen Organization, and Hy Stor Energy will not duplicate these

trade organizations' comments herein. Hy Stor Energy provides below separate comments on its concerns with the Draft Guidance.

A. DOE Must Not Give Blue Hydrogen an Advantage Over Green Hydrogen

Hy Stor Energy is concerned that as proposed, the CHPS could confer an unfair advantage upon hydrogen produced by fossil fuels ("blue" hydrogen). The Mississippi Clean Hydrogen Hub will produce hydrogen through electrolysis powered by onsite solar or other renewable energy resources, each yielding "green" hydrogen. In addition, Hy Stor Energy has committed to meet the "Green Hydrogen Standard" developed by the Green Hydrogen Organisation, which includes a more stringent initial target for lifecycle greenhouse gas emissions than the proposed CHPS would target. Accordingly, Hy Stor Energy's Mississippi Clean Hydrogen Hub will be able to meet the requirements of the CHPS as proposed, but Hy Stor Energy urges DOE to establish a CHPS that does not tilt the playing field in favor of blue hydrogen.

Hy Stor Energy recognizes DOE must abide by the directives in the BIL when developing the proposed CHPS. Specifically, the CHPS must "support clean hydrogen production from each source described in [42 U.S.C. § 16154(e)(2)]," which includes, but is not limited to, fossil fuels with carbon capture, utilization, and sequestration ("CCUS"); hydrogen-carrier fuels (including ethanol and methanol); renewable energy resources, including biomass; and nuclear energy.[1] Elsewhere, DOE, recognizing that the CHPS is not a regulatory standard, explains that, with respect to Regional Clean Hydrogen Hubs ("Hubs"), DOE can select projects "that do *not* meet the CHPS so long as DOE selects projects that 'demonstrably aid the achievement' of the CHPS by mitigating emissions as much as possible across the supply chain (*e.g.*, through aggressive carbon capture onsite, measures to mitigate fugitive methane emissions, or use of clean electricity)."[2]

Through DOE's effort to support hydrogen production from a variety of sources, including fossil fuels, the CHPS may exacerbate advantages blue hydrogen may currently enjoy vis-à-vis green hydrogen. A recent American Petroleum Institute study concluded that the economics of hydrogen production in the U.S. will continue to support blue hydrogen over green hydrogen, even with technological improvements in green hydrogen production.[3] According to the study, the production of green hydrogen will become less costly over time, but will still be more than twice as expensive as that of blue hydrogen in 2050.[4] Hy Stor Energy does not support a CHPS that allows blue hydrogen to be considered the functional equivalent for decarbonization purposes to green hydrogen that in fact is produced without any associated carbon emissions. Blue hydrogen projects already have a cost advantage over green hydrogen projects; providing blue hydrogen projects an opportunity to qualify as "clean hydrogen" projects, while certainly helpful to blue hydrogen projects, sacrifices achievement of the fundamental objective of moving toward a

[1] Draft Guidance at 1.
[2] *Id.* at 2.
[3] The Potential Role of Blue Hydrogen in Low-Carbon Energy Markets in the US, commissioned by American Petroleum Institute, available at https://www.api.org/~/media/Files/News/2022/10/12/API-ICF-Hydrogen-Report.
[4] *Id.*

hydrogen economy – the drastic reduction of carbon emissions produced by use of fossil fuels (even with CCUS being part of the equation).

Hy Stor Energy anticipates that some parties may offer comments on the CHPS in support of an initial target for lifecycle greenhouse gas emissions *greater* than 4.0 kgCO2e/kgH2. Hy Stor Energy strongly opposes any such comments. Hy Stor Energy views the 4.0 kgCO2e/kgH2 initial target proposed by DOE as an upper-limit target, and Hy Stor Energy is hopeful that the initial target will be lowered below 4.0 kgCO2e/kgH2 when DOE revises the CHPS within 5 years, as required by the BIL.[5]

B. DOE Must Ensure That Renewable Energy Credits ("RECs"), Power Purchase Agreements ("PPAs"), and Other Market Structures are Accountable, Regional, and Include Requirements for Temporal Matching

Hy Stor Energy supports the use of RECs, PPAs, and other market structures as an important tool in the United States' path to decarbonization. However, recent modeling suggests that unbundled RECs and annual electricity matching do not drive "effective emissions reductions," and can even increase emissions compared to the status quo.[6] Thus, to "encourage stakeholders to reduce lifecycle emissions to the greatest extent possible,"[7] DOE must put parameters on the use of RECs, PPAs, and other market structures when determining the intensity of electricity emissions for hydrogen production. Accordingly, DOE must consider the following:

1. Additionality

DOE must ensure that the power a hydrogen producer is utilizing, whether through a PPA or on-site generation, represents *additional* clean electricity that would not have been otherwise generated without the investment of the producer. DOE must consider additionality to ensure that electrolyzer loads are contracting new clean generation that would not otherwise exist to offset the grid emissions induced by the new load. This approach is supported by our global partners in Europe, and the DOE must ensure that the United States is not an outlier.

2. Regionality

Regionality refers to the geographic boundary within which the electrolyzer and the clean power being used to power the electrolyzer are located. The DOE must define narrow regional boundaries to provide for greater emissions reductions. Hy Stor Energy supports DOE adopting a requirement that the electrolyzer be in the same region as the renewable project that it claims as the source of electricity. Hydrogen producers should not be able to purchase clean energy in one community while increasing pollution in another community.

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[5] Draft Guidance at 6.

[6] Wilson Ricks, Qingyu Xu, & Jesse D. Jenkins, Enabling grid-based hydrogen production with low embodied emissions in the United States, Andlinger Century for Energy and the Environment, Princeton University (2022), available at https://zenodo.org/record/7183516#.Y2z8vXbMKUk.

[7] Draft Guidance at 6.

3. Temporal Matching

The more granular the time period that is required for hydrogen producers to offset their energy usage with renewable energy, the greater the likelihood that hydrogen producers are truly offsetting induced emissions from grid-powered electrolyzers with clean energy operating at the same time. Recent studies have shown that temporal matching on an annual basis is ineffective at reducing electrolyzer emissions and enables hydrogen sources with very high consequential emissions.[8] Therefore, Hy Stor Energy supports hourly matching of electrolyzer load and renewable generation.

To be sure, some of the proposals discussed above are not achievable currently due to existing technology, however, Hy Stor Energy urges DOE to continue to assess the feasibility of the proposals to advance the goal of reducing emissions and supporting a clean hydrogen economy. Hy Stor Energy encourages DOE to continue collaboratively engaging with stakeholders to evaluate DOE's approach to RECs, PPAs, and other market structures before any approach is chosen by DOE.

Conclusion

Hy Stor Energy has made significant progress in achieving its vision of building a comprehensive hydrogen hub centered in the State of Mississippi that will deliver green hydrogen to power the transition to clean energy and the decarbonization of industries such as transportation, power generation and steelmaking in the Gulf Coast region. The Mississippi Clean Energy Hub project has the support of local and state officials, community groups, suppliers, and potential customers, and Hy Story Energy is poised to bring the Mississippi Clean Hydrogen Hub online in the next few years.

Hy Stor Energy appreciates the DOE's efforts to advance the CHPS, and in the interest of promoting the fastest possible transition to a lower carbon future, Hy Stor Energy hopes DOE will account for its comments when finalizing the CHPS.

[8] Wilson Ricks, Qingyu Xu, & Jesse D. Jenkins, Enabling grid-based hydrogen production with low embodied emissions in the United States, Andlinger Century for Energy and the Environment, Princeton University (2022), available at https://zenodo.org/record/7183516#.Y2z8vXbMKUk.