



Innovation and Investment in Energy

1700 Broadway  
35th Floor  
New York, NY 10019  
T: 212-615-3456

Date: February 23, 2024

Internal Revenue Service  
CC:PA:LPD:PR (REG-117631-23)  
Room 5203  
P.O. Box 7604, Ben Franklin Station  
Washington, D.C. 20044

Filed electronically via the Federal eRulemaking Portal at [www.regulations.gov](http://www.regulations.gov)

**Re: Request for Comments on REG-117631-23**

Dear Ladies and Gentlemen:

LS Power appreciates the opportunity to submit the following comments in response to the Notice of Proposed Rulemaking (the "NPRM") issued by the U.S. Treasury and the Internal Revenue Service ("IRS") regarding the rules for the production tax credit under Section 45V (the "Section 45V Credit").

LS Power (together with its affiliates) is a development, investment, and operating company with a focus on power generation, transmission, and energy infrastructure critical to the energy transition. As one of the largest developers and operators of such infrastructure in the United States, we are involved in all aspects of planning and investment which promote capacity additions and deployment in support of the United States' net-zero emission goal by 2050. We consistently operate at the vanguard of new technologies and have created a brand known for building complex projects at industry-leading scale.

We strongly believe clean hydrogen should play a leading role in our nation's emission reduction efforts. We were encouraged by the inclusion of provisions designed to foster clean hydrogen development in the Infrastructure Investment and Jobs Act ("Bipartisan Infrastructure Law") and the Inflation Reduction Act of 2022 ("IRA"). We support the goals set out in the *U.S. National Clean Hydrogen Strategy and Roadmap* and Department of Energy ("DOE") hydrogen shot initiative, which set a goal of producing clean hydrogen at \$1 per kilogram of hydrogen by 2030 (the "Hydrogen Shot").

LS Power supports the government's approach to greatly expand clean hydrogen's role in the economy. We are committed to producing low-carbon hydrogen to decarbonize the economy, especially in hard to abate sectors, and lower the country's overall emissions. Over the past two years we have advanced internal development of greenfield clean hydrogen projects across the United States and invested in Monarch Energy – a pure-play hydrogen developer – to further increase our footprint in this growing industry.



We believe our rare combination of expertise across development, operations, and investment in energy projects offers a unique perspective regarding the country's ability to accelerate decarbonization prudently. Decarbonization will best be achieved through a combination of robust economic policies that spur investment into the energy sector and make it sustainable for the long term. Our experience and depth of expertise across energy markets forms the basis for our comments regarding the NPRM.

LS Power believes the Section 45V Credit is an indispensable tool to jump start domestic clean hydrogen production. Properly implemented, it will spur significant investment in clean hydrogen facilities while also supporting capital investment in minimal-emitting electricity generation and infrastructure. We agree with the DOE that clean hydrogen needs to achieve cost-parity with legacy fossil-derived hydrogen and that at-scale deployment of electrolytic hydrogen projects is the only way to credibly achieve this goal.<sup>1</sup> Therefore, we urge the adoption of final Section 45V regulations that are environmentally credible and that encourage the types of projects necessary to catalyze the creation of a strong hydrogen economy, create well-paying union jobs, and fulfill the Congressional intent of the IRA.

We appreciate the whole of government approach taken by the Treasury and IRS in drafting the NPRM, including the coordinated guidance from the DOE and Environmental Protection Agency. In our view Section 45V is one of the most, if not the most, complicated provision in the Internal Revenue Code in terms of being fairly and effectively implemented. We believe the similarity of the NPRM's three pillars to the European Union's Renewable Energy Directive for renewable fuels of non-biological origin ("RFNBOs") reflects the need for a multi-disciplinary approach to incentivizing clean hydrogen. As such, we strongly believe the EU's phased implementation, including grandfathering provisions, reflects the need to be flexible as we globally work through the steep learning curve for this nascent industry.

Our comments set forth below reflect our commitment to supporting clean hydrogen projects that deliver the scale necessary to fulfill the goals of the Bipartisan Infrastructure Law, IRA, and the government's Hydrogen Shot while keeping emissions low during this critical early build out phase. We appreciate the delicate balancing act these seemingly conflicting goals pose for the government and urge the government to tailor its final Section 45V regulations to provide a modicum of certainty necessary for projects to be financed. Projects need to be "bankable" or they will not happen at scale, especially for the critical first mover projects needed to jump start the clean hydrogen economy. The proposed Section 45V Credit regulations do not provide these minimum elements of certainty and will likely frustrate the government's goals for hydrogen. Finally, because this is a nascent industry, the final Section 45V Credit regulations need to accommodate the significant learning curve for industry and the government. While we applaud ambitious targets, we strongly believe that the final regulations should temper this ambition with visible commitments to flexibility.

---

<sup>1</sup> Department of Energy Pathways to Commercial Liftoff: Clean Hydrogen



## Response to REG-117631-23 Comment Requests

### **1. GREET Model: Early Development (FEED Study)/Construction Start Reliance on a single GREET Model**

LS Power wants the Section 45V Credit to succeed but that can only happen if clean hydrogen projects can be efficiently financed. Projects need to demonstrate to stakeholders as early as at completion of the front-end engineering design (FEED) study that the project is economically viable and that includes the availability of the Section 45V Credit for the duration of the statutory eligibility period. The latest that a project can reasonably be expected to demonstrate this viability is the “beginning of construction” test for tax credit qualification purposes. Both time periods are critical to a project’s bankability. This viability cannot be currently demonstrated under either scenario because under the proposed Section 45V regulations the eligibility for the tax credit depends on using the “most recent” GREET Model for the taxable year in which hydrogen is produced.

The applicable GREET Model lies at the core of the Section 45V Credit and any changes made to it that negatively impact a taxpayer’s eligibility pose a serious project risk. The uncertainty of having to meet possibly more stringent standards of a future GREET Model in order to qualify for the Section 45V Credit could delay and/or inhibit a sponsor’s or capital provider’s investment decision. Further, upon completion of construction, if construction financing is to be converted into long-term financing or a third-party equity investment, any party providing such capital will need certainty that future changes to the GREET Model’s requirements will not impair the Section 45V Credit’s availability to ensure an adequate return on its investment. Any negative uncertainty will unreasonably raise a project’s cost of capital and make it less competitive compared to existing, higher greenhouse gas emitting hydrogen production projects. This makes the Hydrogen Shot, in particular, an almost impossible goal.

The final regulations should provide stakeholders the requisite long-term visibility into verified Section 45V Credit eligibility to garner a level of confidence on which to deploy capital and manage risk. We suggest that final guidance provide projects the option to apply either the GREET Model in effect during the taxable year in which the qualified hydrogen is produced or the GREET Model in effect during the taxable year in which the FEED study was completed, or at the latest, the taxable year in which the qualified hydrogen facility began construction. In the latter case, hydrogen projects should be able to apply the same GREET Model for the entirety of the 10-year credit period. Treasury has previously recognized the need for certainty surrounding production tax credit/investment tax credit qualification in its historic guidance for the Section 45/48 PTC/ITC start of construction safe harbor. We also note, more recently, a safe harbor provision was included in Treasury’s guidance on the “energy community” bonus that allows for project sponsors to rely on energy community status if the project qualified at the start of its construction.

We believe that the flexibility to apply the GREET Model in effect in the taxable year in which the FEED study is complete or, at the latest, in the taxable year in which construction starts will allow stakeholders the requisite visibility into verified 45V eligibility needed to make long-term investment decisions, raise efficient financing and manage risk. Such stakeholder confidence will be a key element in meeting the decarbonization goals set out by the government.



## **2. Effective and Efficient Monetization of the 45V Credit May Require Claiming the Credit Prior to Final Verification**

LS Power believes that the success of the government’s clean hydrogen goals is only possible with the efficient monetization of tax credits in the early stages of market development. The NPRM indicates that a taxpayer is not eligible to claim the Section 45V Credit until all verification requirements have been satisfied. However, this conflicts with the proposed regulations regarding transferability of tax credits, where elections to transfer credits must be made no later than the due date (including extensions) of the tax return on which the credit is claimed. This means that a taxpayer needs to finalize verification before the due date of its tax return. Otherwise, monetization of the Section 45V Credit is unlikely to be available.

Projects are likely to be uncompetitive without appropriate timing of the receipt of the Section 45V Credit. The NPRM requested comments on whether taxpayers anticipate being able to complete all the requirements for claiming the Section 45V Credit, including these verification requirements, by the extended filing deadline for the taxable year of hydrogen production. We believe that deadline is too ambitious. Therefore, we encourage Treasury and the IRS to allow eligible taxpayers to receive credit prior to final verification, subject to a “true up” when the verification occurs.

We agree in principle that verification is an essential step in ensuring that the Section 45V Credit generates its intended benefits. At the same time, taxpayers are likely to have a high degree of certainty as to the satisfaction of the verification requirements well in advance of concluding the audit process. Given the unknown timeline to audit and verify the various Section 45V requirements, however, formal verification may or may not be possible by the extended tax filing deadline, delaying receipt of the Section 45V Credit. This risk will increase the cost of capital for clean hydrogen production facilities since the inability to monetize tax credits will delay the return of funds to investors or reduce the value of the credits based on the tax profile of particular stakeholders.

To maintain the integrity of the Section 45V Credit program, we believe a true up mechanism is an appropriate means by which to manage verification risk borne by Treasury and the IRS. If the final verification reveals that too many credits were claimed, the project sponsor/seller of the tax credits should be the one to bear the true up (and potentially incur penalties if claimed credits are in excess of a certain threshold). This approach will properly balance the need for a verification requirement with the Congressional intent underlying the transferability of the credits.

## **3. Incrementality: Phased Projects and Construction Delays**

We agree with the general concept of “Incrementality” set forth in the NPRM but believe it should reflect commercial reality to be properly effective. The NPRM states that an Energy Attribute Certificate (“EAC”) meets the incrementality requirement if the electric generating facility that produced the unit of electricity to which the EAC relates entered commercial operation no more than 36 months before the hydrogen production facility for which the EAC is retired was placed in service. As a commercial reality,



clean hydrogen projects will likely be developed in phases and we strongly believe later phases should be able to rely on the initial phase 36-month qualification in satisfying any incrementality requirement.

The incrementality condition must accommodate market realities in order to avoid being counterproductive. Initial hydrogen projects will likely be placed in service in phases (e.g., a 200 MW hydrogen facility may be built in four 50 MW phases over several years). This means that it is highly likely that: (i) before a full transition from existing hydrogen sources to a newer source of clean hydrogen, end-users will want to confirm a hydrogen project has undergone material testing and verification to ensure reliable operation and product availability, (ii) end-users may seek to make smaller purchases initially as the market for clean hydrogen emerges, and (iii) demand for hydrogen outside of existing industry uses is still developing. From the perspective of a hydrogen facility developer and operator, constructing a project in phases is also the preferred method because it: (i) allows for a more conservative deployment of investment capital, (ii) enables more timely delivery of clean hydrogen to customer, (iii) allows, perhaps, for the easing of supply chain constraints, including by the use of modular technologies and increased time for manufacturing ramp-up, and (iv) aligns with the workforce capabilities of contractors in the development ecosystem.

We believe that if a renewable energy resource is built for the designated and planned purpose of supporting a hydrogen facility, then the 36-month test should only apply for the first phase of the hydrogen facility. If the renewable resource has additional generation capacity beyond that which is supplied to the hydrogen production facility in its initial phase but is intended for use in planned future phases of hydrogen development, the subsequent phases of the hydrogen facility should be able to rely on that initial renewable resource to satisfy the incrementality requirement even if outside of the 36-month lookback period. This does not conflict with the underlying goal for incrementality, namely that subsidized hydrogen production should not divert renewable energy production away from other uses within the electricity grid, potentially increasing reliance on fossil fuels to fill the generation gap.

In addition, we believe that the incrementality requirement should take into account potential supply chain issues which are beyond a developer's or operator's control, and which could delay construction of the hydrogen facility well past the initial 36-month period. For example, it could be expected that supply chain difficulties outside of the taxpayer's control could unduly delay projects beyond the 36-month period. Taxpayers should have the ability to continue to satisfy the incrementality requirement in such cases.

We believe the approaches outlined above are necessary to foster investment in the types of projects that will deliver the production levels necessary to achieve the Hydrogen Shot and achieve the IRA's goals of lowering emissions for the overall U.S. economy, especially for hard to abate sectors.

#### **4. Incrementality: Formulaic Approach**

We strongly agree with the NPRM's flexibility in assessing the incrementality pillar. The incrementality requirement needs to take into account increasingly clean generation oversupplies to the grid leading to nonoptimal pricing and curtailment. Given the data presented within the Proposed Regulations, LS Power believes that a 10% allowance of EACs from existing clean generation should meet Section 45V



Credit standards. We believe EAC tracking systems should be able to capture and verify this data from existing and newly built minimal-emitting generators within each deliverability region, catalyzing the creation of a strong clean energy market in the United States.

The NPRM requested comments addressing the ability of hydrogen production facilities to meet the incrementality qualification by utilizing EACs from existing clean generation so long as deliverability and temporal qualifications are also met. The NPRM highlights data from the DOE and Berkeley Lab that find that current transmission capacity constraints increase wholesale negative pricing and clean energy curtailment, with both expected to grow over time.<sup>2</sup> According to the NPRM, Berkeley Lab found that wholesale pricing nodes experienced negative pricing during approximately 5% of all hours in 2020 through 2022.<sup>3</sup> The data in ISO markets where some DOE-sponsored hubs will exist (ERCOT, MISO and SPP) was at least double this amount in 2022.<sup>4</sup> Furthermore, data from BTU Analytics shows curtailments in parts of the year in solar-heavy regions like CAISO and ERCOT exceeded 20%, whereas in a wind-heavy region like SPP an average of 10% of its wind generation was curtailed throughout 2022.<sup>5</sup> The U.S. Energy Information Administration projects that curtailments due to transmission constraints in ERCOT increase to 2035.<sup>6</sup> Absent any near-term transmission capacity buildout, the market inefficiencies of negative pricing and curtailment will weaken the economics of existing clean generation.

If EACs from existing generation could be sold to hydrogen facilities it would support overall renewable economics and bolster the case for future investment in clean generation (whether or not directly tied to clean hydrogen projects). This should incentivize both clean hydrogen production and the buildout of a cleaner grid. To this end, we also suggest final guidance specifically allow Treasury and the IRS to increase the allowance above 10% as necessary to reflect increasingly clean generation oversupplies while also providing the 10% number as a floor. It is plausible that given the available data across ISO regions this allowance can be tailored to reflect the negative pricing and curtailment conditions of clean generation in each region. This allowance and flexibility in final guidance would bolster the short-term success and long-term viability of the Section 45V Credit program.

Finally, we believe clarification is needed regarding how to apply the allowance approach on a group basis. The NPRM raised a number of related questions, including “whether such an allowance should be assessed at the individual plant level or across an operator’s fleet within the same deliverability region.”<sup>7</sup> As noted above, we strongly agree with any flexible approach in assessing the incrementality pillar and believe that an allowance approach assessed on a group basis within the same region has the benefit of simplicity and administrability. However, it is unclear to us whether that is the query’s intent. We respectfully ask for further clarification and opportunity to comment on this issue before it is resolved in final regulations.

---

<sup>2</sup> DOE National Transmission Needs Study. October 2023.

<sup>3</sup> Berkeley Lab, Electricity Markets & Policy, The Renewables and Wholesale Electricity Prices (ReWEP) Tool,

<sup>4</sup> Data from the ReWEP tool shows negative pricing hours existed 13% to over 20% of the time in 2022 varying between states within the same ISO region.

<sup>5</sup> <https://insight.factset.com/wind-and-solar-curtailments-on-the-rise>

<sup>6</sup> U.S. Energy Information Administration. A Case Study of Transmission Limits on Renewables Growth in Texas. July 2023

<sup>7</sup> NPRM at 45.



## **5. Temporal Matching: Hourly Matching**

LS Power believes implementation of the hourly-matching requirement should be delayed. The stark transition from annual to hourly matching in 2028 will create a cost barrier to entry for the country's initial large-scale clean hydrogen projects, in effect slowing overall development of the market for clean hydrogen. Given the long timelines associated with site development, engineering, and offtake contracting (which will likely require at least 3-4 years in total) we believe the transition from annual to hourly matching should take place no earlier than January 1, 2030. Two additional years should give first movers the certainty of Section 45V Credit qualification and operational experience with matching variable electricity production to hydrogen production.

The NPRM's abrupt shift from annual matching of EACs through 2027 to hourly-matched EACs thereafter is inconsistent with temporal matching in other jurisdictions. We note that the EU's RFNBO rules mandate monthly matching until 2030 before hourly matching is required. We point to the EU's example because we view the EU market as a key regional offtaker for American first-mover projects. If the U.S. employs stricter temporal matching provisions, we fear that domestic projects will not achieve and benefit from economies of scale as rapidly as global projects, and therefore produce less competitive hydrogen for export abroad.

We implore Treasury and the IRS to delay the temporal matching provision in order to enable the industry to develop in the near term and gain commercial traction for viability over the long term.

We further request that the final Section 45V regulations explicitly allow for the IRS to postpone or otherwise reduce the burden of the temporal matching requirements. As noted above, the EU's RFNBO rules also contain temporal matching and although we are not proposing strict coordination with the EU rules, we urge the consideration of a provision which would allow the IRS the ability to modify temporal matching provisions as it deems necessary to address market conditions (such a provision would give the IRS the ability to make an informed decision based on a review of data from the EU and other jurisdictions). While we acknowledge that Treasury and the IRS have the inherent power to postpone implementation of a stricter temporal matching requirement, we believe that visible flexibility in the form of an explicit condition precedent will be very important in improving the bankability of clean hydrogen projects.

## **6. Temporal Matching: Delivery from Storage**

The delivery of electricity from stored energy should be included in meeting monthly or hourly matching requirements. The NPRM notes the outstanding issue of the utilization of electricity storage within EAC tracking systems.

As one of the nation's largest electricity storage owners via our affiliate, Rev Renewables, we are convinced that matching renewable generation with hydrogen production on an hourly and sub-hourly basis is within the scope of EAC tracking entities. It is our belief that the lifecycle of an EAC from generation to electricity storage and later dispatch for use in hydrogen production should be verifiable



and auditable with existing metering and data collection tools. The dispatch of electricity storage is already tracked in ISO markets.

We urge Treasury and the IRS to recognize the date that the renewable electricity is dispatched from the energy storage device and used in the production of hydrogen as the EAC retirement date in the final guidance for temporal matching purposes. The “commercial operations date” listed on the EAC would still be determined by reference to the electrical generation source feeding into the electricity storage units.

## **7. Deliverability: Inter-Regional Transmission**

LS Power strongly believes that the deliverability requirement should not unduly burden use of inter-regional electricity transmission. However, there is significant value in leveraging the resource diversity across the regions and inter-regional transmission is critical in realizing this value. Any deliverability requirement must permit EACs from clean energy resources that can demonstrate the physical ability to transmit electricity to hydrogen production facilities outside of their region (as defined by the DOE’s National Transmission Needs Study (“Transmission Needs Study”)).

The NPRM provides that the deliverability requirement is met if the electricity represented by the EAC is generated by a source that is in the same region as the relevant hydrogen production facility. While we understand the rationale for the deliverability rules under the EU’s RFNBO construct, we believe such strict adherence to this requirement in the United States is misplaced. Geographic regions were developed by the Transmission Needs Study merely to represent unique boundaries of power system entities (e.g., RTO/ISO, transmission planning and reliability entities). We note the DOE’s finding that inter-regional transmission constraints tend to be higher than within-region constraints is a generalized high-level view derived from a macro-level national study. This is highly dependent on the transmission topology and generation mix in a region. California is a prime example where load serving entities have multiple contracts with resources in other regions delivered via inter-regional transmission. CAISO is currently performing their second 20-Year Transmission Outlook Study<sup>8</sup> which includes 12,000 MW of out-of-state wind to serve CAISO load in 2045 which would be imported from multiple different regions (per the DOE report definition). In the west, there are several large transmission projects under development that offer inter-regional resource diversity value whereby California can import low-cost out-of-state wind in high demand hours and export excess in-state solar during daytime. Such examples also exist in MISO, PJM, and other regions.

Our planning experience across the United States allows us to speak to existing inter-regional constraints and planned development/construction projects that seek to alleviate these constraints. LS Power is one of the largest private developers and owners of transmission in the United States. To date we have acquired or developed over 1,000 miles of high-voltage transmission infrastructure. This includes operational and awarded projects in California, Nevada, Texas, New York, Delaware and Indiana. We have a dedicated team of transmission planning engineers with intimate knowledge of regional grid and actively participate in transmission planning processes conducted by ISO/RTOs. LS Power’s transmission

---

<sup>8</sup> <https://www.caiso.com/InitiativeDocuments/Presentation-20-Year-Transmission-Outlook-Jan42024.pdf>





projects including ON Line (NV), DesertLink (NV), and Cross Texas (TX) facilitate inter-regional delivery of renewable energy to electrical loads in other regions.

If the DOE's regions were to be relied upon for purposes of satisfying the deliverability requirement, Treasury is implicitly picking winners and losers in the development of clean hydrogen and their corresponding renewable resources. As noted above, the geographic regions proposed in the DOE's Transmission Needs Study represent merely the boundaries of power system entities, irrespective of the inter-regional exchange amongst them. The proposed geographic regions under the NPRM are conceptually different from the EU's "bidding zone" concept underpinning its deliverability requirement, raising concerns about whether the proposed geographic regions under the NPRM will be recognized by the EU. If the EU's RFNBO regime evolves our regulatory framework should similarly have inbuilt flexibility, subject to grandfathering provisions.

We suggest for the purpose of satisfying the deliverability requirement that Treasury and the DOE should take into account the current and future status of inter-regional deliverability both now and on an annual basis. Specifically, renewable energy imported to a region through a direct connection via inter-regional transmission line should qualify for the Section 45V Credit's deliverability requirement. In addition, final guidance should allow Treasury and the IRS to adjust the regions as necessary to reflect inter-regional transmission capacity and resolve conceptual differences with the EU's deliverability rules.

At a time when the industry and the DOE are recognizing the value of inter-regional transfers<sup>9</sup> and resource diversity benefits, limiting hydrogen production facilities to rely only on resources within the same region is a step in the wrong direction.

We appreciate this opportunity to offer comments in response to REG-117631-23.

Sincerely,

Suzanne Pepe  
Senior Vice President and Tax Counsel

---

<sup>9</sup> We point here explicitly to the DOE's October 30<sup>th</sup> 2023 awards for three transmission projects across six states through the Transmission Facilitation Program.