



February 22, 2024

Via Electronic Submission to: www.regulations.gov

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

Re: Monarch Energy Development LLC (“Monarch Energy”) Comments to Internal Revenue Service Request for Comments to Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election To Treat Clean Hydrogen Production Facilities as Energy Property (2023-28359)

On behalf of Monarch Energy, please find below the comments to Internal Revenue Service (IRS) Notice 2023-28359, Request for Comments to Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election To Treat Clean Hydrogen Production Facilities as Energy Property, issued on December 22, 2023.

Monarch Energy appreciates the opportunity to respond to this guidance and would welcome the opportunity to participate in any stakeholder engagements to ensure fair and balanced rules that will drive forward the nascent clean hydrogen industry. Monarch Energy agrees with The Department of Energy (“DOE”) that hydrogen resources are crucial to energy security and resilience and supports policies to promote the growth of clean hydrogen.

Monarch Energy Overview:

Monarch Energy is an early mover in utility-scale clean hydrogen project development in the United States of America. Established in 2021, our company now boasts a 4.5 GW project pipeline¹ that harnesses state-of-the-art electrolyzer technology to merge clean energy with ultra-pure water, producing clean hydrogen and clean liquid fuels that are cost-competitive with fossil fuel alternatives. Monarch has secured \$425+ million in equity financing commitments and has developed our project pipeline in line with the existing language of the Inflation Reduction Act (“IRA”). Many of these projects have confirmed off-take agreements with customers who are unable to electrify their operations directly. Our customers are in urgent need of innovative solutions to achieve their decarbonization goals.

We did not foresee regulatory measures more stringent than the text of the IRA legislation during our project development. Our projects have renewable power supply arrangements which lack a viable path to comply with the December 22 guidelines. In this document, we will outline actionable solutions that would enable our projects to proceed, while maintaining the integrity of a decarbonized grid and the spirit of the December 22 guidance. As a developer of clean hydrogen projects with committed off-takers poised to expand the clean hydrogen economy, we request that the Treasury and IRS take into consideration the nascent stage of both our company and the clean hydrogen sector when assessing the perspectives and recommendations outlined in these comments.

¹ <https://www.prnewswire.com/news-releases/monarch-energy-and-is-power-announce-green-hydrogen-partnership-301990036.html>
<https://www.energynewsroom.com/news/energy-monarch-energy-collaborate-advance-south-louisiana-green-hydrogen-infrastructure/>
<https://www.energynewsroom.com/news/energy-texas-monarch-energy-collaborate-advance-southeast-texas-energy-infrastructure-1323187465/>

Monarch Energy Comments:

The Treasury Department (“Treasury”) and the IRS are requesting comments on whether and under what circumstances electricity generated by an existing electricity generating facility that is dedicated to hydrogen production may be treated as satisfying the incrementality requirement. The temporal matching requirement in proposed §1.45V-4(d)(3)(ii) would require that qualifying EACs are retired that represent electricity produced in the same time period in which the hydrogen production facility consumes electricity in the production of hydrogen. The deliverability requirement in proposed §1.45V-4(d)(3)(iii) would require qualifying EACs to represent electricity that was produced by an electricity generating facility that is in the same region as the relevant hydrogen production facility.

A qualifying EAC must meet the three-pronged “pillars” test of incrementality, temporal matching, and deliverability. All three standards would restrict the extent to which a hydrogen producer may claim to be using low carbon grid power for purposes of calculating the carbon intensity of its production process which determines its section 45V credit amount.

Incrementality (Additionality):

Time window: As written, the proposed regulations require that a clean hydrogen project’s renewable power must be from a facility that has a commercial operation date no earlier than 36 months before the date the hydrogen facility was placed in service. The proposed regulations also provide for “Uprating” or increased capacity of an older power facility within 36 months before the hydrogen facility is placed in service, although this is only applicable to the increase in capacity. Requiring dedicated renewable resources to power electrolyzers is a requirement only applied to electricity used to produce hydrogen. No such requirement is considered or imposed upon the electricity used for other incentivized industries such as electric vehicle charging, grid-scale battery charging, biofuel production, or any others. *It is difficult to understand why such a requirement is being discussed for only clean hydrogen production, with a narrow 36-month window that doesn’t provide for the many schedule risks in project development.*

Developing a large renewable power project is a complex undertaking, with significant risks associated with permitting, interconnection, financing and construction. Developing a clean hydrogen project is an even more complex undertaking, with those same risks plus a technology risk associated with rapidly developing clean hydrogen technologies. Current guidance of 36 months is not enough time between the start of two complex projects for a developer to operationalize. Given the newness of the hydrogen industry and the schedule risk inherent in project development and construction, it would be more useful to provide 72 months. Since the electrolyzer project is heavily dependent on the power production process, this accommodation would allow a generator to reach a Final Investment Decision based on the offtake interest of the electrolyzer project and give the electrolyzer project time to complete FEED and construction without the binary risk of missing the 36-month window required to earn the PTC.

Proposed Solution A: Treasury should increase the time to commercial operation date for power utilized to 72 months prior to the date the hydrogen facility was placed in service.

Regulated Service Areas: Additionality claims can discount the investment of utilities and regulators in regions that have historically produced low-carbon energy. It is important to acknowledge broad trends:

- At low penetration levels, intermittent renewable power projects were simple to integrate into a local power grid from a dispatch and control perspective. In the early days, these projects were also much more expensive than modern wind and solar power solutions.
- As renewable power penetration increased, integration costs increased, but as the cost of wind and PV solar plummeted these higher integration costs were offset by projects that were less expensive to design, build, and maintain.

- As power grids make the final push to completely decarbonize, they will require extensive investments in short and long-duration energy storage.

By disallowing EACs from plants over 3 years old, the guidance is penalizing early mover regions in favor of regions that have yet to act. Late-comer regions benefiting from the cost-experience curve borne by the early movers, can tap “higher grade” resources, and receive an additional premium that may well force older renewable power projects in adjacent regions offline.

Proposed Solution B: Require EACs in regulated utility service areas only to the percentage of the region that is not currently renewable. Many regulated utility service areas, such as Xcel Energy, have over 50% in low carbon generation. In this case, a clean hydrogen production facility would procure an additional 50% in EACs to meet the Incrementality standard. This honors the historical investment while also ensuring that the region continues to make progress on additionality. These historical percentages will be annually balanced, so this solution will also permit progress on temporality while recognizing that temporality needs have only emerged recently.

Providing additionality recognition related to curtailment and retirement: Treasury proposed some exceptions to the 36-month additionality requirement in two key areas. The first is a recognition that some low-carbon generation resources are in danger of retiring without some premium for their comparative advantage in carbon footprint. The second is the recognition that these generation sources face growing levels of economic curtailment. Two groupings for low-carbon generator retirements exemplify this:

- 1) Vintage wind power generators. Though they maintain the same zero-cost dispatch rates of a newer generator, without Section 45V tax credits and RECs, they fall below newer resources in dispatch priority. These vintage resources experience curtailment rates higher than newer resources, reaching levels where energy revenues are no longer sufficient to cover the fixed cost of operating the facilities. At that point, the facility must shut down or undertake an 80/20 repowering to restart both the wind PTC and the additionality claims. In some cases, the projects are too small to justify a repower (<100 MW), resulting in a significant net reduction in renewable energy on the system. By allowing hydrogen projects to utilize EACs from older wind projects, their operational lives can be extended, preventing fossil fuel generation from filling the void.
- 2) The operational nuclear fleet. Existing facilities would be prohibitively expensive to replicate today due to heightened engineering and permitting costs. Treasury referenced ~5% of the US nuclear fleet is in danger of retirement and that offering premium pricing for EACs from those facilities may be additional as the DOE defines it. Some of the proposed implementations can add to the regulatory risk of the tax credit, which will raise the cost of financing and the produced cost of green hydrogen. *It is important to note that high capacity factor low-carbon generation resources are very important for clean hydrogen production.*

Proposed Solution C: Treasury should propose a concrete number of MWs by Zone that can be considered additional and applied to all low-carbon generation resources. It would give nuclear, geothermal, wind and other low-carbon asset owners a clear amount of additional generation to market and would allow hydrogen producers to contract with high confidence in the additionality claims.

Treasury and the IRS seek comments on the five percent allowance approach, including the merits of the approach compared to the targeted pathways described, particularly with respect to balancing administrative feasibility and burden with accuracy of identifying circumstances with a low risk of induced grid emissions. Treasury and the IRS also seek comments on whether 5 percent is the appropriate magnitude for an allowance. In particular, as noted earlier, data shows that curtailment rates have increased in recent years, and NREL’s Cambium model predicts additional increases going forward. In light of these data and projections, Treasury and the IRS seek comments on whether a higher amount, such as up to 10 percent, would be appropriate, either in general or in certain cases or circumstances. Treasury also describes consideration of, and requests comments on, a formulaic approach to addressing incrementality pursuant to which, for example, five percent of the hourly generation from generators placed in service before 2023 would be

deemed to satisfy the incrementality requirement. In support of this approach, Treasury references a variety of studies that show at least a five percent curtailment rate for power in general and renewable power in particular, along with a projected five percent of the existing nuclear fleet being at risk of retirement. Such an approach would provide a path for nuclear power to satisfy incrementality, albeit only to the extent of five percent of its power generation.

Issued guidance proposes to use national averages in determining curtailment rates. This approach punishes regions that acted early on decarbonization and consequently have higher curtailment rates. Why use curtailment rates in Georgia to determine how much Texas generation should qualify?

Some utilities have reached levels of renewable concentration above 50% and others have reached even higher levels of low-carbon energy through the use of nuclear, geothermal, hydro, and other legacy technologies, and the actual grid mix should be reflected. This poses several distinct problems:

1. The cost of renewables integration increases as grid penetration increases. States and regions that have made little or no renewable investment prior to the IRA will find it easier to add hundreds of MW of renewables than states that have already incorporated thousands of MWs.
2. The amount of available non-renewable generation to displace with additional resources is smaller in states that moved early on renewable generation. A state with 5,000 MW of load that was already at 60% renewables would already have closed older simple cycle gas plants and subcritical coal plants.
3. If a utility with a legacy fleet of low-carbon energy production is forced to bring on new renewables, policymakers may hope that it will force offline older coal plants, but in several geographies, the marginal units are low-carbon generation resources like run-of-river hydroelectric or single-unit nuclear plants, or biomass plants. As discussed in previous comments, this may also be legacy wind projects that no longer qualify for the PTC.

There are many root assumptions utilized in determining guidance for Section 45V. Chief among these is the assertion that a longer transitional period and/or grandfathering will result in a surge of high-emitting generation resources to power electrolyzers coming online during that period. One analogy used has been that of solar photovoltaic (PV) resources from 2000-2016. This is misguided in the fact that early PV industry growth was driven by demand-side mandates (RPS, QFs, etc.), much simpler project execution, and market structures that were favorable to new entrants (e.g. generator competition).

Conversely, green hydrogen has no material state or federal demand-side mandates. Relative to electricity, hydrogen demand is concentrated in a few regions and industries and much less open to new entrants since (1) over 75% of hydrogen is produced and consumed onsite; (2) “merchant” supply is concentrated among a handful of industrial gas companies; and (3) the market relies on bilateral contracts and not organized exchanges. Even with very inexpensive low-carbon generation resources, deployment of clean hydrogen will be limited due to interconnection constraints and hydrogen transportation challenges. The “harm” of a transitional period is severely overstated. Without an adequate transitional period, clean hydrogen risks never realizing the virtuous cycle of adoption and cost-reduction as seen in wind and solar, contrary to the goals of IRA.

Proposed Solution D: Monarch Energy recommends that 20% of all existing clean energy resources in a region be included regarding Section 45V incentives. This would allow a hybrid product blending multiple technology solutions to be created in markets without much renewable energy penetration that will progress the clean hydrogen initiatives as outlined in the National Clean Hydrogen Strategy and Roadmap.

Temporal Matching:

Treasury and the IRS acknowledge uncertainty in the timing of implementing an hourly matching requirement, however, and request comments on the appropriate duration of this transition rule to hourly matching, including specific data

regarding current industry practices, the predicted timelines for development of hourly tracking mechanisms, and the predicted timeline for market development for hourly EACs.

Treasury acknowledges that no reliable tracking system for hourly matching is widely available in the current market. The proposed rules include a transition to allow annual matching until 2028 when hourly tracking systems are hoped to be more widely available. In addition, Treasury is proposing to require hourly matching two years earlier than the 2030 date set by the European Union for moving to hourly matching as well as Executive Order 14057, which establishes the goal to power Federal facilities with 100 percent carbon free electricity (CFE), including at least 50 percent on a 24/7 basis by 2030. Lastly, Treasury suggested it may be willing to delay the switch to hourly matching if the tracking systems required are not yet ready by 2028.

The burden of procuring, tracking, operating and auditing data based on an hourly analysis is impractical to the point of disincentivizing the development of clean hydrogen projects. As Treasury stated there is no mechanism to effectively track this through current registries at scale and it will take quite some time to establish. The California Air Resources Board (CARB), which has established book-and-claim accounting for low-carbon inputs to hydrogen production under the California Low Carbon Fuel Standard (LCFS), allows RECs to be generated in the quarter of hydrogen production or the prior two quarters. In addition, most tracking systems issue EACs quarterly. MRETS has piloted an hourly program, although it will take quite some time to develop and apply nationally at scale to give the market the confidence needed to push forward. In addition, there isn't a tradable market for procuring hourly EACs that would be economic for clean hydrogen producers. The time-matching requirement will also result in periods of over / underperformance that would not benefit taxpayers and undermine the intent of the clean hydrogen production incentive. Developers will find it challenging to finance projects that require tax credits thereby stalling the clean hydrogen industry and going against the intent of the IRA.

The currently proposed shift from annual matching to hourly matching in 2028 does not create any extra incentive for early movers. Because a producer will have to meet hourly matching requirements at any point in its operational life due to the shift in 2028, project financing requirements will likely mandate that the project can meet hourly matching immediately upon operations from a design and commercial perspective. As discussed, this is not possible with current market services. A grandfathering period would be a much more useful method to kickstart the industry and drive near-term projects to completion. This is an extremely important consideration as the industry needs confidence in near-term projects to collectively deploy hundreds of millions into FEED studies and commercial contract securities.

Proposed Solution E: The lowest granularity that can be expected to deliver time matching at scale through 2030 is quarterly matching. If hourly is required to stand, then Treasury must have a grandfathering provision for existing clean hydrogen facilities to honor the intent of the IRA. We propose:

- 1) *Projects that come online before December 31, 2027 are grandfathered into a 10-year period of PTCs based on **annual** matching.*
- 2) *Projects that come online before December 31, 2029 are grandfathered into a 10-year period of PTCs based on **quarterly** matching.*

These adjustments will support a learning curve to bring the industry to scale in time to meet stricter rules after hard execution, financing, and operational lessons are learned by first-movers.

Deliverability:

Treasury and the IRS request comments on whether there are additional ways to establish deliverability, such as circumstances indicating that electricity is actually deliverable from an electricity generating facility to a hydrogen production facility, even if the two are not located in the same region or if the clean electricity generator is located outside of the United States



Proposed guidance would provide that an EAC meets the deliverability requirements if the electricity represented by the EAC is generated by a source that is in the same region as the relevant hydrogen production facility. Treasury and the IRS recognize that transmission limitations exist within these specified regions but are not aware of readily administrable options to reflect those grid constraints. A generator or hydrogen plant will be treated as in the balancing authority to which it is electrically interconnected (rather than its geographic location). Each balancing authority is linked to a single region, with the exception of the MISO balancing authority that is split into two US regions.

According to a DOE report of regional ISO's and current and future AC and DC transmission resources, total median interregional transfer capacities across the contiguous United States are nearly 125 GW for scenarios with moderate load and high clean energy growth assumptions, a fivefold increase from scenarios with similar load assumptions but lower clean energy growth assumptions. Several regions would benefit from increased connectivity with their neighbors as clean energy deployment increases to over 80% annual generation.

Proposed Solution F: The proposed regions based on DOE study can be workable if Treasury also considers the possibility that low-carbon energy generation resources can flow between regions on existing and future AC and DC transmission lines. Since these interregional transfers are a part of the current grid dispatch optimization, and the need for expansion of those lines is called out in the DOE work from which those region definitions are drawn, it stands to reason that both the DOE and the Treasury should anticipate success and develop rules that accommodate those interregional transfers. This could be accomplished most directly by allowing the transfer of EACs between the regional tracking systems in proportion to the annual, quarterly, or monthly capacity available on those lines. For example, the existing 1,000 MW internal transfer capacity between MISO North and MISO South could allow 8,760,000 MWh annually of EACs to be transferred within MISO zones in MRETS. After the conversion to hourly matching, the limit would be 1,000 MWh per hour.

Endorsement:

Monarch Energy would like to highlight and formally ensure the public submission by LS Power and The American Clean Power Association to the extent related to the Hydrogen PTC and the rules and regulations promulgated by the IRS and Treasury with respect thereto.

Conclusion:

Developing regulations applicable to a clean hydrogen Production Tax Credit is a complex and delicate balance to align the economic viability of clean hydrogen production with environmental goals and objectives. It is critical to ensure that regulations don't impair the development of the clean hydrogen economy or the overarching goals of mitigating climate change through decarbonization initiatives. To achieve this balance, some refinements are needed to the proposed Section 45V guidance.

As an early mover in clean hydrogen project development in the United States, Monarch Energy is appreciative of the opportunity to provide these comments. We are dedicated to supporting the Treasury Department, IRS, and the Administration to ensure that the guidance on clean hydrogen tax incentives accurately reflects what is needed to build this nascent clean hydrogen industry. We would be pleased to meet to discuss this letter's contents at your earliest convenience. Please contact us with any comments or questions you may have regarding this submission.

Sincerely,

Ben Alingh, CEO and Co-Founder, Monarch Energy
Charles Koontz, COO and Co-Founder, Monarch Energy