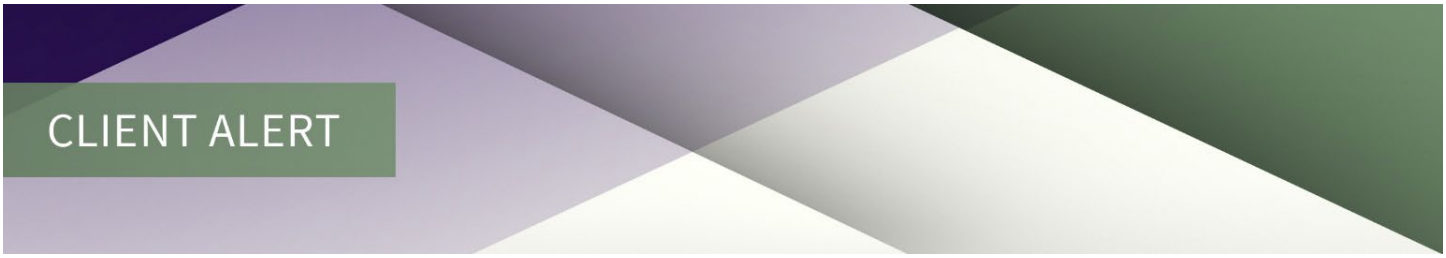

Final Rules for the Clean Hydrogen Production Tax Credit

January 9, 2025

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1. History[1]

While the Inflation Reduction Act (the "IRA") was signed into law in 2022, the credit for production of clean hydrogen, introduced under section 45V of the Internal Revenue Code, as amended (the "Code"), was subject to notice and comment. The credit for production of clean hydrogen (or the "45V credit") incentivizes the production of hydrogen while reducing greenhouse gas ("GHG") emissions. The 45V credit is based on the lifecycle GHG emissions rate of the hydrogen production process. In late December 2023, the Treasury Department and the IRS released proposed regulations for the implementation of Code section 45V, with comments due February 2024.

2. Hydrogen Production Constraints Post-IRA

Hydrogen provides a promising solution to the world's GHG emissions challenge because it can be burned like oil or gas but releases only water – not carbon dioxide (CO_2). Green hydrogen that is produced using electricity from a renewable source, such as wind or solar, results in the lowest amount of GHG emissions, but currently the cost of such production is high. Electolyzers that split hydrogen from water are expensive and developers have had difficulty obtaining funding. Solar and wind are intermittent electric generation resources that only produce power when the sun is shining or the wind is

[1] For further analysis regarding the 45V credit, see our previous alerts: Treasury and the IRS Issue Proposed Regulations under Code Section 45V Relating to Clean Hydrogen Production and Tax Credit Opportunities for Nuclear Energy.

blowing, which means the electrolyzers may not be utilized to their full capacity without a battery energy storage system. Finally, although hydrogen production facilities have achieved commercial operation to supply hydrogen feedstock to single source users, there is a lack of available offtakers to execute long-term agreements for material hydrogen quantities. These challenges, together with a lack of clarity regarding the regulatory framework, have resulted in several project delays and cancellations.

Hydrogen proponents are optimistic that publication of the final regulations regarding the 45V credit will address the regulatory uncertainty facing developers and spur a renewed interest in investing in hydrogen projects.[2]

Final Rules

On January 3, 2025, the IRS released final regulations (available: https://www.federalregister.gov/public-inspection/2024-31513/credit-for-production-of-clean-hydrogen-and-energy-credit), officially implementing Code section 45V, but with revisions to its initial rules that, according to the IRS, are intended to offer greater flexibility to hydrogen producers. The final rules become effective January 10, 2025 and maintain the European Union's "three pillars" approach to green transition, which seeks to ensure electrolytic hydrogen production contributes to GHG emissions reduction. Under this approach, to be eligible for the credit for production of clean hydrogen, an electrolytic hydrogen production facility must satisfy the IRS's requirements of (i) temporality, (ii) deliverability (geographic correlation), and (iii) incrementality.

1. Temporal Matching

Matching focuses on the time alignment between when electricity is generated and when hydrogen is produced – the hydrogen production must be linked to the electricity generation within a specific timeframe. For temporal matching to be satisfied, the final rules require that the electricity used in the production of the hydrogen be generated in the same year that the hydrogen is produced; provided that starting in 2030, the source electricity must be produced within the same hour as the hydrogen production. Comments to the proposed regulations expressed concern that when hourly matching commences, the 45V credit may be forfeited if the GHG emissions requirement is not satisfied for an entire year's production. In response, the final regulations allow a producer to calculate GHG emissions on an hourly basis, potentially avoiding such forfeiture as long as the weighted annual emissions average per kilogram of hydrogen is under the 45V credit's limit of 4 kilograms of CO_2e per kilogram of H_2. This should provide investors with greater certainty, mitigating the risk that modest foot-faults in the relative rate of CO_2 emissions over the course of an annual production cycle do not prohibit a producer's eligibility for the 45V credit.

[2] "With this added clarity, many projects that have been delayed may move forward, which can help unlock billions of dollars in investments across the country," Kim Hedegaard, CEO of Topsoe's Power-to-X, said in a statement. Topsoe plans to construct a $400 million electrolyzer manufacturing facility in Chesterfield, Virginia.

2. Deliverability

This pillar seeks to ensure the hydrogen is produced in close proximity to the electric generation facility supplying such production, minimizing transmission losses and ensuring the local source of the electricity supply. For deliverability to be satisfied, the final regulations require that the electricity generation facilities supplying the hydrogen production facility be from the same geographic region.

3. Incrementality

This pillar attempts to ensure that the hydrogen production is truly new and does not simply displace existing renewable energy sources that were already in place to serve other purposes. Generation satisfies incrementality if the electric facility begins commercial operation within 36 months of the qualifying hydrogen facility being placed in service. The final rules also provide the following means to satisfy incrementality:

- *Nuclear Sourced Power*. Nuclear power is now an eligible fuel source, with a cap of 200 megawatt-hours per operating hour per reactor, if the nuclear plant is deemed at risk of retirement or codependent on hydrogen investment.
- *State Emissions Capping.* An exemption exists for electricity that is produced in states with renewable portfolio standards that meet certain criteria for capping GHG emissions (currently California and Washington).
- *Carbon Capture and Sequestration*. Electricity produced from a thermal generation facility (e.g., natural gas fired) that has implemented carbon capture and sequestration technology up to 36 months before the hydrogen facility is placed in service can satisfy incrementality. Also, for hydrogen produced using methane gas, producers will no longer have to demonstrate that their plant represents the first productive use of such methane.

Conclusion

As shown in the table below, the 45V credit's value is based on the lifecycle GHG emissions of hydrogen production, not to exceed 4 kilograms of CO_2e per kilogram of hydrogen produced. The maximum possible credit is $3.00 per kilogram of H_2, if produced with .45 kilogram of CO_2e or less of lifecycle GHG. The value amounts will be adjusted annually by multiplying each amount by the inflation adjustment factor.

Lifecycle Emissions (kilogram of CO_2e per kilogram of H_2)	Production Tax Credit Value ($ per kilogram of H_2)
4-2.5	$.60
2.5-1.5	$.75
1.5-.45	$1
.45-0	$3

In the aftermath of what many are characterizing as an expansion of Code Section 45V, developers of pink hydrogen using nuclear power and blue hydrogen using thermal generated power, coupled with carbon capture capability, may have new life under the final rules. Alternatively, those committed to the vision of a truly carbon-neutral intention of Code Section 45V may be skeptical that any expansion of tax credits beyond the production of green hydrogen falls short of the emissions reductions goals Code Section 45V was adopted to address. The final rules seek to reach a workable compromise. The implications of the new regulations will need to be assessed in light of the impending Trump Administration's policies, which may impact clean energy production tax incentives, including the credit for production of clean hydrogen under Code Section 45V.

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