

**Energy Innovation Oral Testimony to the United States Treasury Department and Internal Revenue Service  
45V Clean Hydrogen Production Tax Credit (REG-117631-23)  
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Introduction

Good morning. My name is Dan Esposito, and I'm with Energy Innovation, which is a nonpartisan energy and climate policy think tank. We provide customized research and policy analysis to decision-makers to support policy design that reduces emissions at the speed and scale required for a safe climate future.

I've led our clean hydrogen research as a Manager in our Electricity Program and previously spent four years in energy market analytics to help finance new power generation assets across North America. I have master's degrees in public affairs and environmental science and bachelor's degrees in math and physics.

We do not have a financial stake in 45V or the hydrogen industry. Instead, our interest comes from two angles: (1) we know we'll need a large, thriving clean hydrogen industry to help decarbonize industrial feedstocks as well as aviation and marine shipping fuels; and (2) we know the tax credit is so rich that, without the right guardrails, it'll be exploited to the severe detriment of climate, consumers, and the hydrogen industry's own longevity.

My main takeaway today is that Treasury must hold strong on its commendable rules for incrementality, deliverability, and hourly time-matching. This framework ensures the tax credit supports verifiably clean hydrogen production with rules that are straightforward to comply with. My remarks will cover why this framework is necessary to keep emissions low, is critical to growing a healthy industry, and will not suffocate the industry's near-term development.

Strong guardrails are necessary to keep emissions low

First, on emissions: our analysis finds electrolytic hydrogen production that fails to meet all three pillars will drive greenhouse gas emissions that are two to five times worse than how hydrogen is made today. For example, an electrolyzer buying power from an existing nuclear power plant will displace clean electricity that was serving demand elsewhere. Today, in the vast majority of hours, fossil fuel power plants will ramp up to fill in this gap—an outcome directly induced by the electrolyzer. Calling this hydrogen "clean" would be textbook greenwashing.

In reviewing all evidence, there's consensus that forgoing any pillar will drive greenhouse gas emissions that far exceed the statutory requirement for earning the tax credit. In fact, emissions would be much higher even after accounting for hydrogen's use downstream.

To put this in perspective, an Evolved Energy Research study finds 45V could drive 11 to 26 million metric tons of electrolytic hydrogen production annually by 2032. Without the three pillars, the production of hydrogen that's clean in name only would increase emissions by 200 to 1,000 million metric tons of CO<sub>2</sub> per year, at an annual

taxpayer bill of 30 to 80 billion dollars. This would put the U.S. target of halving climate pollution by 2030 well out of reach.

While the three pillars help ensure 45V rewards truly clean hydrogen production, we know that electrolyzers' use of existing clean energy would occasionally not worsen greenhouse gas emissions. Ideally, the rules would qualify these instances.

In our written comments, we propose a few targeted exemptions meant to capture these cases in a readily-administrable manner. For example, we suggest exempting incrementality in hours when the locational marginal price at an electrolyzer's node falls below a threshold price that implies the use of clean energy that would otherwise have been curtailed. We lay out similarly tailored exemptions for the use of clean energy from facilities that would otherwise retire or are located in regions with binding emissions caps.

That said, a broad carve-out that indiscriminately exempts five—or any other—percent of existing clean energy generation from incrementality would not come close to matching those instances when it ought to qualify.

While clean energy curtailment is on the rise, it's too spiky in time and scattered in space for electrolyzers to capture more than a tiny fraction of this would-be wasted electricity. Offering a broad exemption to existing clean energy that would have been generated regardless doesn't reduce curtailment in other hours or locations—it just causes fossil fuel power plants to ramp up to serve the new demand.

We've found just a five percent broad exemption would drive 30 to 60 million metric tons of carbon pollution per year, with a hydrogen emissions intensity that far exceeds the statutory threshold.

In sum, we need all three pillars to ensure truly clean hydrogen production, and any exemptions should strictly qualify the circumstances they're intended to capture.

#### Strong rules are critical to growing a healthy industry

Next, on growing a healthy industry: hydrogen will need sustained policy support for a long time before it'll be able to compete on its own. The hydrogen industry has a chance to do things right from the start, building and maintaining public trust that it's truly clean.

If 45V instead subsidizes highly-emitting hydrogen production, worsens local air pollution, raises consumer energy bills, and transparently greenwashes a dirty fuel source, the hydrogen industry will lose its social license to operate.

We're already seeing this through opposition letters from communities and environmental justice groups against the hydrogen hubs due to the hubs' efforts to weaken these rules. The industry will have a far better chance of quickly permitting and building projects if communities aren't trying to fight them at every juncture—and fewer development risks will cut investment costs.

We'll also need 45V to stand up an industry that can someday survive without subsidies, but this will only happen with the right design.

Loose rules kill the incentive to innovate and encourage a race to the bottom. Despite what companies say they'll do, they'd make the most money by buying the cheapest electrolyzers on the market and making hydrogen around the clock. But this sets up long-term failure.

For example, loose rules would push electrolyzers to pair up with existing nuclear power plants, as 45V is worth much more than nuclear facilities' going-forward costs, and their constant output would maximize tax credit revenue. But when the credit expires, the electrolyzer won't be able to pay the nuclear plant nearly enough to cover its costs. It also won't be set up to pivot to price-hunting for cheap power on the market, due to inflexible operations or a lack of storage to help provide a constant hydrogen supply to offtakers.

The project will have already made its money, but it'll either shut down in the post-subsidy period or leverage the jobs at stake to lobby for a tax credit extension—much like many commenters this week are doing even before these rules have been finalized. Zooming out, overinvestment in rigid electrolyzers will have done little to cut costs for the flexible technologies we'll need to make cheap hydrogen.

By contrast, strong rules would generally see electrolyzers pair with new renewables. Here, hourly matching would drive innovation on and investment in flexibility. When 45V expires, these projects would ramp up in hours of low power prices and ramp down in high-priced hours.

This allows the continued production of low-cost, truly clean hydrogen, while boosting rather than undermining the transition to a clean power grid. It also brings flexible electrolyzers down the cost curve and much more investment in hydrogen storage.

We have a real chance to grow a thriving clean hydrogen industry, but efforts to weaken the pillars risk trading this success for a flash in the pan, where every project makes its money but at great societal harm.

#### Strong rules would not suffocate the industry's near-term development

Lastly, on how strong rules would affect near-term growth: we point to analytical and real-world evidence.

First, a review of cost studies by Princeton shows three-pillars-compliant projects can be highly profitable. Solar-only projects may not pencil out under an hourly-matching framework, but projects designed with the three pillars in mind from the start can absolutely be in the money.

Second, Europe put similar rules in place for clean hydrogen production, and despite threats that this would destroy their industry, they've seen investment increase.

Third, many hydrogen companies are in favor of strong rules for 45V. They're not trying to shoot themselves in the foot—they know they can comply with these rules and that the industry will be better off for it.

Frankly, everyone has always known 45V requires upstream emissions accounting—this isn't some surprise. You're hearing a lot this week from the subset of companies that chose to ignore this and now may need to abandon dirty project designs in favor of clean ones. But it's not Treasury's responsibility to make every project successful, emissions be damned, nor is the department to blame for any cancelled investments. The fault lies with those who made cynical bets that Treasury will accede to their demands for lax rules.

Fortunately, many companies say they can rise to the occasion—and we should believe them.

#### Summary of recommendations

In closing, we recommend holding strong on the draft rules. We find no justification for loosening the pillars, and doing so would drive climate pollution well beyond the statute's thresholds.

In particular, we recommend: (1) rejecting the broad exemption for existing clean energy in favor of targeted approaches; (2) keeping the hourly matching phase-in date at 2028 with no grandfathering, as this period is meant to give ample time to develop tracking software rather than to give first-movers free reign to pollute; (3) averaging hourly emissions on an annual basis to avoid cross-subsidizing dirty production; and much more in our written comments.

With loose rules, greater hydrogen production will mean increasingly worse outcomes for climate, public health, consumers, taxpayers, and the industry's long-term viability. But with strong rules, more hydrogen production will drive more emissions reductions, help clean up our power grid, and responsibly use taxpayer money to grow a thriving, truly clean industry.

Treasury can have full confidence and conviction in its draft rules, and we're ready to assist with any questions that arise. Thank you very much for your time and continued hard work on this issue.

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