

Washington Post Ad Paid for by NRDC

“Fossil fuel interests are trying to weaken the clean hydrogen tax credit.

President Biden: Finalize strong rules for climate.”

Supporters of the ad include: Earthjustice, the Environmental Defense Fund, Evergreen, the League of Conservation Voters, the Natural Resources Defense Council, Public Citizen, Sierra Club, Sunrise Movement, and the Union of Concerned Scientists.

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1. What protections are needed for fossil fuel-based hydrogen?

99% of hydrogen today is made from fossil fuels, and 45V offers funding for this type of hydrogen with carbon capture in place. The current tool used to determine tax credit eligibility could significantly [underestimate](#) the methane and hydrogen emissions associated with this production method – and companies are pushing to make it even easier to qualify for the tax credit without sufficient emissions verification.

Some are also calling for a loophole that would allow heavily polluting hydrogen projects to qualify as ‘clean’ by purchasing [biomethane offsets or credits](#) rather than changing their underlying technologies or production processes. For example, under this loophole, blue hydrogen producers could achieve the top \$3 tax credit tier by purchasing offsets for only [4% of its fuel use](#).

Without closing these loopholes and adding safeguards, 45V could incentivize hydrogen that is [worse for the climate](#) in the near term than the fossil fuels it’s replacing, while worsening local air pollution. Treasury must avoid these perverse outcomes by updating its models to more accurately capture hydrogen’s climate impact and disallowing the use of carbon-negative offsets. To keep hydrogen truly clean, producers must be held responsible for their full set of on-site emissions.

2. What are the three pillars and why are they necessary for electrolytic hydrogen?

Electrolytic hydrogen is produced via electrolysis, where electricity is used to split water (H₂O) into hydrogen (H) and oxygen (O). When powered by renewable energy (ex. wind or solar power) and with the right guardrails in place, this process offers the cleanest pathway to hydrogen production.

Electrolysis is a power hungry process, and without certain protections, it would drive substantial amounts of fossil fuel generation on the grid. The three pillars are a robust and straightforward solution to prevent this harmful outcome. They include:

- **Incrementality** - to ensure that electrolyzers are drawing on new clean energy supplies, rather than diverting existing renewables and causing the grid to backfill with fossil fuels;
- **Hourly matching** - to ensure that renewables are actually available during the hours that the electrolyzer is running; and
- **Deliverability** - to ensure that the clean energy can be physically delivered to the electrolyzer and not blocked by constraints between electricity grids.

In short, the pillars ensure that electrolyzers are powered by new clean energy located in the same geographic region and generated during the same hours, which will prevent increases in GHG emissions and electricity prices linked to hydrogen production.

3. Why the three pillars are necessary to protect the climate and adhere to the IRA requirements

Without the three pillars, there is a high risk for significant emissions increases from hydrogen production. Overwhelming evidence – including from [DOE](#) and the [EPA](#) – shows that absent the

three pillars, **the risks of significant emissions from hydrogen production are high and would violate IRA emissions thresholds and [statutory language](#).**

- Studies by [Princeton ZERO Lab](#), [Energy Innovation](#), and the [MIT Energy Initiative find](#) that if hydrogen projects are not required to comply with all three pillars, they could have an emissions intensity more than 2x worse than today's incumbent gas-derived hydrogen.
- The [Electric Power Research Institute](#) and [Evolved Energy Research](#) draw the same conclusion and find that **hydrogen production that is not subject to the three pillars will lead to *hundreds of million tons* of carbon emissions increases through the mid-2030s.**

4. What loopholes are we concerned about for electrolytic hydrogen production?

The draft rule considers potential carveouts to allow that share of existing clean energy to power hydrogen production. A frontrunner option under consideration – namely, a broad carveout allowing 5-10% of existing clean energy generation to power hydrogen production – could have serious negative consequences and **should be rejected**. This is a substantial volume of existing electricity supply powering homes and businesses – with the upper bound equivalent to the power usage of the state of Illinois– being diverted for hydrogen production. In the majority of cases, fossil fuel generation will ramp up to fill the gap, leading to significant emissions increases.

- [Rhodium Group](#) finds that a 5% allowance could drive up to **1.5 billion metric tons** of cumulative emissions through 2035 – the equivalent of putting 325 million new gasoline powered cars on the road.
- [Energy Innovation](#) finds that a 5-10% allowance in the California Independent System Operator, a relatively clean grid, could yield a climate footprint for electrolytic hydrogen that is **1.5 to 2 times higher than today's incumbent gas-derived hydrogen production**. [Princeton](#)'s analysis of Southern California confirms these numbers.

5. On the ground evidence shows the three pillars will support substantial industry growth

The **bulk** of first mover projects in the U.S. and the EU are already three pillar compliant. A subset of announced U.S. projects can be found starting on page 21 of this [document](#). A resounding chorus of companies have publicly supported Treasury's proposal.

In December 2023, **Air Products, Hystor Energy, Synergetic, EDP Renewables**, among others sent a letter to Treasury expressing confidence in the three pillars' ability to deliver robust industry growth, indicating that they have a collective scale of planning and interest exceeding a whopping 50 gigawatts of three-pillar compliant projects in the U.S. **This scale alone will deliver**

significant technology cost reductions, and likely more than halve the costs of electrolyzer technologies in this decade. A list of supportive statements from across the hydrogen value chain in the U.S. can be found, [here](#).

The European Union also offers a powerful precedent and further evidence that the three pillars will support substantial industry growth. Despite some in industry claiming that the three pillars would stymie growth in the EU, the pipeline of announced hydrogen **projects since the EU adopted the three pillars in 2023 has [already grown by 20 percent](#).**

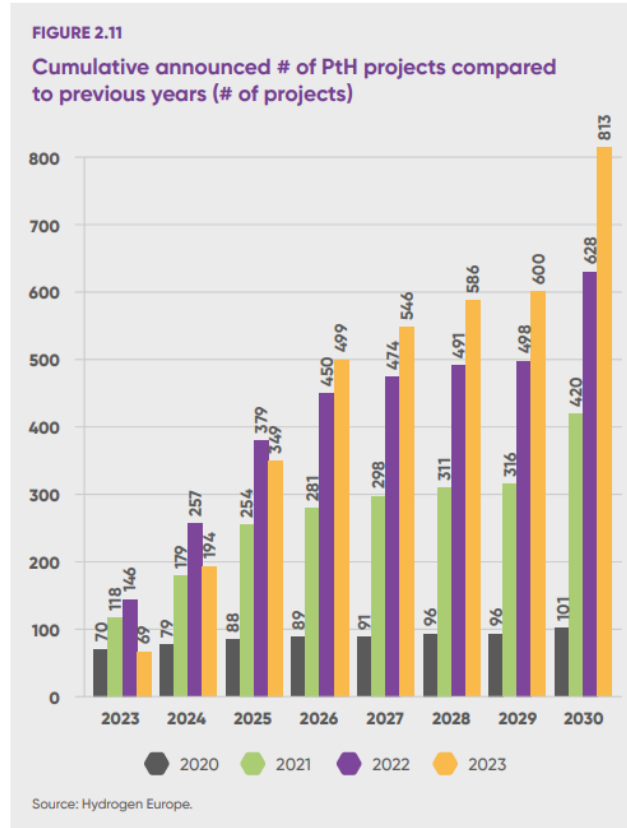


Figure: Cumulative number of announced three pillar compliant or PtH projects announced each year in the EU. Source: Hydrogen Europe.

In February 2024, results of the EU’s innovation fund hydrogen auction far exceeded expectations. The auction was only open to hydrogen projects that are three-pillar compliant *and* that have secured hydrogen off-takers. While the [Hydrogen Bank](#) was only awarding funds to cover up to 400 MW of projects, investor appetite far exceed this amount with 8,500 MW in projects being proposed. According to the European Commission, the first bidding round was a success. *"This shows that industry is keen to take on the challenge of spearheading the transition from fossil to clean fuels,"* said Paloma Aba Garrote, director of CINEA.” This clearly demonstrates that the three pillars did *not* inhibit early market creation in the EU.

6. Analytical evidence shows the three pillars will support substantial industry growth

The [Electric Research Power Institute](#) finds that the three pillars will support 20 million metric tons per year of clean hydrogen production by 2036. This is *double* DOE's 2030 clean hydrogen production target. EPRI explains that the section 45V credit is very generous and could cover up to 90 percent of hydrogen production costs in the most favorable cases (e.g., where high quality wind resources are available combined with lower electrolysis capital costs).

[Evolved Energy Research](#) finds the deployment of clean hydrogen by the early 2030s to be very similar in a three pillars case vs. a no pillars case. In both cases, deployment is substantial, and achieves the DOE goal of supporting 10 million tons of clean hydrogen production by 2030. [Evolved](#) finds the administration's decision to adopt the criteria or not is therefore not a question of whether the industry will rapidly grow or not, but is rather *“a question of the expected returns for investors for hydrogen production and not whether IRA will be successful in driving electrolyzed hydrogen adoption.”* The role of taxpayer-funded, public subsidies is to support needed deployment of flexible electrolyzers, to drive cost reductions and enable a flourishing, unsubsidized market; the three pillars do this.

7. The 3 Pillars Steer Investment in the Right Direction

Not only will the 3 pillars enable sufficient hydrogen buildout, but they are also critical to ensuring investment flows to the right locations and types of equipment. For instance, hourly matching incentivizes flexible proton exchange membrane (PEM) electrolyzers that have the [ability](#) to ramp up and down depending on renewable availability and that can work with lower capacity utilization rates. These PEM electrolyzers are largely manufactured in the U.S. and the EU, presenting a significant opportunity to build a new market to counteract China's dominance of the more inflexible alkaline electrolyzers, which pair better with annual matching and constant operation.

8. Cost to Taxpayers Soar without the 3 pillars

The [Electric Power Research Institute](#) has estimated that the fiscal costs of 45V could be substantial if the pillars are weakened. Their lower-end estimates show that total fiscal outlays with the three pillars would amount to \$385 billion, but that number rapidly jumps into the upper 400's and 500's of billions of dollars as the pillars are weakened.

9. The The 3 pillars Protect Against Electricity Price Spikes

[Consumer advocates sent a letter](#) to the White House and U.S. Treasury Department with concerns that weak Treasury guidelines implementing the 45V hydrogen production tax credit [will negatively impact consumers](#). Electrolyzers are large electricity users, so expanding their use

without corresponding new clean generation will push electricity markets to call on more expensive generators, raising wholesale electricity prices.

- A [study by Princeton University's ZERO Lab](#) supports their concerns and indicates that without these three pillars, power prices could increase by 8 percent in California and 10 percent in Colorado. **A study by TU Berlin in Europe found a 43% increase in power prices with weak hydrogen production rules.**
- A helpful parallel can be seen in the rise of [crypto-mining](#) and its price, reliability, and emissions impacts, where the costs of power-hungry crypto-mining are already being socialized onto ratepayers. A [Berkeley study](#) found that cryptocurrency mining operations in upstate New York have pushed up annual electric bills by about \$165 million for small businesses and \$79 million for individuals.