

HYDROGEN HYPE

Pay no attention to the polluter behind the curtain

by Sarah Lutz, Climate Campaigner at Friends of the Earth

Hydrogen is having a moment. Touted as a versatile climate solution for everything from power and heating to transportation and heavy industry, the tiniest element in the universe is suddenly very trendy. But beware the hydrogen hype.

The Bipartisan Infrastructure Law and the Inflation Reduction Act invest a combined \$21 billion in tax incentives and direct spending for hydrogen. This is a seismic shift in industrial policy likely to spur billions in new projects. It is also very dangerous. If the Biden Administration implements this new money recklessly, it could delay or even reverse the transition from fossil fuels.

The Treasury Department is already hard at work designing the rollout of the most generous new incentive: a hydrogen production tax credit (PTC), established under section 45V of President Biden's signature Inflation Reduction Act. Projected to cost [\\$13.1 billion](#) over the next decade, the PTC is one of only three so-called "[direct pay](#)" provisions in the entire bill available for corporations. This means that even if a corporation can reduce its taxes to zero using loopholes and other gimmicks, the hydrogen PTC is still valuable.

Currently, hydrogen is produced almost exclusively from steam reforming the methane in fossil gas (SMR) for use in the industrial sector—overwhelmingly in fertilizer production and diesel fuel refining. But the new PTC is designed to incentivize cleaner hydrogen production on a sliding scale, so that lower lifecycle carbon emissions translate into higher tax credit payments.

The new policy is theoretically "technology neutral," meaning that only emissions, not particular production processes, are considered. Many questions remain about implementation, but the tax credit seems designed to award the highest payments to so-called "green" hydrogen, produced from renewable electricity and water, and the lowest payments to blue hydrogen, produced from fossil gas paired with carbon capture and sequestration.

Maximum PTC Value	\$.60 per kg of H2	\$.75 per kg of H2	\$1.00 per kg H2	\$3.00 per kg H2
CO2e Emissions	2.5-4 kgs CO2e	1.5-2.5 kgs CO2e	.45-1.5 kgs of CO2e	<.45kgs CO2e

The fact that [blue hydrogen](#) could be subsidized at all is a major concession to fossil fuel interests. Because the law requires lifecycle emissions to be measured using the deeply flawed GREET model, blue hydrogen that achieves a 95% carbon capture rate is likely to qualify. This is an unfortunate lifeline to the fossil

industry, as the GREET model [underestimates](#) methane leakage by at least 50 percent. The latest research indicates that accurately accounting for both methane leakage and the power demands of CCS makes blue hydrogen even [worse for the climate than coal](#), per unit of heat energy.

Like the rest of the Inflation Reduction Act, the hydrogen PTC was passed as part of a tortured compromise with fossil fuel interests. Nevertheless, those same polluters are now hard at work pressuring the Biden Administration to go over and beyond the letter of the law to deliver an even weaker, more compromised definition of clean hydrogen. The end result of Big Oil’s wish-list would reverse progress on climate and render the PTC a taxpayer-funded greenwashing scam.

Big Oil is not satisfied with the likely subsidization of fossil hydrogen with CCS. Based on a review of nearly 200 official comments submitted to the Treasury and the IRS in December 2022, it is evident that the fossil industry has its eye on weakening the higher value tiers of the credit as well. Here is a cliff-notes guide to how Big Oil and other polluters want to co-opt the hydrogen production tax credit:

Greenwash Hydrogen Produced from Fossil-Heavy Power Grids

“Strict additionality rules requiring electrolytic hydrogen to be powered by new renewable energy is not practical, especially in the early years, and will severely limit the development of hydrogen projects.”—[BP America](#)

“An exclusive focus on new resources would severely impair the efficiency of producing clean hydrogen.”—[Constellation](#)

In theory, renewably powered electrolysis (splitting water into its hydrogen and oxygen components) should produce hydrogen with minimal lifecycle emissions. However, in practice, these so-called ‘green hydrogen’ projects can become massive polluters if they use power from the grid without building new wind or solar projects to meet their new energy demand. If a hydrogen project simply ‘claims’ existing renewable electricity, then the most likely result is that dirtier energy sources across the grid are used to meet the increased power demand. This results in hydrogen production that is effectively diverting renewable energy and replacing it with fossil fuels – dramatically [ramping-up lifecycle emissions](#) far above the requirements for federal clean hydrogen subsidies.

Unsurprisingly, fossil fuel companies are hoping that Treasury will turn a blind eye to the grid impact from connected hydrogen production. BP is adamant that clean electrolysis projects shouldn’t have to be tied to new renewable capacity. So is the Clean Hydrogen Future Coalition, a trade group dominated by oil and utility interests.

The nuclear industry, which never misses a chance to tout its climate credentials, is siding with Big Oil—and its own bottom line. Constellation, the largest nuclear generator in the country, is calling on the Biden

Administration to ditch additionality. This is so that its aging and increasingly uncompetitive fleet of nuclear reactors can qualify for yet another subsidy. This double-dipping is especially egregious because Constellation's reactors were the largest single beneficiary of a [\\$30 billion](#) bailout passed as part of the Inflation Reduction Act.

What all of this amounts to is Big Oil and Big Nuclear working together to make sure that hydrogen cannibalizes existing renewable capacity—a loss for the climate and a win for incumbent dirty energy interests.

Rampant Carbon Accounting Shell Games

“For each tax year, the taxpayer should reconcile its total consumption of inputs to the hydrogen production process with any indirect book accounting factors.”—[BP America](#)

“With respect to the question on granularity of time matching, Olin recommends taking as permissive of an approach as possible to facilitate and stimulate growth of the clean hydrogen production industry. Therefore, Olin recommends an annual time period for matching purposes.”—[Olin Corporation](#)

“On an annual frequency to not be too onerous.”—[Shell USA](#)

Big Oil is eager to turn the hydrogen PTC into a massive pollution shell game using “book-and-claim” accounting. This is a market mechanism that allows the environmental attributes of a product, such as renewable energy, to be traded between consumers with no direct, physical connection to the original product. Its hallmark is alleged “on paper” reductions measured through Renewable Energy Credits, or RECs, which allow for emitters to claim that pollution in one place is being offset by renewable power in another. Tradable emissions systems like these [tend to lead to](#) pollution hot spots that concentrate harm in already overburdened communities.

In all 300 hundred pages of the Inflation Reduction Act, the words “book-and-claim” never appear—concerning hydrogen or anything else. All the law says is that the lifecycle emissions of the hydrogen “production process” need to be measured using the GREET model.

Letting industry take credit for renewable electricity that doesn't reduce its climate pollution would lead to wildly inaccurate estimates of the lifecycle emissions from hydrogen production—contrary to the clear requirements of the statute. But this isn't stopping Big Oil from demanding the hydrogen tax credit be implemented with a book-and-claim system that would allow producers to play shell games with GHG emissions.

Big Oil doesn't just want a book and claim system—it wants a particularly lax version of it that allows producers to seek out and ‘claim’ cheap existing renewable energy, undermining efforts to drive investment into new renewable capacity. Under proposals from BP and chemical giants Air Liquide and Olin, an electrolyzer in Texas could draw 1 megawatt of coal and gas power from the grid, and then sometime in the following year, a wind farm in the same region could generate a REC based on 1 megawatt of wind. If the

electrolyzer then bought that REC, it could use it to claim the full value of the clean hydrogen PTC, despite powering production with a mix of gas and coal.

Needless to say, this would be disastrous from an emissions perspective. [Modeling](#) from the Princeton University's Low Carbon Technology Consortium is clear that regional time-matching the renewable energy claimed by hydrogen producers with their actual production is essential for achieving lifecycle emissions rate required by law. These massive emissions spikes will not be 'balanced out' by a book and claim system if the matching requirement is an annual or even a weekly basis. Without hourly time matching, grid connected electrolysis will emit between 10-40 kgCO_{2e} per kgH₂, depending on the grid. Even in regions with grids at the lower end of this rate, hydrogen production would be higher than the highly polluting status-quo fossil hydrogen.

Fossil Hydrogen Bait and Switch

“Limiting the use of these market-based mechanisms to electricity would inappropriately favor one production pathway over another and would stifle investment in a broad range of production pathways.”—[Air Liquide](#)

“IRS should allow for the use of book-and-claim for the movement of low carbon intensity natural gas, renewable natural gas (RNG), and other renewable gases that are supported by commercial contracts.”—[Valero](#)

“Lastly, in respect to RNG, co-locating the renewable feedstock with hydrogen production is not generally practical.”—[Shell USA](#)

Electrons aren't the only thing that can be traded as part of a book-and-claim system—and therein lies one of Big Oil's most dangerous demands. Companies like Shell and Valero are pushing book-and-claim for biogas captured from landfills and factory farms. This could put taxpayers on the hook for billions in new subsidies to Big Oil without the fossil fuel status quo changing one bit.

The reason we know this system is so dangerous is because a version of it already exists. Look no further than the California Low Carbon Fuel Standard (LCFS), which allows for hydrogen produced from fossil gas to generate valuable compliance credits via book-and-claim accounting. Take the example of an SMR facility in [Wilmington, California](#) owned and operated by Air Products and Chemicals, one of the biggest hydrogen producers in the US and a vocal proponent of a gas book-and-claim system for 45V.

The facility produces bog standard grey hydrogen, but the company selling this hydrogen as a transportation fuel promises that the “environmental attributes” of methane biogas have been acquired from two factory farms in Indiana. This shell game is common under the LCFS, which allows for wildly inflated claims of carbon negative methane biogas. In practice, factory farms and landfills across the country can sell paper credits to LCFS participants, despite having installed methane capture [years before](#) LCFS biogas incentives were available. This makes industry claims that those emissions are being “avoided” as a result of the policy

especially bogus. The incentive structure is becoming so perverse that a dairy trade publication [recently noted](#) that profits from paper credits could exceed profits from milk.

This double (or more) dipping into climate incentives while making no meaningful changes to a polluting status quo is hugely problematic on both environmental justice and climate grounds. Factory farms are massive sources of soil, air, and water pollution — with documented health harms on surrounding, disproportionately BIPOC, communities. Factory farms benefit from a lax to nonexistent air emissions regulatory environment, allowing methane biogas producers to ignore leakage during production and transportation while raking in clean energy subsidies. Similarly, perverse incentives for producing [landfill gas](#) encourage landfill operators to abandon best pollution abatement practices in order to increase their methane biogas production and energy value. This has resulted in [significant emission leakage](#) that is not reported or captured in modeling.

Despite outsized claims about the purported climate benefit of producing and capturing methane biogas, the real impact of subsidizing biogas has been a [market distortion](#) that effectively penalizes more sustainable practices—such as organics separation at landfills and pasturing livestock that could reduce emissions and pollution at the source. The factory farm and landfill industries have formed a tight alliance with fossil gas, as methane biogas rebranded as RNG is a lucrative greenwashing tactic.

If BP, Shell, and the rest of Big Oil get their way and a similar bait and switch to the LCFS is allowed for the hydrogen tax credit, pollution-intensive fossil hydrogen could qualify for the full value of the credit by purchasing paper credits from landfills and factory farms.

Existing grey hydrogen facilities may also be able to join in the cash grab. Although the PTC is largely intended for new hydrogen production, there is a provision allowing existing hydrogen facilities to qualify if they make capital investments that reduce lifecycle emissions to qualifying levels. This was likely intended for grey hydrogen producers installing carbon capture equipment. But the (il)logic of gas book-and-claim system means that direct investments in geographically non-contiguous factory farm or landfill projects could result in claiming the full credit amount.

Polluters' vision for a fossil gas bait and switch would allow all three industries—Big Oil, factory farms, and landfills—to gain access to massive hydrogen subsidies without making any meaningful changes to their polluting status quo.

Ignore Advances in Emissions Modeling

“Once provisional emissions rate are confirmed by the IRS, the methodology used to determine such emissions rates should not change, regardless of any changes or updates or updates to the GREET model, or any other model used in the determination.”—[BP America](#)

“We believe that the GREET model is the appropriate tool for measuring the lifecycle greenhouse gas emissions and that the rules should not attempt to modify or tailor the use of the GREET model for purposes of the credit under IRC Section 45V.” — [CNX Resources Corporation](#)

“Because there is no fixed schedule for updates or revisions to the GREET model, it will be necessary for Treasury and IRS to ensure that producers are provided with certainty that their method will not become disqualified due to changes in modeling without sufficient time to revise their production method if necessary.”—[American Petroleum Institute](#)

The Inflation Reduction Act requires the lifecycle emissions of hydrogen to be measured using “GREET or a successor model.” This was an overlooked coup for Big Oil and other polluters, simply because the GREET is particularly out of step with the latest scientific literature, underestimating methane leakage from oil and gas by at least 50 percent. GREET also seriously undercounts the emissions impacts of relying on grid electricity to produce hydrogen. The model measures emissions on an average basis, leaving it poorly equipped to measure marginal emissions if electrolyzers connected to the grid cause a spike in power demand. This is why commenters like the [NYU Institute for Policy Integrity](#) are calling for Treasury to work with the Department of Energy and the Argonne National Lab to adopt a successor model. Whether the Department of Energy updates GREET or develops a successor model, it is vital that the government rely on a model that reflects the true toll of hydrogen production on the climate.

BP and others are essentially demanding that fossil hydrogen investments be made immune to needed improvements in modeling. BP suggests that Treasury be prohibited from reevaluating and updating provisional emissions rates based on changes to GREET or any other model. This egregious request to lock-in hydrogen subsidies, even if scientific improvements demonstrate it should no longer qualify, is a blatant cash-grab attempt.

ENDING THE HYDROGEN HYPE

Despite Big Oil spin about the widespread “need” for hydrogen, demand is limited to a few sectors, with over two-thirds of production used for [petroleum refining](#). While truly green hydrogen may have a limited role in hard to decarbonize sectors, visions of a sprawling hydrogen economy are a [dangerous myth](#). Polluters are simultaneously trying to manufacture artificial demand for a purportedly clean product, rake in subsidies to produce the product, and weaken emissions requirements to the point where the subsidized hydrogen is actively worsening the climate crisis.

The hydrogen PTC wasn’t meant to make billions for a handful of companies. It wasn’t even necessarily designed to produce a large amount of hydrogen. It was designed to incentivize the production of hydrogen with actually lower emissions. The polluter demands would achieve the opposite – embedding and expanding a status quo of highly polluting hydrogen production at the expense of communities already overburdened with pollution. President Biden and his Treasury Department must ignore this dangerous wishlist.