



FACTS ABOUT HYDROGEN HUB DEVELOPMENT

Rural New Mexico urgently needs a significant economic lift, but hydrogen production is not the answer. The federal grant money is compelling, but it will soon run out, and the U.S. has already wasted billions of dollars on this false solution. The science and economics outlined below illustrate clearly why hydrogen development won't work. But a more modest investment in our abundant renewable energy could create jobs and state and local revenue while helping us meet our ETA goals. We encourage our legislators to work on *real* solutions, not to waste time and money going down a false path.

Hydrogen is not the answer. It will lead to economic losses and increased emissions.

Carbon capture technology has repeatedly failed to achieve results, causing billions of dollars in public and private losses. Hydrogen Hub viability depends on something that simply doesn't work: carbon capture and storage.

Of \$2.66 billion spent by the U.S. Department of Energy (DOE) since 2010 to develop advanced fossil energy technologies, nearly half was dedicated to nine carbon capture and storage P(CCS) demonstration projects. Only three major projects remained active at the end of FY17 and cost the DOE a combined \$615 million.¹

- **Petra Nova Carbon Capture Project, USA: Received \$190 million in public funding and cost over \$1 billion. Captured less than 2 million tons of CO² annually. It was shuttered in 2021 for financial reasons.** The CCS technology at Petra Nova required so much energy that NRG built a separate gas plant (the gas plant emissions were not offset by the Petra Nova technology) just to power the scrubber. NRG, the plant's major investor, said CCS couldn't compete because of its reliance on volatile oil and gas markets. **The government lost all its investment, as did other investors.**
- **Mississippi Power's Kemper Project, USA:** The project was supposed to cost \$2.4 billion but the cost ballooned by 212% to \$7.5 billion, \$270 million of which came from the DOE, and the project never came online. **Mississippi Power's ratepayers and taxpayers were stuck with the bill.**²
- **Many other CCS projects were abandoned for financial reasons, despite large amounts of public funding,** among them the Antelope Valley Project, USA, (\$400 million in public funding), the Sweeny Gasification Project, USA, (\$3 million in public funding), and numerous international projects.

Tim Baxter, a senior researcher with the Australian Climate Council, reported that he was not aware of a single large carbon capture and storage project linked to fossil fuels in the world that had delivered on time, on budget, and captured the agreed amount of carbon.³

Hydrogen has no environmental benefits. Hydrogen production increases climate-warming emissions.

- 98% of hydrogen is developed using fossil fuels (coal and natural gas).⁴
- Burning hydrogen derived from natural gas (methane) for electricity is worse than just burning the natural gas directly.⁵ There are by-product poison gasses.

¹ <https://www.powermag.com/doe-sank-billions-of-fossil-energy-rd-dollars-in-ccs-projects-most-failed>

² <https://mbspolicy.org/two-years-since-kemper-clean-coal-project-ended>

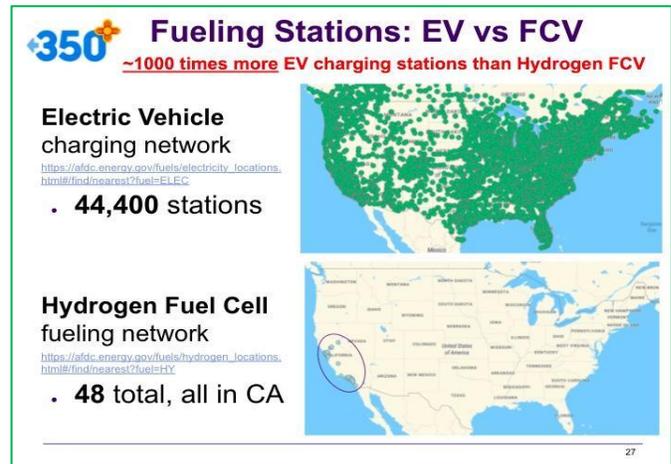
³ <https://www.smh.com.au/environment/climate-change/australia-s-giant-carbon-capture-project-fails-to-meet-key-targets-20210719-p58b3i.html>

⁴ <https://www.eia.gov/energyexplained/Hydrogen/production-of-Hydrogen.php>

⁵ <https://www.nytimes.com/2021/08/12/climate/hydrogen-fuel-natural-gas-pollution.html>

Hydrogen is not economical. There is no cost benefit to hydrogen as fuel.

- Hydrogen-based electricity generation is more costly than solar or wind and battery storage.⁶
- Fuel cells will remain more expensive than simpler battery systems.⁷
- Hydrogen has value today mainly in ammonia fertilizer production and oil refining.⁸
- The electric transportation industry based on batteries is already dominant.⁹
- With state, federal, and private investments, a robust network of EV charging stations is being developed to support trucking and private vehicles. Virtually no such investment has been made in hydrogen fueling stations. See graphic at right.

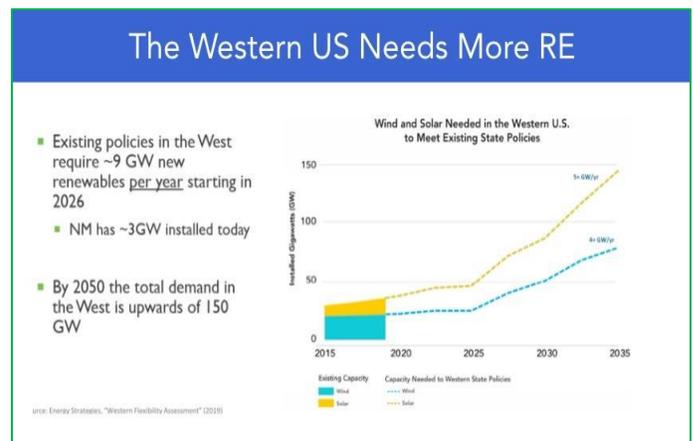


Hydrogen production and distribution is technically complex, leading to cost overruns and failed projects (as noted above).

- Hydrogen is the smallest atom, highly reactive and difficult to contain. It embrittles pipelines, making it difficult to transport. Truck-stop refueling is a problem.¹⁰ Hence the far greater investment in e-charging nationwide.

NEW MEXICO HAS CLEAN, ACHIEVABLE ALTERNATIVES

A 2022 report estimating the potential benefits of public ownership of New Mexico's power production and transmission infrastructure concluded that development of 16,700 to 23,500 MW of renewable energy above current production plans, with investment in transmission, **could generate energy export revenue in excess of \$1 Billion annually, and annual wheeling revenue from transmission would exceed \$100 million, while generating a minimum of 550 permanent jobs.**¹¹ The report is based on an analysis of growing renewable energy demand in the western United States and a RETA study identifying solar and wind production and transmission growth capacity in New Mexico.



Investing in solar and wind makes more economic sense. Consider the proposed conversion of the Escalante plant to hydrogen. The plan: Invest \$450M to convert from coal-fired, connect to a methane pipeline, convert to hydrogen through new chemical processing, capture the carbon and other waste gas, dispose of the carbon. Create 110 jobs. Total power output, just 160MW due to losses (estimate). **A BETTER ALTERNATIVE: Invest just \$350M. Install a 250MW solar array plus utility-scale battery storage to provide electricity with NO methane source or carbon emissions. Create 110 jobs AND use the excess \$100M to develop more clean jobs.**¹²

⁶ <https://www.lazard.com/perspective/levelized-cost-of-energy-levelized-cost-of-storage-and-levelized-cost-of-hydrogen>

⁷ <https://insideevs.com/news/332584/efficiency-compared-battery-electric-73-hydrogen-22-ice-13/>

⁸ <https://www.eia.gov/energyexplained/Hydrogen/use-of-Hydrogen.php>

⁹ <https://insideevs.com/news/482386/us-Hydrogen-fuel-cell-car-sales-2020>

¹⁰ <https://electrek.co/2022/01/11/cyclum-renewables-reimagines-the-truck-stop-ahead-of-electric-semi-truck-surge>

¹¹ https://www.publicpowernm.org/files/ugd/3207b0_297237acacb34d26a6019b84e50f5021.pdf

¹² Adapted from <https://350newmexico.org/350nm-presentations/> Blue Hydrogen Briefing by Tom Solomon, 350NM, 2021.