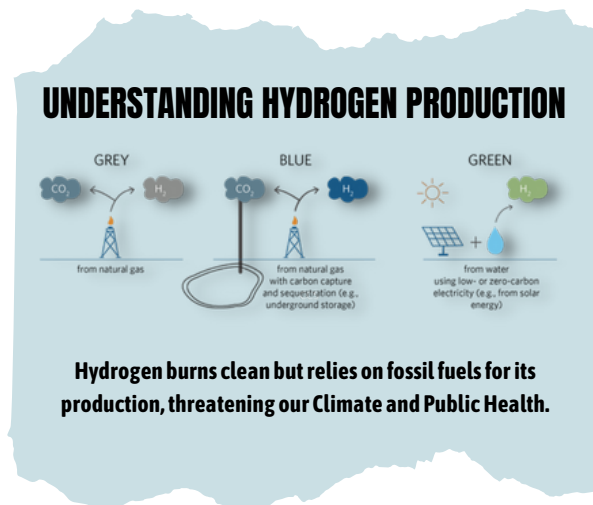


# FACT SHEET: HYDROGEN PITFALLS

The proposed Hydrogen Hub in New Mexico is not the solution to our unsustainable boom and bust economy and the climate crisis. **Why? because more than 99.8% of hydrogen is produced using enormous quantities of fracked gas**, including both "blue" hydrogen, in which carbon emissions from production processes are sequestered using carbon capture, and "grey" hydrogen, which results in more emissions than actual hydrogen produced. **Grey hydrogen emissions are 38% greater than directly burning natural gas for energy, and blue hydrogen is not much better, resulting in 22% more emissions.**



## THE HYDROGEN HUB PROPOSAL, FUNDED THROUGH PUBLIC PRIVATE PARTNERSHIPS AND FUELED BY METHANE GAS, WILL CAUSE:

### DANGEROUS EXPLOSIONS THAT HARM WORKERS AND CONSUMERS

**Hydrogen is highly flammable; production and distribution will lead to cost overruns, failed projects and safety risks.**

- As the smallest molecule, 14 times lighter than air and 57 times lighter than gasoline vapor, it escapes containment easily and those same properties prevent adding odorants so it's difficult to detect leaks. Deadly explosions are a frequent result.
- Hydrogen is highly reactive. It embrittles pipelines and holding tanks, making it difficult and dangerous to contain, transport and use without specialized technology and materials. The presence of hydrogen in pipelines can increase the risk of flashback (flames moving upstream into the supply system) from combustion devices, including customer appliances, causing explosions and potential injury or death.

### INCREASED METHANE EMISSIONS, DELAYED INVESTMENT IN SOLAR AND WIND, AND ACCELERATING CLIMATE DESTRUCTION

**Hydrogen production from methane gas is not "clean." Fossil fueled dirty hydrogen increases climate-warming emissions.**

- Oil and gas companies produce 99.8% of the United States' hydrogen supply from methane gas. Globally, less than 1% of hydrogen is produced through electrolysis of water, and less than 0.02% is green (i.e., powered by renewable electricity).
- Hydrogen Hub projects being proposed in New Mexico are primarily fueled by methane gas. When the entire life cycle of fossil-fueled hydrogen is calculated, grey hydrogen emissions are 38% greater than directly burning natural gas for energy, and blue hydrogen is not much better, resulting in 22% more emissions. Green hydrogen production from renewable energy requires 9kg of fresh water for every 1kg of hydrogen and is not feasible for production in our arid New Mexico climate.
- Blue hydrogen depends on Carbon Capture and Storage, a half-baked technology that has resulted in stranded assets worldwide.

### MILLIONS OF DOLLARS IN LOSSES AND STRANDED ASSETS FUNDED BY NEW MEXICAN TAXPAYERS

**Grey and Blue Hydrogen will soon be obsolete and will result in stranded assets and the loss of millions of taxpayer dollars.**

- Rethink Energy predicts that by 2026 green hydrogen will undercut the cost of grey hydrogen supplies, reaching just \$1.54/kg by 2030. Fossil fueled hydrogen infrastructure built today will become obsolete within just a few years, resulting in millions of dollars in stranded assets and opportunity costs.
- Hydrogen-based electricity generation is more costly than solar & wind energy, resources that NM possesses in abundance.

## NEW MEXICO HAS A CLEAN ENERGY ALTERNATIVE WITH ENORMOUS ECONOMIC POTENTIAL ---->

### Sources:

- Jacobson, M.Z., A.-K. von Krauland, S.J. Coughlin, F.C. Palmer, and M.M. Smith (2021), Zero air pollution and zero carbon from all energy at low cost and without blackouts in variable weather throughout the U.S. with 100% wind-water-solar (WWS) and storage, *Renewable Energy*, 184, 430-444, 2022.
- Mark Z. Jacobson, "Zero Air Pollution and Zero Carbon From All Energy Without Blackouts at Low Cost in New Mexico" December 7, 2021
- Howarth RW, Jacobson MZ. "How green is blue hydrogen?" *Energy Sci Eng.* 2021;00:1-12. <https://doi.org/10.1002/ese3.956>
- Leigh Collins. "Green hydrogen will be cost-competitive with grey H<sub>2</sub> by 2030 — without a carbon price," *Recharge*, 27 April 2021.
- Adam Dorr and Tony Seba. "Rethinking Energy 2020-2030: 100% Solar, Wind, and Batteries is Just the Beginning." *A RethinkX Sector Disruption Report*, October 2020.
- HBailey Group. "The Potential for Public Power in New Mexico." December 2021.

# PROVEN, LOW IMPACT, COST SAVING TECHNOLOGIES CAN FUEL OUR ECONOMIC TRANSITION AND BENEFIT ALL NEW MEXICANS

**NEW RESEARCH CONFIRMS THAT A 100% RENEWABLE ENERGY ECONOMY IS POSSIBLE NOW. WITH THE RIGHT INVESTMENTS AND BUSINESS MODEL EXPONENTIAL ECONOMIC BENEFITS ARE POSSIBLE AS WE LOWER OUR ANNUAL ENERGY COSTS, REDUCE THE SOCIAL COSTS OF CLIMATE DISRUPTION, SAVE LIVES, AND GAIN 23,500 NET INCREASE IN JOBS IN NM.**

Stanford Professor Mark Jacobson and a team of researchers published a landmark study, updated in 2021, proving that the world's energy needs can be met using clean, renewable energy sources. Their analysis, calculated on a state by state basis, confirms that a transition to solar, wind and batteries in New Mexico:

- **will result in 68.2% lower annual energy costs for New Mexicans** (from \$17.2 down to \$5.5 billion/yr)
- **reduce annual social costs (energy plus health plus climate costs) by about 90%** (from \$55 down to \$5.5 billion per year)
- **save 280 New Mexican lives annually** by reducing air pollution
- **eliminate about 61M tonnes-CO2-equivalent per year** in climate-affecting emissions
- **create a net increase of 23,500 more long-term, full-time jobs in the state**

---

## RETHINKX CONFIRMS THOSE FINDINGS, PREDICTING EXPONENTIAL BENEFITS FROM A 100% SOLAR, WIND & BATTERY GRID

RethinkX is an independent think tank that analyzes and forecasts the speed and scale of technology-driven disruption and its implications across society.

### Key findings of the RethinkX 2020 energy report:

- **It is both physically possible and economically affordable to meet 100% of electricity demand with a combination of solar, wind, and batteries by 2030.**
- **Just as the Internet disrupted many incumbent industries and created trillions of dollars of new value by reducing the marginal cost of information to near zero, the solar, wind and battery disruption will have a similar impact by reducing the marginal cost of energy to near-zero for a substantial portion of the year.**
- **The optimal lowest cost solar, wind and battery systems will produce surplus energy output (generating capacity that exceeds current electricity production). Clean energy super-abundance of near-zero marginal cost energy will create new possibilities for transportation, housing, and novel products, services & industries.**
- **Combined with electric vehicles, a 100% solar, wind and battery system could eliminate all fossil fuel use and emissions in both the electricity and road transportation sector simultaneously.**

---

## AN ECONOMIC ENGINE TO POWER NEW MEXICO'S FUTURE

New Mexico has the 2nd highest solar capacity and 11th highest wind capacity of any state in the nation. A 2022 report by the HBailey Group found that **these benefits would be maximized through a public ownership model - whereby cost-savings and revenue generation would benefit New Mexicans rather than private utility shareholders.** The report found that development of 16,700 to 23,500 MW of renewable energy above current production plans, to include transmission, **could generate energy export revenue for the state in excess of \$1 Billion annually.**

**DEVELOPMENT OF 16,700 TO 23,500 MW OF RENEWABLE ENERGY ABOVE CURRENT PRODUCTION PLANS, TO INCLUDE TRANSMISSION, COULD GENERATE ENERGY EXPORT REVENUE FOR THE STATE IN EXCESS OF \$1 BILLION ANNUALLY**