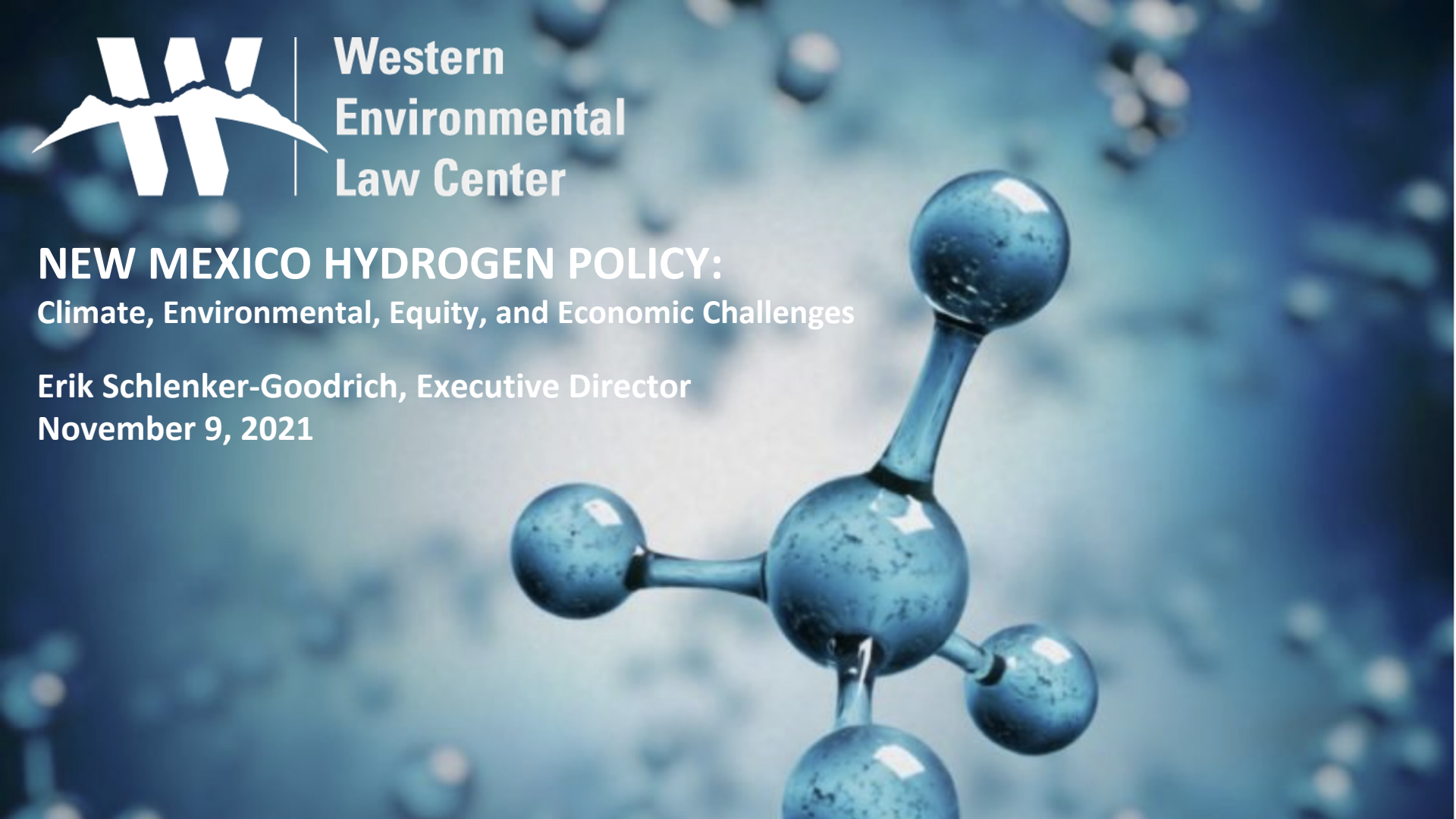


Western Environmental Law Center

NEW MEXICO HYDROGEN POLICY:

Climate, Environmental, Equity, and Economic Challenges

Erik Schlenker-Goodrich, Executive Director

November 9, 2021

CLIMATE WEAVES EVERYTHING TOGETHER

Fourth National Climate Assessment, November 2018

"Climate change creates new risks and exacerbates existing vulnerabilities in communities across the United States, presenting **growing challenges to human health and safety, quality of life, and the rate of economic growth**."

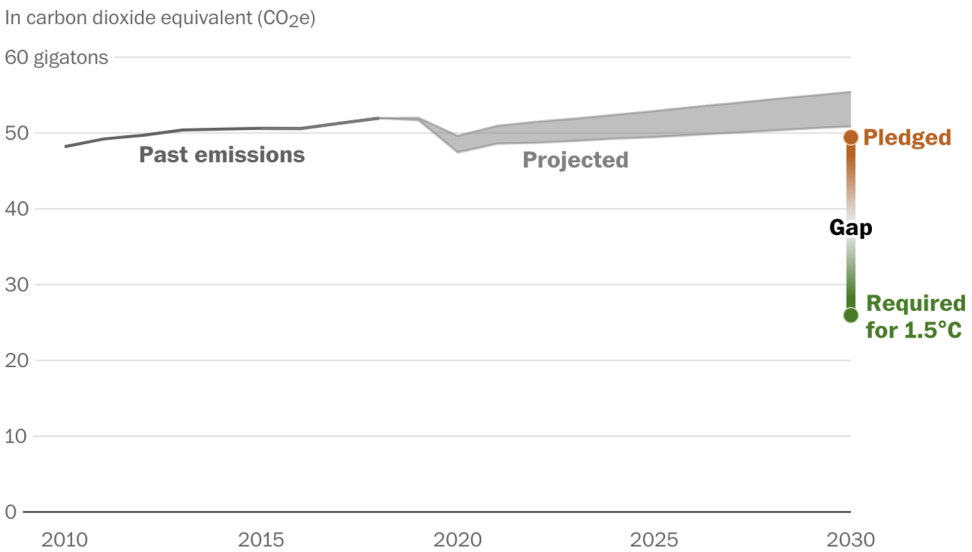
"Climate change affects the natural, built, and social systems we rely on individually and through their connections to one another. These **interconnected systems are increasingly vulnerable** to cascading impacts that are often difficult to predict, threatening essential services within and beyond the Nation's borders."

The Washington Post
Democracy Dies in Darkness

National climate pledges are too weak to avoid catastrophic warming. Most countries are on track to miss them anyway.

The global effort to combat climate change boils down to this: Bending a very stubborn curve.

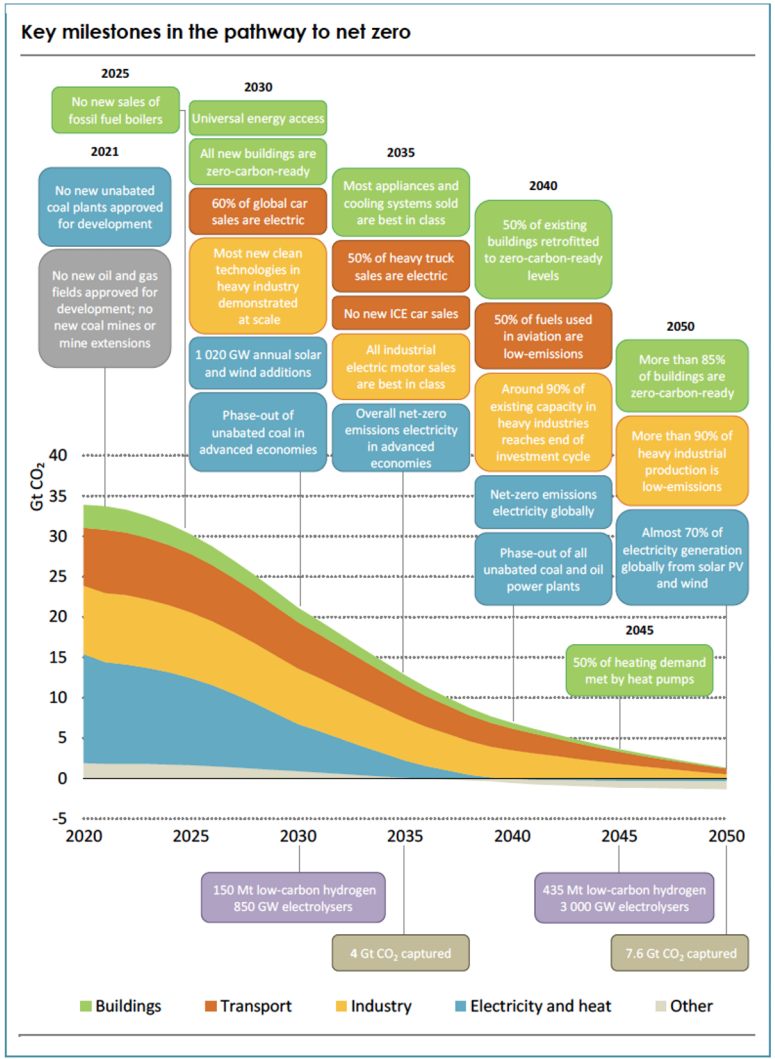
Global greenhouse gas emissions



Note: Greenhouse gas emissions are expressed in carbon dioxide equivalent, or CO_2e, to normalize gases based on their warming potential over 100 years.

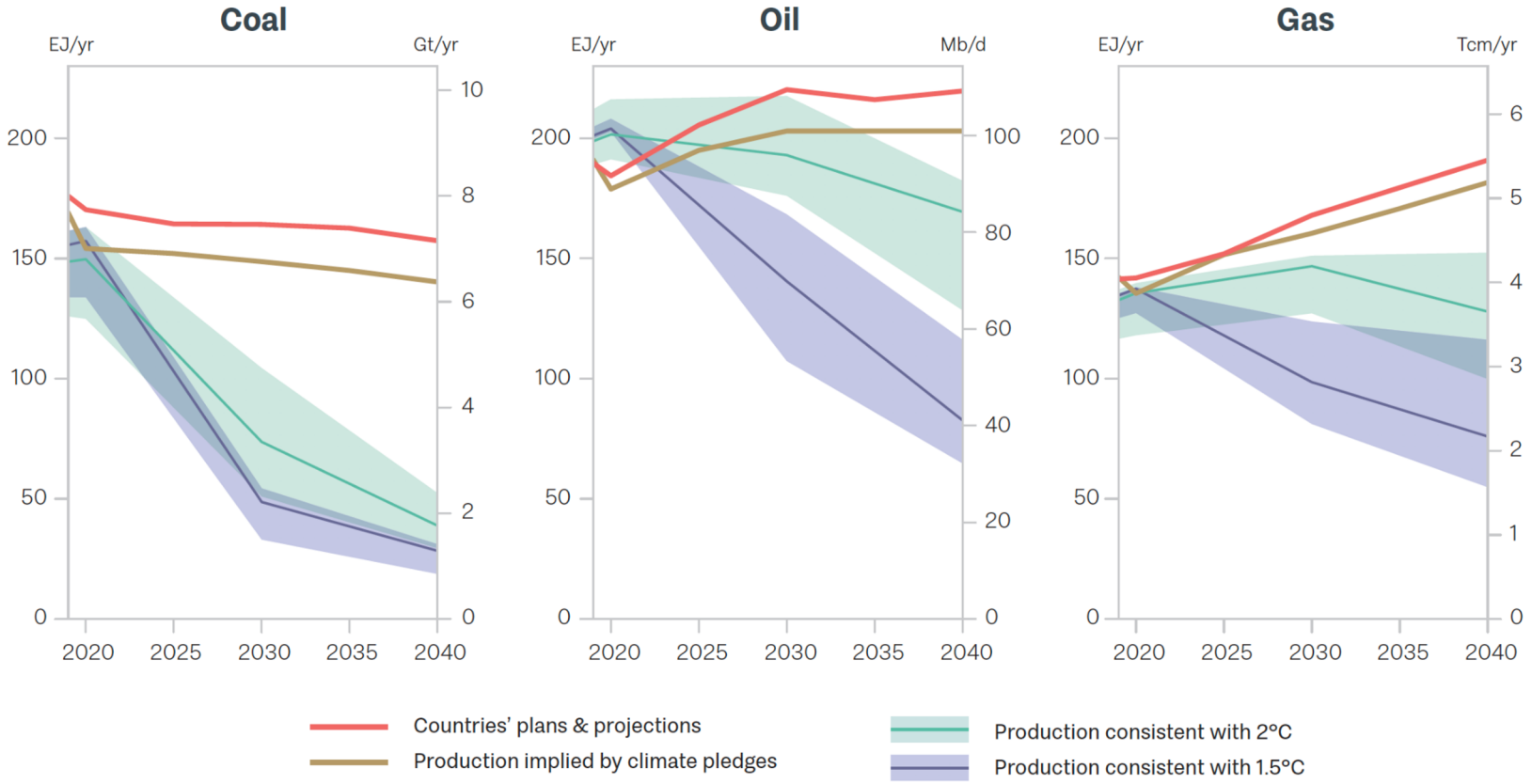
“Recent climate action announcements might give the impression that we are on track to turn things around. This is an illusion. Our addiction to fossil fuels is pushing humanity to the brink. We face a stark choice: either we stop it, or it stops us … Enough of burning and drilling and mining our way deeper. **We are digging our own graves**.’”

-António Guterres, U.N. Secretary General

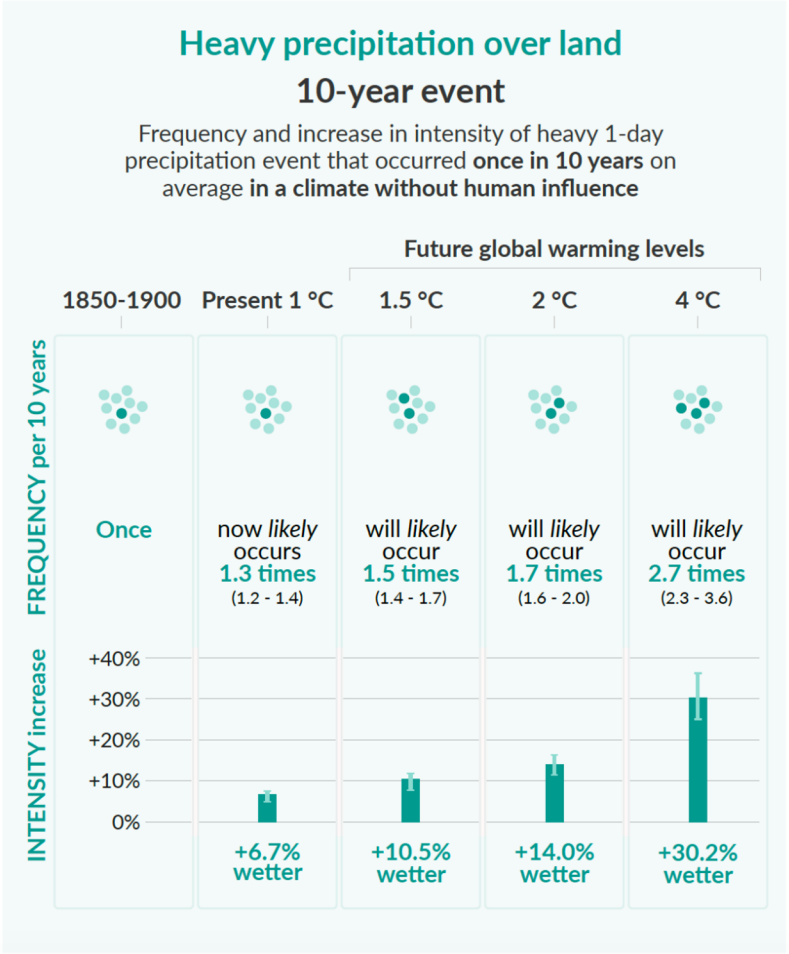


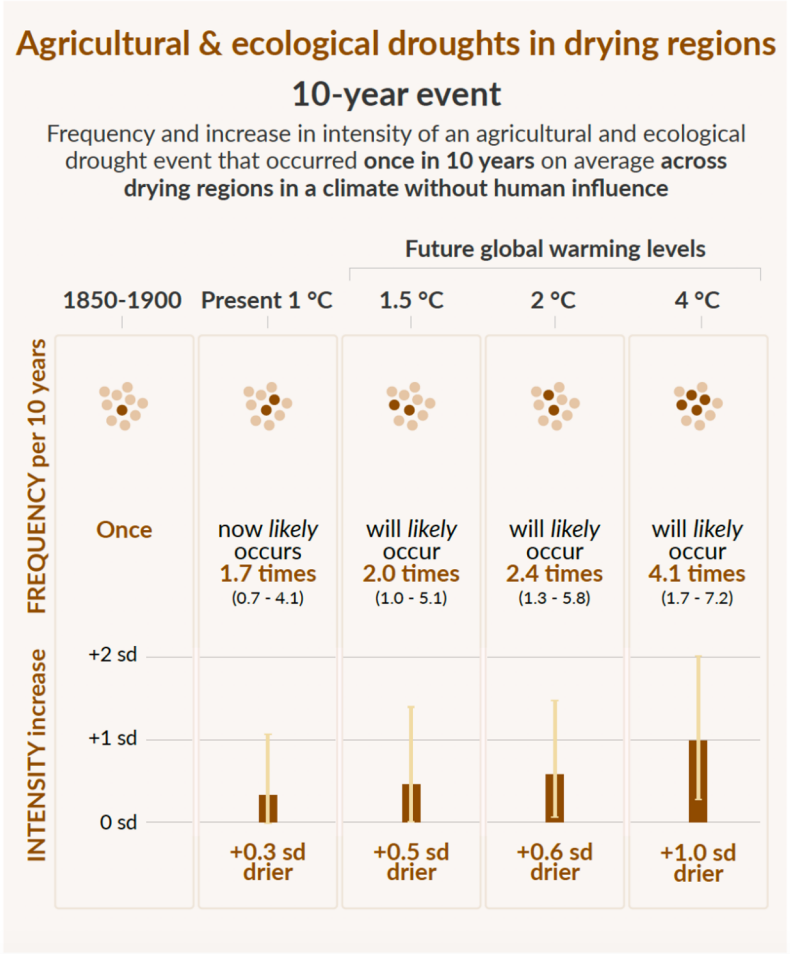
"Beyond projects already committed as of 2021, there are no new oil and gas fields approved for development in our pathway, and no new coal mines or mine extensions are required. The unwavering policy focus on climate change in the net zero pathway results in a sharp decline in fossil fuel demand, meaning that the focus for oil and gas producers switches entirely to output – and emissions reductions – from the operation of existing Assets."

-International Energy Agency, Net Zero By 2050 (July 2021)



Source: Production Gap Report 2021





Source: IPCC AR6 WG1 SPM 2021

SEVEN HYDROGEN PRINCIPLES FOR NEW MEXICO

350 NEW MEXICO ✦ AMIGOS BRAVOS ✦ CENTER FOR BIOLOGICAL DIVERSITY ✦ CENTER FOR CIVIC POLICY ✦ CITIZENS CARING FOR THE FUTURE ✦ CLIMATE ADVOCATES VOCES UNIDAS ✦ COALITION FOR CLEAN AFFORDABLE ENERGY ✦ CONSERVATION VOTERS NEW MEXICO ✦ DINÉ CITIZENS AGAINST RUINING OUR ENVIRONMENT ✦ DREAMS IN ACTION ✦ HEALTH ACTION NEW MEXICO ✦ NATURAL RESOURCES DEFENSE COUNCIL ✦ NATIVE AMERICAN VOTERS ALLIANCE EDUCATION PROJECT ✦ NEW MEXICO ENVIRONMENTAL LAW CENTER ✦ NEW MEXICO NATIVE VOTE ✦ NEW MEXICO SPORTSMEN ✦ OLÉ – ORGANIZERS IN THE LAND OF ENCHANTMENT ✦ NEW MEXICO VOICES FOR CHILDREN ✦ PARTNERSHIP FOR RESPONSIBLE BUSINESS ✦ PROGRESSNOW NEW MEXICO ✦ RIO GRANDE INDIVISIBLE NEW MEXICO ✦ ROCKY MOUNTAIN FARMERS UNION ✦ SAN JUAN CITIZENS ALLIANCE ✦ SANTA FE GREEN CHAMBER OF COMMERCE ✦ SIERRA CLUB – RIO GRANDE CHAPTER ✦ SOUTHWEST ENERGY EFFICIENCY PROJECT ✦ TÓ NIZHÓNÍ ÁNÍ ✦ WESTERN ENVIRONMENTAL LAW CENTER ✦ WESTERN LEADERS NETWORK ✦ WILDEARTH GUARDIANS

PRINCIPLE 1:

New Mexico Must First Put In Place A Comprehensive, Durable, And Enforceable Climate Policy Framework Before Assessing Hydrogen.

- Are we putting in place a durable and enforceable framework for action that will guide us into the future?
- Is New Mexico doing its fair share to reduce greenhouse gas (GHG) emissions, i.e., at least a statewide reduction in GHGs of at least 45% by 2030 as compared to 2005?
- Are we accelerating action to cut GHG emissions from all sectors of our economy, sparking new markets for economic growth and innovation that position New Mexico to benefit from a global energy economy that prioritizes decarbonization?
- Are we supporting working families, the backbone of New Mexico's economy, to participate in and benefit from the transition to a 100% emissions-free, renewable energy economy?

PRINCIPLE 2:

Equity and justice Must Shape Hydrogen Policy Decisions And Implementation.

- Have impacted and overburdened communities been included in policy development and implementation?
- Has New Mexico consulted with Tribal governments and communities?
- Has New Mexico provided assurances that all due care has been taken to reduce adverse effects to impacted and overburdened communities?
- Will any legislation and its implementation foster equitable and just outcomes?
- Has New Mexico assured accountability and transparency of legislation and its implementation?

PRINCIPLE 3:

Hydrogen Must Neither Divert From Nor Delay New Mexico's Transition To A Renewable Energy Future.

- Could we make deeper and quicker emissions cuts and promote economic opportunity by strengthening our transition to renewable energy?
- Does fossil gas hydrogen risk further anchoring New Mexico to volatile boom-bust oil and gas cycles or the prospect of a structural decline in fossil fuel markets to the detriment of state financial stability and diversification?
- Is fossil gas hydrogen truly a clean energy source or industry propaganda designed to entrench fossil fuel interests and take advantage of government subsidies?

PRINCIPLE 4:

Hydrogen Must Avoid Adverse Climate, Environmental, Public Health, And Community Impacts.

- Has New Mexico avoided or minimized hydrogen infrastructure impacts to the climate, environment, public health, and communities?
- Are we just reducing emissions on an annual basis or making real progress to achieve science-based climate security goals that constrain warming well below 2℃/3.6℉.?
- What are the implications of a build-out of hydrogen infrastructure to sacred and beloved New Mexico landscapes and regions, such as Greater Chaco?
- Will hydrogen incentivize the development of new oil and gas fields or perpetuate aging and emissions-intensive existing oil and gas fields in New Mexico?
- Can new methane rules and carbon capture technology support the claim that fossil gas hydrogen can be “clean”?

OCD Well Statistics

Generated on: 1/28/2021 8:14:30 AM

Number of Wells

Well Type	Approved APDs, Not Plugged, Not Cancelled	Completed Wells
Carbon Dioxide	752	733
Gas	28877	27093
Injection	3320	3285
Misc	130	115
Oil	33480	27794
Salt Water Disposal	974	849
Water	46	44
Total	**67579**	**59913**
Coalbed Methane (Included Above)		5952

Number of Wells by Land Type

Land Type	Approved APDs, Not Plugged, Not Cancelled	Completed Wells
Federal	37526	31333
All Indian	2830	2750
Private	10954	10590
State	16269	15240
Total	**67579**	**59913**

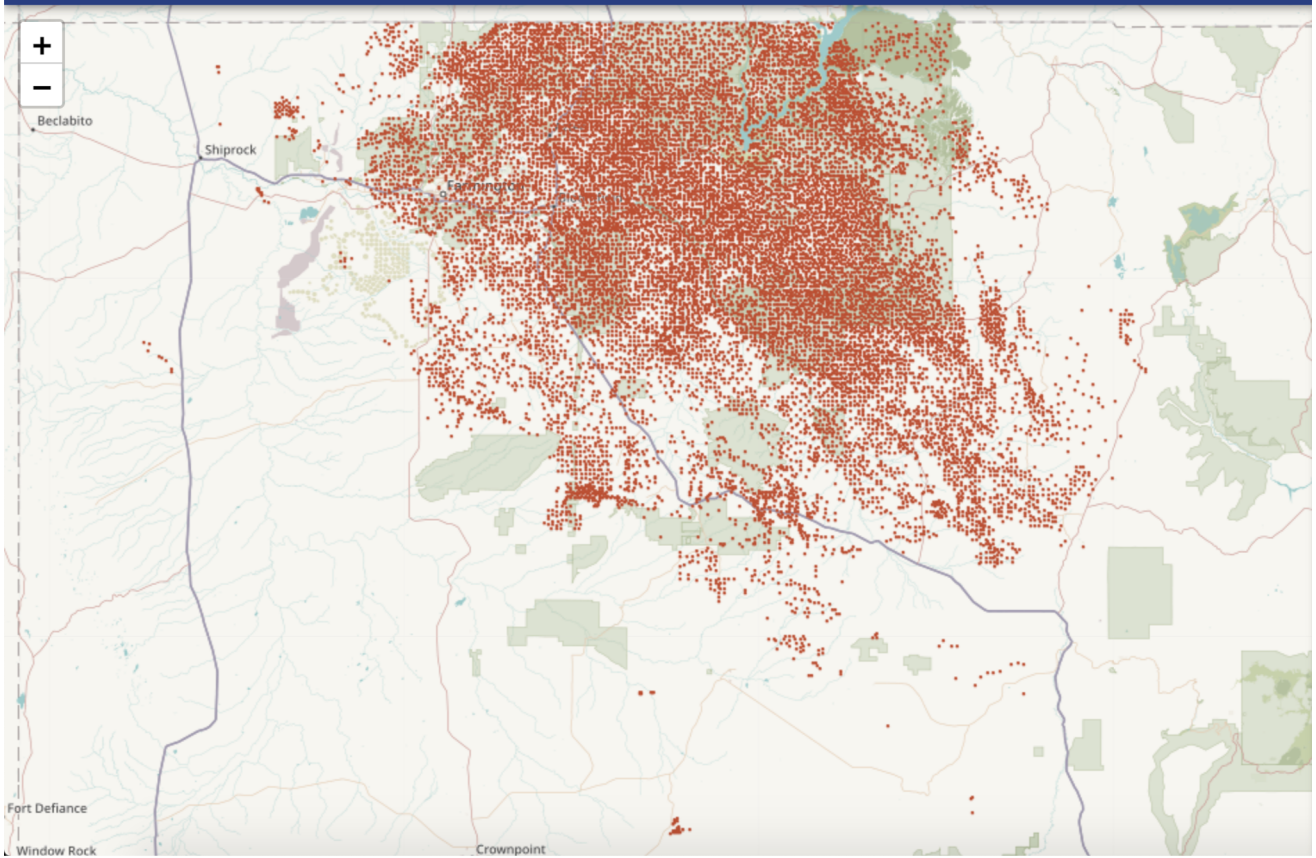
Number of Producing Wells

Number of wells that produced oil or gas in 2020:	49975
Number of oil wells producing oil:	33293
Number of coalbed methane wells producing oil:	92
Number of gas wells producing gas:	46462
Number of coalbed methane wells producing gas:	5578

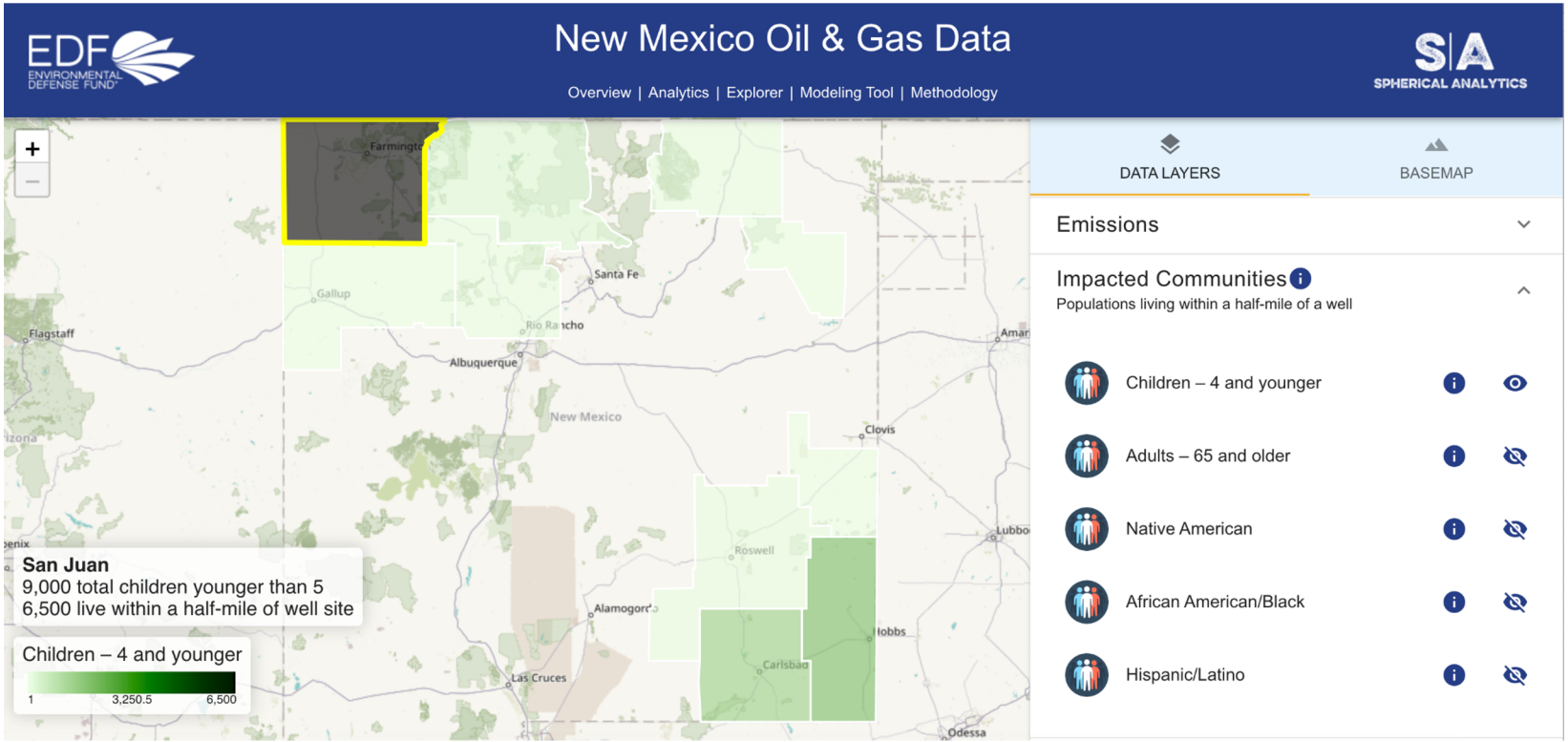
EDF
ENVIRONMENTAL DEFENSE FUND

New Mexico Oil & Gas Data

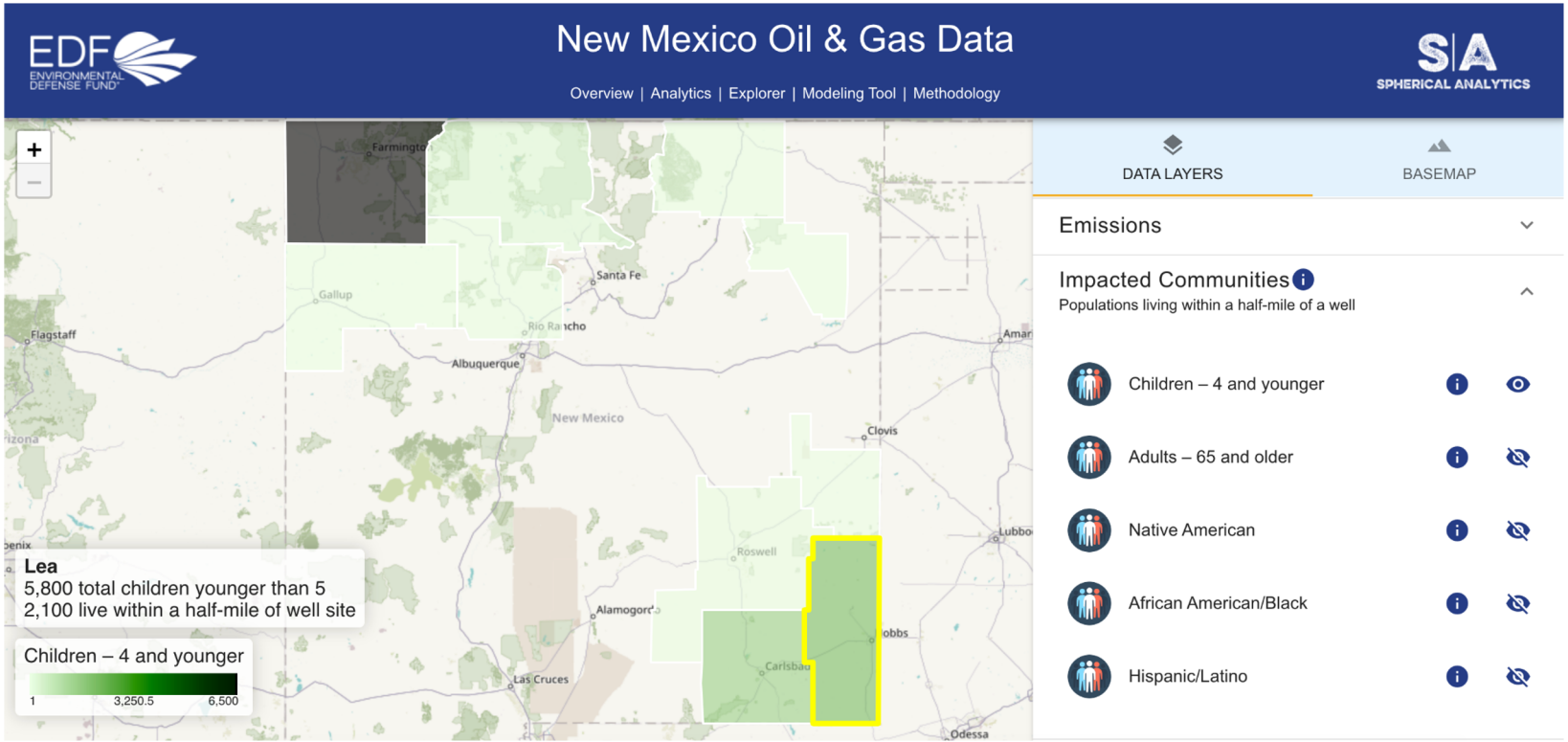
Overview | Analytics | Explorer | Modeling Tool | Methodology



6,500 New Mexico Children Under The Age Of 5 In San Juan County Live Within 0.5 Miles Of An O&G Well



2,100 New Mexico Children Under The Age Of 5 In Lea County Live Within 0.5 Miles Of An O&G Well



PRINCIPLE 5:

New Mexico Must Rigorously Scrutinize The Financial And Economic Prospects Of Hydrogen As A Climate And Energy Transition Tool.

- Is New Mexico chasing federal money for short-term gain for a subsidy-dependent projects or are we creating the conditions for the state to generate durable, long-term economic opportunity for the benefit of all New Mexicans?
- What is the risk that investments in fossil gas hydrogen will fail within the next decade, wasting public taxpayer resources and stranding capital?
- Is New Mexico creating a framework that will inure to the long-term benefit and stability of frontline and energy-producing communities and working families?
- What are the realistic end-use hydrogen markets and opportunities for New Mexico?

‘Green’ Hydrogen to Outcompete ‘Blue’ Everywhere by 2030

May 5, 2021

This article first appeared on the BNEF mobile app and the Bloomberg Terminal.

- Fossil hydrogen with CCS currently cheaper than ‘green
- The opposite should be true by 2030 in all major markets

Clean Hydrogen Ladder: Competing technologies

Liebreich Associates

Unavoidable

Key: No real alternative | Electricity/batteries | Biomass/biogas | Other

A	Fertiliser	Hydrogenation	Methanol	Hydrocracking	Desulphurisation	
B	Shipping*	Off-road vehicles	Steel	Chemical feedstock	Long-term storage	
C	Long-haul aviation*	Remote trains	Coastal and river vessels	Vintage vehicles*	Local CO2 remediation	
D	Medium-haul aviation*	Long distance trucks and coaches	High-temperature industrial heat			
E	Short-haul aviation	Local ferries	Commercial heating	Island grids	Clean power imports	UPS
F	Light aviation	Rural trains	Regional trucks	Mid/Low-temperature industrial heat	Domestic heating	
G	Metro trains and buses	H2FC cars	Urban delivery	2 and 3-wheelers	Bulk e-fuels	Power system balancing

Uncompetitive

** Via ammonia or e-fuel rather than H2 gas or liquid*

Source: Liebreich Associates (concept credits: Adrian Hiel/Energy Cities & Paul Martin)

PRINCIPLE 6:

New Mexico Must Provide A Clear-Eyed Assessment Of Water Availability, Efficiency Challenges, And End-use Markets For Green Hydrogen.

- Where's the water coming from? Are we using freshwater resources that should be conserved and used for the long-term benefit and need of communities?

- Again, what are realistic prospects for end-use green hydrogen markets?

PRINCIPLE 7:

New Mexico Must Carefully Consider Hydrogen Infrastructure Concerns.

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- Given that hydrogen is corrosive and can embrittle pipelines, what are the leakage, health and safety risks of blending hydrogen into existing natural gas pipeline systems and how will these risks be prevented?
- Where hydrogen is not blended, what is the contemplated scale of new, dedicated, and capital-intensive pipelines or other infrastructure to transport and store hydrogen from production centers to end-use markets?
- What voice will communities have in the infrastructure siting process, especially communities already overburdened with a legacy of oil and gas production?
- What cumulative impacts would hydrogen infrastructure cause to land, air, water, and communities?
- How will New Mexico avoid impacts of hydrogen infrastructure?

KEY TAKEAWAYS

1. We can't just reduce greenhouse gas emissions. We need to reduce GHGs to meet science-based targets to limit warming to well below 2℃/3.6℉.
2. It is essential to consider the prospect of hydrogen in two contexts:
    a. Comprehensive climate action to decarbonize the economy; and
    b. Action underway via the SB112 Sustainable Economy Task Force "to transition the state economy away from reliance on natural resource extraction."
3. There are a variety of environmental, public health, land and water, and financial and economic risks associated with hydrogen that require a clear-eyed and candid assessment as well as action that avoids those risks.
4. If hydrogen, especially fossil gas hydrogen, fails, it would be yet another unmet promise to communities and working families who seek long-term stability and security.

FOR FURTHER READING

- New Mexico NGO hydrogen policy letter: https://westernlaw.org/nm-groups-lawmakers-fossil-fueled-hydrogen-climate-threat-not-solution/
- Fourth National Climate Assessment: https://www.globalchange.gov/nca4
- IPCC Assessment Report 6 WG1 Report: https://www.ipcc.ch/report/ar6/wg1/
- Limits of national climate pledges: https://www.washingtonpost.com/climate-environment/interactive/2021/climate-pledges-cop26/
- 2021 Fossil Fuels Production Gap Report: https://productiongap.org/2021report/
- An overview of fossil gas hydrogen risks: https://time.com/6098910/blue-hydrogen-emissions/

FOR FURTHER READING (Cont.)

- The role of hydrogen in a clean energy transition: https://blog.ucsusa.org/julie-mcnamara/whats-the-role-of-hydrogen-in-the-clean-energy-transition/
- Hydrogen climate emission concerns: https://www.nytimes.com/2021/08/12/climate/hydrogen-fuel-natural-gas-pollution.html
- Reclaiming hydrogen for a renewable energy future: https://earthjustice.org/features/green-hydrogen-renewable-zero-emission
- Green hydrogen to outcompete fossil gas hydrogen by 2030: https://about.bnef.com/blog/green-hydrogen-to-outcompete-blue-everywhere-by-2030/
- Economic prospects of green hydrogen: https://www.irena.org/newsroom/pressreleases/2020/Dec/Making-Green-Hydrogen-a-Cost-Competitive-Climate-Solution