NEW MEXICO

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Energy, Minerals and Natural Resources Department

Innovation Needs for the Energy Transition

Melanie Kenderdine
November 8, 2025
Socorro, New Mexico

CETS: The Energy Trilemma and High-level Goals

Innovation

Infrastructure

Investment

Incentives

Inclusion

Inclusion

Inclusion

Ensure Energy System Security, Reliability, and Resilience

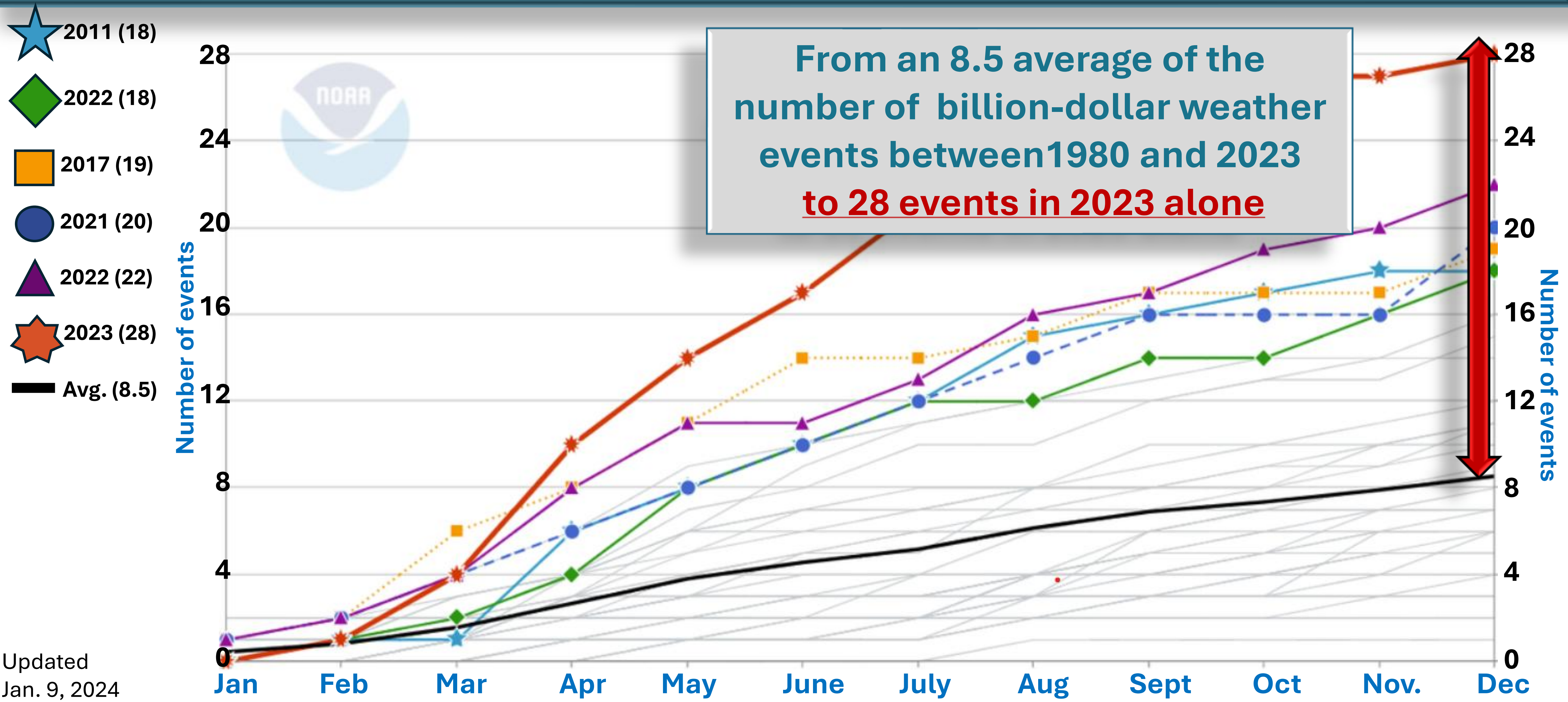
Maximize Economic Value, Opportunities and Consumer Equity

Enable a Clean Energy Future

New Mexico's Comprehensive Clean Energy Transition Strategy

DRAFT for discussion only

US Billion Dollar Weather and Climate Disasters, 1980 -2023 (CPI adjusted)



From an 8.5 average of the number of billion-dollar weather events between1980 and 2023

to 28 events in 2023 alone

Updated
Jan. 9, 2024

Event statistics are added according to the date on which they ended

https://www.climate.gov/news-features/blogs/beyond-data/2023-historic-year-us-billion-dollar-weather-and-climate-disasters

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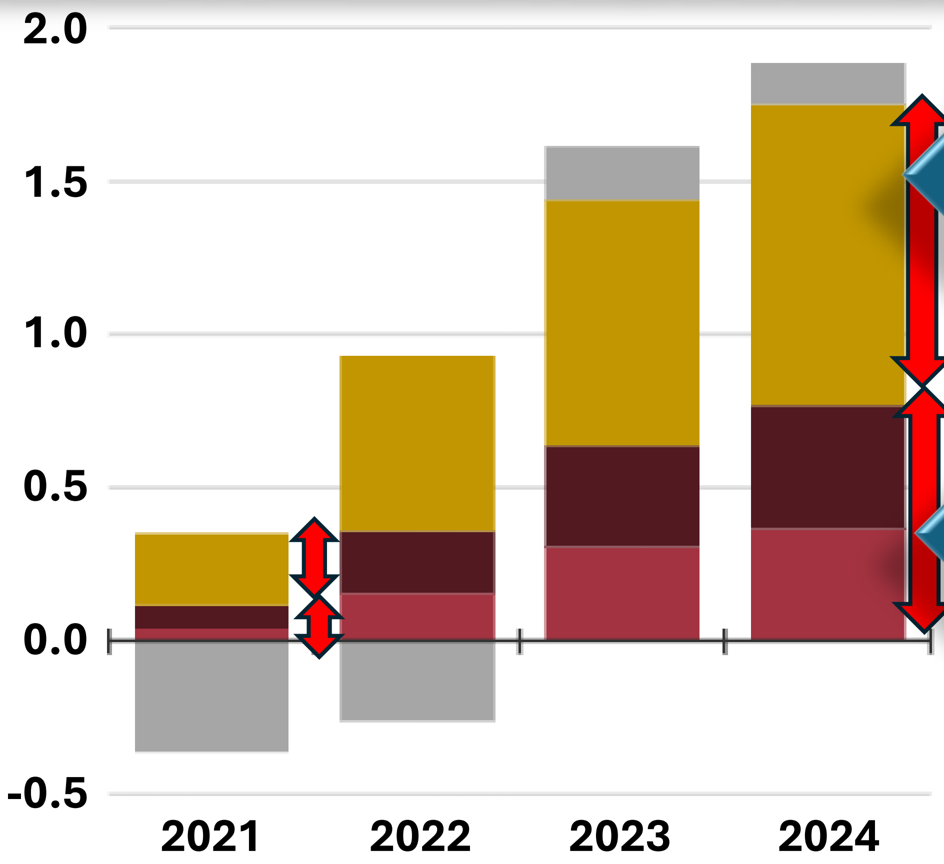
The Importance of the Permian Basin to US Oil Supplies

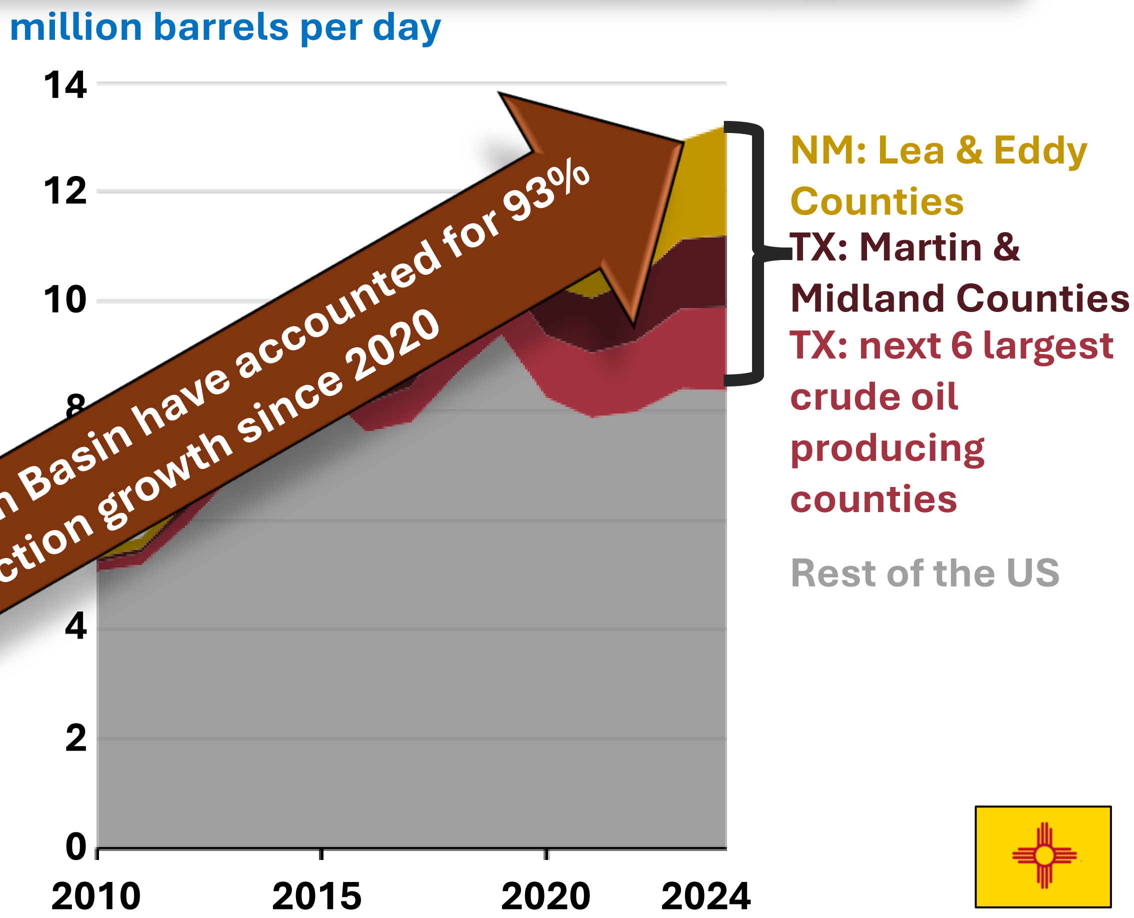
Cumulative Oil Production Change Since 2020 (mbpd/day)



NM from approx. 0.25 mbpd to 1.1 mbpd in 3 years (2 counties), + 240%

TX from approx. 0.12 mbpd to 0.63 mbpd in 3 years (8 counties), + 392%

US Crude Oil Production (2010-2024)



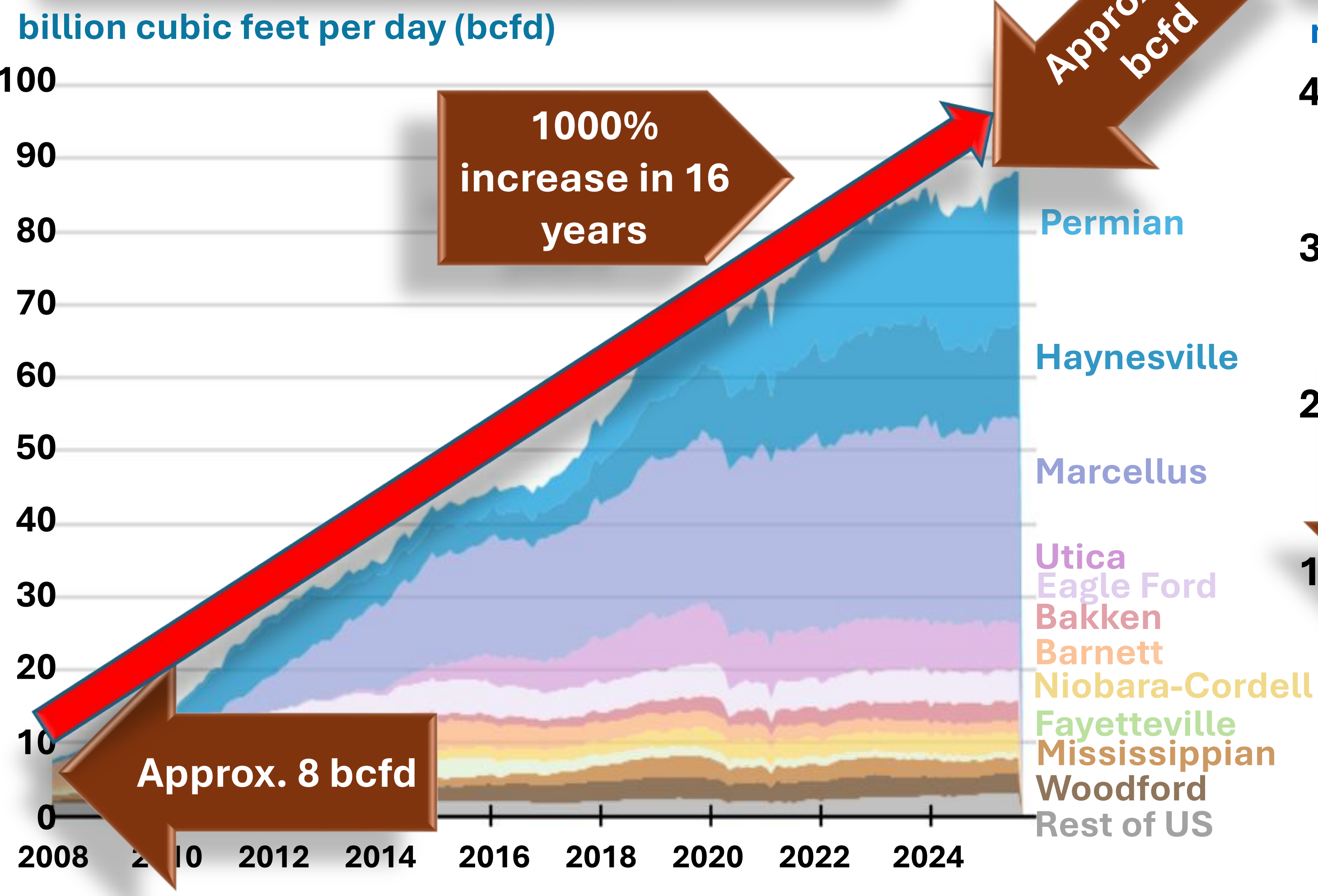
10 Counties in the Permian Basin have accounted for 93% of US oil production growth since 2020

Data Sources: US EIA, Short-term Energy Outlook, May 2025, Petroleum Supply Monthly

US Energy Data

US Shale Gas Production (2008-24), LNG Liquefaction Capacity of Post-FID Projects (2025-2030)

Monthly US Dry Shale Gas Production by Formation (2008-2024)

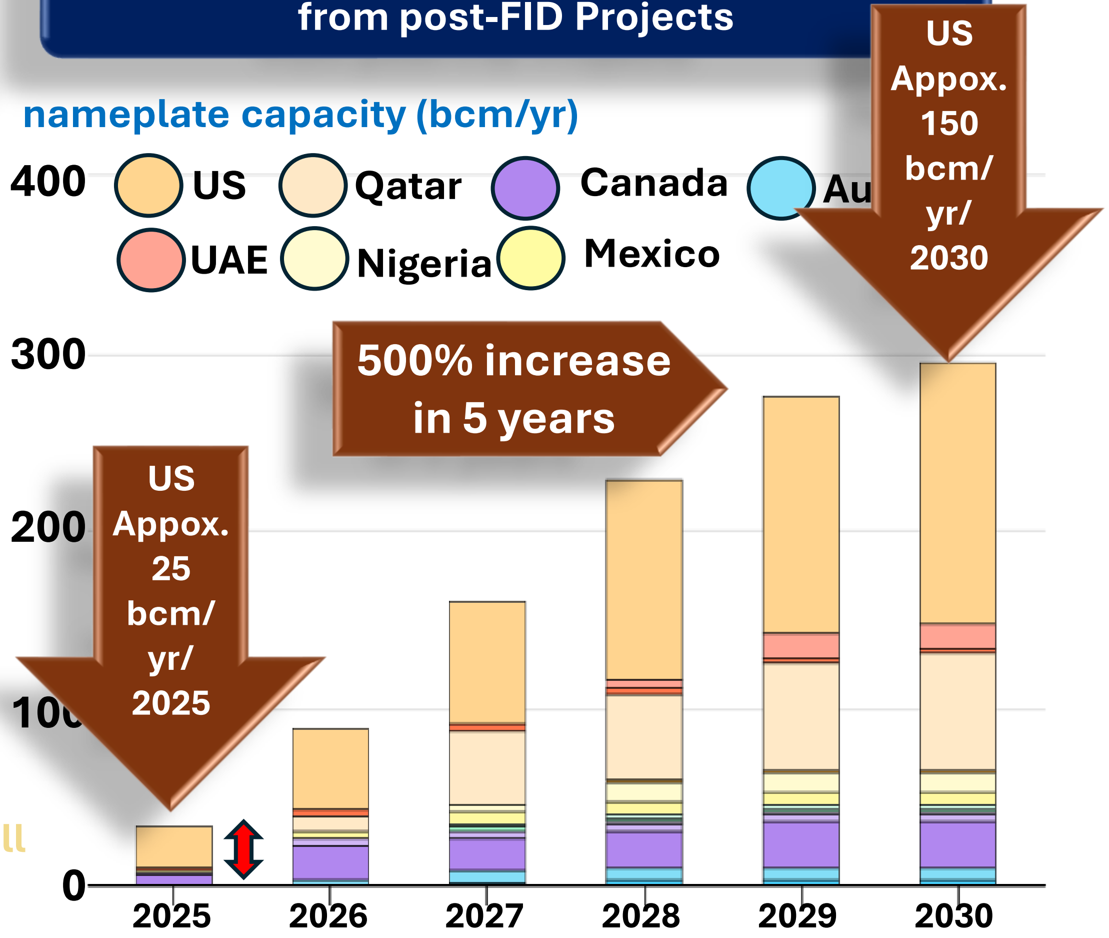


1000% increase in 16 years

Approx. 88 bcfd

Approx. 8 bcfd

Cumulative LNG Liquefaction Capacity from post-FID Projects



500% increase in 5 years

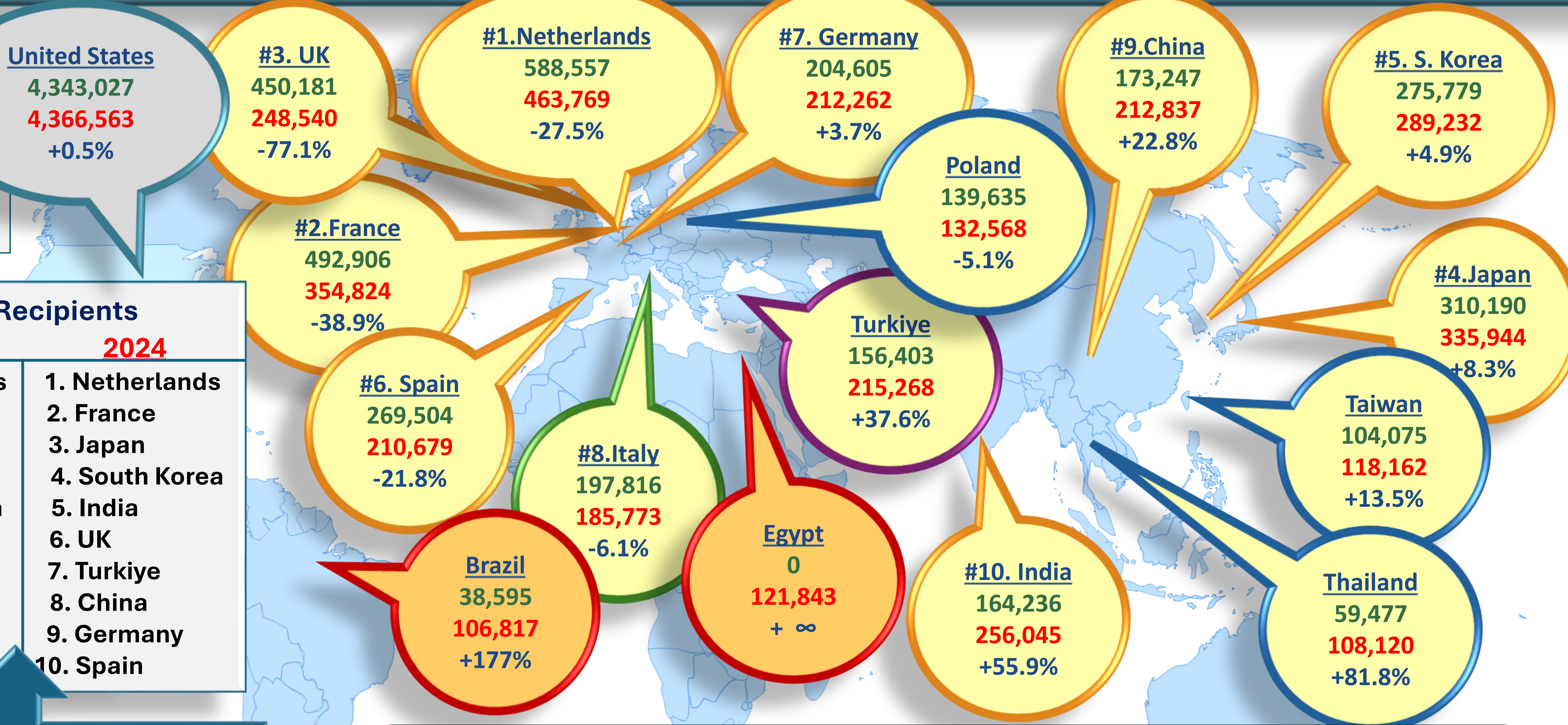
US Appox. 25 bcm/yr/2025

US Appox. 150 bcm/yr/2030

Data sources: US EIA website accessed 09/11/25; US EIA, Short-term Energy Outlook, August 2025

Top Recipients of US LNG by Volume in 2023/Volumes 2024, % Change (mcf)

Rank 2023
2023 volume
2024 volume
% change 23/24



United States
4,343,027
4,366,563
+0.5%

#3. UK
450,181
248,540
-77.1%

#1.Netherlands
588,557
463,769
-27.5%

#7. Germany
204,605
212,262
+3.7%

#9.China
173,247
212,837
+22.8%

#5. S. Korea
275,779
289,232
+4.9%

#2.France
492,906
354,824
-38.9%

Poland
139,635
132,568
-5.1%

#4.Japan
310,190
335,944
+8.3%

Turkiye
156,403
215,268
+37.6%

#6. Spain
269,504
210,679
-21.8%

Taiwan
104,075
118,162
+13.5%

#8.Italy
197,816
185,773
-6.1%

Brazil
38,595
106,817
+177%

Egypt
0
121,843
+ ∞

#10. India
164,236
256,045
+55.9%

Thailand
59,477
108,120
+81.8%

Top 10 Recipients

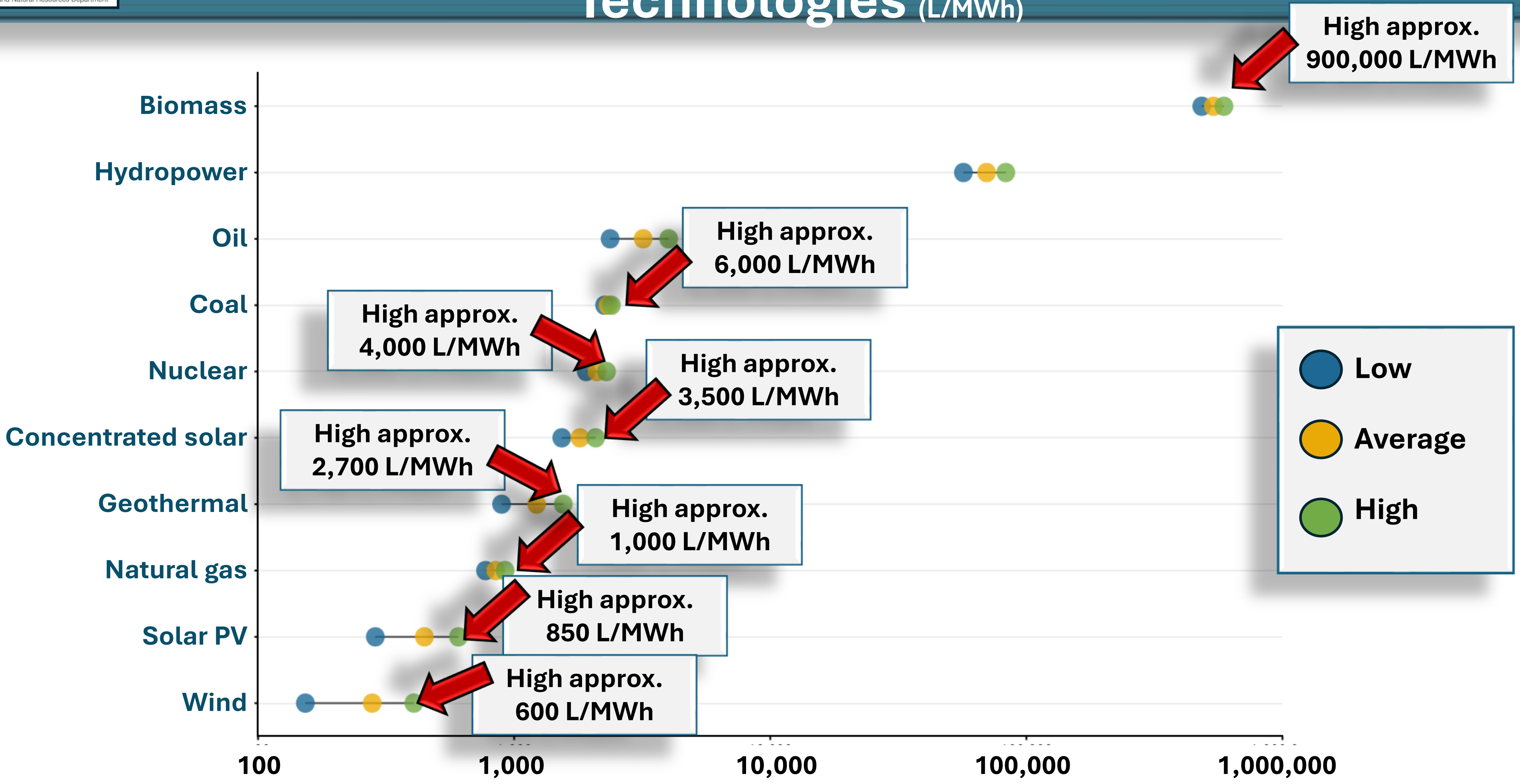
2023	2024
1. Netherlands	1. Netherlands
2. France	2. France
3. UK	3. Japan
4. Japan	4. South Korea
5. South Korea	5. India
6. Spain	6. UK
7. Germany	7. Turkiye
8. Italy	8. China
9. China	9. Germany
10. India	10. Spain

Europe change 2023/24: -19.0%
Asia change 2023/24: +21.5%

○ Top 10 2023 & 2024	○ Other significant volumes Europe & Asia, 2023 & 2024
○ Top 10 2023, not 2024	○ Significant volume increases, 2023-2024, Africa, S. Ameria
○ Top 10 2024, not 2023	○ US export volumes, 2023 & 2024

Source: EIA Website, accessed 070124 and 041525

Water Consumption by Electricity Generation Technologies (L/MWh)



High approx. 900,000 L/MWh

High approx. 6,000 L/MWh

High approx. 4,000 L/MWh

High approx. 3,500 L/MWh

High approx. 2,700 L/MWh

High approx. 1,000 L/MWh

High approx. 850 L/MWh

High approx. 600 L/MWh

https://visualizingenergy.org/what-methods-of-electricity-generation-use-the-most-water/

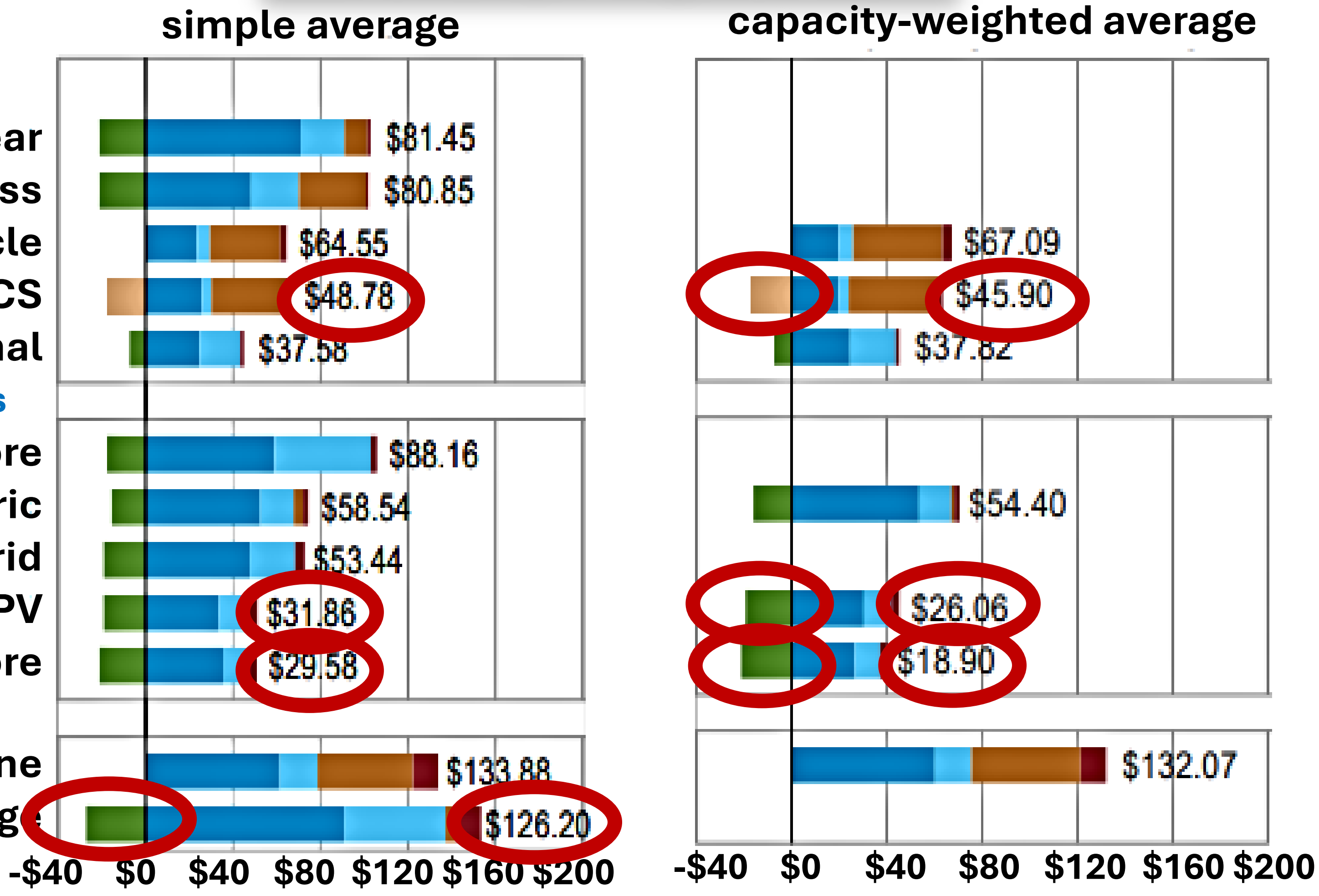
EIA's Estimated LCOE/LCOS for New Resources Entering Service in 2030

2024 dollars per megawatt hour

dispatchable technologies
- advanced nuclear
- biomass
- ✓ combined-cycle
- combined-cycle with CCS
- geothermal

resource-constrained technologies
- wind, offshore
- hydroelectric
- PV-battery hybrid
- ✓ solar PV
- ✓ wind, onshore

capacity resource technologies
- combustion turbine
- ✓ battery storage



Avg. LCOE/LCOS

- levelized capital cost
- levelized fixed O&M
- levelized variable O&M
- levelized transmission cost
- levelized tax credit
- levelized carbon capture credit

Data source: US EIA, AEO 2025. Note: technologies w/ no additions in 2030 do not have capacity weighted average. The stated LCOE values include the levelized tax credit component for eligible technologies. CCS = carbon capture and sequestration, PV = photovoltaic, O&M = operations and maintenance

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Focusing the Energy Innovation Portfolio on Breakthrough Potential, DOE Earthshots, EFI Critical Innovation Areas

ENERGY earthshots
U.S. DEPARTMENT OF ENERGY

- ✓ **Hydrogen Shot**
- ✓ **Long Duration Storage Shot**
- ✓ **Carbon Negative Shot**
- ✓ **Enhanced Geothermal Shot**
- ✓ **Floating Offshore Wind Shot**
- ✓ **Industrial Heat Shot**
- ✓ **Clean Fuels and Products Shot**
- ✓ **Affordable Home Energy Shot**

Critical innovation areas identified are:

- ➢ **Storage and battery technologies**
- ➢ **Advanced nuclear reactors**
- ➢ **Technology applications for industry and buildings as sectors that are difficult to decarbonize including hydrogen,** advanced manufacturing technologies; and building technologies
- ➢ **Systems: electric grid modernization and smart cities**
- ➢ **Deep decarbonization/large-scale carbon management; carbon capture, use and storage at scale;** sunlight to fuels; enhanced biological and oceans sequestration

Source: https://www.energy.gov/energy-earthshots-initiative
Source: Advancing the Landscape of Clean Energy Innovation, 2019, EFI, IHS Markit

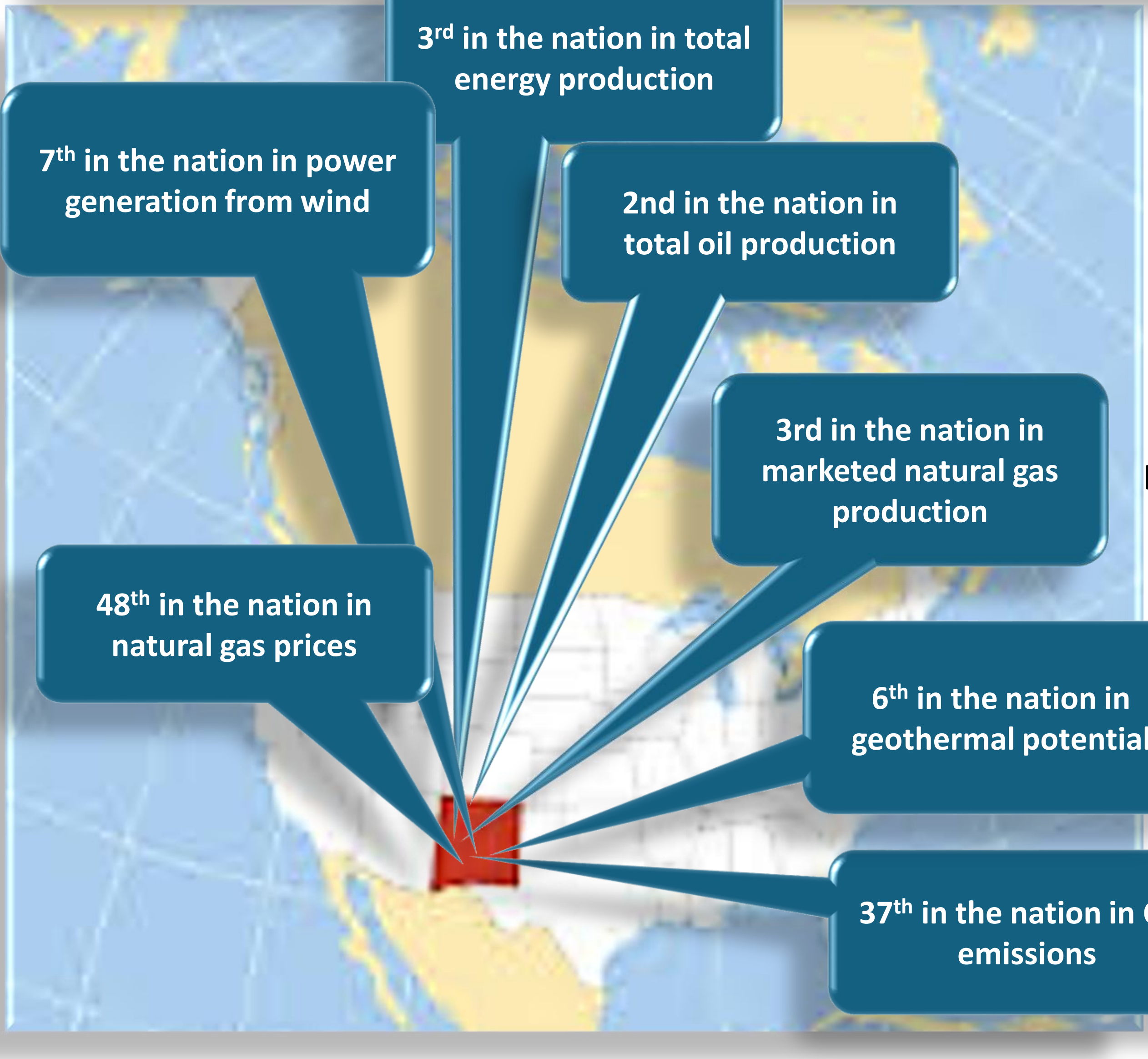
Illustrative Assessment of AI Potential for Accelerating Progress Against Selected Energy Technology Challenges

Technology challenge	Solution space complexity	Structured data availability	Pre-deployment verification	Integration and scaling
Synthetic fuels – Catalysts with high efficiency, selectivity and stability	🟢	🟢	🟢	🟡
Hydrogen electrolysis – Low-cost, highly efficient and durable electrolyser catalysts	🟢	🟢	🟢	🟡
Carbon capture, utilization and storage – Stable CO2 capture materials with high affinity and low energy penalty	🟢	🟡	🟢	🟡
Electric vehicles – Novel battery chemistries using cheap materials (e.g., sodium-ion, solid-state	🟢	🟡	🟢	🟡
High-temperature heat storage – Stable phase change materials with high conductivity and latent heat	🟢	🔴	🟢	🟡
Desalination – Productive, stable and energy efficient reverse osmosis membranes	🟢	🟡	🟢	🔴
Advanced biofuels – Improved performance of enzymes and yeasts for 2nd/3rd generation biofuels	🟢	🟢	🟡	🔴
Solar photovoltaics – Efficient, stable, scalable perovskite cells without critical mineral inputs	🟢	🔴	🟢	🟡
High-temperature heat pumps – Identification of working fluids that phase change at high temperatures	🟡	🔴	🟢	🟡
Long duration energy storage – Cheaper, efficient re-dox flow or other long-duration batteries	🟢	🔴	🟡	🟡
Decarbonized cement – Cement production from calcium silicate raw materials	🟡	🔴	🟡	🟡
Plastics recycling – Energy-efficient upgrading of pyrolysis oils	🟡	🟡	🔴	🟡
Effective nuclear fusion – Fusion reaction controlled	🟢	🔴	🔴	🔴

🟢 High
🟡 Medium
🔴 Low

https://iea.blob.core.windows.net/assets/601eaec9-ba91-4623-819b-4ded331ec9e8/EnergyandAI.pdf

Some Key New Mexico Energy Rankings



3rd in the nation in total energy production

7th in the nation in power generation from wind

2nd in the nation in total oil production

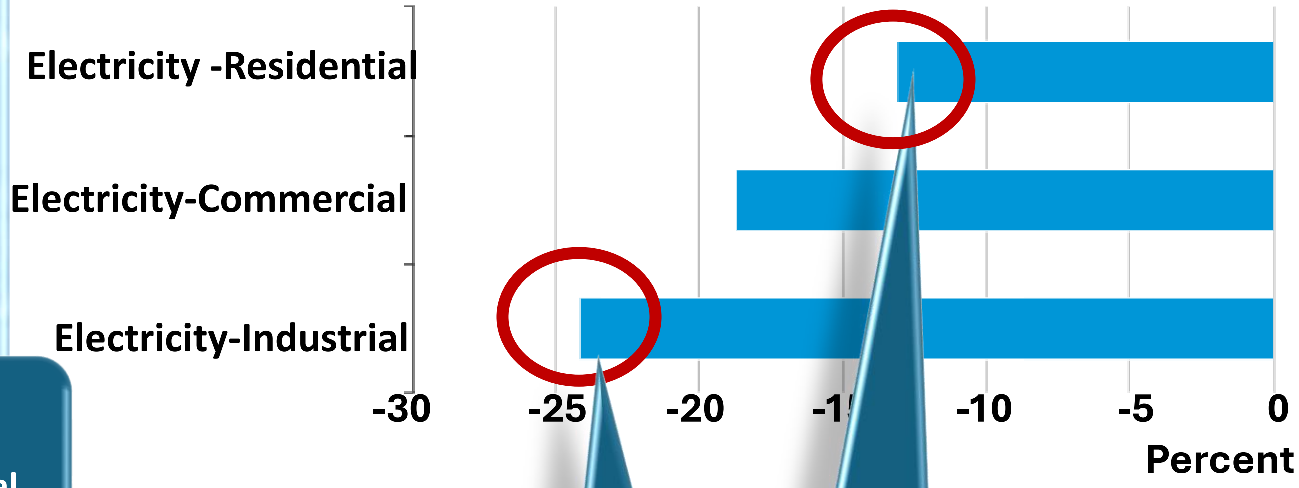
3rd in the nation in marketed natural gas production

48th in the nation in natural gas prices

6th in the nation in geothermal potential

37th in the nation in CO_2 emissions

NM Price Differences from US Average



Very good for cost of living

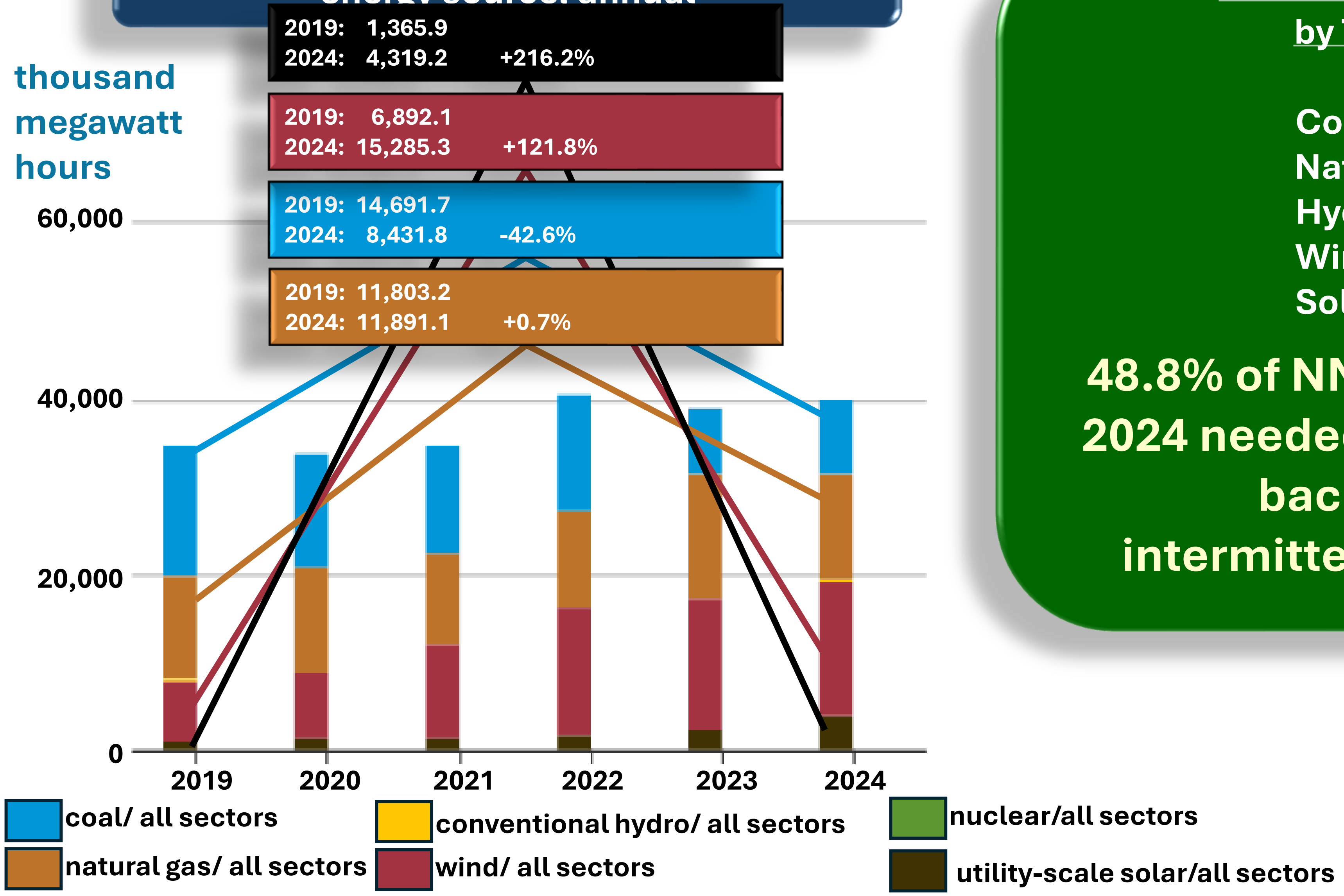
Very good for business

https://www.eia.gov/state/?sid=NM#tabs-5

NM Energy Data

NM Power Generation by Source, 2019-2024

Net electricity generation (utility scale) by energy source, annual



2019: 1,365.9
2024: 4,319.2 +216.2%

2019: 6,892.1
2024: 15,285.3 +121.8%

2019: 14,691.7
2024: 8,431.8 -42.6%

2019: 11,803.2
2024: 11,891.1 +0.7%

% Net Utility Scale Generation by Technology, 2024*

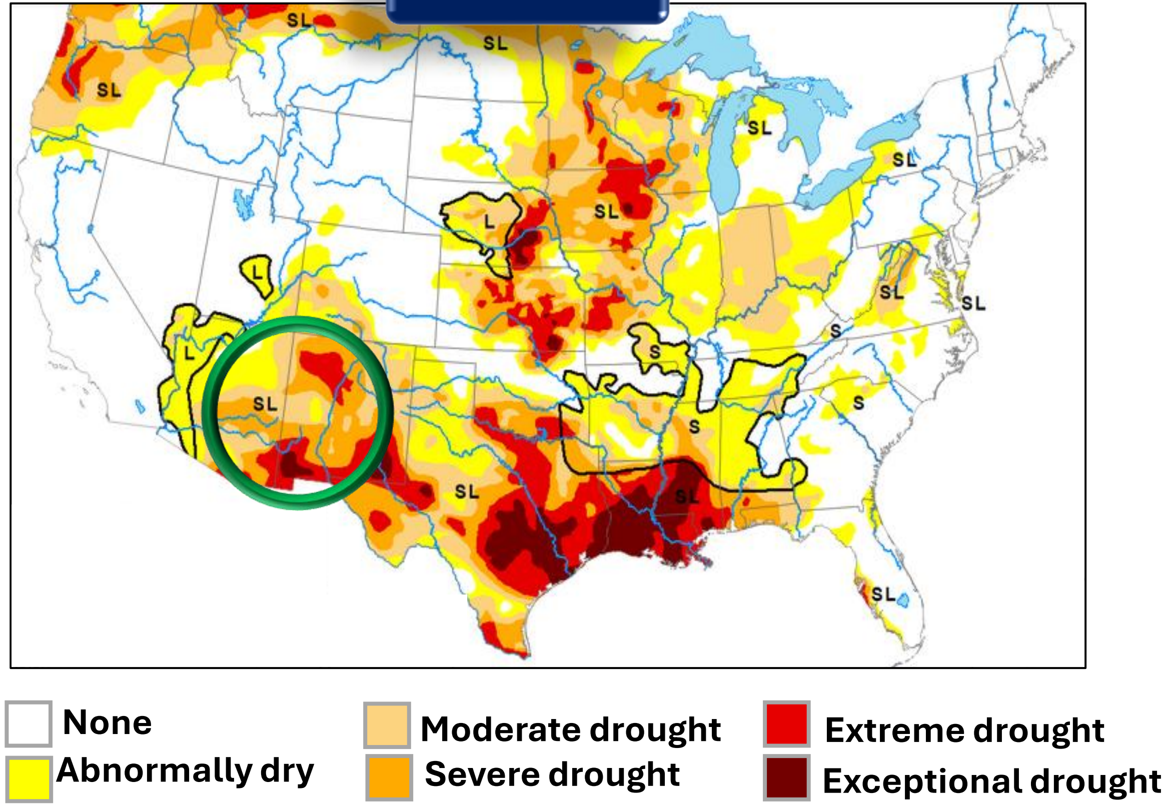
Coal	21.0%
Natural gas	29.6%
Hydroelectric	0.5%
Wind	38.0%
Solar	10.8%

48.8% of NM's power generation in 2024 needed storage or natural gas back-up to manage intermittency/ensure reliability

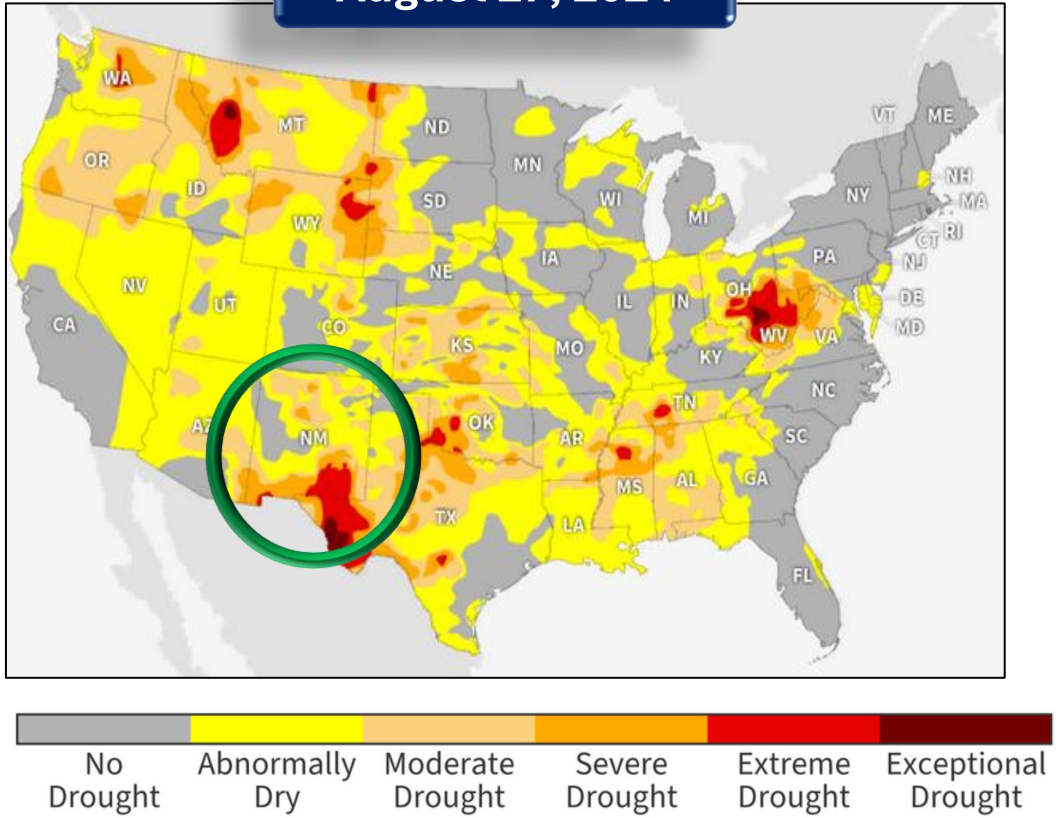
Source: EIA website, accessed 09/26/25

U.S. Drought Monitor, 2023, 2024

2023



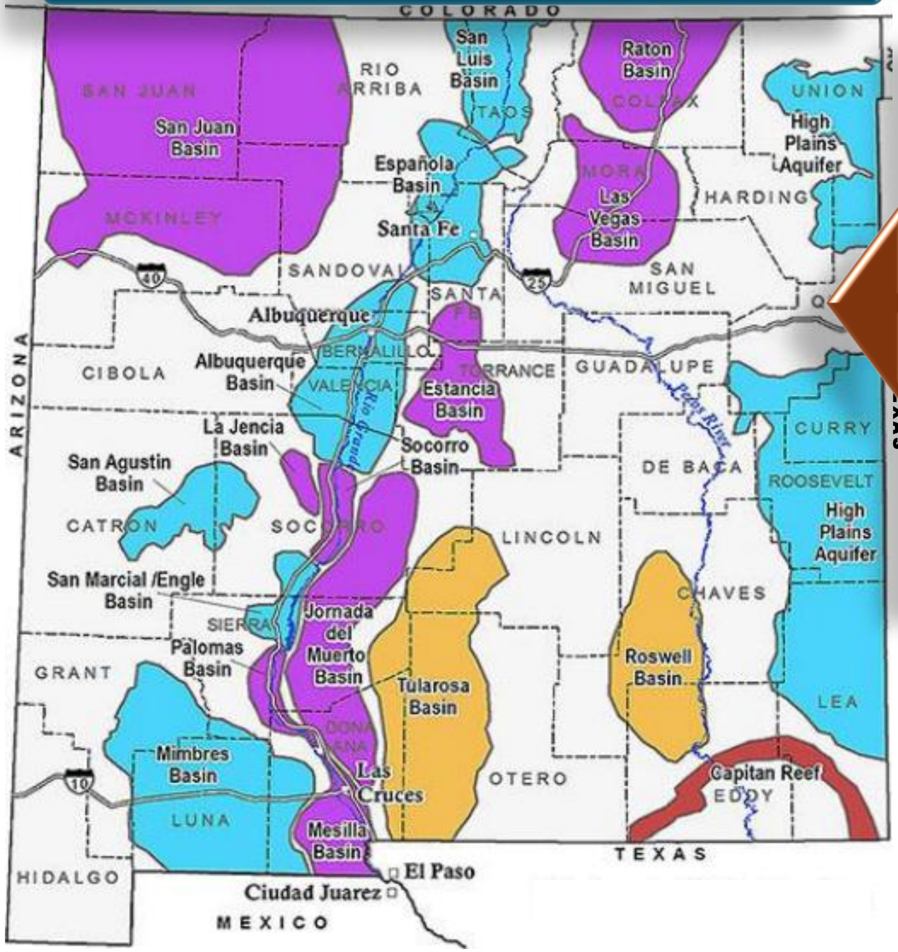
August 27, 2024



https://droughtmonitor.unl.edu/CurrentMap.aspx

Treating NM Brackish and Produced Water is Supported by the State's Strategic Water Supply Program

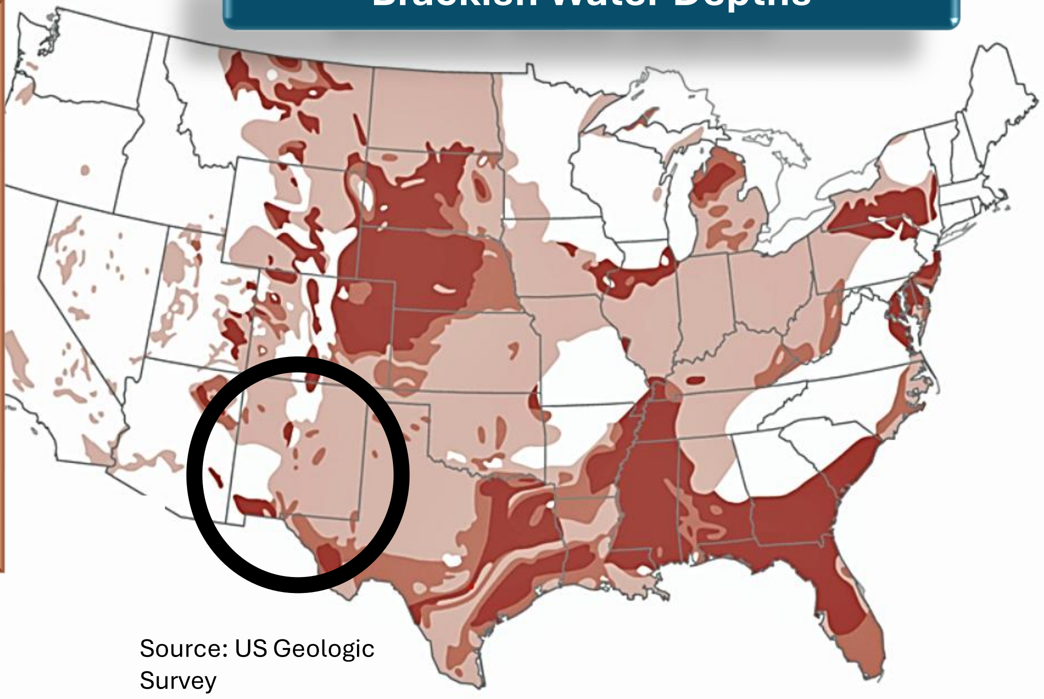
Brackish Water Aquifers in New Mexico



Blue: TDS <1,000 mg/L (potable)
Purple: TDS 1,000-3,000 mg/L (slightly brackish)
Orange: TDS 3,000-10,000 mg/L (brackish)
Red: TDS >10,000 mg/L (saline or brine)

> **"Estimates indicate that there may be between two and four billion acre-feet of brackish water underneath New Mexico"****

Brackish Water Depths



Source: US Geologic Survey

Depth to saline (including brackish)* groundwater, in feet

*Dissolved solids concentration of greater than 1,000 milligrams per liter

- ▨ **Less than 500**
- ▨ **500 to 1,000**
- ▨ **Greater than 1,000**
- ☐ **Inadequate information**

https://nmbizcoalition.org/nm-oil-and-gas-producers-making-progress-on-produced-water/

Source: NM Bureau of Geology and Mineral Resources, Dr. Lewis Land & Stacy Timmons'; **Office of the Governor press release, 12/05/23

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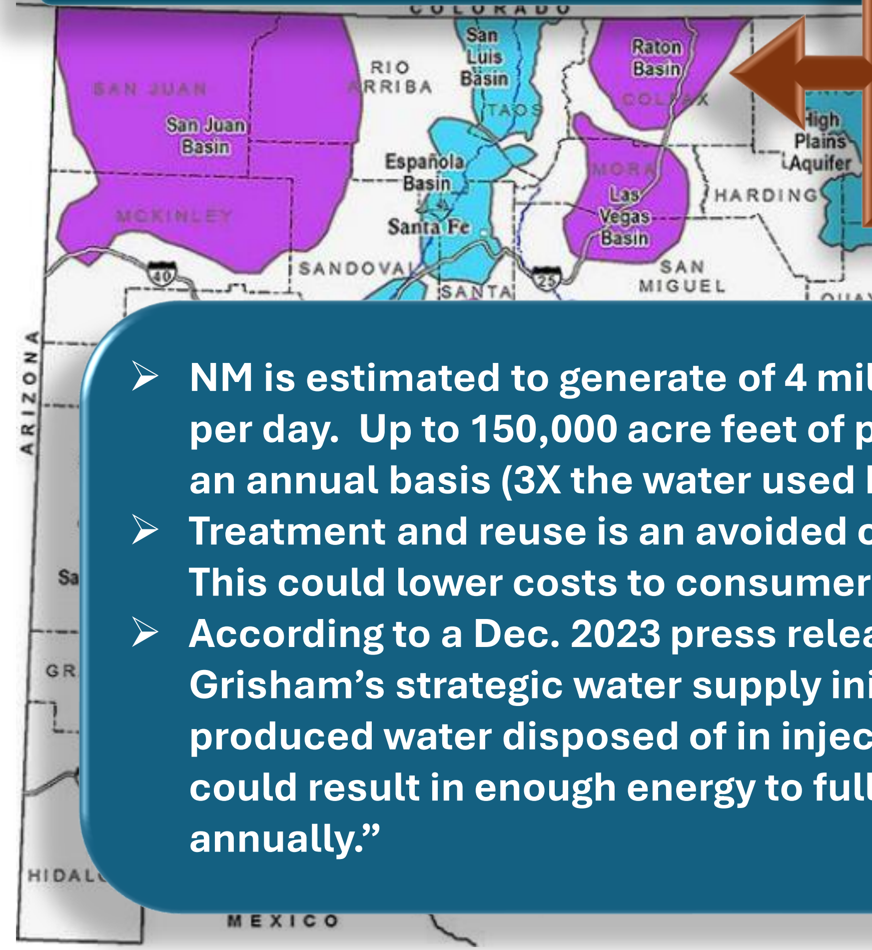

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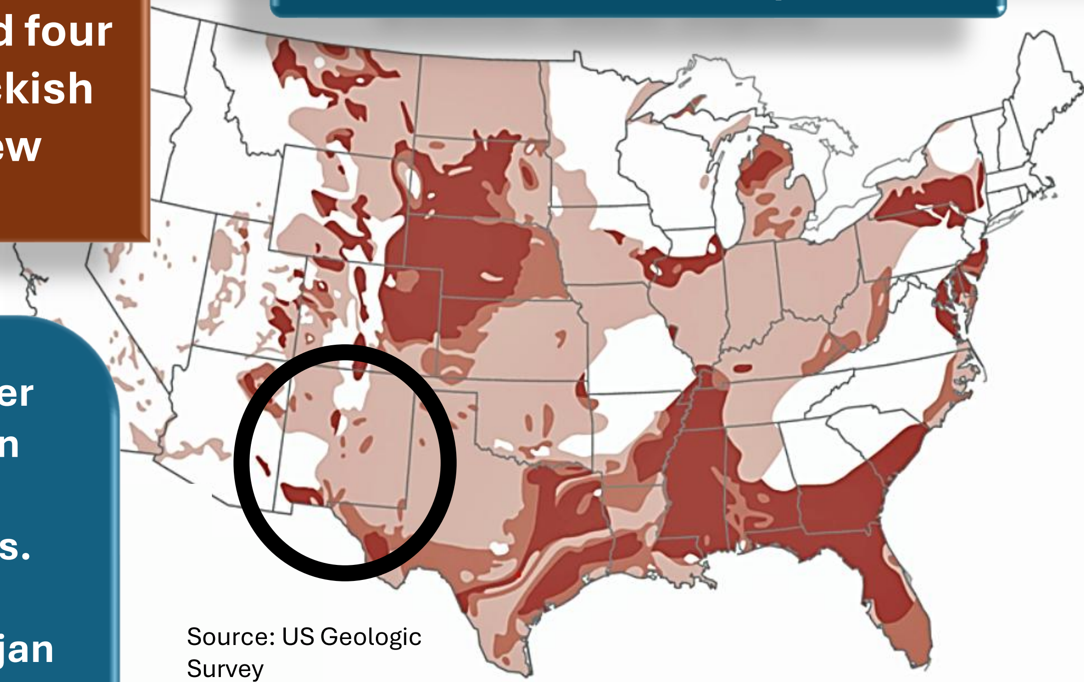
Brackish Water Depths



Source: US Geologic Survey

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- 🟥 **Greater than 1,000**
- ☐ **Inadequate information**

*Dissolved solids concentration of greater than 1,000 milligrams per liter

- NM is estimated to generate of 4 million barrels of produced water per day. Up to 150,000 acre feet of produced water is available on an annual basis (3X the water used by ABQ)
- Treatment and reuse is an avoided cost for oil and gas companies. This could lower costs to consumers
- According to a Dec. 2023 press release announcing Governor Lujan Grisham’s strategic water supply initiative, “Diverting just 3% of the produced water disposed of in injection wells to make hydrogen could result in enough energy to fully power over 2 million homes annually.”

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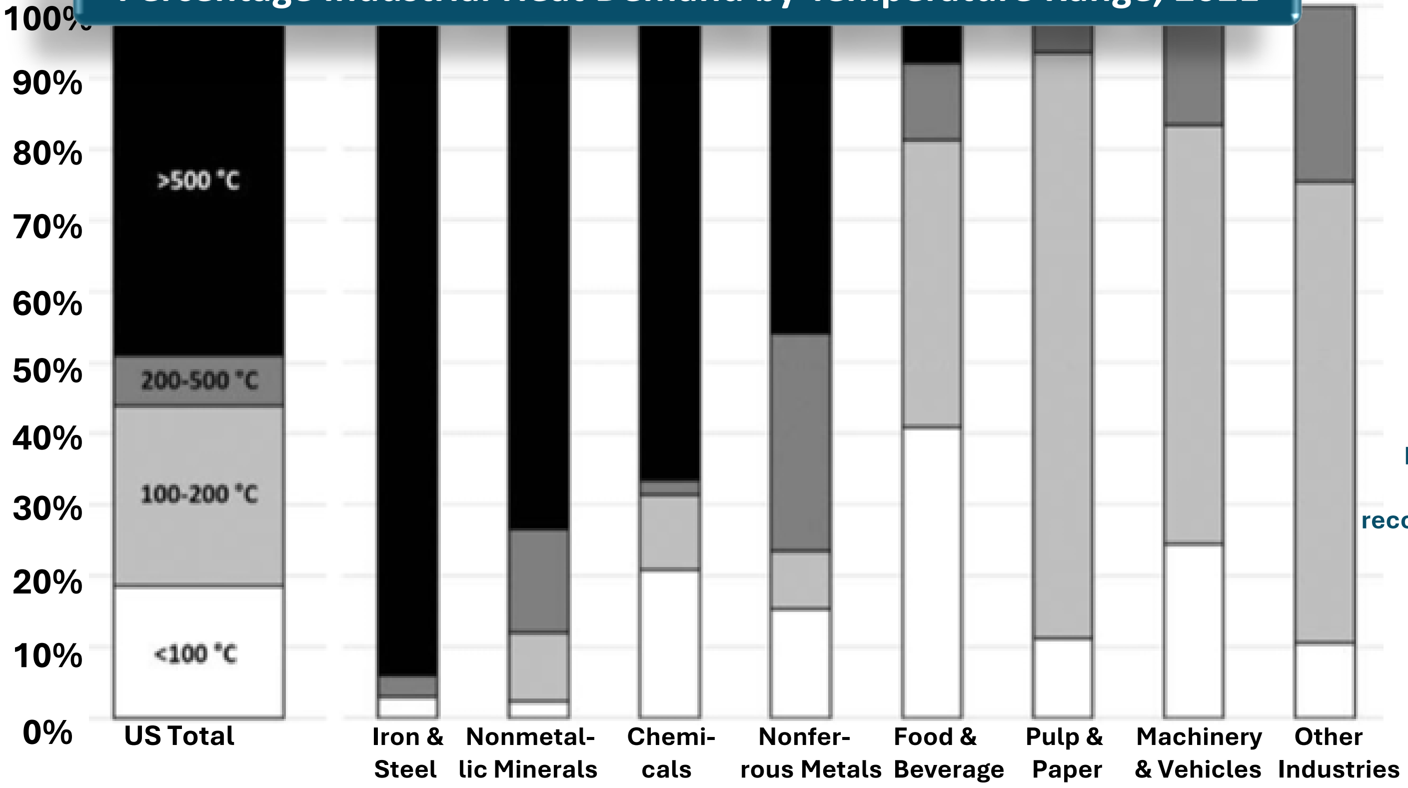
https://nmbizcoalition.org/nm-oil-and-gas-producers-making-progress-on-produced-water/

Source: NM Bureau of Geology and Mineral Resources, Dr. Lewis Land & Stacy Timmons’; **Office of the Governor press release, 12/05/23

Heat Requirements for Key Industrial Processes

> **"Even after net-zero CO2 emission scenarios have been reached, combustion will continue to play a significant role in meeting a substantial fraction of the global energy demand, especially for industrial and difficult-to-electrify sectors"**

Percentage Industrial Heat Demand by Temperature Range, 2021



	Market size in EU plus	Scope of temperature range up to...	Technological maturity
Heat pumps	~35	<200°C	Fully mature
Induction heaters1	~20	501-1000°C	Low
Mechanical vapor recompression	~10-15	200-50°C	Fully mature
E-boilers	~10	200-500°C	Advanced
Turbo heaters1	~5-10	501-1000°C	Advanced
Others	~20		

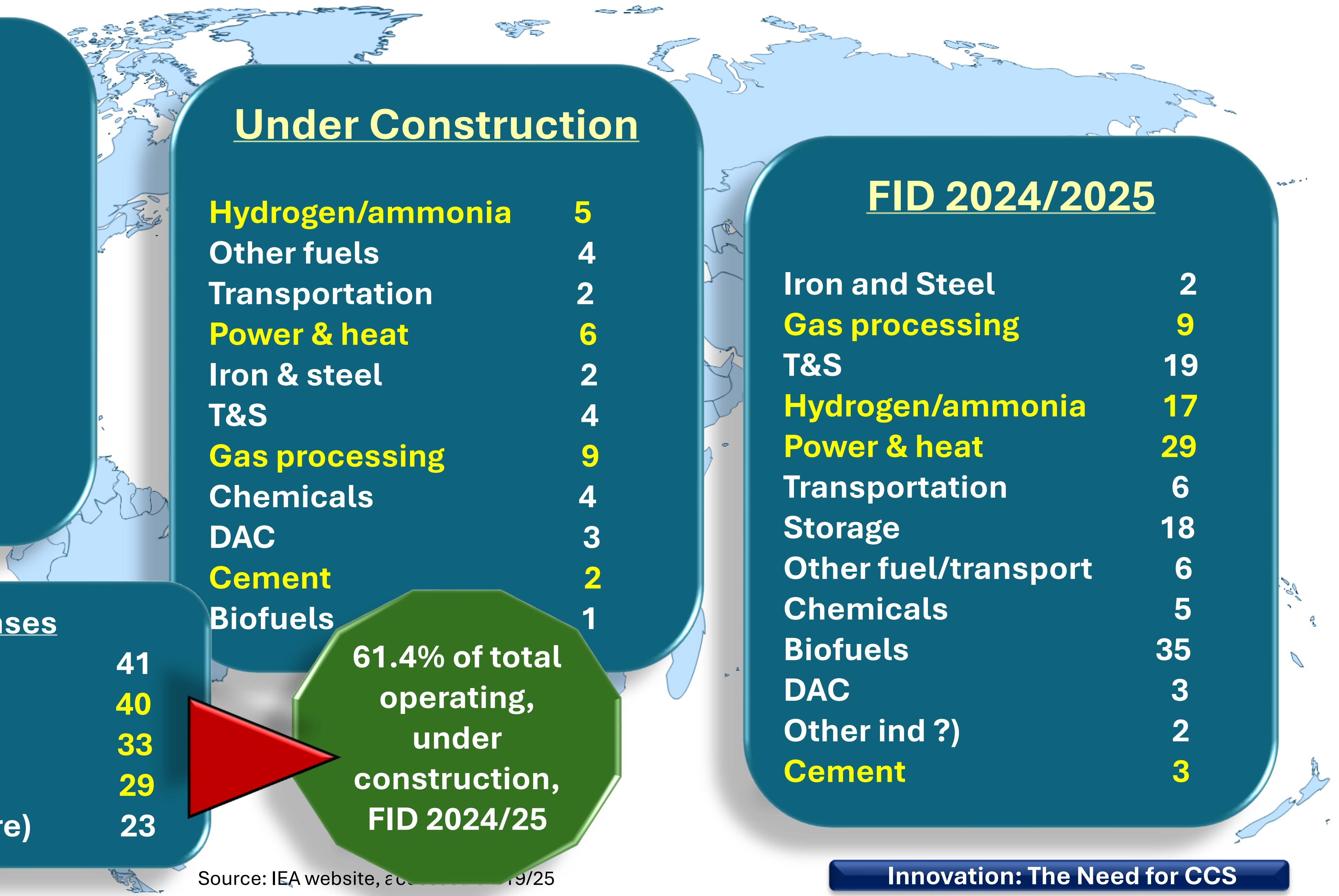
chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://energyinnovation.org/wp-content/uploads/Decarbonizing-Low-Temperature-Industrial-Heat-In-The-U.S.-Report-2.pdf

*Source: McKinsey & Company, Tackling Heat Electrification to Decarbonize Industry, 12/24

Note: High-temperature applications in hard-to-abate industries (eg steelmaking and cement) are excluded

1Technically, temperatures >1000^0 C are possible depending on the technical setup (eg by hybrid conventional or electric setup or directly induced heat); 2 Includes resistive heater, clean-steam boiler, air preheater, etc

CCS Projects 2024, Operational, Under Construction



Operating

Iron and Steel	2
Biofuels	5
Power/heat	5
Gas processing	15
DAC	3
Other fuel/transport	9
Chemicals	10
Storage	2
Transport	1

Under Construction

Hydrogen/ammonia	5
Other fuels	4
Transportation	2
Power & heat	6
Iron & steel	2
T&S	4
Gas processing	9
Chemicals	4
DAC	3
Cement	2
Biofuels	1

FID 2024/2025

Iron and Steel	2
Gas processing	9
T&S	19
Hydrogen/ammonia	17
Power & heat	29
Transportation	6
Storage	18
Other fuel/transport	6
Chemicals	5
Biofuels	35
DAC	3
Other ind ?)	2
Cement	3

Top 5 Types, All Phases

Biofuels	41
Power and heat	40
Gas processing	33
Storage (e.g., CCS hubs)	29
T&S (e.g., large scale capture)	23

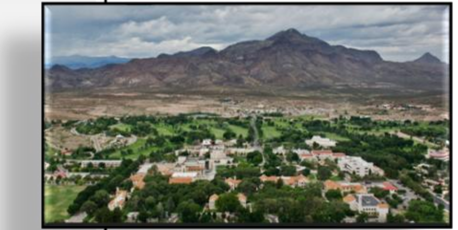
61.4% of total operating, under construction, FID 2024/25

Source: IEA website, ac 9/25

NM &Class VI Primacy: NM Out Front on CCS, Critical for Blue Hydrogen

NM Tech focused on tasks 1,2,3,4,8. $976,464 in states funds supported the initial tranche of work.

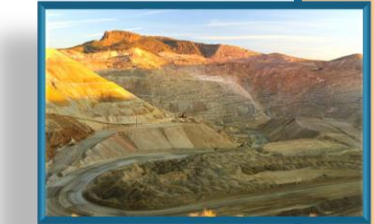
1. Class VI Research and Planning
2. Class VI Rule Development
3. Stakeholder Education and Engagement
4. Continued Proposed Rule Development based on Feedback from Task 3
5. EPA Preapplication Review Package
6. Undertake State Level Class VI Rulemaking
7. Formal Class VI Application for Submittal
8. Identify Potential State-Level Legislative Changes Necessary to Support a Successful Class VI Program
9. General Legal Support

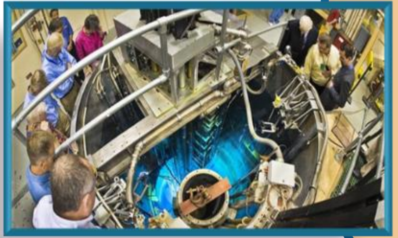


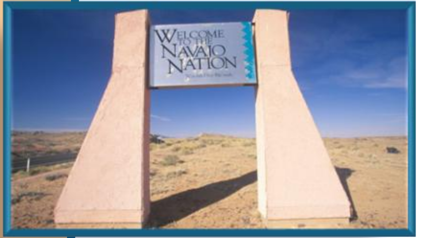
Why New Mexico is Ideal for CCS

- **Vast Gas Processing Capacity:** The state has numerous gas processing plants, including five that qualify for the 45Q tax credit for carbon capture.
- **Extensive Pipeline Infrastructure:** There is existing infrastructure for transporting CO2 for storage and utilization.
- **Geological Storage Opportunities:** New Mexico has suitable geological formations, such as those in the Permian and San Juan Basins, for long-term underground storage of captured CO2.
- **Incentives:** The 45Q tax credit provides financial incentives for the permanent geologic storage of CO2

What NM Brings to the Table on Hydrogen







- ✓ State revenue and many jobs in New Mexico depend on the fossil industry. Hydrogen is an energy carrier of the future that aligns with the skills of the fossil energy workforce
- ✓ Major oil, gas, refined products, and CO2 pipelines cross the state some of which are at low utilization, and some abandoned providing opportunities for retrofit
- ✓ The top three GHG point sources in New Mexico (excluding electricity generation, oil and gas production) are refineries, cement (Tijeras), and mining (major mining operations with several large potash and copper mines)
- ✓ Innovation assets in the hydrogen industry including Sandia and Los Alamos National Labs; and a focus on energy related research and work force development at universities, colleges and technical schools
- ✓ Significant existing pipeline rights of way and the strong potential for blending are being researched by Sandia National Laboratory
- ✓ The largest population of Native Americans is in the Navajo Nation and Native Americans also have a history of energy production and other restorative justice considerations

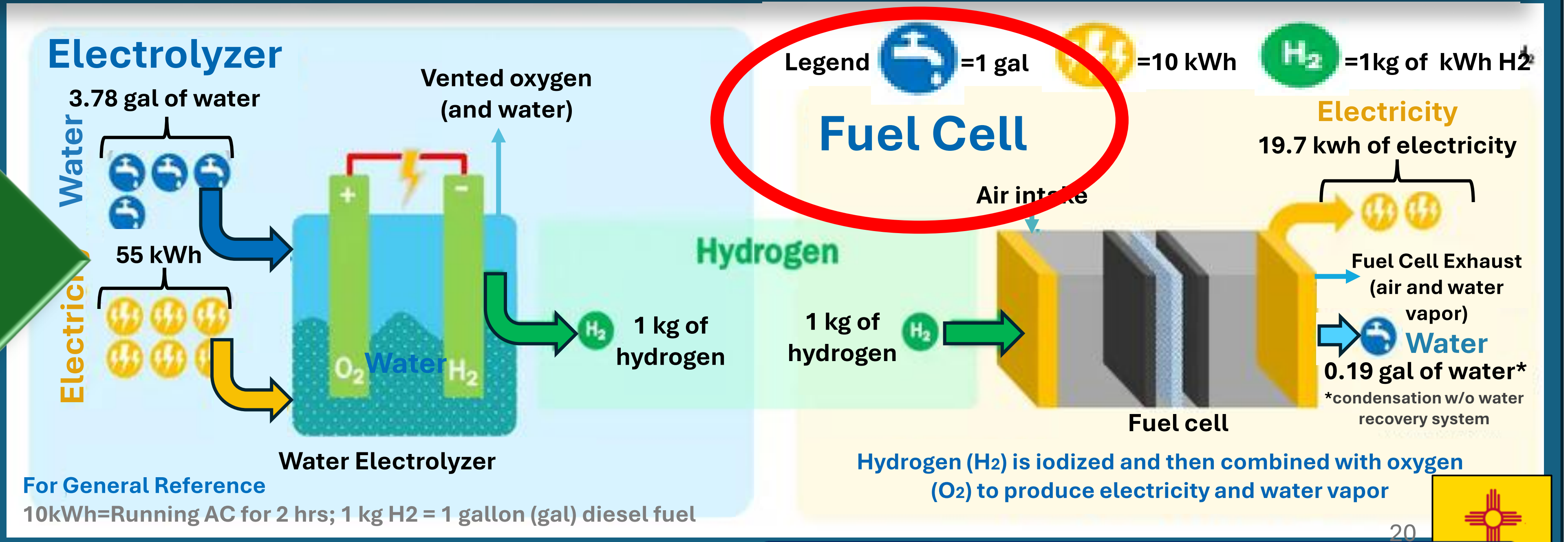
Kit Carson Coop: NM Example of How *Green Hydrogen* will Ensure the Reliability of the Co-op's Solar Generation

Kit Carson Electric Cooperative was recently awarded $231 million from the USDA *Empowering Rural America Fund* for its Green Hydrogen Power Generation Project. These funds will:

- Provide 104 MW of energy from 100% renewable resources [solar] and provide a solution for long-duration energy storage
- Support new power generation and storage facilities expected to power approximately 25,000 homes
- Generate roughly $298 million in economic benefits for rural communities served by KCEC and create up to 350 local jobs during construction
- Reduce climate pollution by nearly 98,000 tons each year, equivalent to over 20,700 gasoline-powered vehicles annually [helping coops meet 2050 ETA targets]

Source: FCW

Green hydrogen acts as a battery for renewable energy from sources like solar and wind. When energy is being produced, it's used to power electrolyzers that split the hydrogen from the oxygen and store it in a fuel cell. When needed, the fuel cell is burned to produce electricity.

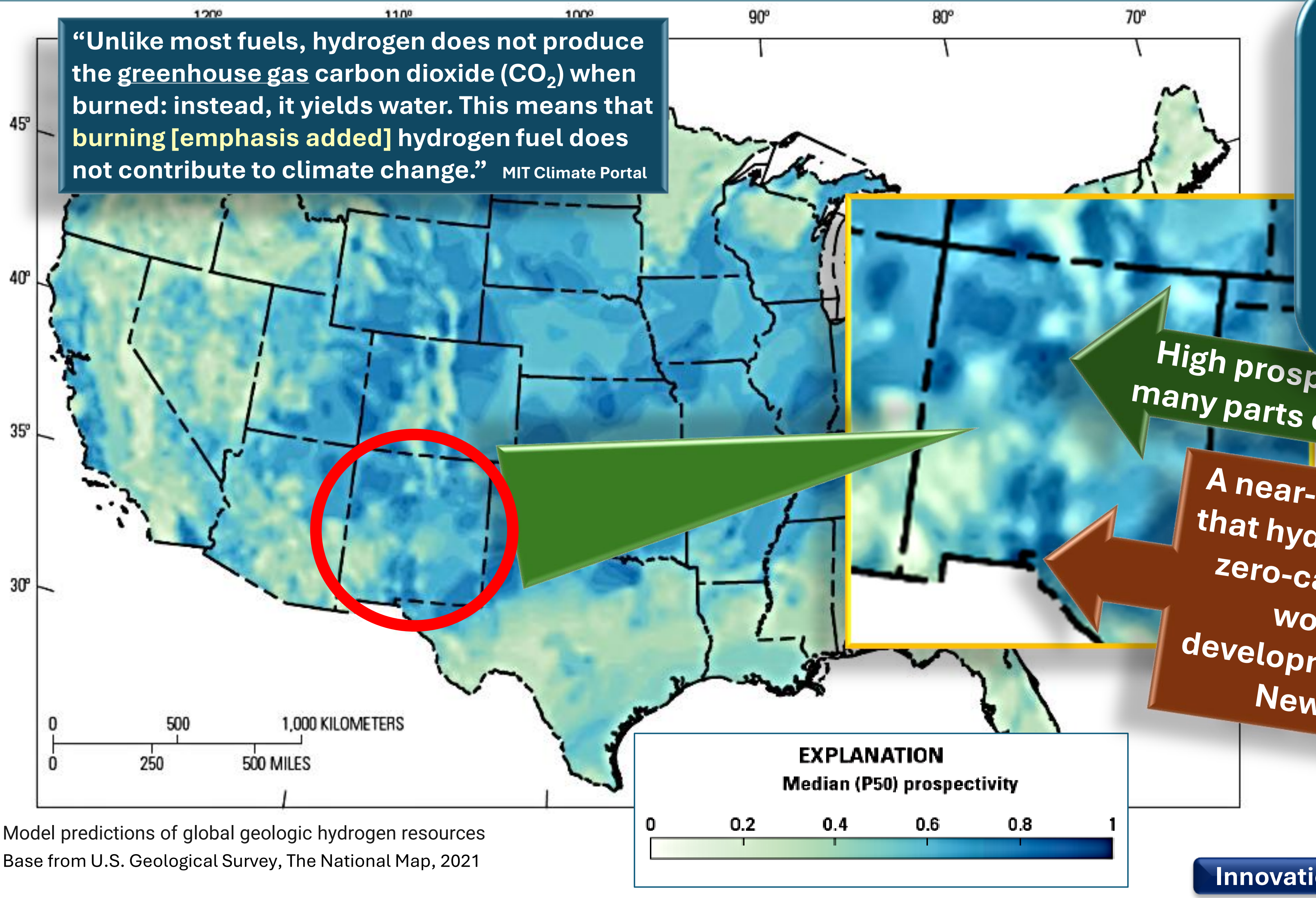


Hydrogen (H_2) is iodized and then combined with oxygen (O_2) to produce electricity and water vapor

For General Reference

10kWh=Running AC for 2 hrs; 1 kg H2 = 1 gallon (gal) diesel fuel

Early USGS Assessments of Geologic (White) Hydrogen



"Unlike most fuels, hydrogen does not produce the greenhouse gas carbon dioxide (CO_2) when burned: instead, it yields water. This means that burning [emphasis added] hydrogen fuel does not contribute to climate change." MIT Climate Portal

"…we can estimate that if 2% of the most probable amount of in-place geologic hydrogen…could be recovered, that would amount to…roughly twice as much energy as is stored in all the proven natural gas reserves on Earth."

Geoffrey Ellis, Sarah Gelman, USGS Denver

High prospectivity in many parts of the state

A near-term ruling from the PRC that hydrogen would qualify as a zero-carbon resource in 2045 would likely spur the development of this substantial New Mexico resource

Model predictions of global geologic hydrogen resources
Base from U.S. Geological Survey, The National Map, 2021

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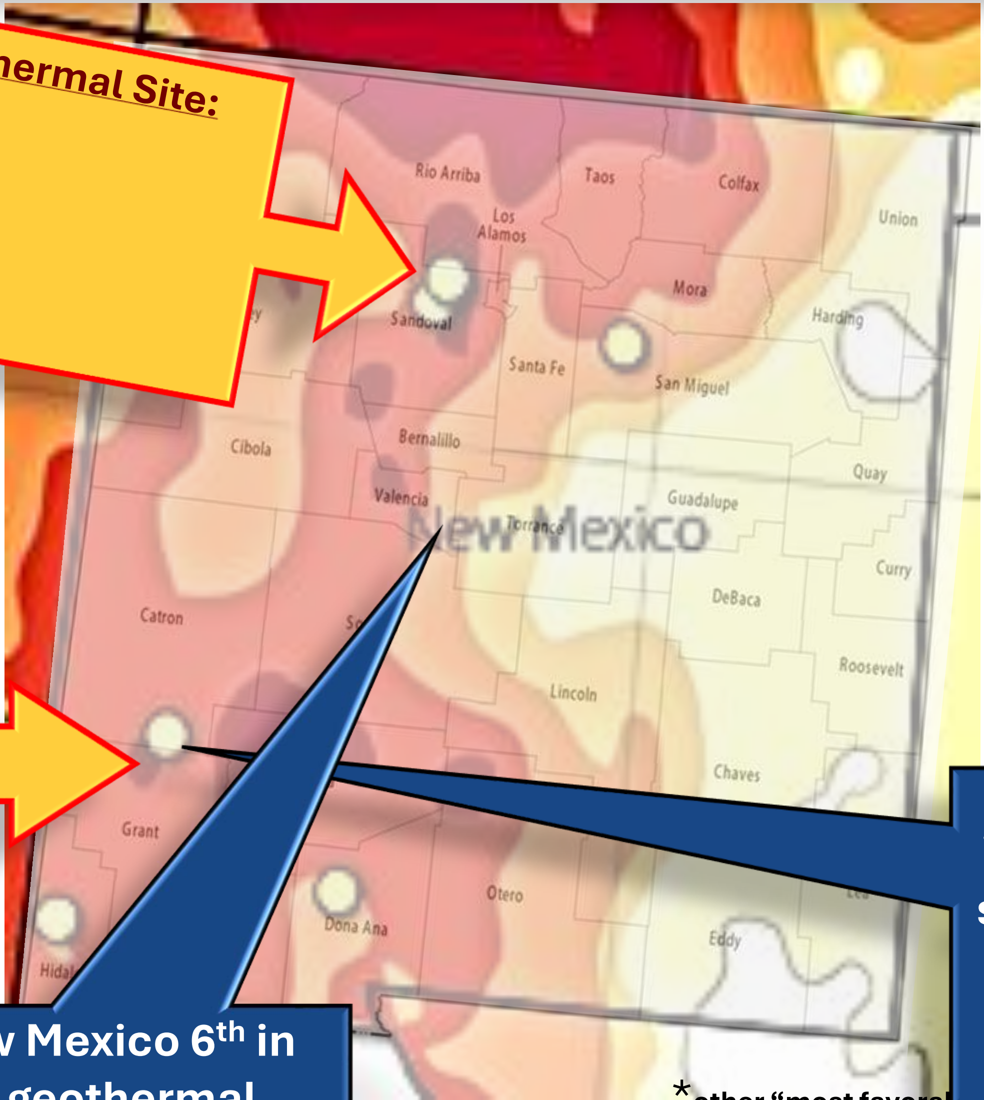
Initial Mapping of New Mexico’s Geothermal Resources

Counties with Identified Hydrothermal Site:

- Sandoval*
- San Miguel
- Dona Ana
- Catron*
- Hidalgo

Counties with “Most Favorable” Geothermal Potential:

- Rio Arriba
- San Juan
- Sandoval
- Taos
- Colfax
- Bernalillo
- Valencia
- Socorro
- Sierra
- Luna
- Otero
- Grant
- Catron
- Cibola
- McKinley



Relative Favorability

🟥	Most
🟧	↕
🟨	Least
☐	N/A
▨	No data
●	Identified Hydrothermal Site (≥ 90º C)

This make New Mexico 6th in the nation in geothermal potential but …

Five NM counties have identified hydrothermal sites. Fifteen counties – 45% -- have “most favorable” geother potential

*other “most favora potential as well

Energy Innovation: Need for Generation w/ High Capacity Factors

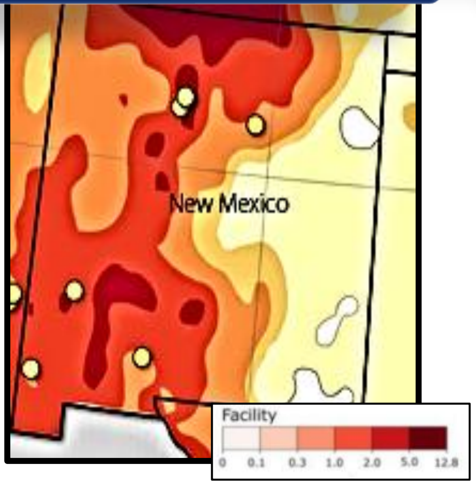
Need for Detailed Subsurface Characterization, Regulation

Model predictions of global geologic hydrogen resources

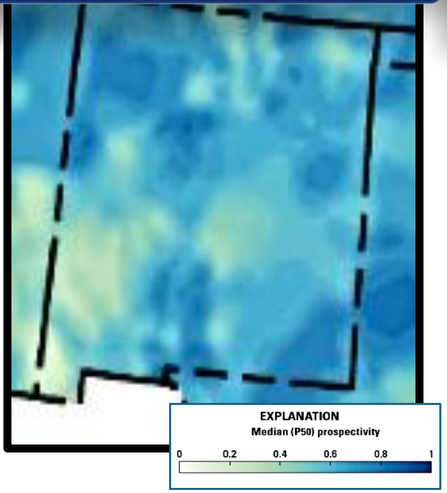
Base from U.S. Geological Survey, The National Map, 2021

US EPA

Geothermal

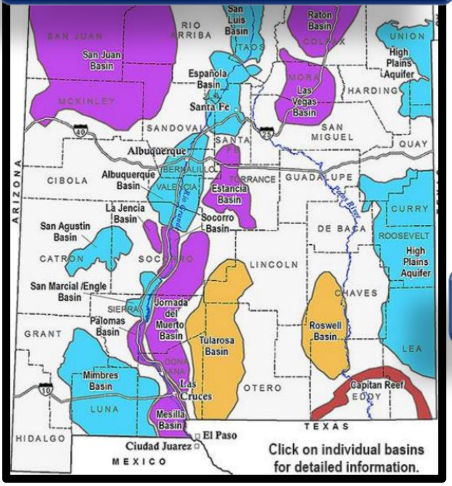


White Hydrogen



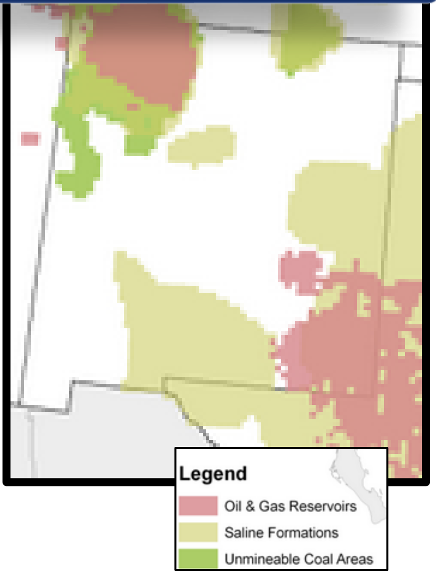
Hydrogen Storage

Potable Water

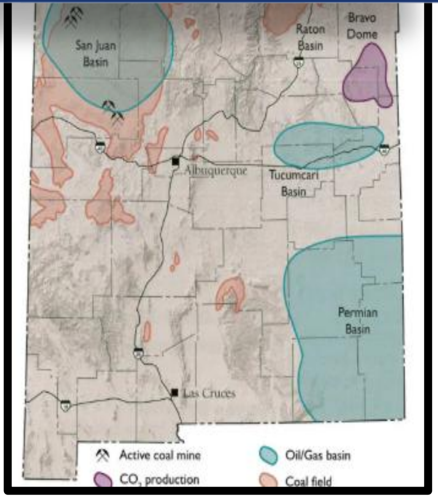


Blue: Potable

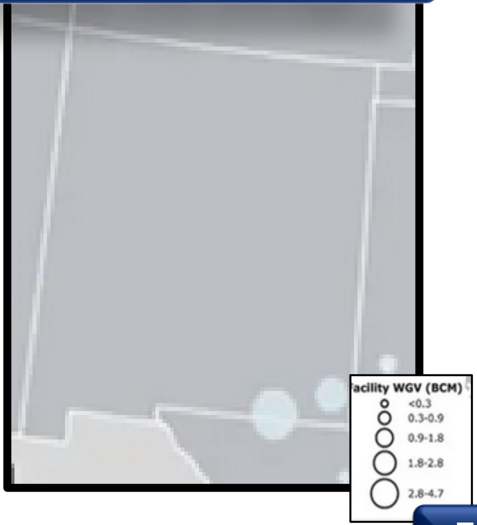
CCS Potential



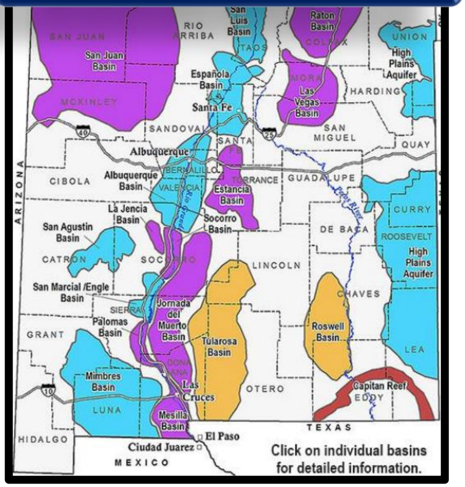
Oil, Gas, Coal Basins



Natural Gas Storage



Brackish Water



Purple Gold Red various levels of brackish

https://grist.org/energy/why-a-natural-gas-storage-climate-disaster-could-happen-again/

Source: NM Bureau of Geology and Mineral Resources, Dr. Lewis Land & Stacy Timmons'; **Office of the Governor press release, 12/05/23

Energy Innovation Needs

NEW MEXICO
emnrd
Energy, Minerals and Natural Resources Department

Metals Demand for Low Carbon Technologies

Light Emitting Diodes (11)
Aluminum, Chromium, Copper, Indium, Iron (cast), Lead, Manganese, Molybdenum, Nickel, Silver, Zinc

Wind (10)
Aluminum, Chromium, Copper, Indium, Iron (cast), Iron (magnet), Lead, Manganese, Molybdenum, Neodymium (proxy for rare earths), Nickel, Steel (engineering)

CCS (8)
Aluminum, Chromium, Cobalt, Copper, Indium, Manganese, Molybdenum, Nickel

Nuclear Power (8)
Chromium, Cobalt, Copper, Indium, Lead, Molybdenum, Nickel, Silver

Electric Vehicles (6)
Cobalt, Copper, Manganese, Neodymium (proxy for rare earths), Nickel, Silver

Solar PV (6)
Aluminum, Copper, Indium, Nickel, Silver, Zinc

Electric Motors (3)
Aluminum, Copper, Iron (magnet)

Energy Storage
Aluminum, Cobalt, Lithium, Iron (cast), Nickel

Concentrating Solar (3)
Aluminum, Iron (cast), Silver

In 2017, UNEP calculated that **low carbon technologies will need over 600 million metric tons more metal resources in a 2° C scenario compared to a 6° C scenario where fossil fuel use continues on its current path.**

The lifespans of metals intensive clean energy technologies could/should become a new energy security indicators and should be studied/analyzed.

Better Meets Reality, March, 2019

NM Metals, Minerals on Which the US is 75-100% Import Dependent, Country Suppliers of US Market/% Total Imports from Country

All are on the 2022 USGS Critical Metals/Minerals List

This year, copper and uranium were added to the USGS Critical Metals/Minerals List

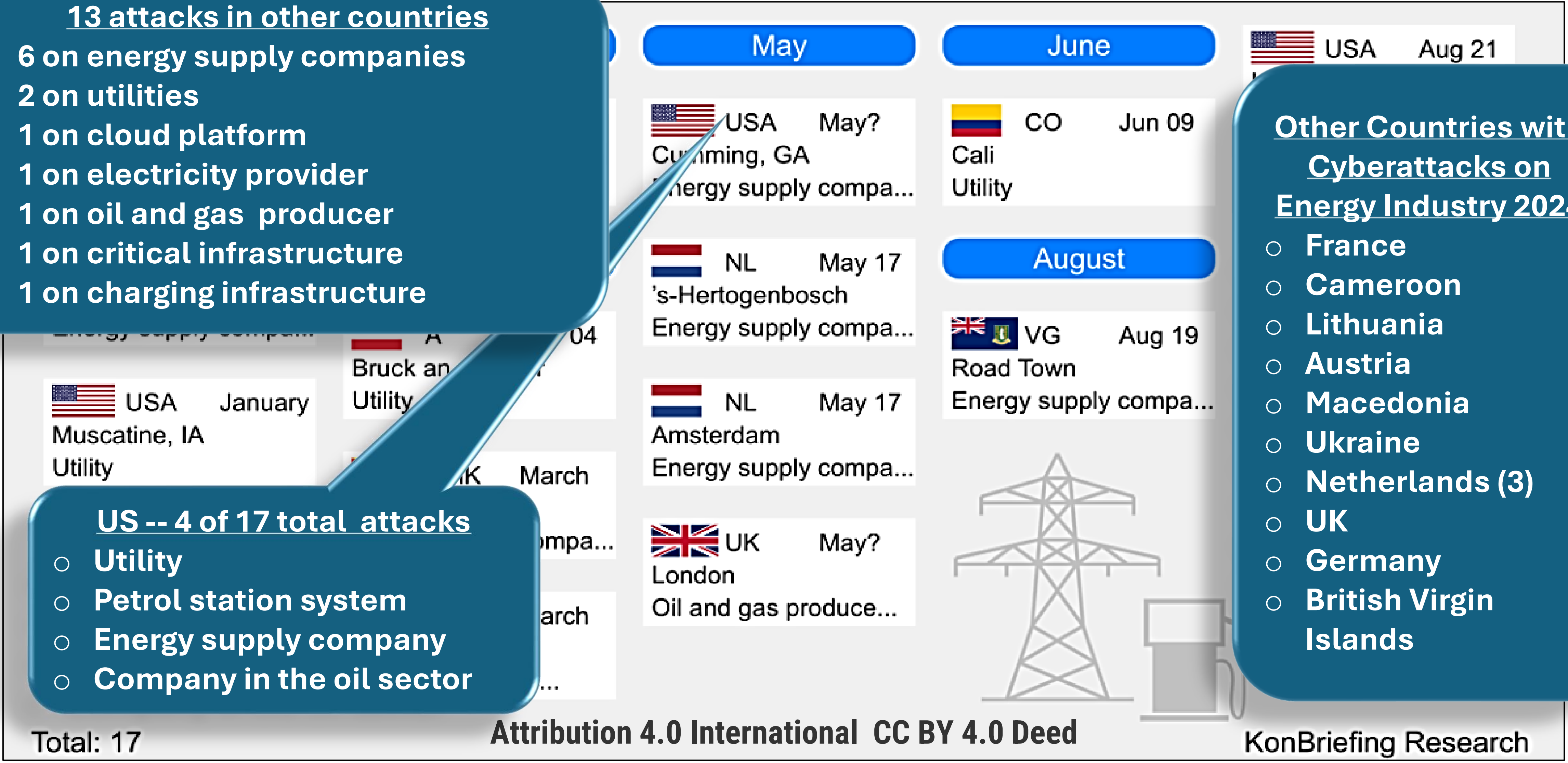
New Mexico is 2nd in states with uranium reserves and is the 3rd largest copper mining state in the country

Source: USGS

Found and/or Produced in NM

Mineral	% Import Dependent	% Suppliers	Key Uses
Antimony	81	63% China	Ceramics, glass
Arsenic	100	58% China	Lumber preservatives
Bismuth	94	69% China	Medical, atomic research
Gallium	100	55% China	LEDs
Graphite	100	9% India 33% China 23% Mexico 7% Canada	Batteries, fuel cells
Indium	100	34% China 22% Canada 15% S. Korea	Electrical components
Manganese	100	69% Gabon	Steel production
Niobium	100	[illegible]	Steel alloys
Rare earths	100	80% China	Metallurgy, glass, wind turbines
Scandium	100	China, Japan Europe (% NA)	Aluminum, fuel cells electronics
Tellurium	95	57% Canada	Solar cells, cooling
Titanium	75	39% South Africa 20% Australia 11% Canada	Steel alloys
Vanadium	95	37% South Africa 14% Russia 11% China	Steel
Zinc	83	64% Canada 14% Mexico	Metal galvanizing

Cyberattacks on the Energy Industry 2024



Energy supply compa...

A 04
Bruck an
Utility

USA January
Muscatine, IA
Utility

K March
mpa...

arch
...

May

USA May?
Cu nming, GA
nergy supply compa...

NL May 17
's-Hertogenbosch
Energy supply compa...

NL May 17
Amsterdam
Energy supply compa...

UK May?
London
Oil and gas produce...

June

CO Jun 09
Cali
Utility

August

VG Aug 19
Road Town
Energy supply compa...

USA Aug 21

Total: 17

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KonBriefing Research

13 attacks in other countries

- 6 on energy supply companies
- 2 on utilities
- 1 on cloud platform
- 1 on electricity provider
- 1 on oil and gas producer
- 1 on critical infrastructure
- 1 on charging infrastructure

US -- 4 of 17 total attacks

- Utility
- Petrol station system
- Energy supply company
- Company in the oil sector

Other Countries with Cyberattacks on Energy Industry 2024

- France
- Cameroon
- Lithuania
- Austria
- Macedonia
- Ukraine
- Netherlands (3)
- UK
- Germany
- British Virgin Islands

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Critical Cybersecurity Issues the Energy Sector Needs to Address

Ransomware Threats: Attacks targeting energy and utility providers have surged, making it clear that a robust cybersecurity strategy is essential for combating this persistent threat and minimizing its impact.

IT/OT Convergence: While integrating IT and OT systems has unlocked greater efficiencies, it has also exposed critical infrastructure to new risks. A unified cybersecurity approach across both domains is now more important than ever.

Regulatory Compliance: With stringent and evolving cybersecurity regulations in place, staying compliant is not just about avoiding penalties – it's also about reducing vulnerabilities and safeguarding the integrity of critical infrastructure.

Aging Infrastructure: The sector's reliance on outdated technologies creates significant security gaps. To stay ahead of modern threats, companies must invest in upgrading systems and enhance collaboration between IT and OT systems.

Geopolitical Significance: The energy sector's strategic importance makes it a prime target for state-sponsored cyberattacks. Providers must be ready to defend against highly sophisticated threats that are as much about national security as they are about financial gain.

By addressing these key areas, energy and utility providers can better prepare for the evolving cyber threat landscape. Strengthening defenses, investing in new technologies, and maintaining a proactive security strategy will help ensure the continued reliability and safety of operation, even in the face of growing risks.

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