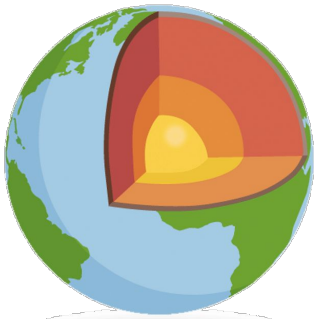
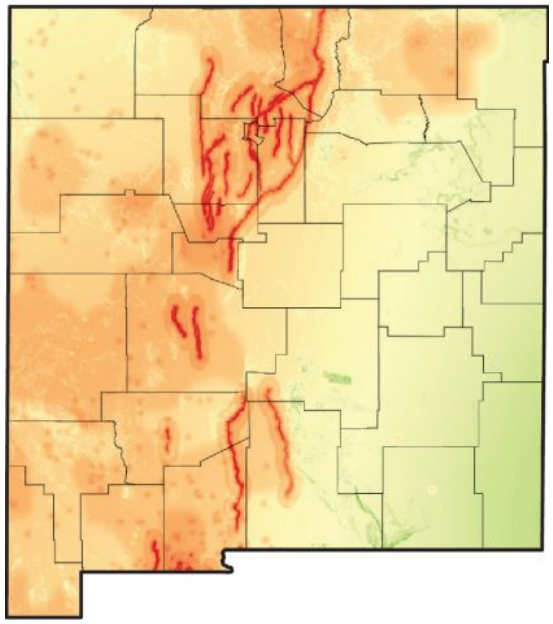
Developing New Mexico's Geothermal Energy



Geothermal Opportunities in New Mexico



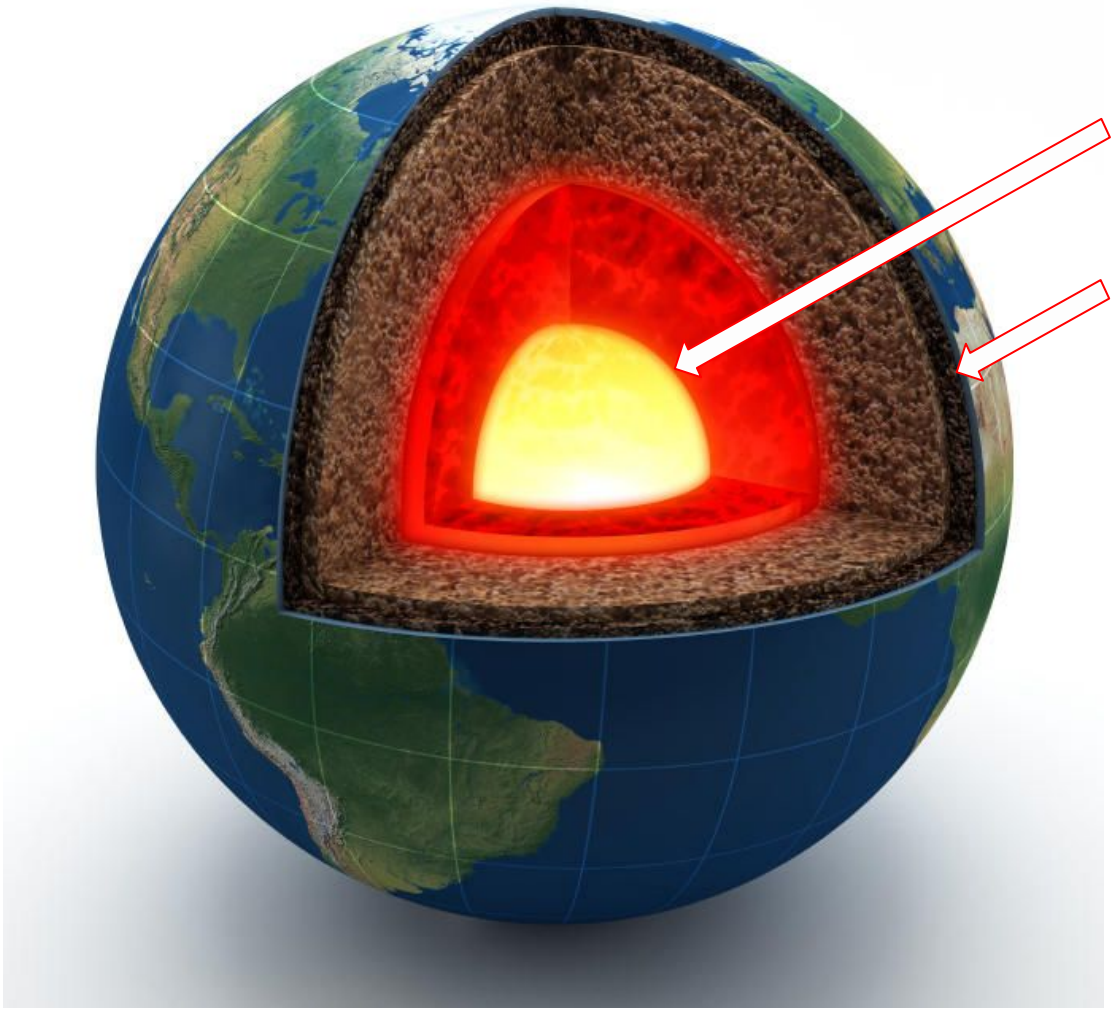
Aug 11, 2025 ERDPC

Tom Solomon

NM Geothermal

Working Group

Geothermal Energy: Using Earth's Heat



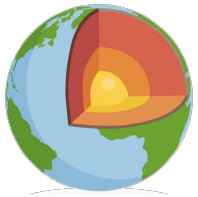
The temperature in the **inner core** is ~5,200°C or **9,392°F**

Five miles underground it can be 204°C or **400°F** *

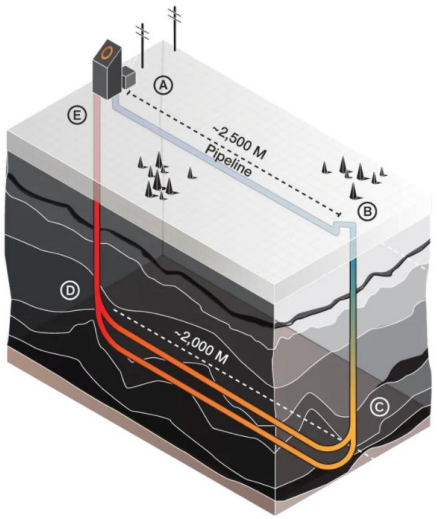
Temps can be higher at shallower depths where the crust is thinner.
Like in New Mexico.

** Far above water's boiling point of **212°F**.*

https://earthscience.stackexchange.com/questions/240/is-the-earths-hot-inner-core-necessary-for-life
https://education.nationalgeographic.org/resource/core



Why Geothermal Heat Energy & Electricity?

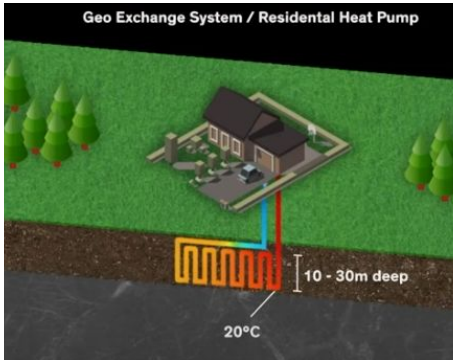


- Clean, zero emission source of heat & electricity
- A world-class 24x7 power source in New Mexico
- May provide “last 10%” of clean energy transition
- **Sustainable economic development for NM**
- Transition for oil industry skills & rigs - drill for heat

Types of Geothermal Vary by Depth

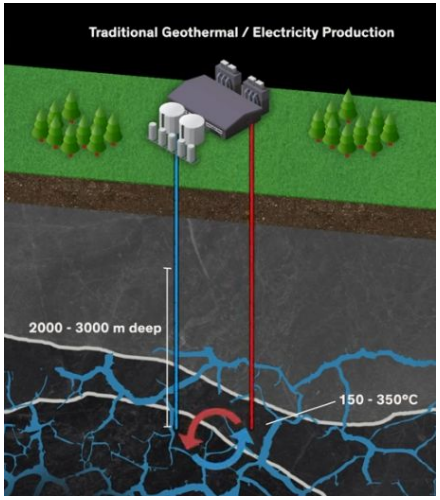
Geothermal today, phase 1:

- **Ground source heat pumps**
  HVAC for buildings: 5 feet to 300 feet deep.



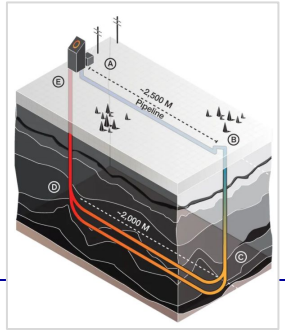
- **Hot Springs & direct use**
  Depths to ~1000 ft.

- **Traditional geothermal electricity** from a hot water aquifer > 6000 ft. (Lightning Dock)



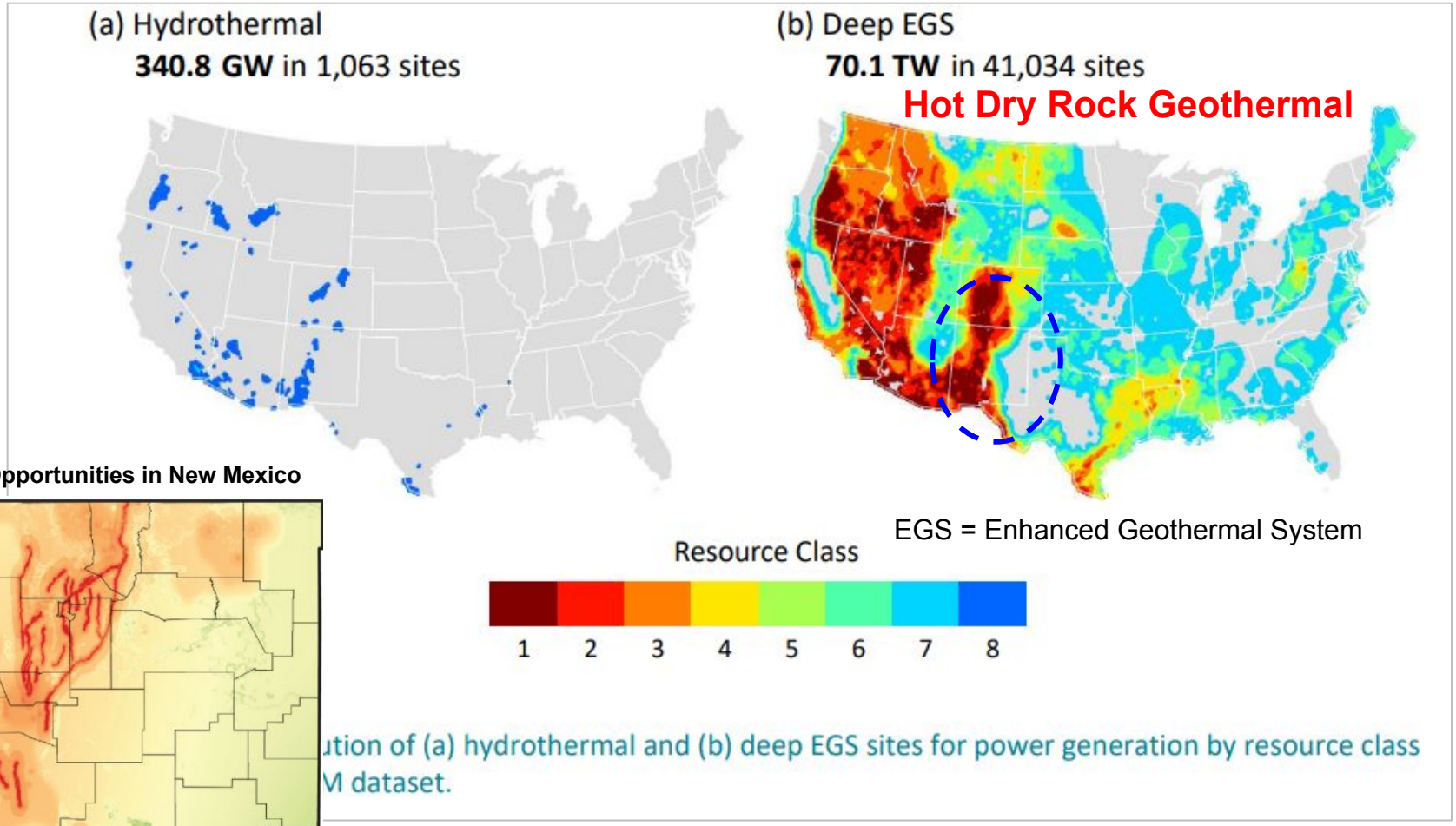
Geothermal future, phase 2:

- **Ph2 - Advanced geothermal electricity:**
  closed loop in deep hot dry rock: > 15,000 ft.

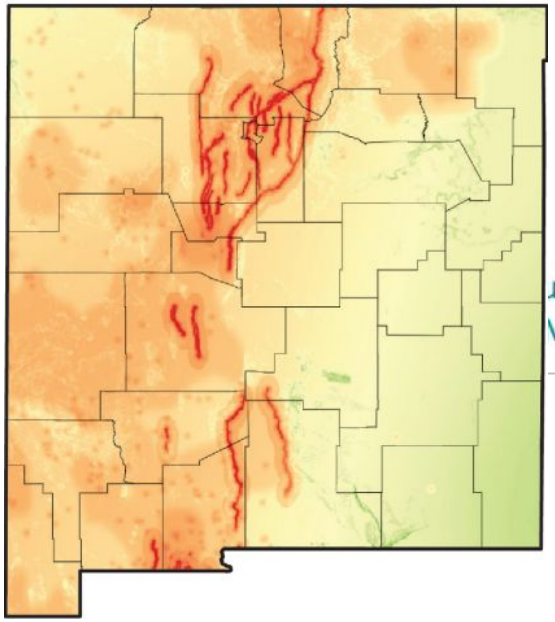


Eavor video https://www.youtube.com/watch?v=PtQmGPmyLA0

NM is #6 in US Geothermal Potential



Geothermal Opportunities in New Mexico



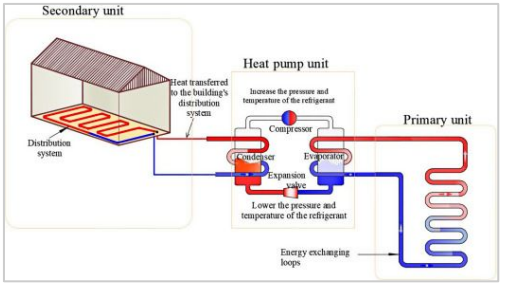
New Mexico is rated #6 in the US for geothermal energy potential (US EIA).

Both hydrothermal & deep EGS- hot/dry rock.

links https://www.nature.com/articles/s44359-024-00019-9 https://www.epri.com/research/products/00000000300

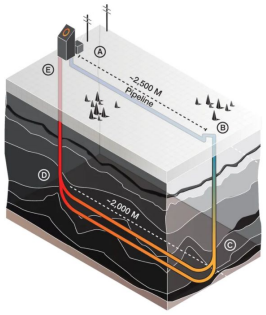
Geothermal Goals

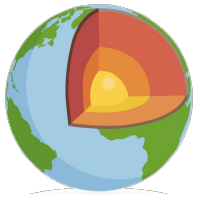
WG goal, achieved in 2024: Pass the geothermal energy development bill plus NMTech & EMNRD funding, to support the two-phase development of geothermal energy in New Mexico:



Phase 1) In the **2020**'s expand known existing geothermal resources: heat pumps in buildings, green houses, hot springs & spas, for clean electricity (Lightning Dock).

Phase 2) promote longer term development of advanced geothermal electricity to provide the final 10% of clean NM grid electricity through the **2030**'s: 1 to 3GW.



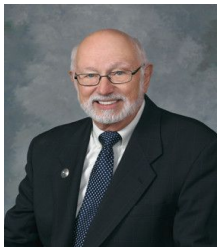


NM Geothermal Working Group

We meet monthly on Zoom as an unofficial body

- Started by **Sen. Ortiz y Pino** Feb 2022; facilitator Tom Solomon
- Members of the (40+) NM Geothermal Working Group include:
  - **Universities** - NM Tech, NMSU, UNM
  - **National Labs** - LANL & Sandia geothermal office heads
  - **State Government** - Office of Gov MLG (Travis K), EMNRD-ECAM energy office, SLO/State Lands, Econ Dev/EDD, NM legis
  - **US Sen. Heinrich's office**
  - **Geothermal developer community**: GeoTh Rising, Proj Innerspace. **Companies:** XGS, TLS, Zanskar, Fervo, EnviTrace, Chthonian
  - **Venture Capital funders:** Dangerous Ventures, Adv Energy United

NM's Geothermal Policy Platform




Thank you!
Sen. Ortiz y Pino,
Rep. Roybal Caballero,
Rep. Lujan,
Sen. Soules.

Legislation passed in 2024: HB2, HB 91, SB58, SB40:

- NM Tech funded through FY '27 as geothermal center of expertise and research
- Geothermal Grant & Loan Program w/ EMNRD, $15M
  - Grants up to $250k to 'a political subdivision of the state or to a state university… or an indian nation, tribe or pueblo' (link to statute). Loans can go also to private biz's
- Geothermal Electricity Production Tax Credit of 1.5¢ /kWh plus a capital equipment gross receipts tax deduction
- Geothermal Heat Pump Tax Credit: 30% of system cost for ground-coupled heat pumps up to $9000.

Record Breaking Well Repowers Lightning Dock to 15MW

- Feb 3, 2025: (Zanskar) announced its new well is **the most productive pumped geothermal well operating in the USA**, **producing around 5000 GPM at 330 °F (165 °C)**. In **Hidalgo County**, NM.
- The large diameter directional well was drilled into a fracture zone at 7500-**8000 feet** (2286 – 2438 meters), more than enough heat capacity for the **15 MWe Lightning Dock** power plant.
- The Governor cut the ribbon on the **newly repowered Lightning Dock plant on July 18th**.
- Lightning Dock may have capacity to expand further.

Zanskar reports exceptional results of new geothermal well at Lightning Dock, NM

link https://www.thinkgeoenergy.com/zanskar-reports-exceptional-results-of-new-geothermal-well-at-lightning-dock-nm/

New XGS-Meta NM Geothermal Plant

- Developer: XGS Energy, “supporting Meta’s data center operations in NM”
- Output: **150MW** using XGS closed loop TRE ‘thermal reach enhancement’ tech
- Grid: Will connect to **PNM electric grid**
- Project value: up to **$1.2B**
- Jobs: up to **3000 trade workers** at construction peak and up to 100 long term jobs.
- Timing: smaller phase 1, larger ph. 2, both operational **by 2030**.
- Location: “Northwestern New Mexico” (not yet sited)
- Water usage: **zero operating water use** due to closed loop recirculation

Meta, XGS Energy announce plans to build geothermal site in New Mexico

By Hannah García / Journal Staff Writer Jun 12, 2025 Updated Jun 12, 2025 3 min to read

1 of 2

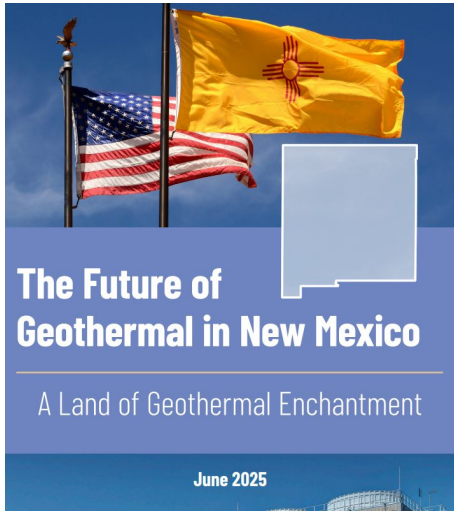
Story in ThinkGeoEnergy, XGS press release
Story in Abq Journal, Story in Source NM
Gov MLG press release, Story in Santa Fe New Mexican

June 12, 2025, “XGS Energy and Meta Platforms Inc. announced Thursday plans to build a geothermal power plant in northwestern New Mexico, aiming to jumpstart the state’s geothermal industry as tech companies seek new energy sources for data centers and artificial intelligence growth.” XGS Energy CEO Josh Prueher, Meta global head of energy Urvi Parekh

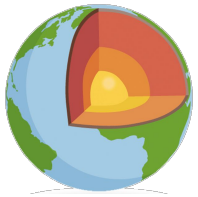
link https://www.abqjournal.com/business/article_e5b20eca-85cc-4b3a-8dd2-049b241f9fa1.html#tncms-source=login

Future of Geothermal in NM

- *The state has the potential to produce **163 gigawatts of geothermal power**, more than 15 times the state's installed capacity in 2023.*
- *Adopting a 5 GW goal would create 2,000 construction jobs, 750 indirect jobs, and 125 permanent operations and maintenance jobs.*

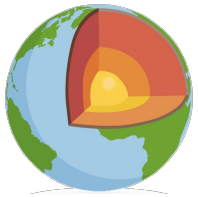


- Future of Geothermal in NM Report chartered by **Project Innerspace & NMT**
- **Published June 12, 2025**. 15 authors, 238 pages, 9 chapters:
  1: Geothermal 101: overview
  2: The Geothermal opportunity in New Mexico
  3: Where is Geothermal in New Mexico
  4: Geothermal heating and cooling for Industry, Ag, Municipal, Resid
  5: Leveraging Oil and Gas technologies, labor and workforce
  6: Who Owns Heat? Navigating subsurface rights
  7: Policy and Regulatory pathways to catalyze geothermal in NM.
  8: New Mexican Stakeholders: opportunities and implications
  9: Environmental Considerations for responsible geothermal growth



Geothermal Federal Bipartisan Support

- DOE secretary Chris Wright supports geothermal. His Feb 5th DOE order prioritized geothermal on a 4-item list, “fossil fuels, advanced nuclear, **geothermal,** & hydropower.”
- The bipartisan federal **Geothermal STEAM act** was reintroduced by Senators Cortez Masto (D-NV) & Murkowski (R-AK) and Representatives Lee (D-NV) & Maloy (R-UT). “Streamlining Thermal Energy through Advanced (permitting) Mechanisms” (link).
- The Dept of Defense is pursuing geothermal energy for ‘inside the fenceline’ power sources for **US military bases**. NM has four.
  - Feb 2025: 11 geothermal companies selected as ‘awardable’ by the Air Force office of energy assurance. Three are in the NM working group (TLS, XGS, Power Planet)



Geothermal 'Low Hanging Fruit'

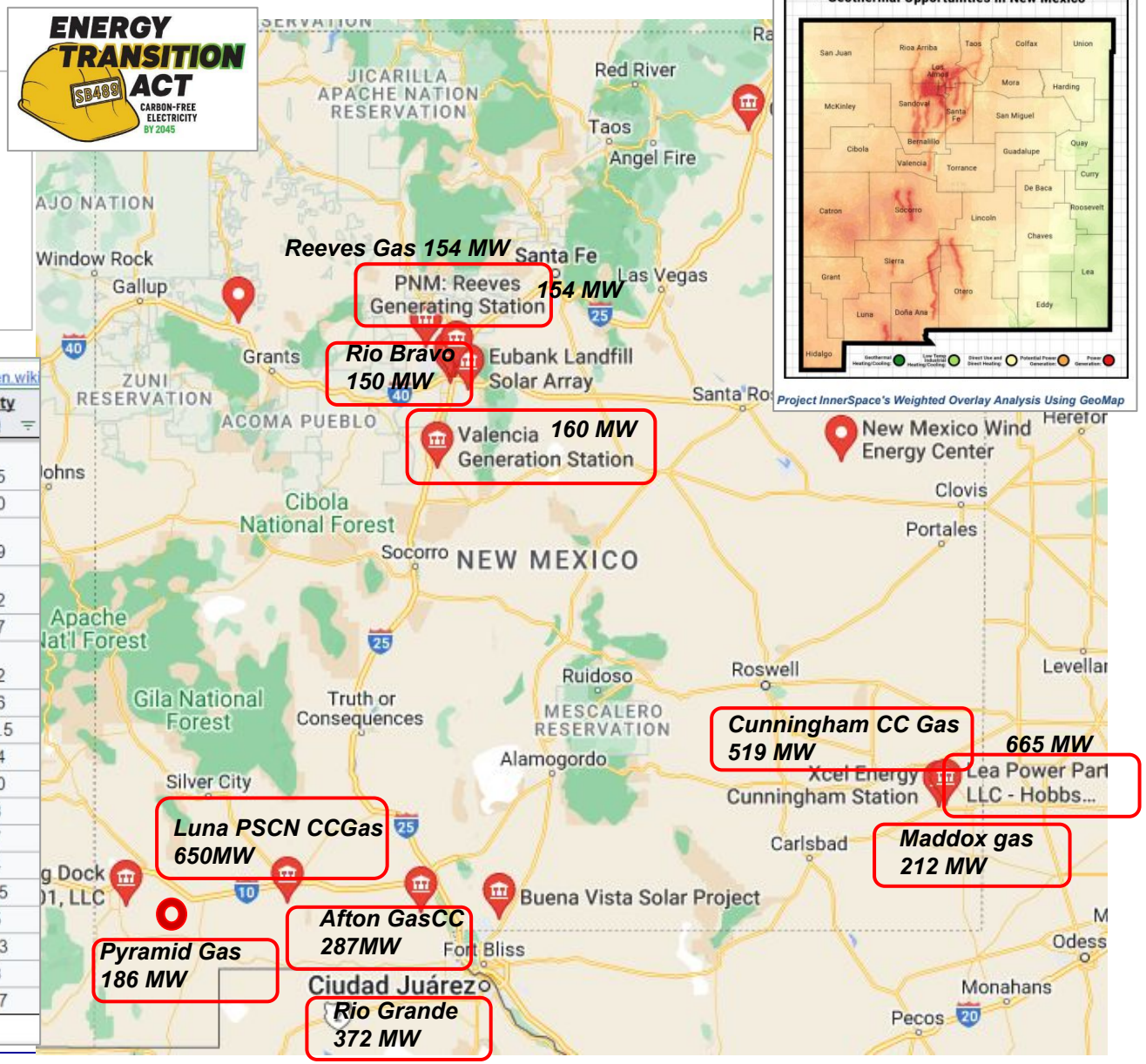
- **GT electric plant for data centers: META Los Lunas. Done!**
- **Geothermal electric plant inside a NM military base**
- **Expand Lightning Dock geothermal electric plant**
- Ohkay Owingeh geothermal grant application to DOE DE-FOA-0003401
- Zia Pueblo DOE study 2012-2013 with potential geothermal sites
- Rebuild '80s NMSU geothermal infrastructure & drill deeper
- Revisit 1980's Jemez Springs attempt to develop hydrothermal
- Mesa del Sol 'integrated cascading community GT' development
- UNM campus utilities ground source heat pumps

Decarbonizing NM Power Plants

New Mexico's **18 gas plants** must decarbonize within 20 years (ETA). Utilities should consider geothermal.

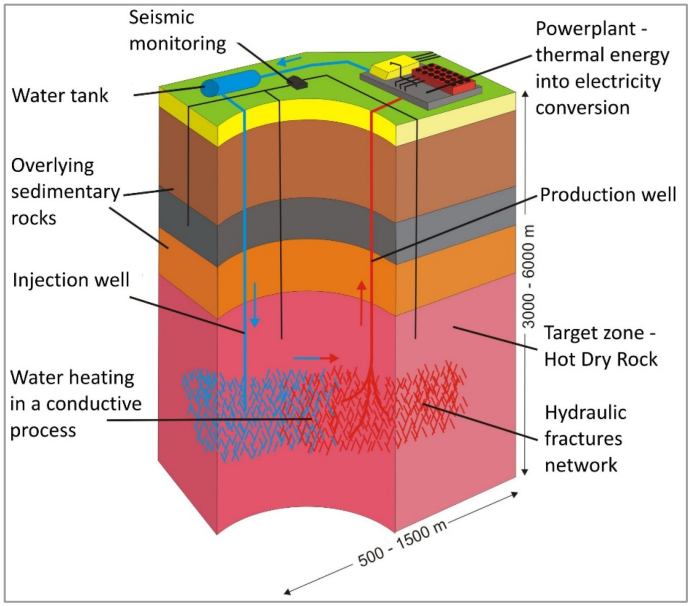
The ten biggest ->

Natural Gas Power Plants in New Mexico		https://en.wik	
Name	Location	Coordinates	Capacity (MW)
Hobbs	Lea County	32.7283°N 103.3094°W	665
Luna	Luna County	32.2993°N 107.7834°W	650
Cunningham	Lea County	32.7131°N 103.3533°W	519
Rio Grande	Dona Ana County	31.8047°N 106.5472°W	372
Afton	Dona Ana County	32.1142°N 106.8465°W	287
Maddox	Lea County	32.7142°N 103.3015°W	212
Pyramid	Hidalgo County	32.2363°N 108.5494°W	186
Valencia	Valencia County	34.6115°N 106.7322°W	159.5
Reeves	**Bernalillo County**	35.1710°N 106.6019°W	154
Rio Bravo	**Bernalillo County**	35.0260°N 106.6440°W	150
Lordsburg	Hidalgo County	32.3505°N 108.6980°W	88
Bluffview	San Juan County	36.7166°N 108.2153°W	67
Chino Hurley Mines	Grant County	32.6956°N 108.1225°W	54
LCEC Generation	Lea County	32.9781°N 103.3239°W	46.5
Algodones	Sandoval County	35.3844°N 106.4642°W	45
La Luz	Valencia County	34.6161°N 106.8150°W	42.3
Animas	San Juan County	36.7251°N 108.1920°W	18
Ford Utilities	**Bernalillo County**	35.0841°N 106.6262°W	13.7
Natural Gas	total MW	**3729**	



https://en.wikipedia.org/wiki/List_of_power_stations_in_New_Mexico, Google map of "power plants in new mexico"

NM Geothermal WG Next Steps



Apply for GT grants at:
emnrd.nm.gov/ecmd/

- Q4 2025 - EMNRD issue rules for GT grant/loan program & tax credit
- Fall 2025 - start classes for the NMT graduate geothermal certificate
- Q4 2025 - draft the NM Geothermal Roadmap for developers

➢ Announce additional NM geothermal electric power projects

- EMNRD acting as SEFI to raise the funding (state energy financing institution)
- Possibly: XGS energy, Zanskar, TLS geothermics, Sage Geosystems, Fervo

link