Impact of the ETA on Energy in New Mexico

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&

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New Mexico Energy Initiatives

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Energy Transition Act - Key Dates

- 2019 NM Energy Transition Act
  - Investor Owned Utilities and Rural Co-Ops 50% renewable by 2030
  - Investor Owned Utilities and Rural Co-Ops 80% renewable by 2040
  - Investor Owned Utilities 100% **carbon-free** by 2045
  - Rural Co-Ops 100% **carbon-free** by 2050
  - Includes grid modernization
  - Includes goal to lead to lower electricity costs for consumers
- Fastest path to comply for utilities has been to shut down coal plants and build wind and solar
  - Escalante (250 MW) shut down in August of 2020
  - San Juan Generating Station (1.8 GW total)
    - Unit 2 and 3 shut down in 2017 (924 MW)
    - Unit 1 and 4 shut down in 2022 (924 MW)
- Four Corners Power Plant (1.54 GW) is last remaining coal plant and is on the Navajo Nation
  - Originally scheduled to shut down in 2031
  - Navajo President wants to extend to 2038

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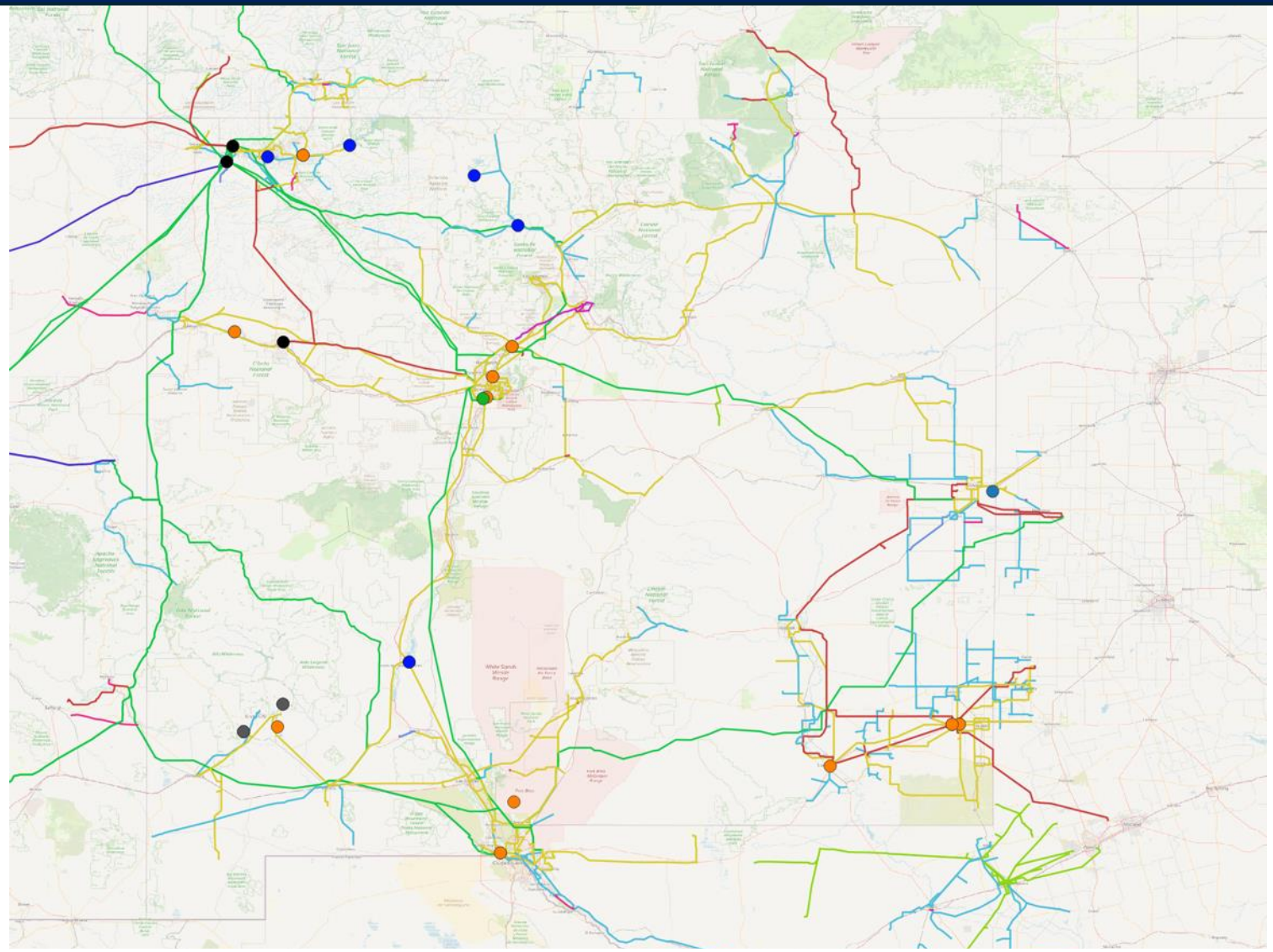
Primary Energy Types by Source 2000



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- Batteries
- Conventional Hydroelectric
- Conventional Steam Coal
- Geothermal
- Landfill Gas
- Natural Gas Fired Combined Cycle
- Natural Gas Fired Combustion Turbine
- Natural Gas Internal Combustion Engine
- Natural Gas Steam Turbine
- Onshore Wind Turbine
- Other Waste Biomass
- Petroleum Liquids
- Solar Photovoltaic

Electric Power Transmission Lines

- 115
- 13.8
- 138
- 230
- 3
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- 500
- 69

Source: Form EIA-860, Form EIA-923, homeland infrastructure foundation-level data (hifld)

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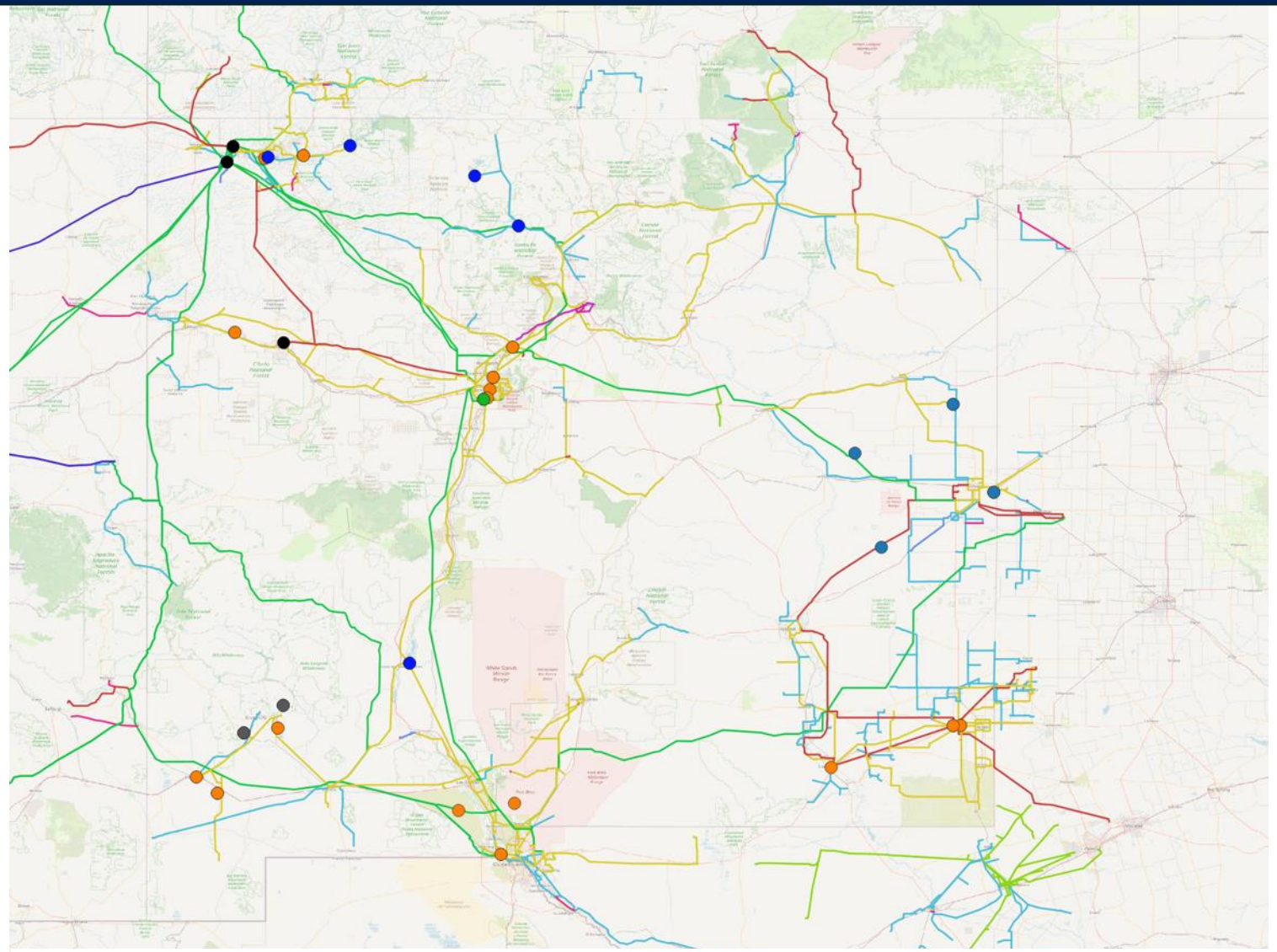
Primary Energy Types by Source 2005



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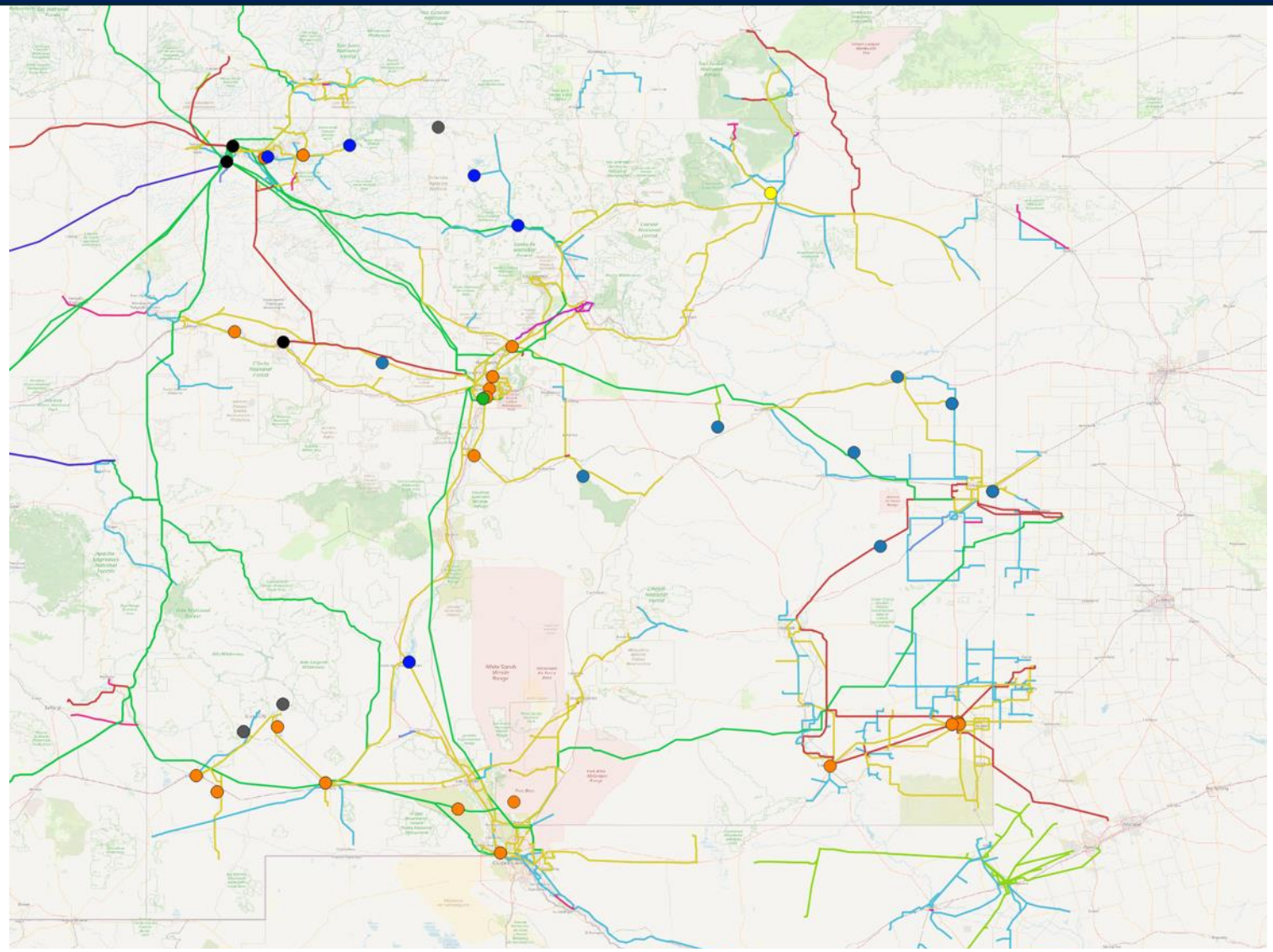
Primary Energy Types by Source 2010



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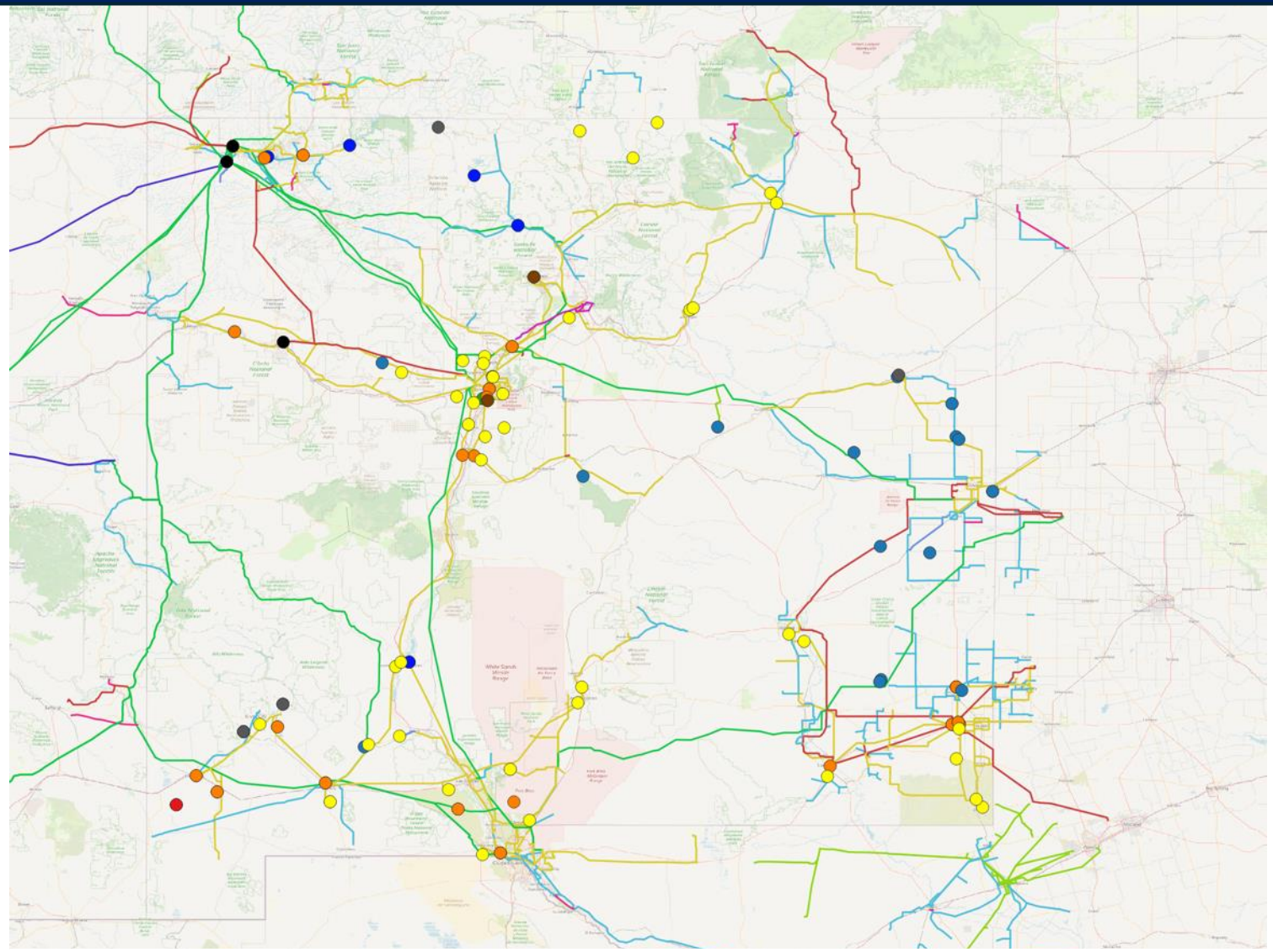
Primary Energy Types by Source 2015



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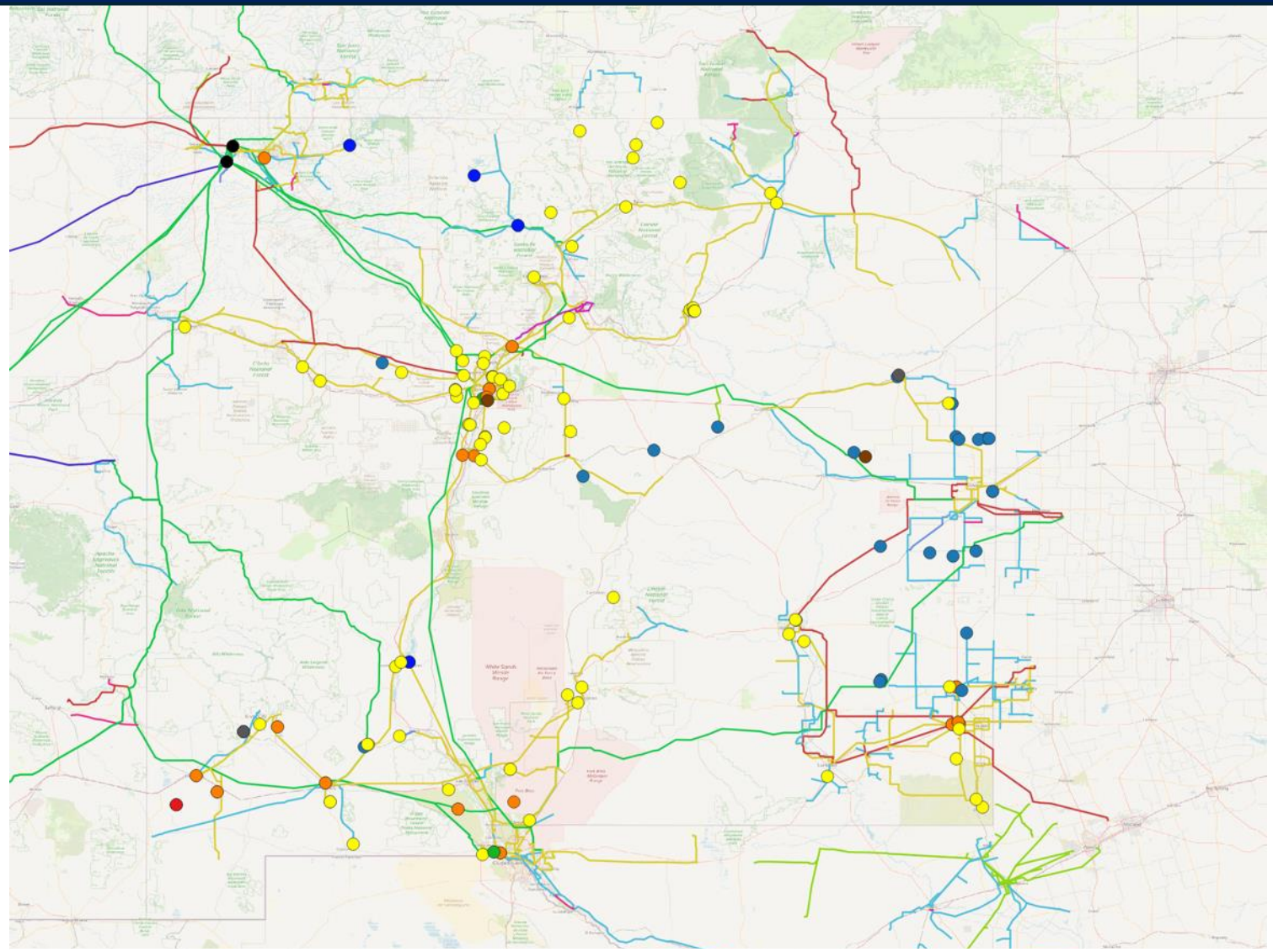
Primary Energy Types by Source 2020



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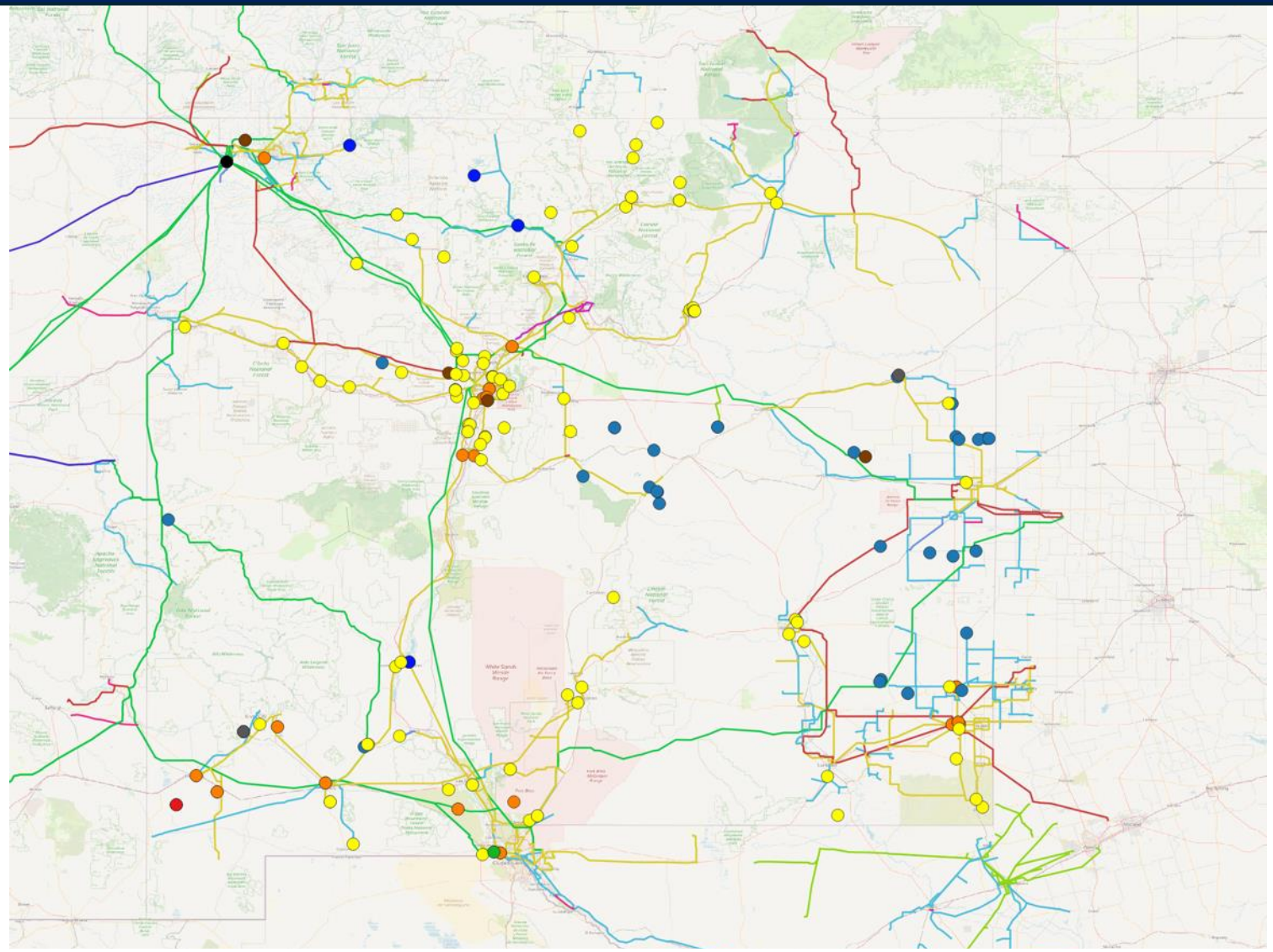
Primary Energy Types by Source 2024



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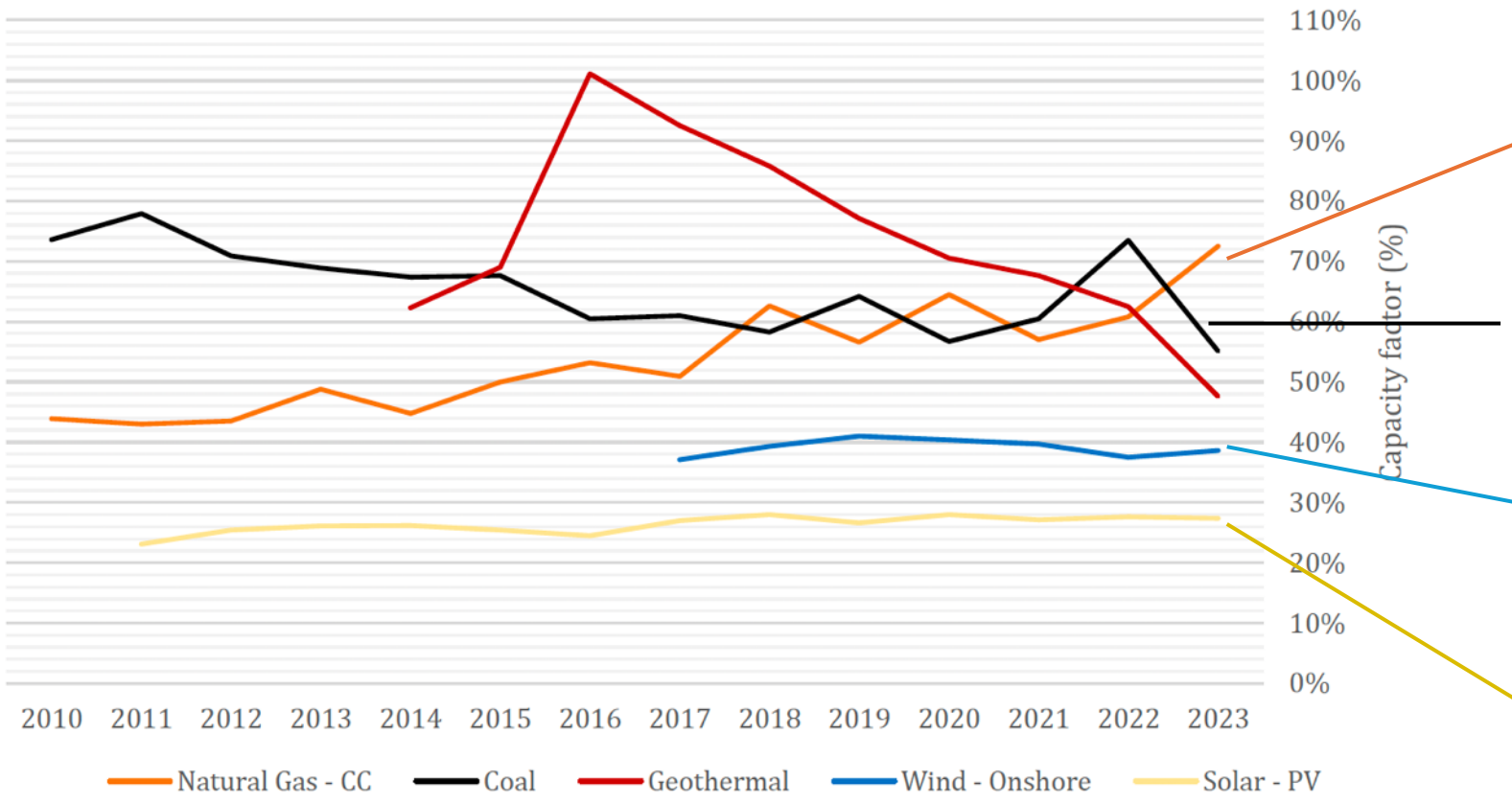
Capacity Factors by Source

Ratio of power source actual production compared to its potential maximum



Natural Gas Combined Cycle is close to Max capacity factor in 2023, compared to moderate capacity factor in 2010s.

Coal has dropped from Max capacity factor in 2010's, compared to moderate capacity factor in 2020s.

Wind has a typical Capacity Factor of 20-40%, New Mexico does well in wind, at the top of the scale

Solar has a typical Capacity Factor of 23-25%, New Mexico does well in solar at close to 30%

Source: Fonquergne et al., NMEIC, New Mexico Energy Landscape: Overview and Analysis 2025

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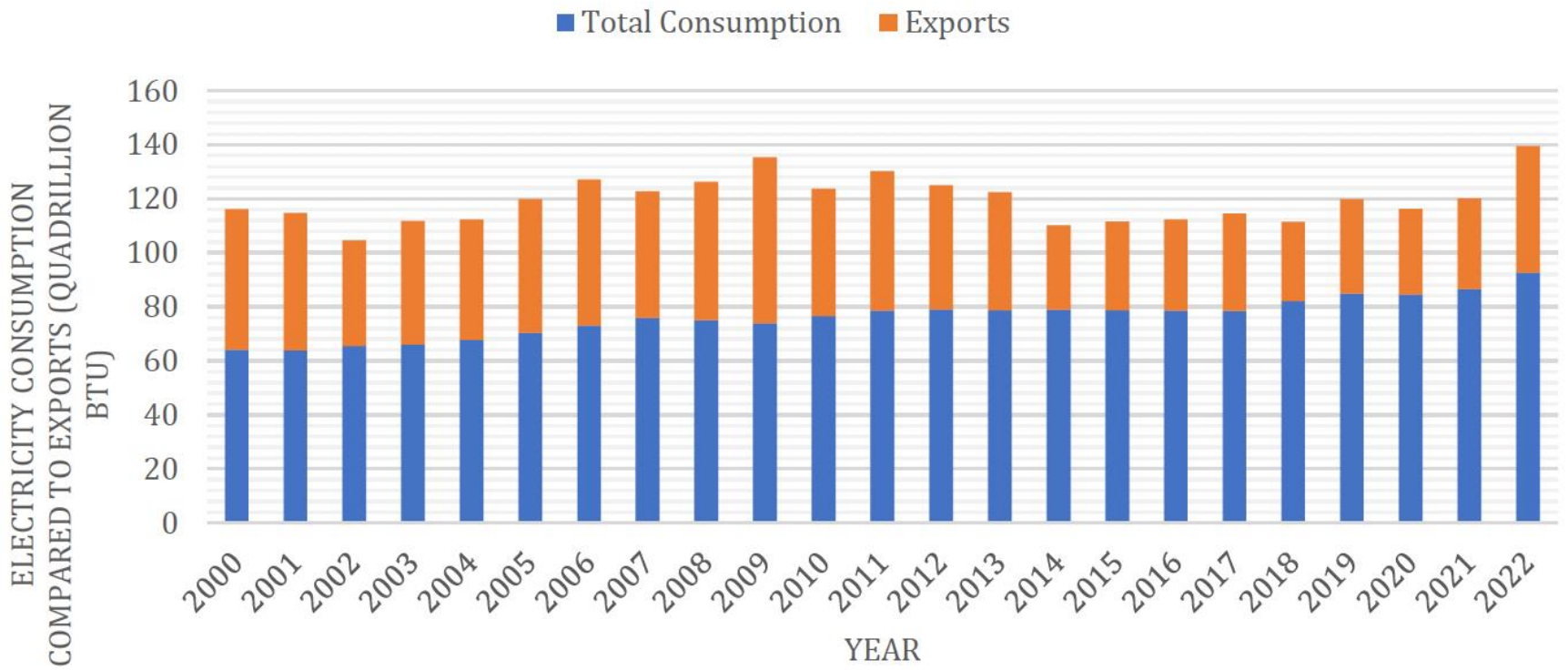
So How Does this Translate to Supply/Demand?

- 1GW of Coal can make about 700 MW of electricity at peak
- 1 GW of NG CC can make about 700 MW of electricity at peak
- 1 GW of Wind can make about 400 MW of electricity on average
- 1 GW of Solar can make about 300 MW of electricity on average



New Mexico consumes 90 Quads or 26.4 million GWH's per year (yes that's 26.4 TWHs)

Exports dropped during ETA but seems to be recovering (wind)

This plot does not show imports

Wait, You said MWH not Megawatts?

- A coal or natural gas combined cycle plant can make its electricity 24 hours per day, so a 1GW coal/gas plant at 70% Capacity factor can make:
  - 24hrs*700MW =16,800 megawatt hours

- A 1 GW wind farm at 40% capacity factor can make:
  - 24hrs*400MW = 9,600 megawatt hours

- A 1GW solar farm at 30% capacity factor can make:
  - 8hrs*300MW = 2,400 megawatt hours

You might need 2GW of Wind or 7GW of Solar to match a 1GW coal plant, with storage of about ½ to 2/3 of that power for windless days or night time

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How Much Battery Storage is Deployed in NM?

- **Goal is 1GW/3.5 GWH by 2028 and 2GW/7GWH by 2034**
- As of this month NM has 864 MW of grid scale storage in 14 projects
  - Those batteries can be fully depleted in less than 4 hours and can take days to recharge

- In 2024 we were using on average 83,000 MWH per day in NM
- Hard to pin down between wind and solar (2023ish), but with:
  - 4.4 GW of wind we can generate about 42,400 MWH per day, and
  - 3.5 GW of solar we can generate bout 8,400MWH per day, or
  - **About 51,000 MWH per day, roughly 61% of power needs!**
- So why isn't our capacity factor higher than 30-40%?
  - Wind is not always reliable and has slower periods and sometimes weeks with no wind
  - and solar can only generate full power about 8 hours per day

  - To double our effective capacity, we would need about an equal amount of battery storage to our current renewable generation

  - That means 51,000 MWH*4 hour drain time = 204,000 MWH*365 days, or:

5GW/35GWH

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Still Some Work to do to Meet ETA Goals

- Roughly double current deployment of wind/solar
- Roughly 10x battery, or other storage, over current 864 MW
- And Batteries are very expensive about $15-30 million per 100 MWH for lithium ion at grid scales
  - $5-$10 Billion to battery backup current wind and solar in the state
  - Double that at full renewable deployment (2050)

This has resulted in a conversion from coal to natural gas as our primary base power, and the addition of many gas "peakers" to switch on when renewables are not available

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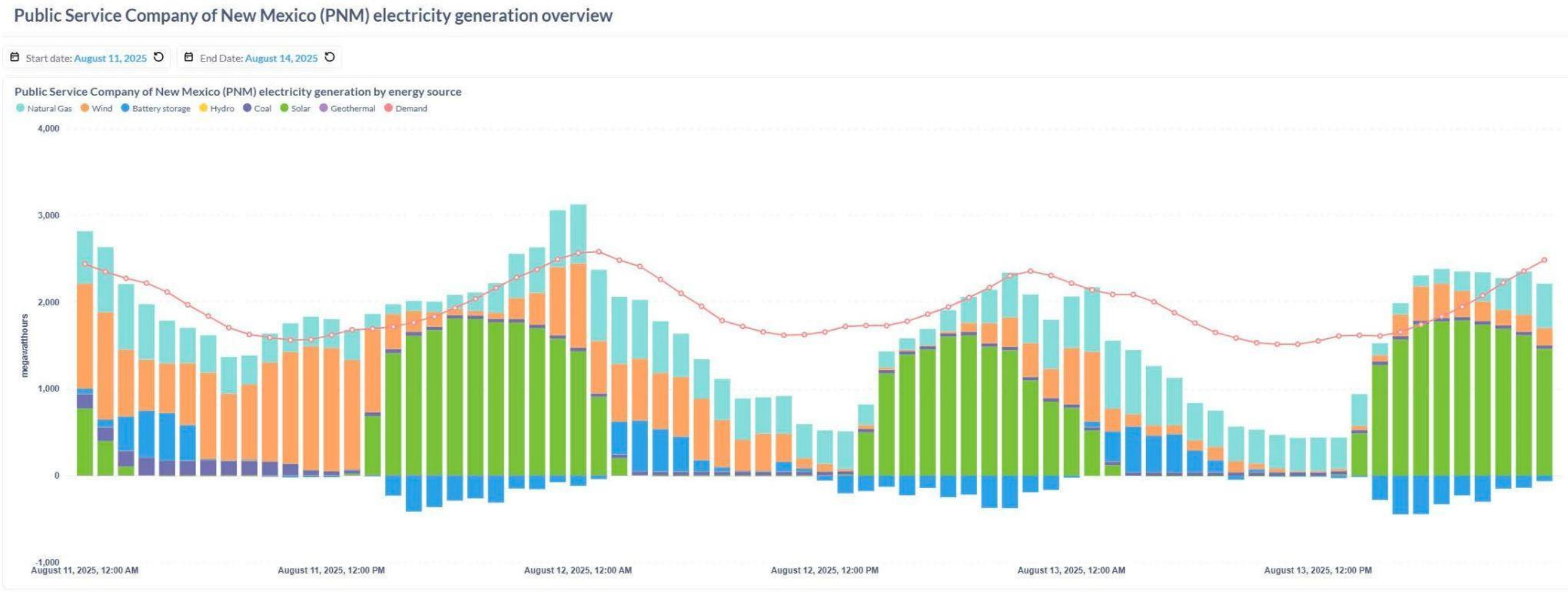
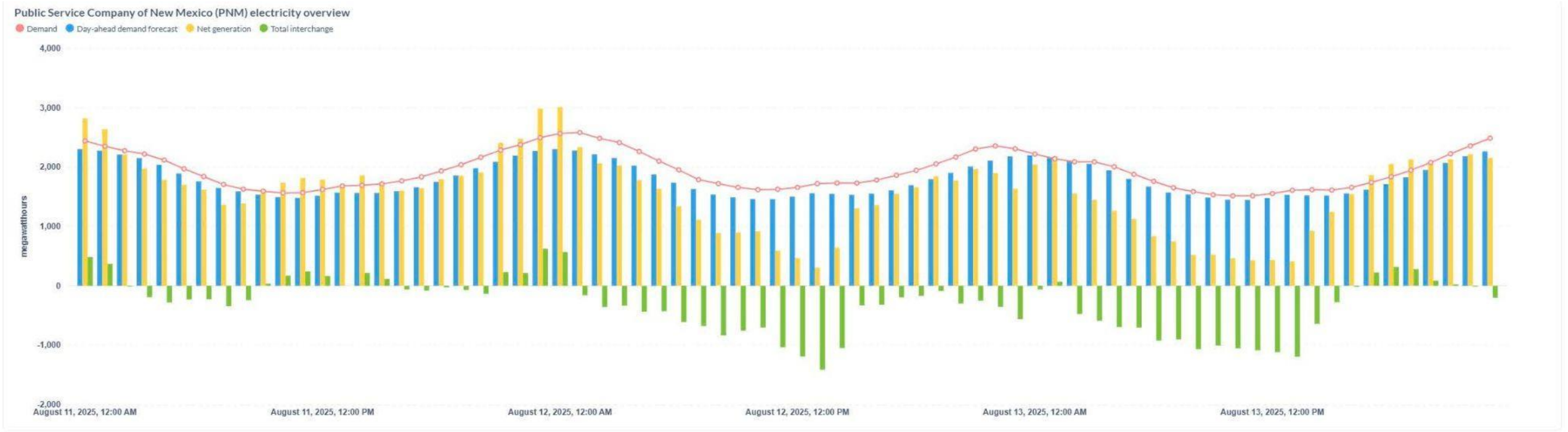
The ETA Requires Robust Power Management

Distribution of power supply for a few days in August 2025 - PNM

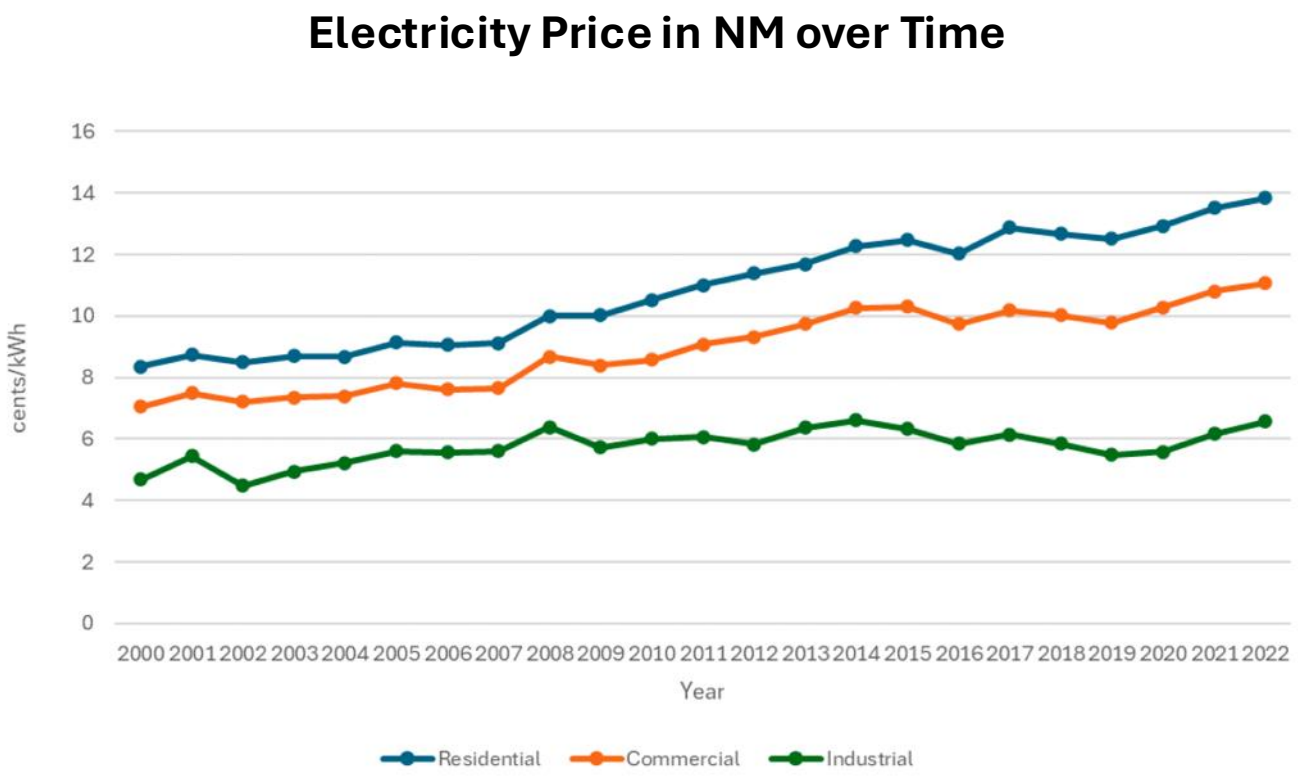


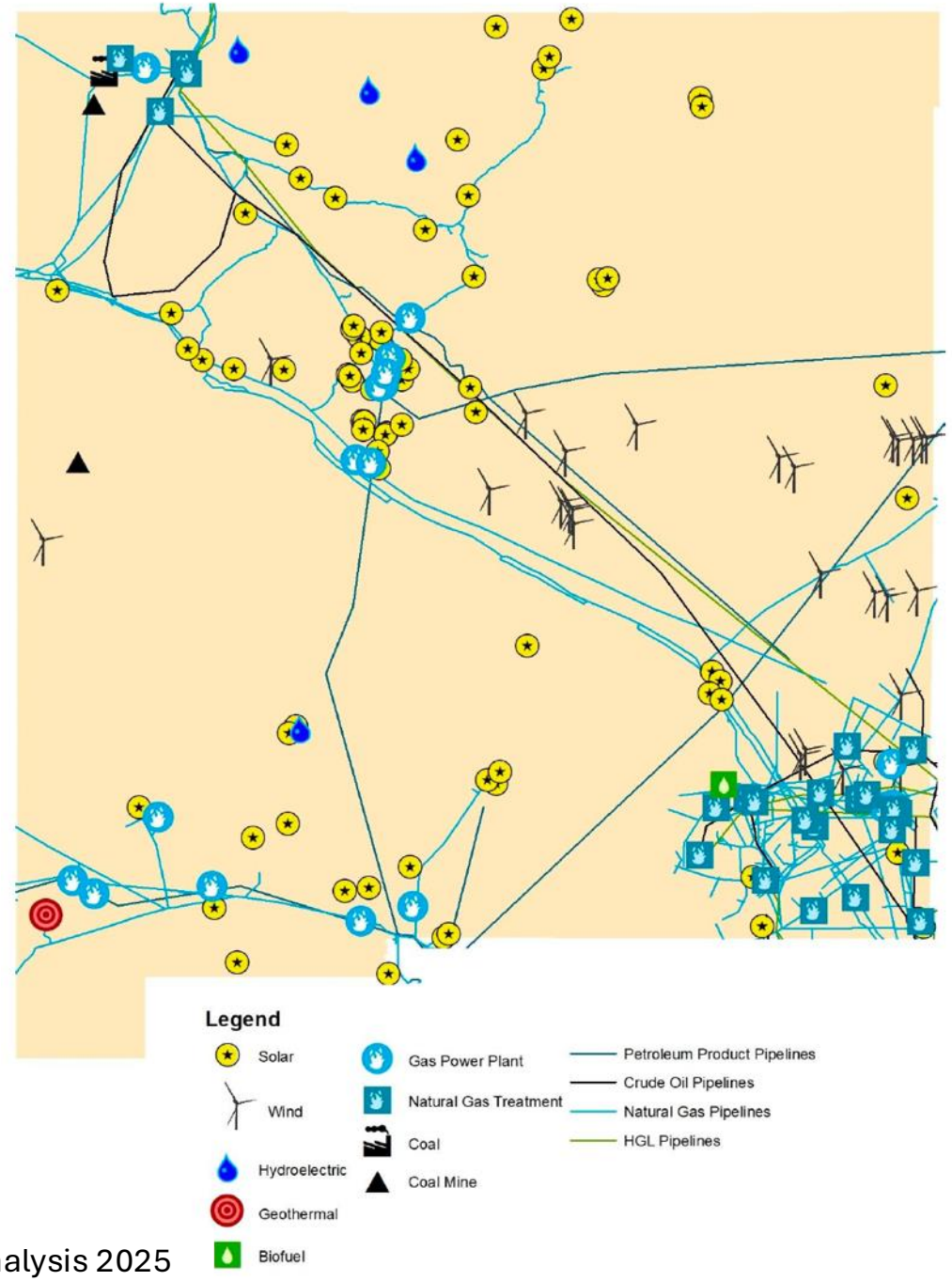
Lacking Storage We Must Draw From the Grid

Import and Export of Power – Same two days in August 2025 - PNM



Current Energy by Source in New Mexico





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