

Natural Gas & The Future Of North American Energy

Robert Bryce presentation to:
Centuri
Construction Operations Roundtable
Frisco, TX
2 June 2026

Four Points:

- Where's that energy transition?
 - AI is a gas & electricity story
- How much gas? How much juice?
 - N2N: Nat gas to nuclear



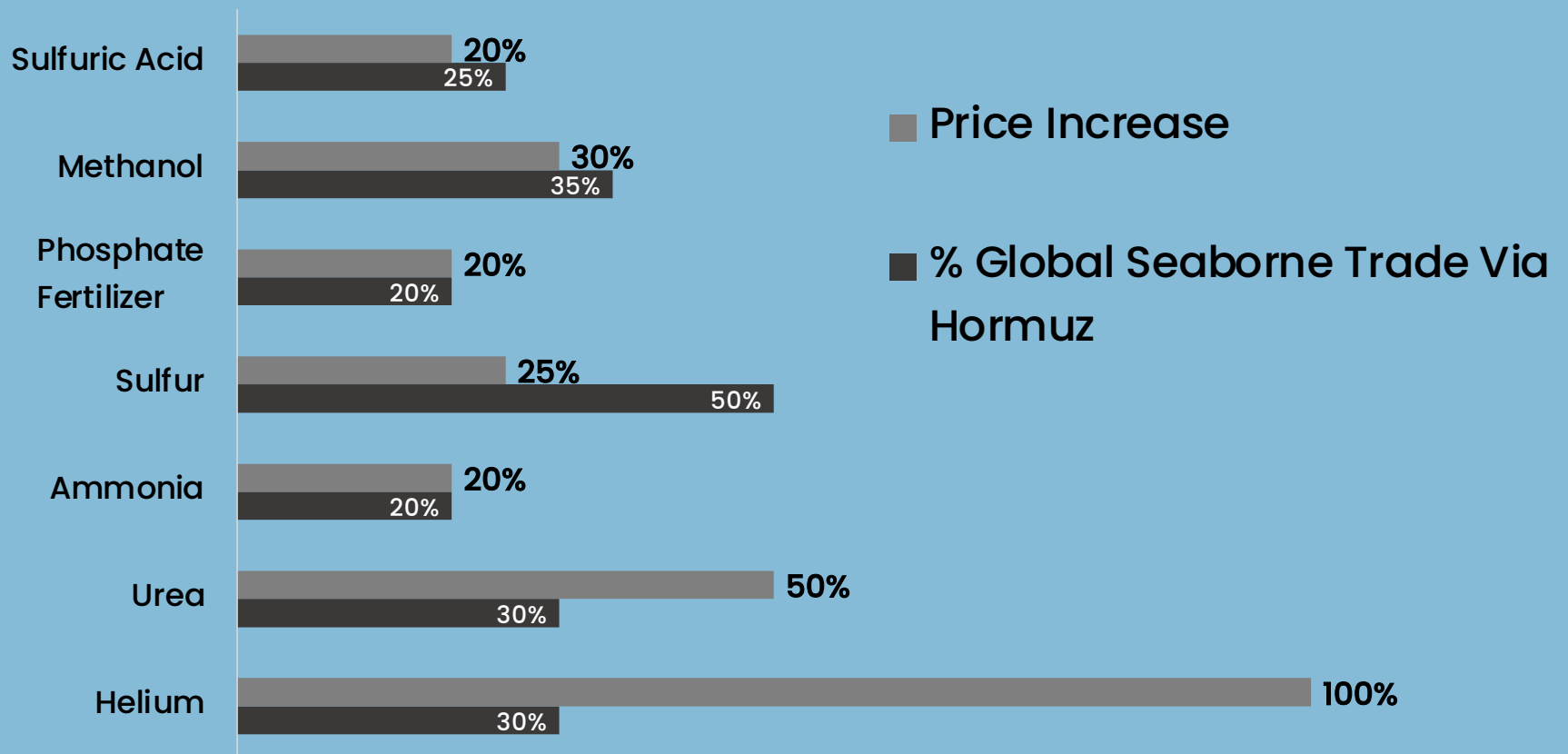
The World's Energy Economic Chokepoint



The shipping lanes in the Strait of Hormuz are two miles wide in each direction. On a normal day, 20% of global LNG and 20% of global crude oil pass through it.



It's NOT Just Oil & Gas



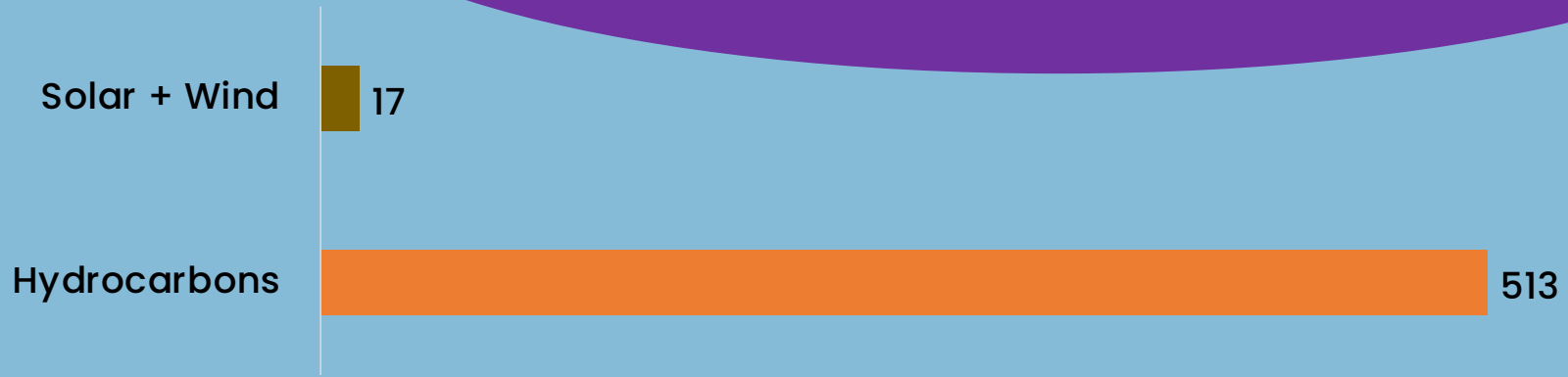
Source: IEA, S&P, media outlets

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Where's That Energy Transition?

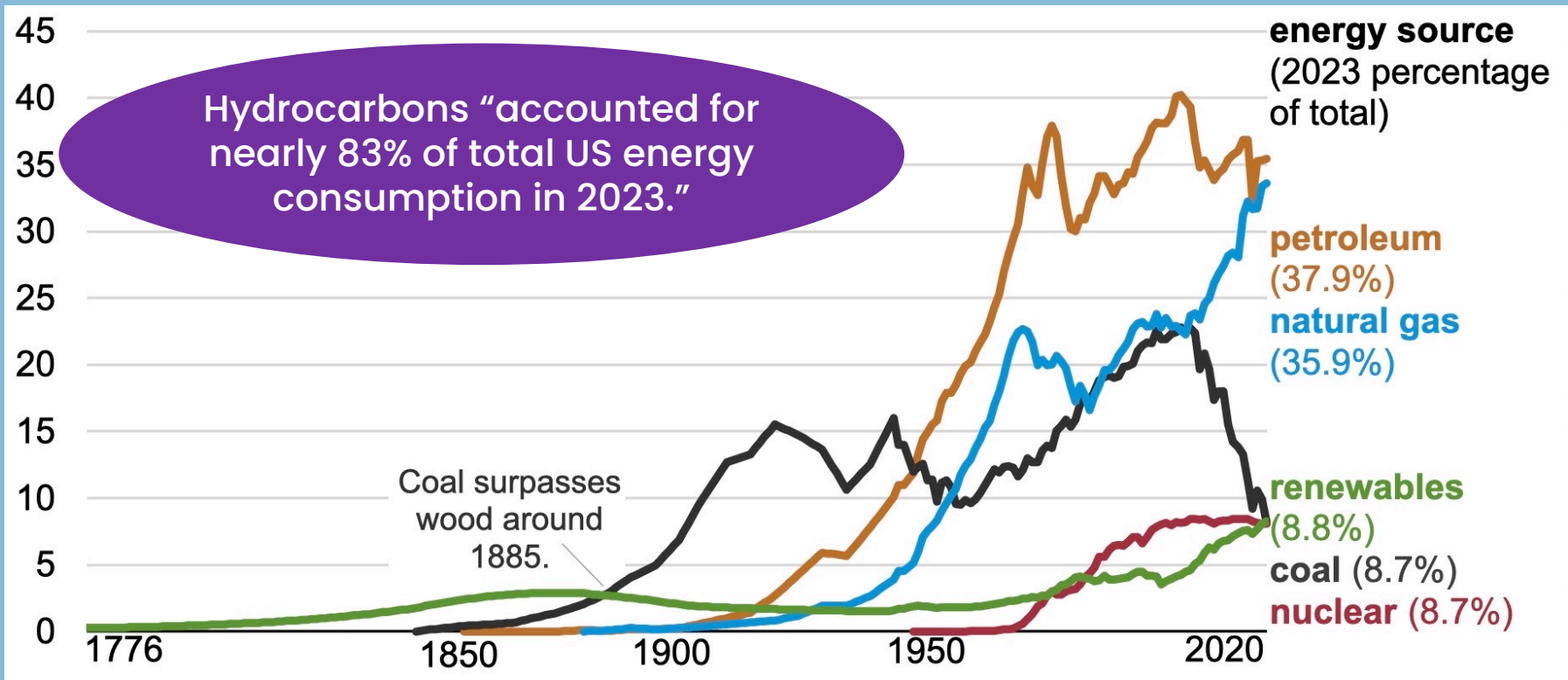
Global hydrocarbon use is 30x larger than solar + wind combined. And in 2024, hydrocarbon consumption grew 2.7x faster than solar + wind combined (8 EJ vs 3 EJ)



Global primary energy use, in EJ, 2024

Source: Statistical Review of World Energy 2025

US Energy Use, 1776 to 2023



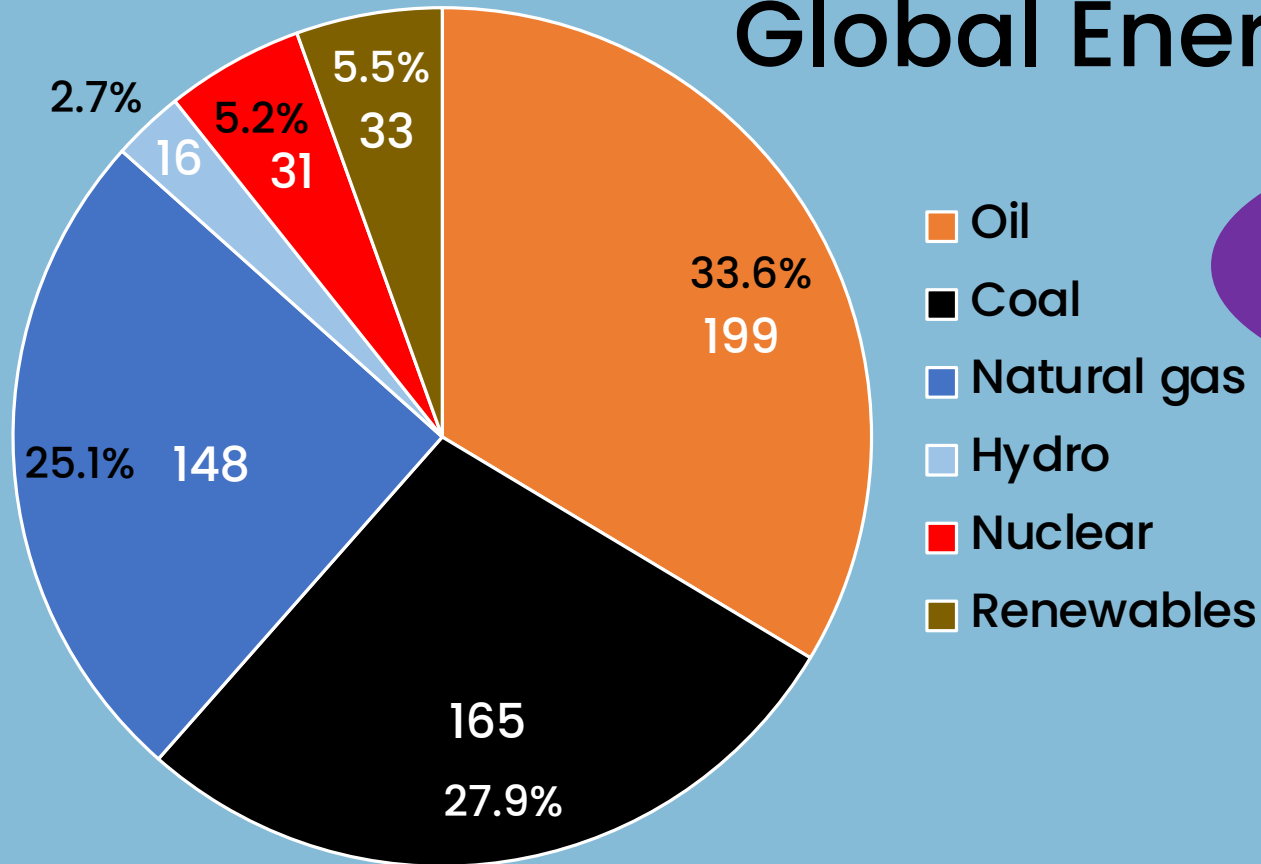
Annual US energy use, quadrillion Btu, 1776-2023

Source: EIA, July 3, 2024, <https://www.eia.gov/todayinenergy/detail.php?id=62444>

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Global Energy Use, 2024



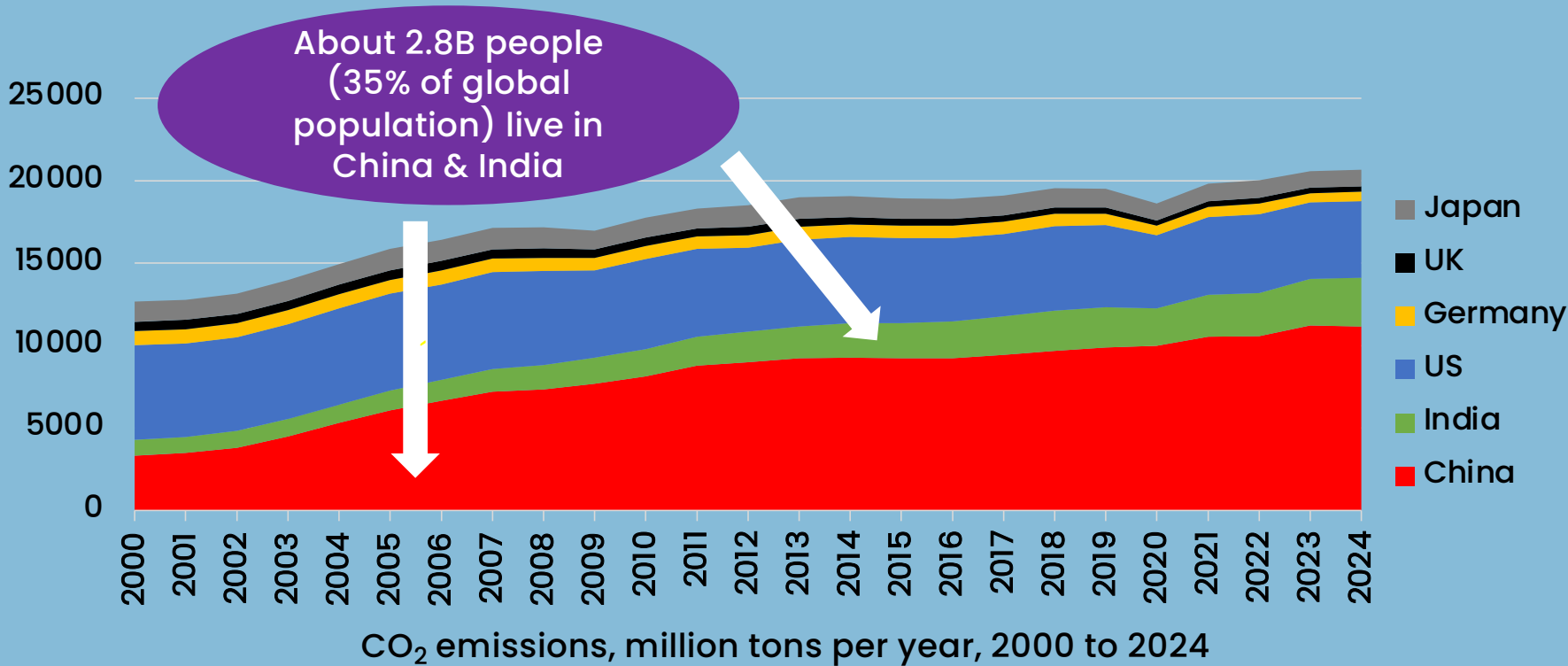
Hydrocarbons provided 86.6% of global energy in 2024

Global energy use, by type, in EJ, and %, 2024



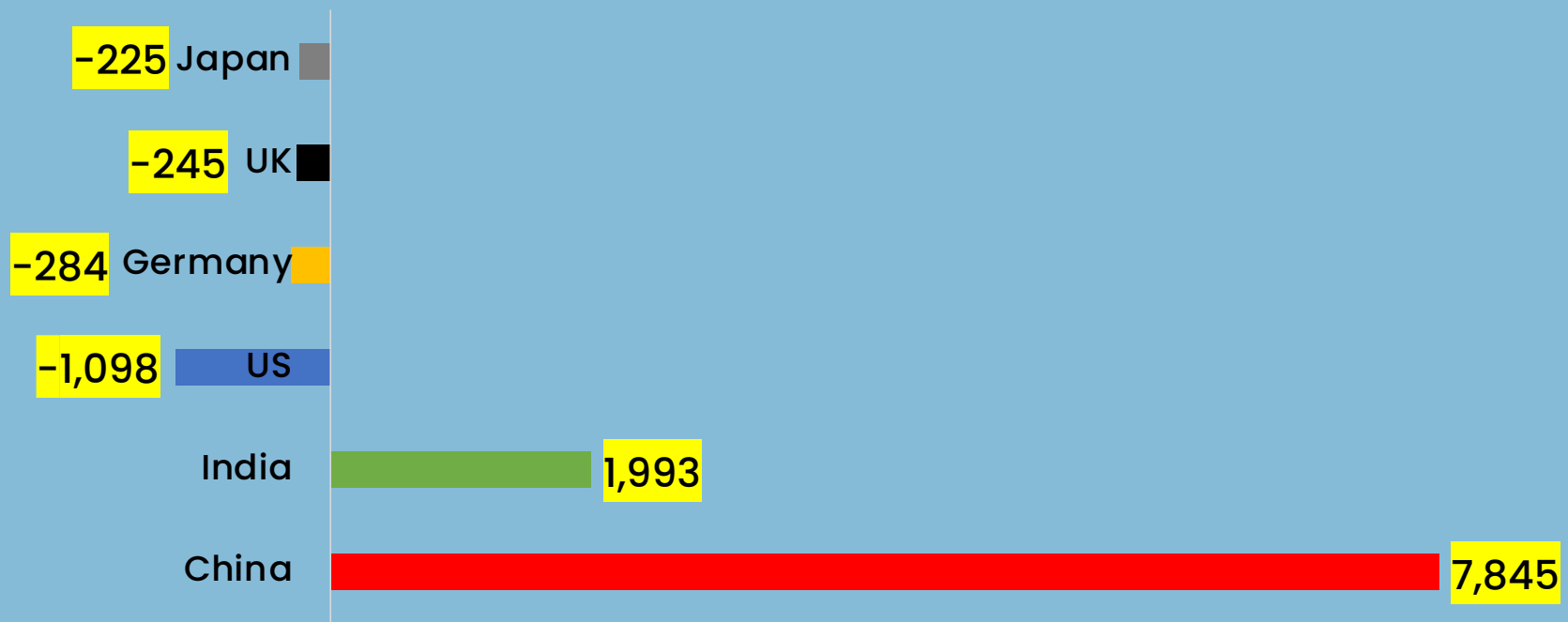
China & India Are The Emissions Story

CO₂ Emissions In Six Largest Economies



Source: Statistical Review of World Energy 2025

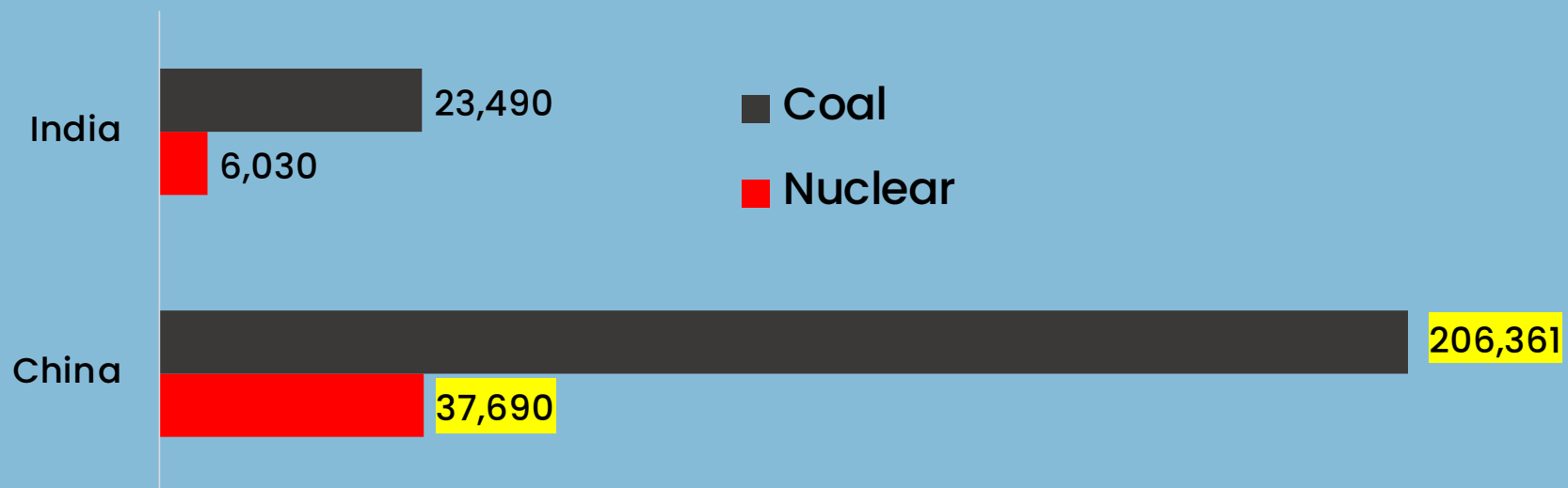
Change In CO₂ Emissions In The Six Largest Economies, 2000 to 2024



Change in emissions, million tons, 2000 to 2024



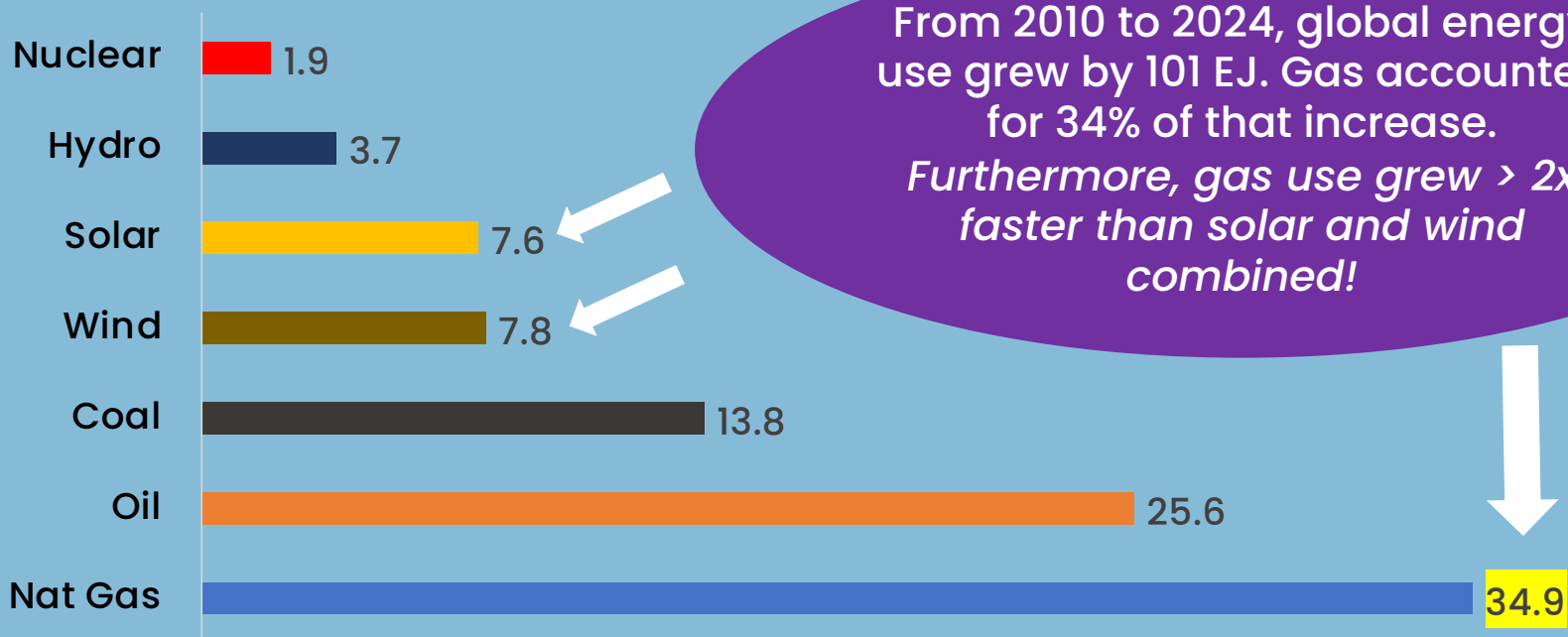
58% Of New Nuclear Is Being Built In China & India. But China's Coal Capacity Is Growing >5x Faster Than Nuclear



Power plant capacity under construction, in megawatts, April 2026



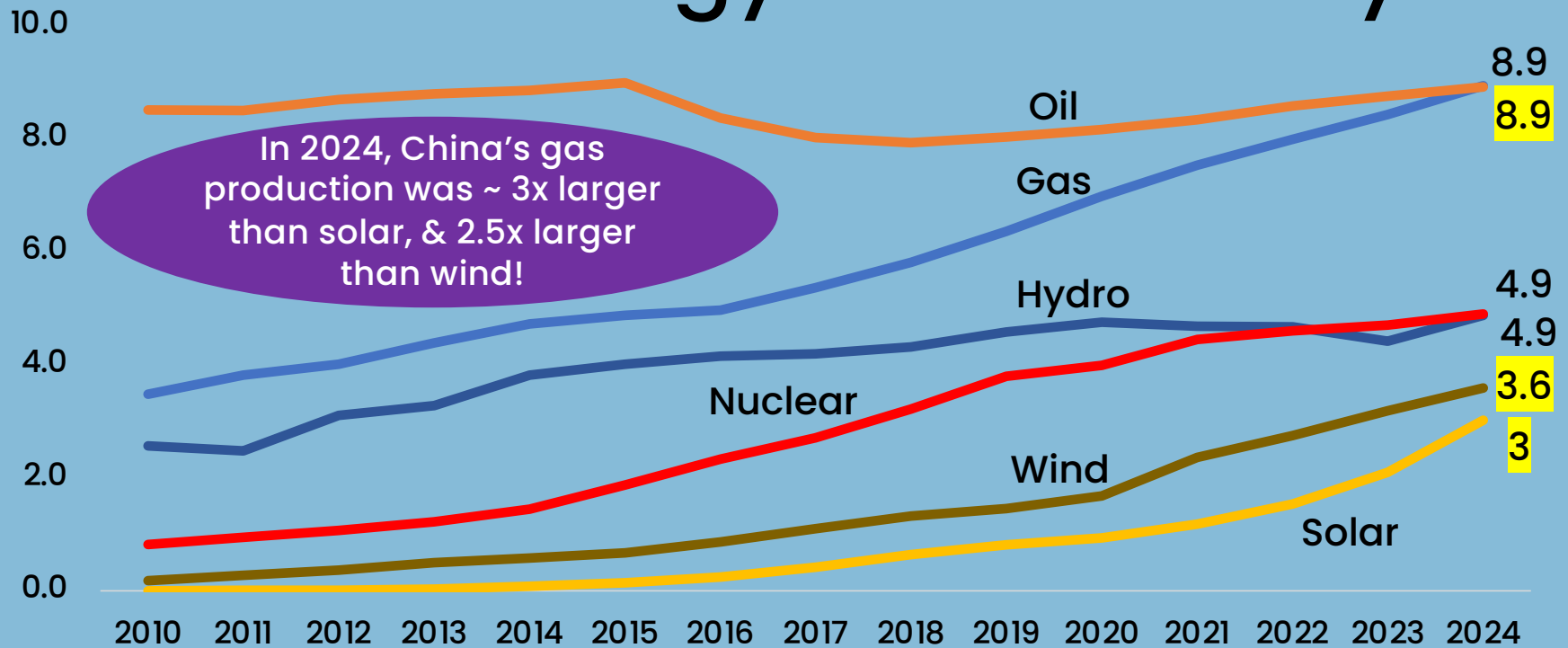
Since 2010, Natural Gas Has Grown Faster Than Any Other Type Of Primary Energy



Change in global energy use, in EJ, 2010 to 2024



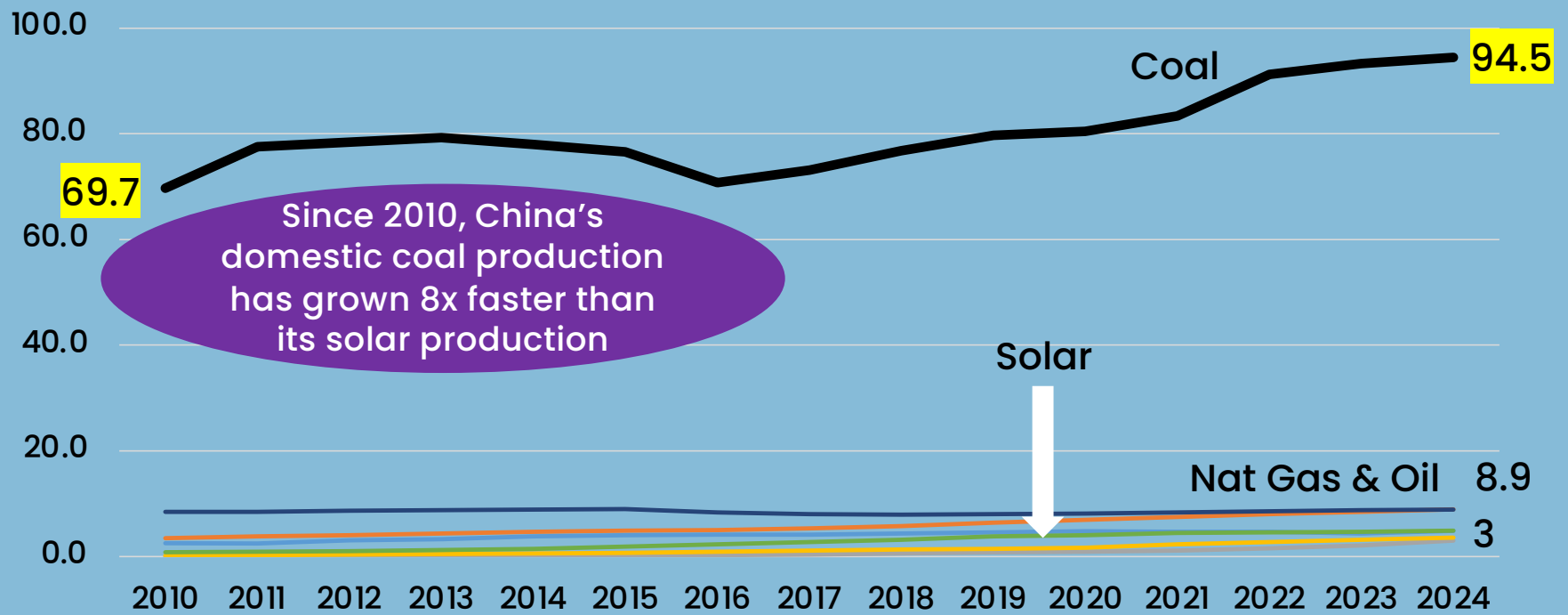
Under Xi, Gas Has Been China's Untold Energy Growth Story



Change in China's domestic energy production, (excl. coal), in EJ, 2010 to 2024



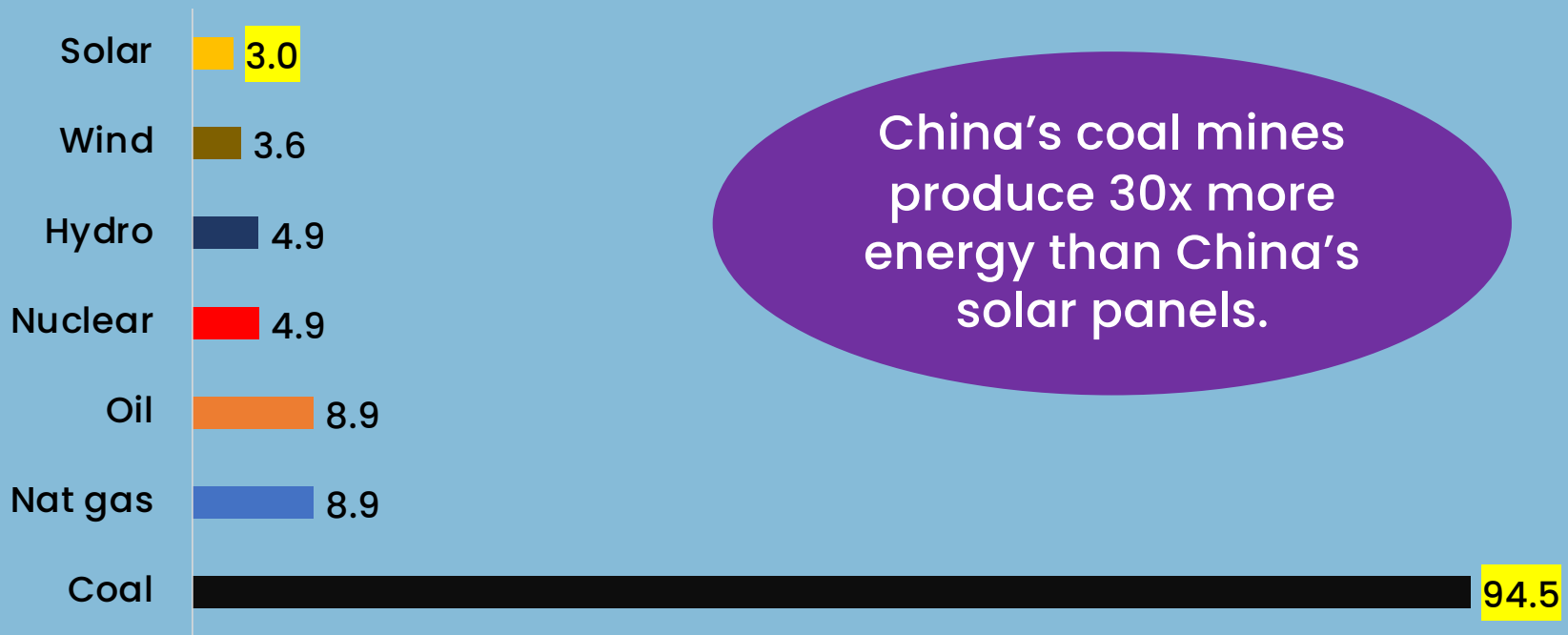
But Coal Is Still King



Change in China's domestic energy production, Including coal, in EJ, 2010 to 2024



China's "Clean" Energy Production Is Dwarfed By Its Coal Sector

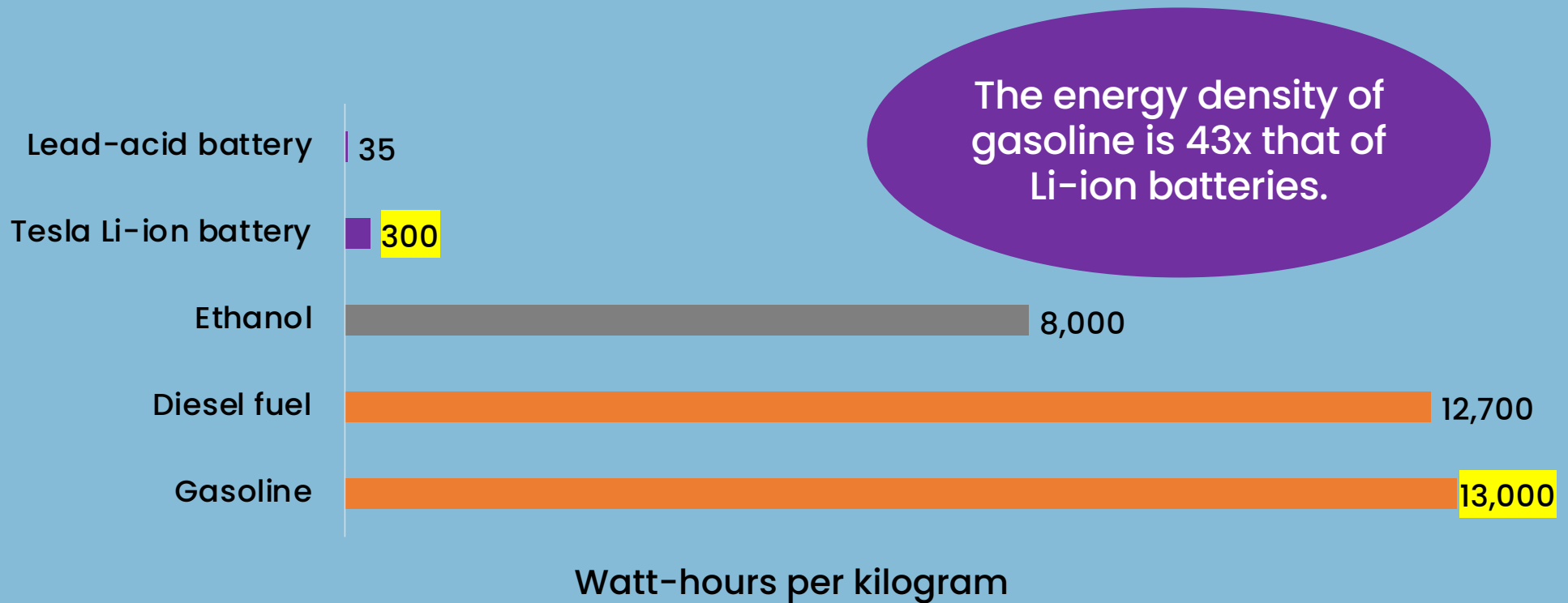


China's coal mines produce 30x more energy than China's solar panels.

China's domestic energy production, in EJ, 2024



If Oil Didn't Exist, We'd Have To Invent It



Sources: Donald Sadoway, MIT;; David J.C. MacKay, "Without the Hot Air," <https://insideevs.com/news/598656/tesla-4680-battery-cell-specs?>

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Big Wind: Friction From Ireland To Oz



Residents of Ballyfasy, Ireland protesting a wind project

Cherokee County panel adopts 1-year wind farm moratorium

Reno Commission approves moratorium on wind, to consider development ban in zoned areas

Gage County extends ban on new wind or solar permits, through mid-July

Moonlight Range Wind Farm project axed by Queensland government

Laramie County commissioners deny major wind project application after public outcry

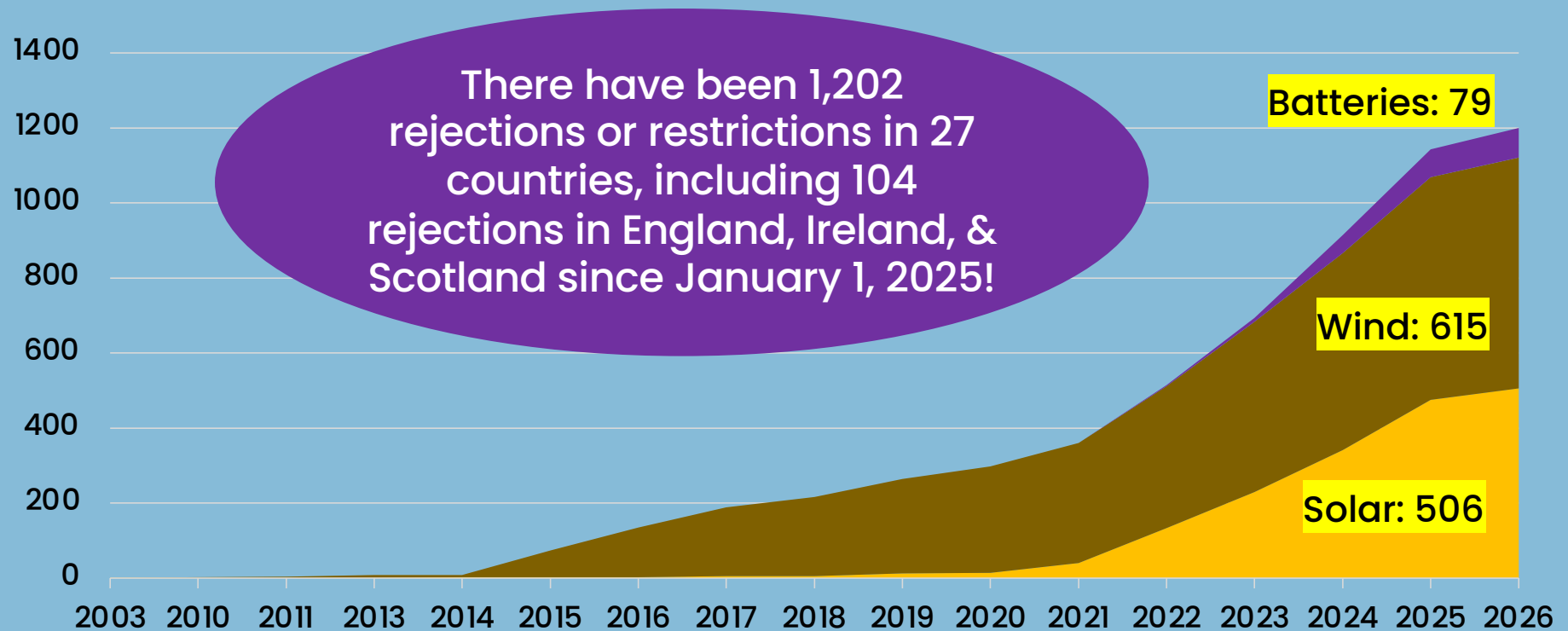
San Bernardino County bans large-scale solar, wind in some areas

4 Druze seriously injured, 12 cops hurt in massive riots against Golan wind farm

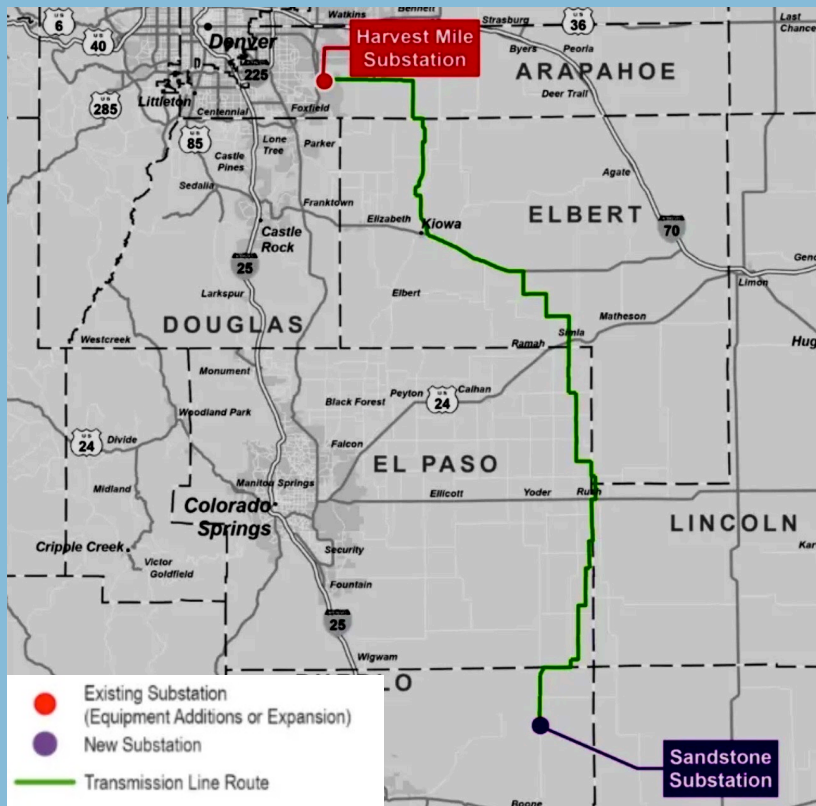
Rejection of 200m turbine bid near Loch Ness hailed by campaigners



Global Rejections Of Solar, Wind, & Batteries



HV Transmission: Friction Across US



Colorado Power Pathway route map

El Paso County says no to billion-dollar energy project over 'great concerns'

Elbert County says no to Xcel Energy's Power Pathway permit request

Commissioners are irked the state's largest utility started suing residents for eminent domain before it had permits for a crucial route through their rural county

Frankly, I don't care about Denver.
— Elbert Cty Commissioner Byron McDaniel, June 26, 2025



AI Is An Electricity Story



- It's hard to overstate how important energy is to the future here...Eventually the cost of intelligence, the cost of AI, will converge to the cost of energy and it'll be how much you can have. The abundance of it will be limited by the abundance of energy.

— OpenAI CEO Sam Altman, to US Senate Commerce, Science, and Transportation Committee, May 8, 2025



Data Centers Dwarf All Other Customer Classes

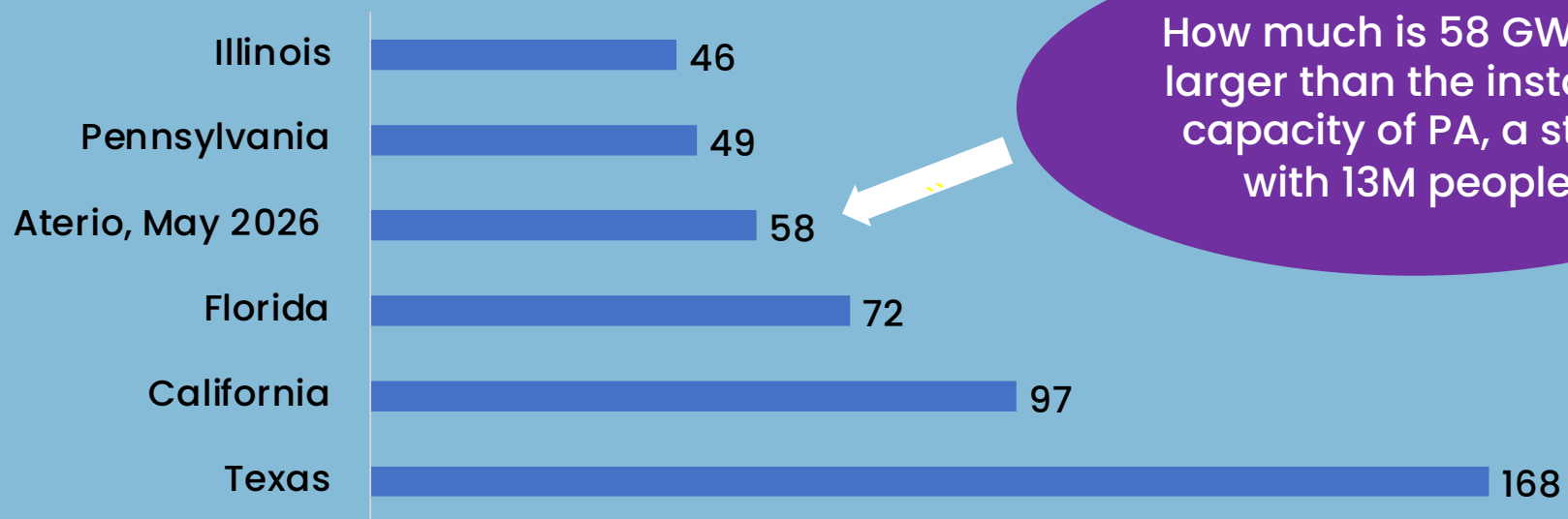


Source: MISO, <https://cdn.misoenergy.org/20241218%20Medium%20and%20Long%20Term%20Forecast%20Workshop%20Presentation667265.pdf>, 15.

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US Is Now Building 58 GW Of Data Center Capacity

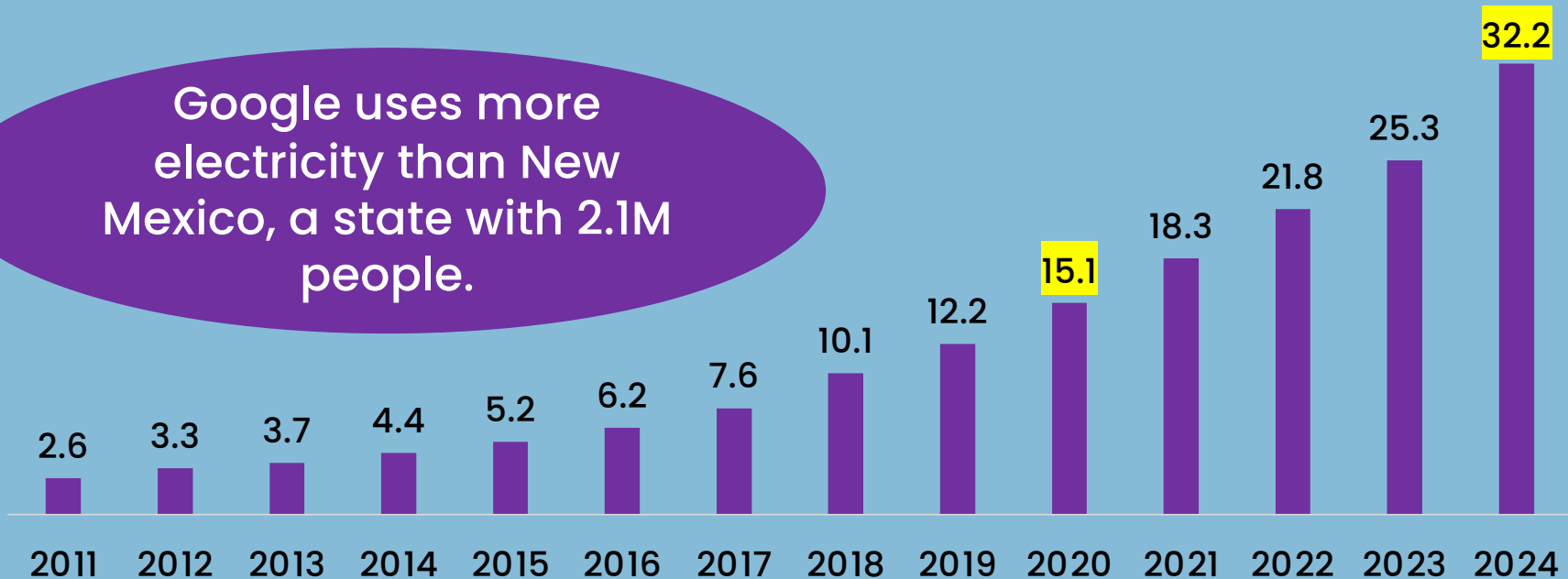


Summer 2024 generation capacity by state, in GW, and Aterio estimate



Since 2020, GOOG's Electricity Use Has Doubled

Google uses more electricity than New Mexico, a state with 2.1M people.

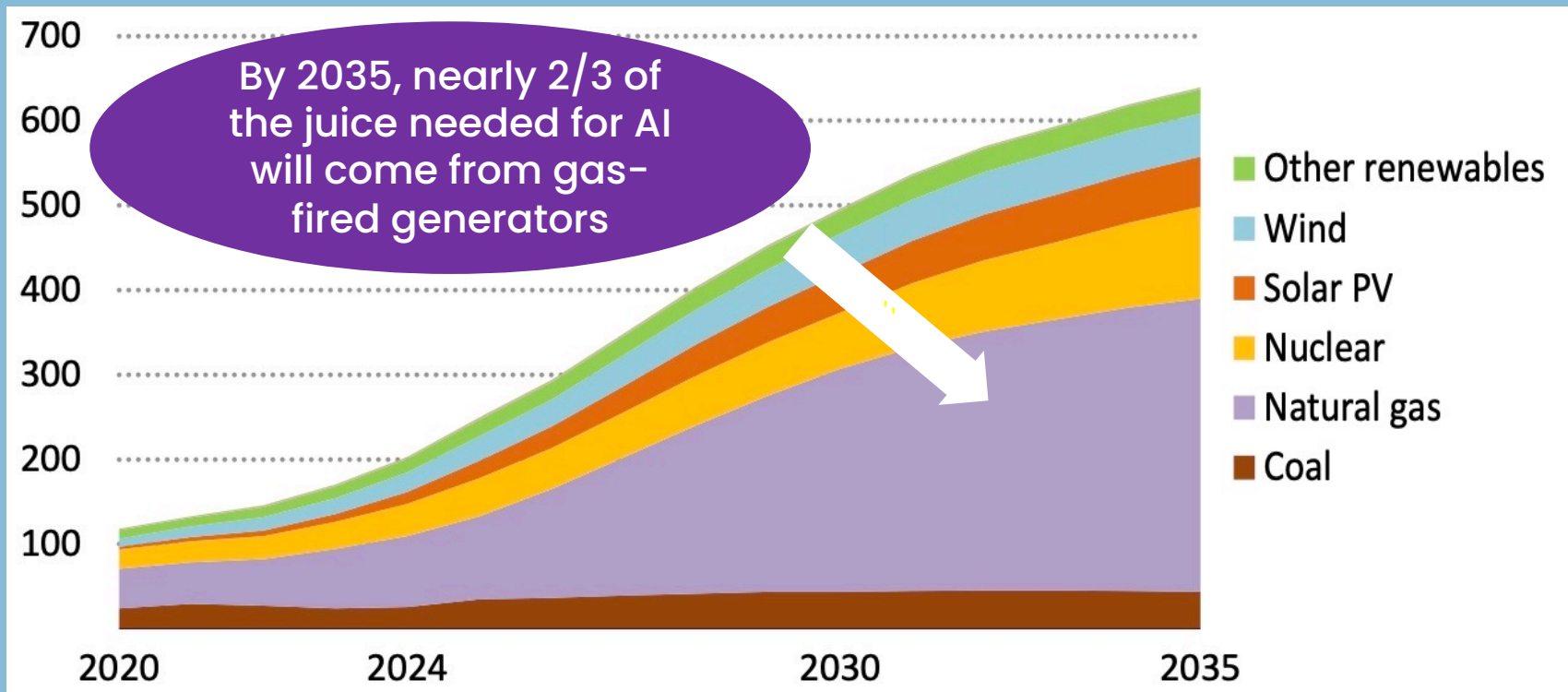


Electricity use per year, in TWh, 2011 to 2024

Source: <https://www.gstatic.com/gumdrop/sustainability/google-2024-environmental-report.pdf>, <https://www.gstatic.com/gumdrop/sustainability/google-2019-environmental-report.pdf>, <https://www.gstatic.com/gumdrop/sustainability/google-2025-environmental-report.pdf>



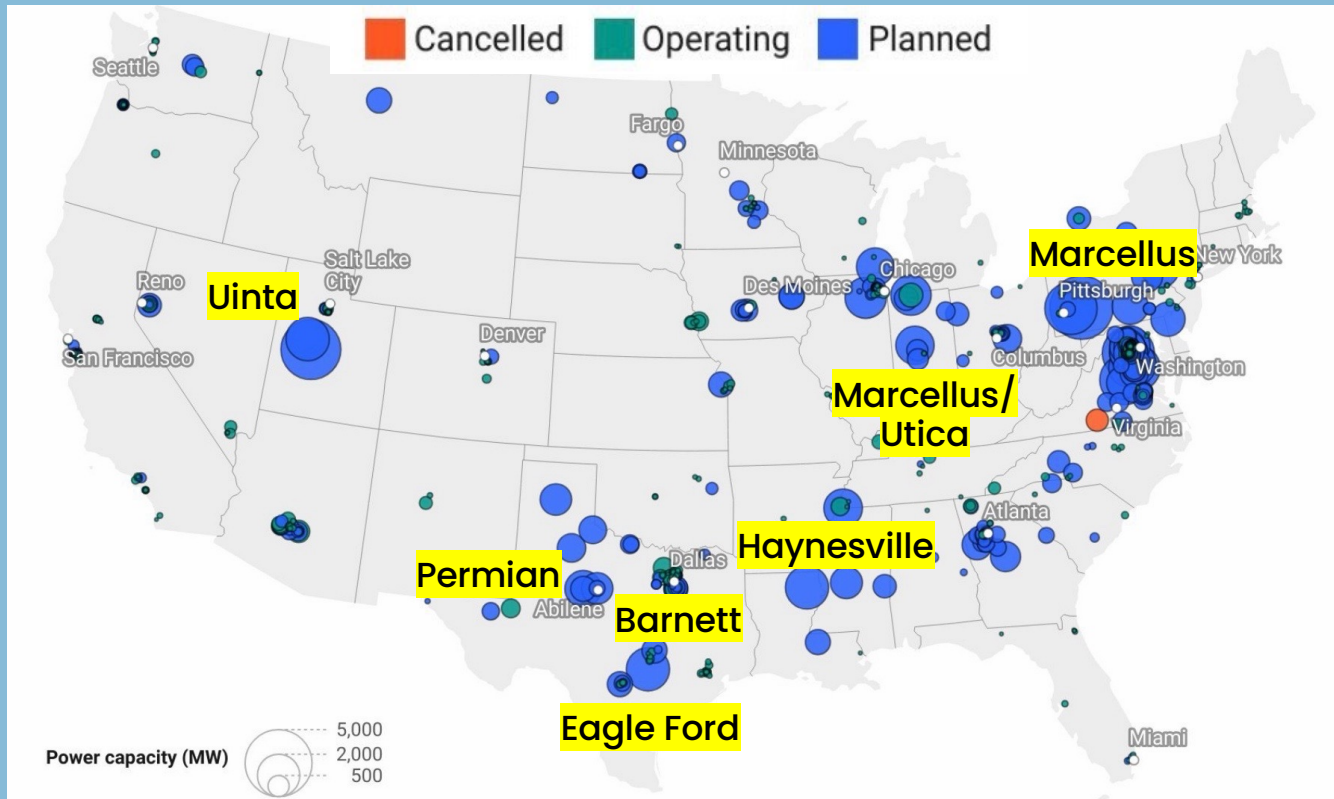
AI Is A Gas Story



IEA: Projected electricity generation for US data centers, in TWh, 2020 to 2035



AI Data Centers Are Being Built On Or Near Major US Gas Fields



Source: AGA, author

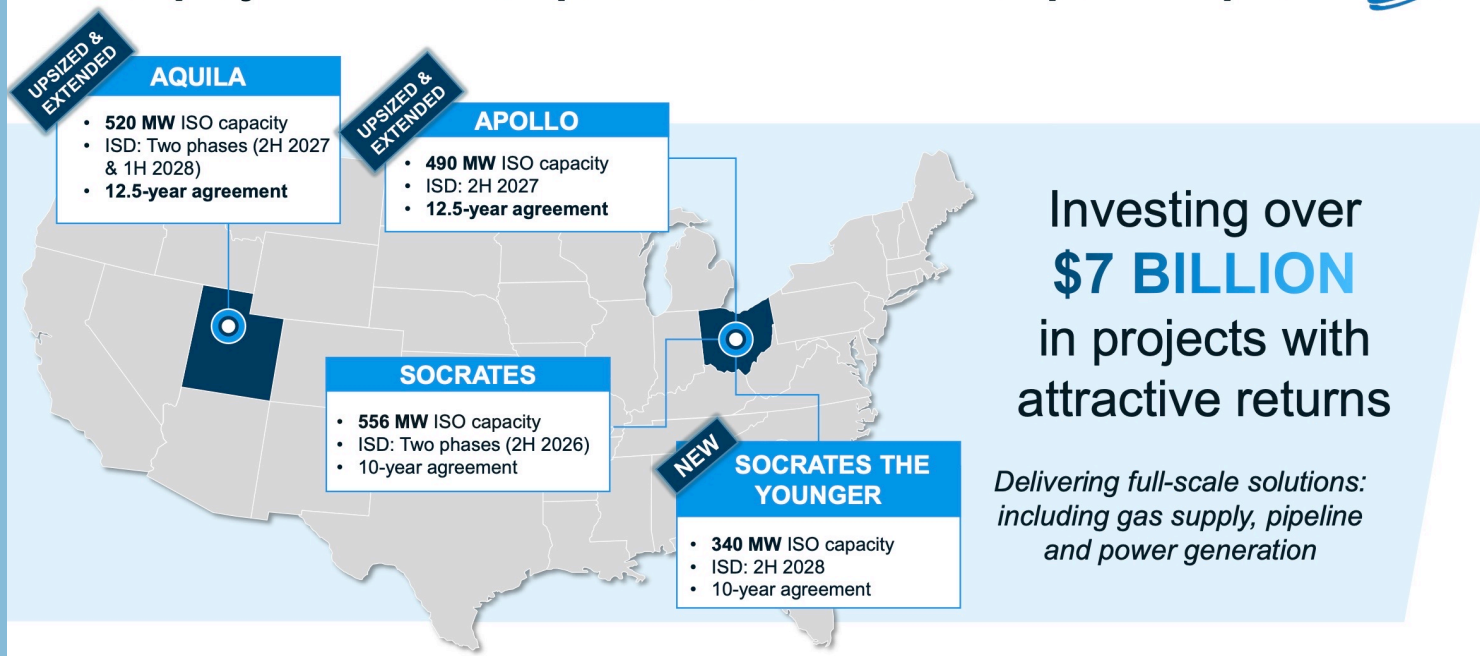
US data centers capacity expected by 2030

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Gas Pipeline Companies Are Getting Into The Power Business: WMB

New project secured; upsized and extended Aquila & Apollo 



Investing over
\$7 BILLION
in projects with
attractive returns

*Delivering full-scale solutions:
including gas supply, pipeline
and power generation*

Williams analyst day presentation, February 2026

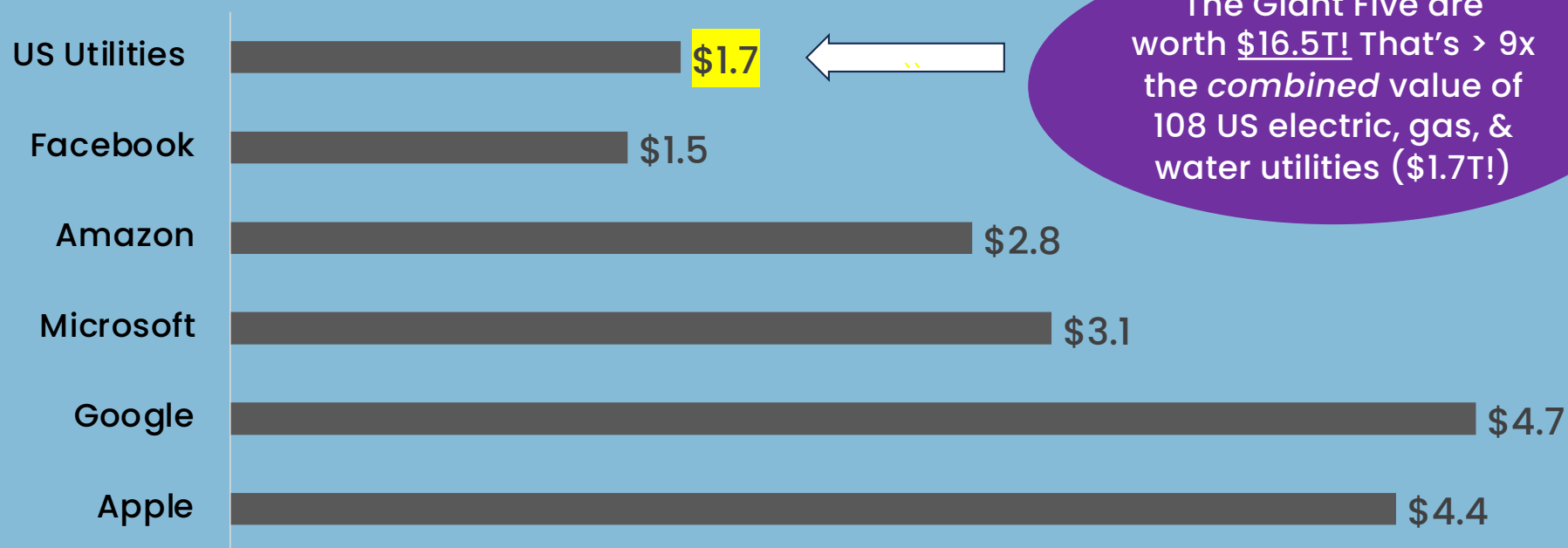
And Now, Tallgrass...

Tallgrass and Mitsubishi Power Americas Announce Turbine Allocation for Cheyenne Power Hub

Tallgrass and Mitsubishi announced delivery of the first two M501JAC gas turbines that will support Phase 1 of Tallgrass' Cheyenne Power Hub in southeast Wyoming. The high-efficiency turbines are expected to provide approximately 1,150 megawatts of site-ready power fueled by natural gas supplied through Tallgrass' Rockies Express Pipeline, leveraging the region's existing energy infrastructure.

— Tallgrass press release, May 15, 2026

Big Tech Dwarfs US Utilities

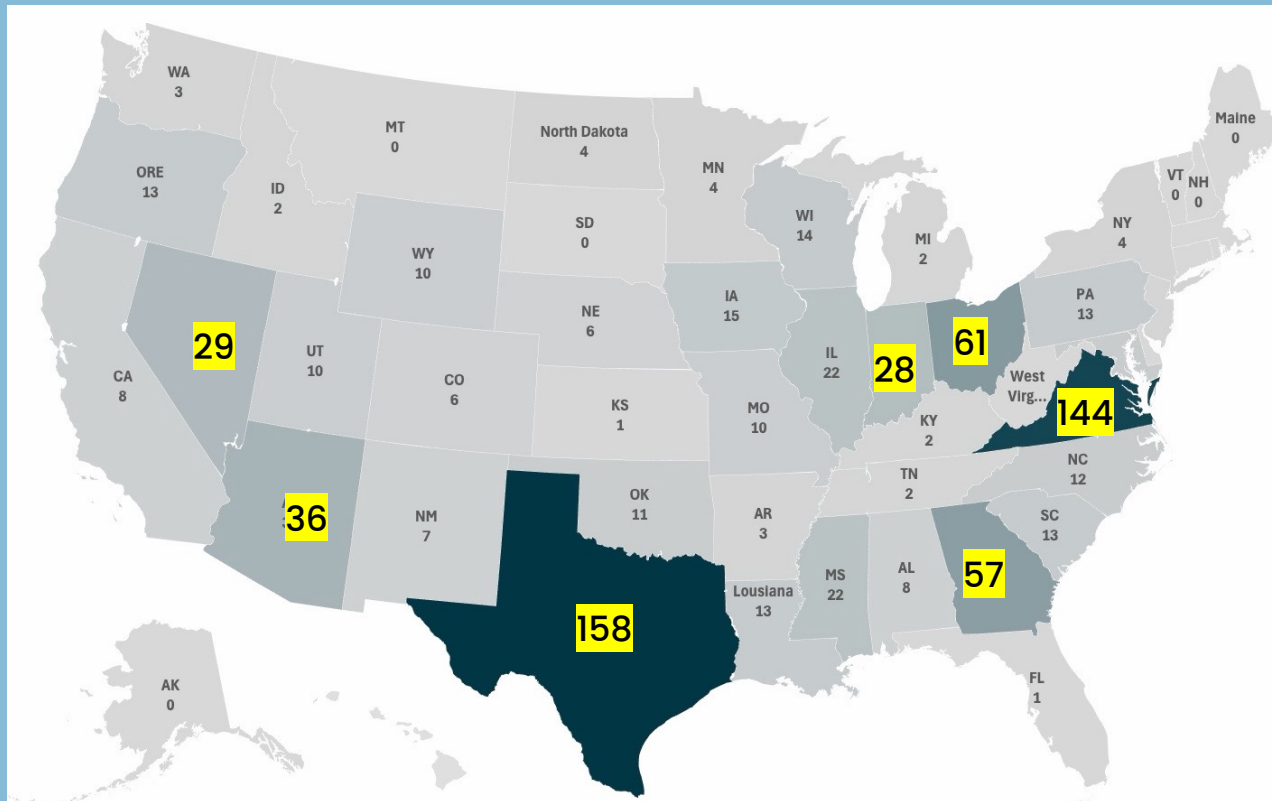


The Giant Five are worth \$16.5T! That's > 9x the *combined* value of 108 US electric, gas, & water utilities (\$1.7T!)

Market cap of Big Five tech companies vs. 108 US-listed utilities, in \$Trillion



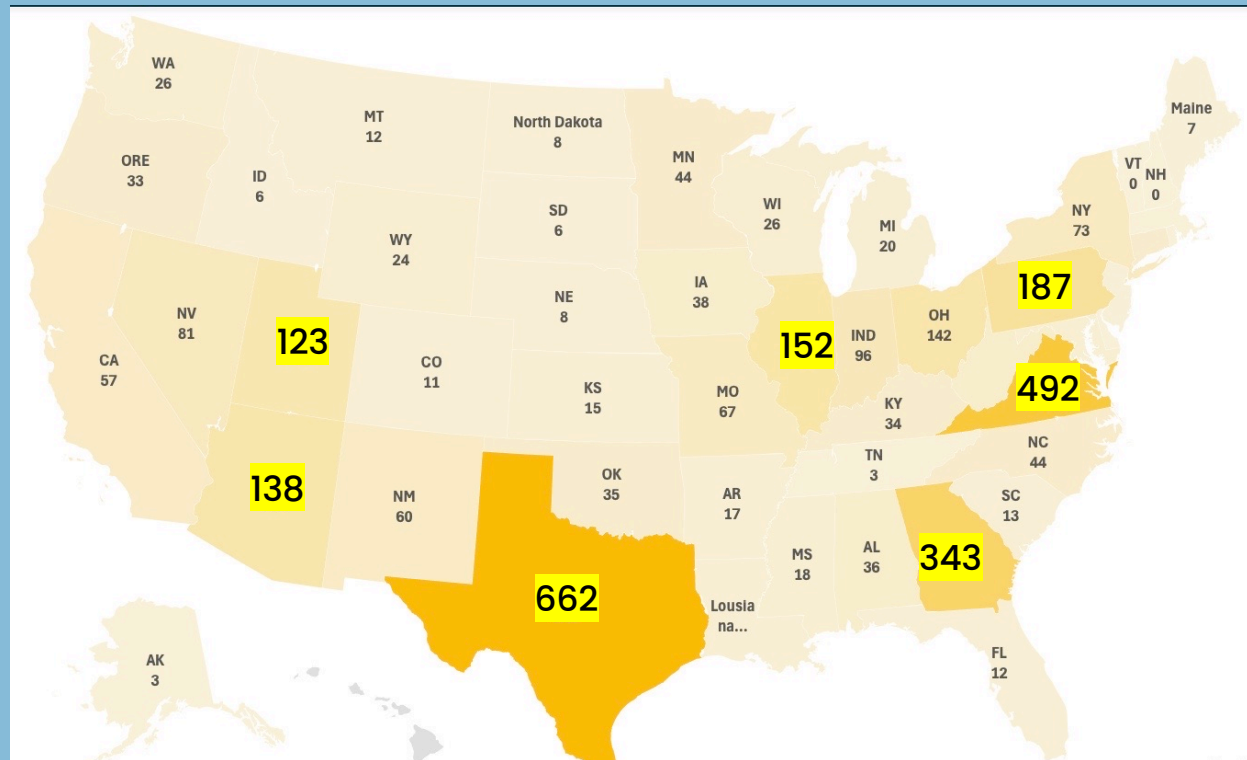
These 7 States Account For 64% Of All Data Centers Under Construction



US data centers under construction, May 2026

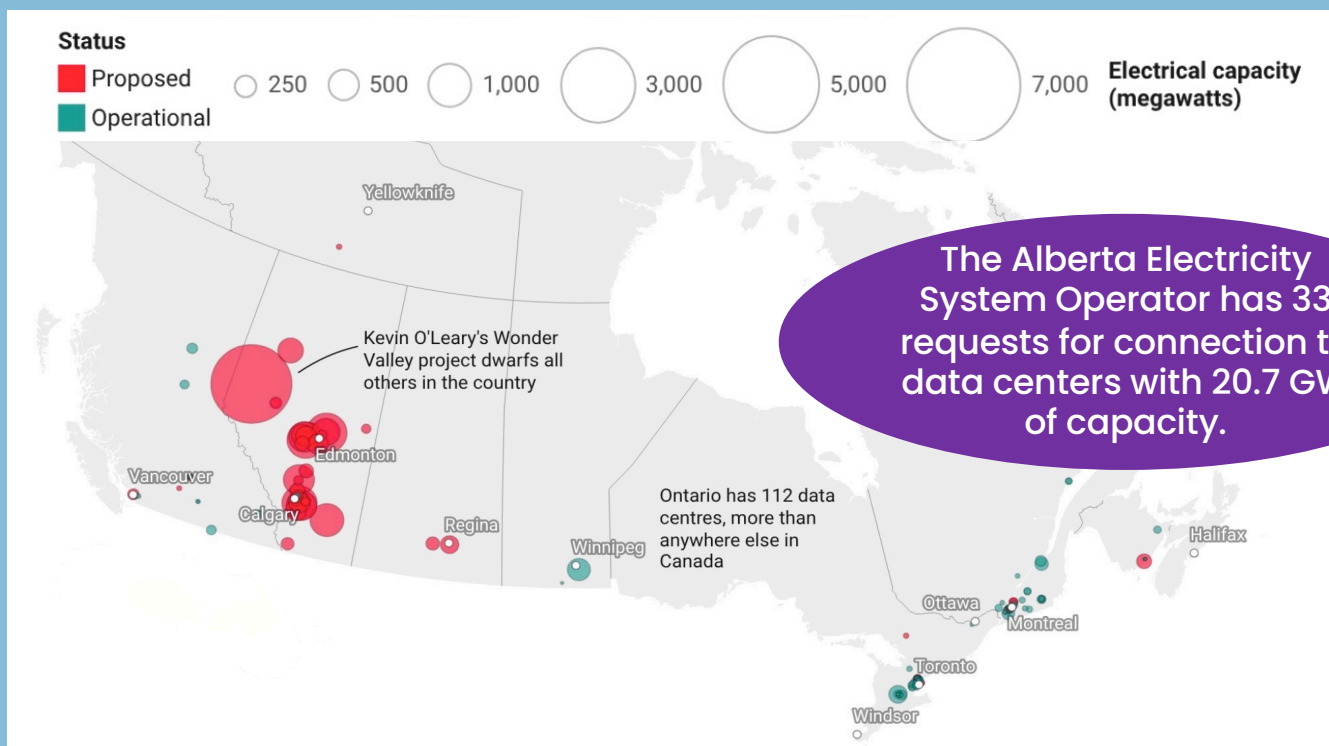
Source: Aterio, March data center report, <https://www.aterio.io/insights/us-data-centers>, ERCOT, <https://www.ercot.com/files/docs/2026/03/12/March-TAC-Report.pdf>

These 7 States Account For 67% Of All Announced Data Centers



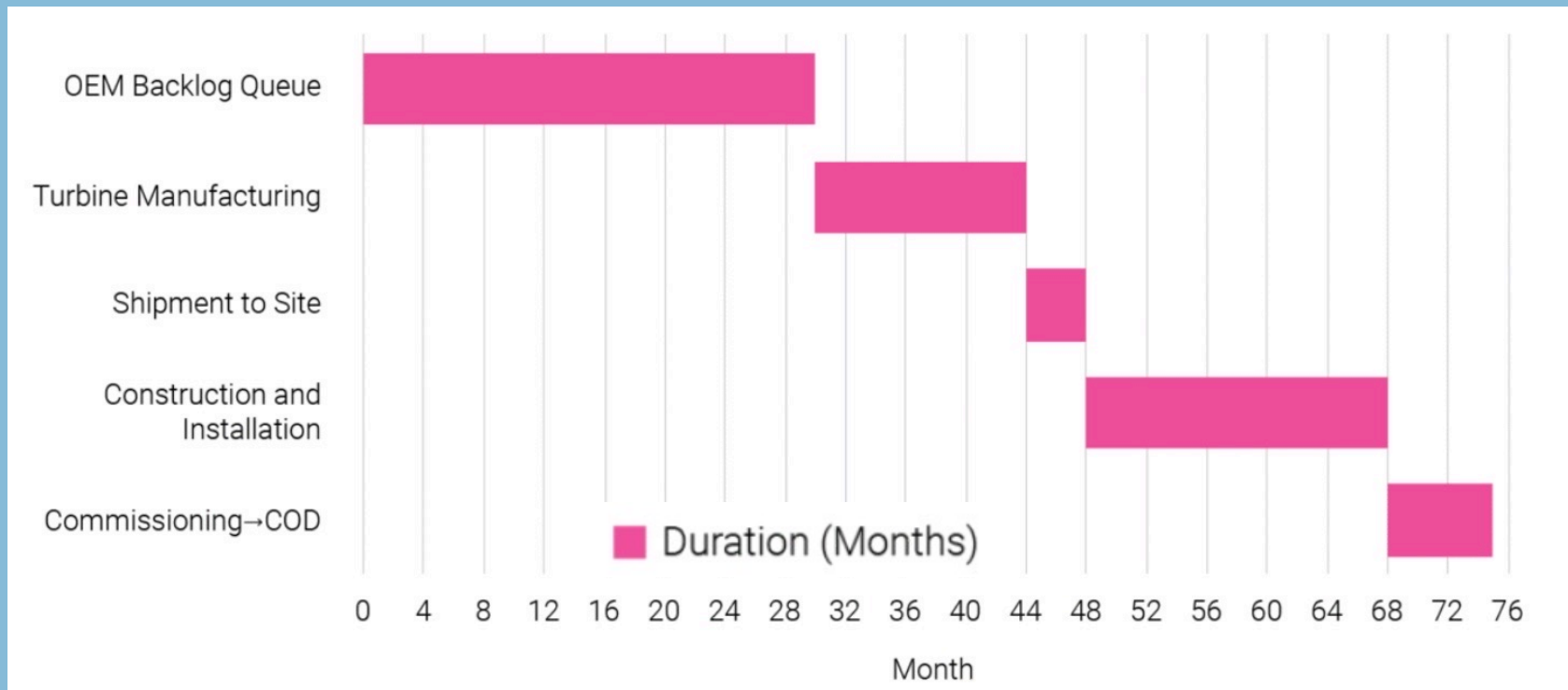
US data centers that have been announced, May 2026

Alberta Is Canada's AI Future. Why? AB Produces 61% of Canada's Gas!



Proposed and operational data centers, April 2026

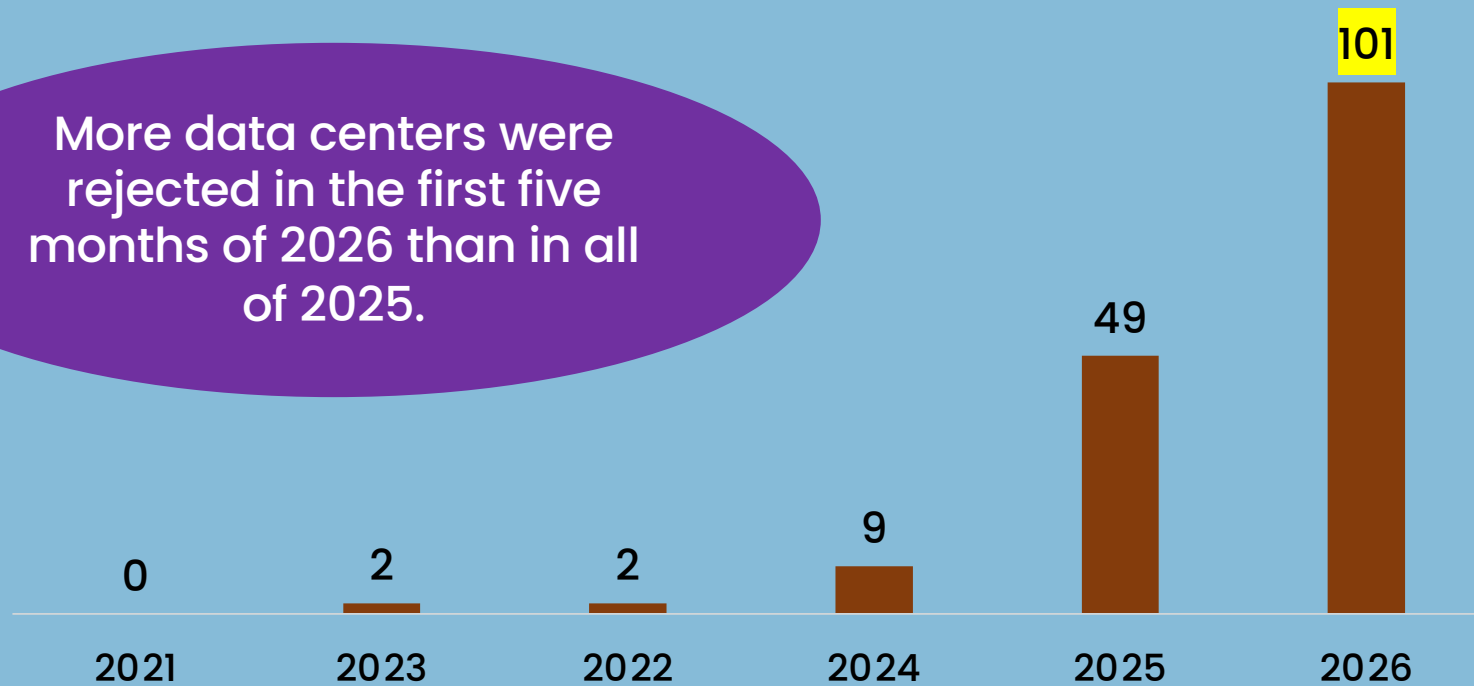
What About Supply Chains?



Timeline for large gas-fired generation installation

US Data Center Rejections By The Numbers

More data centers were rejected in the first five months of 2026 than in all of 2025.



US rejections or restrictions of data centers, 2021 to May 2026

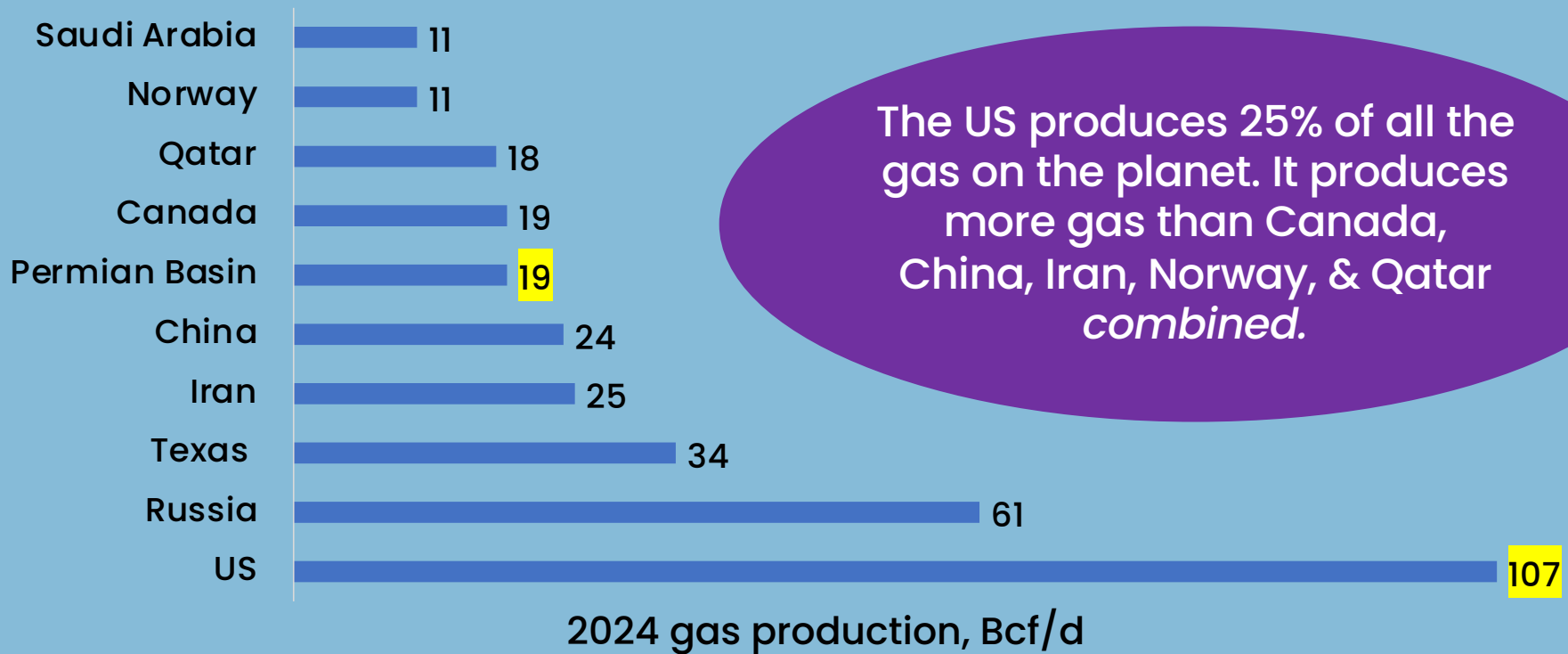
N2N: Natural Gas To Nuclear

Why Natural Gas?

- It's affordable & dispatchable
- CH₄ resources are super abundant & widely distributed
 - Low political risk, can be burned in turbines & ICEs
- Gas-fired generation in developing world is miniscule
 - Gas pipeline & storage network is huge



The US Is A Gas Superpower

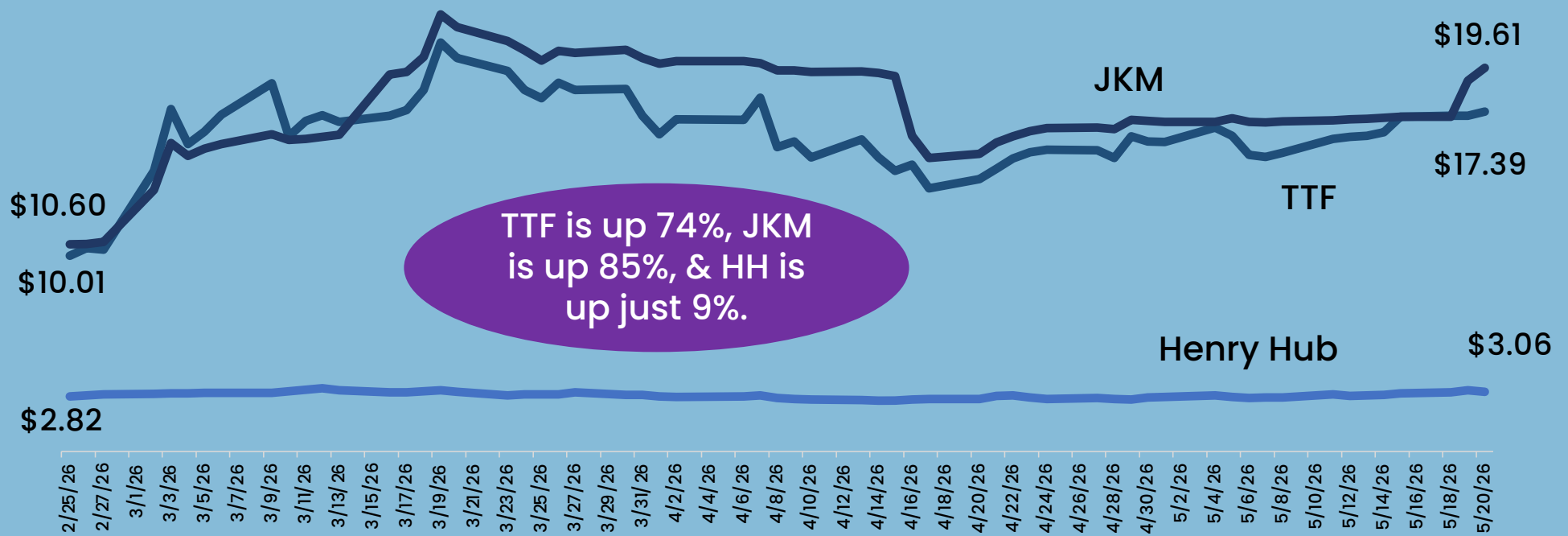


Source: Statistical Review of World Energy 2025, TXOGA. Note: Numbers for TX and Permian are for March 2025.

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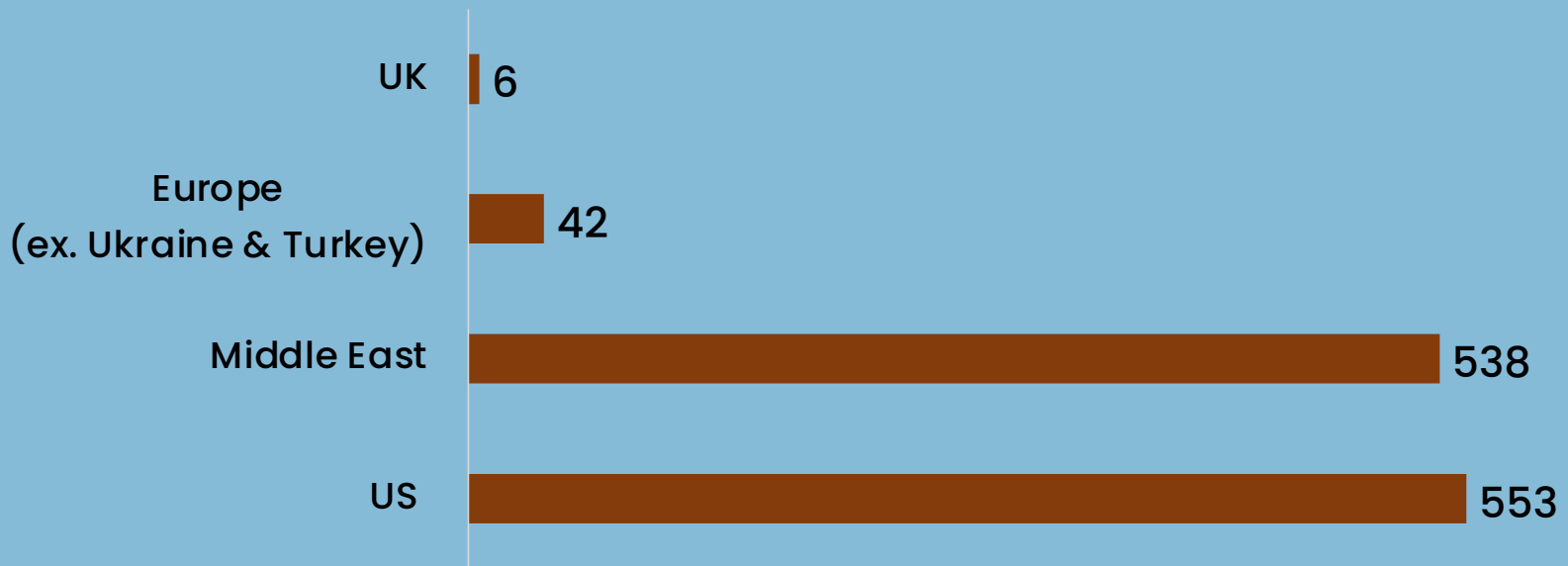
Since The Start Of The Iran War, Natural Gas Prices In The US Have Been Flat. But In Europe (TTF) and Asia (JKM) They've Soared.



Front-month nat gas spot price, \$US/MMBtu, Feb. 25 to May 20, 2026



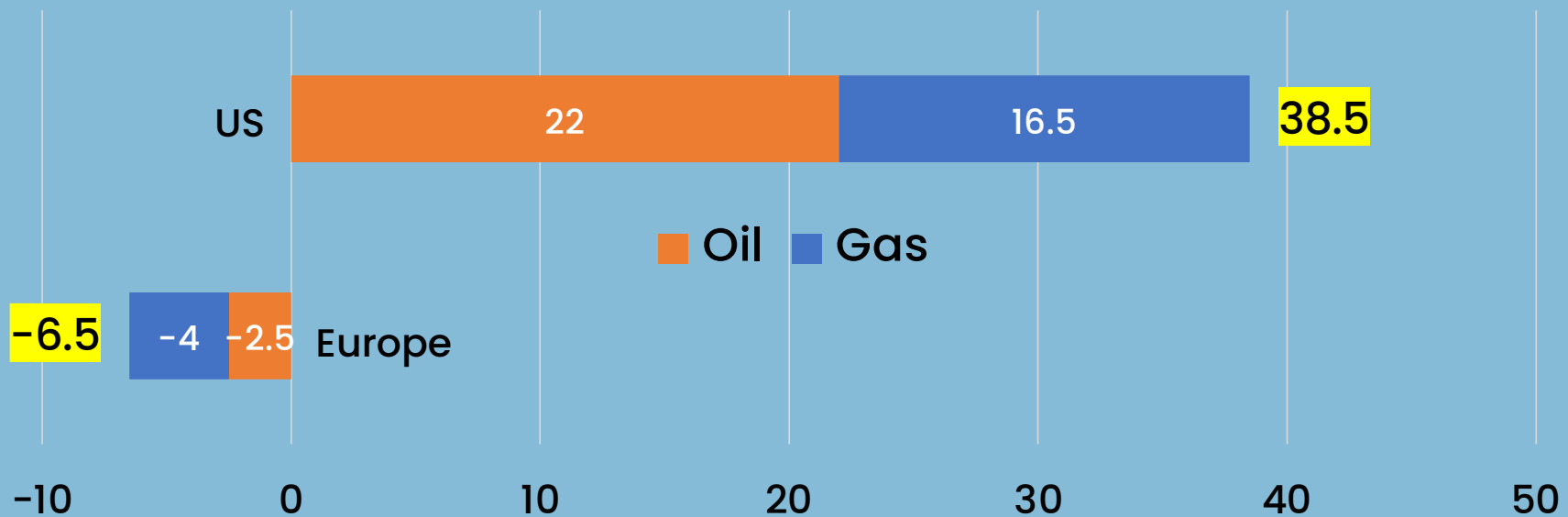
The More You Drill, The More Oil & Gas You Produce



Drilling rig counts for specific regions/countries, March 2026



Drill Or No Drill? The Results Are Clear

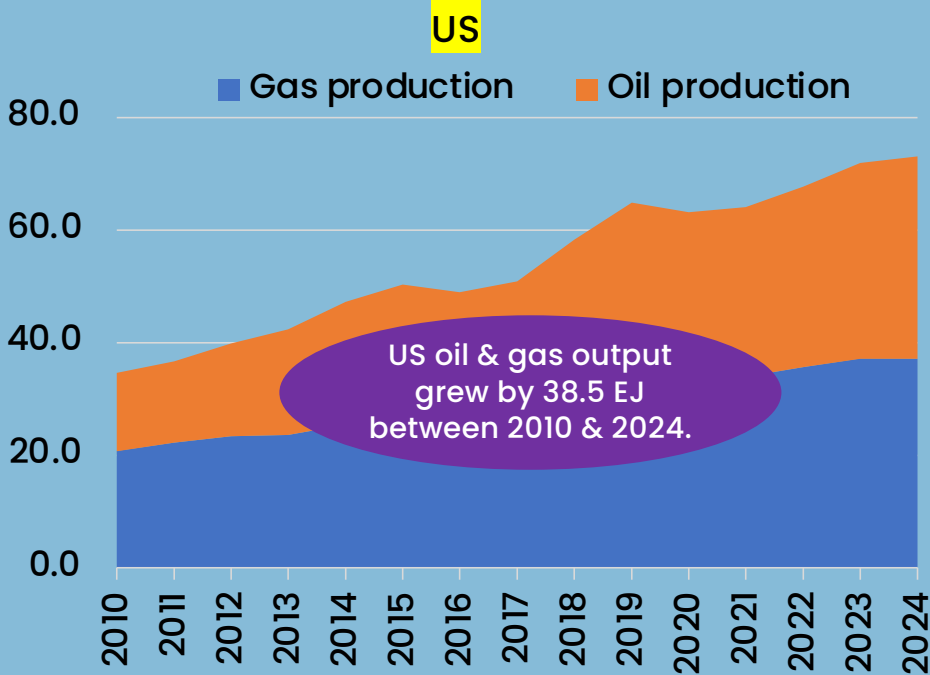
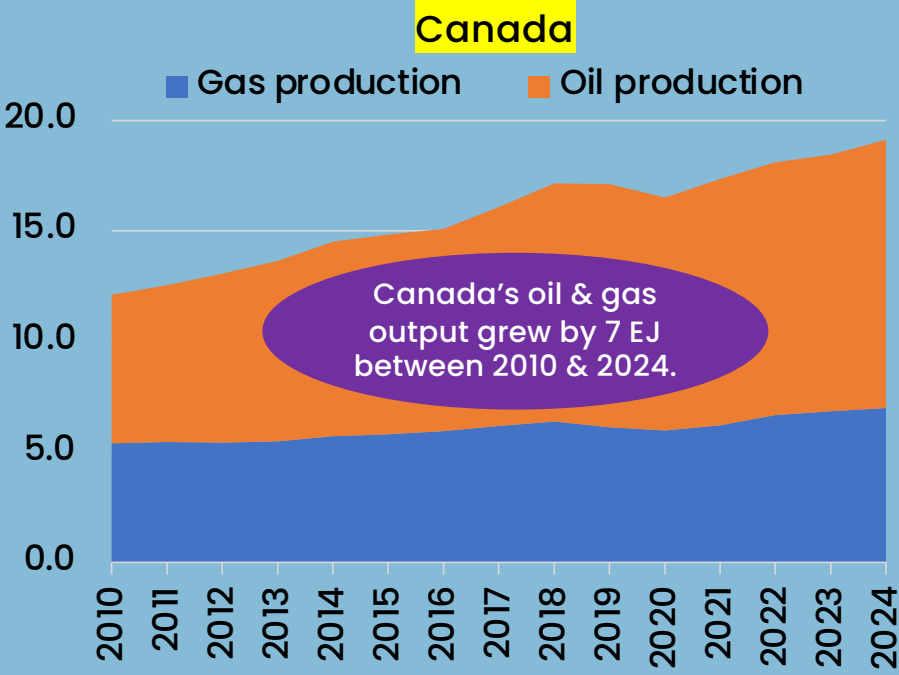


Change in oil & gas production in US vs. Europe, in EJ, 2010 to 2024



Canada & US Are Leading The World In Oil & Gas Production Growth

US & Canada are #1 & #2 in oil growth since 2010



Change in oil & gas production, in EJ, 2010 to 2024

Source: Statistical Review of World Energy 2025

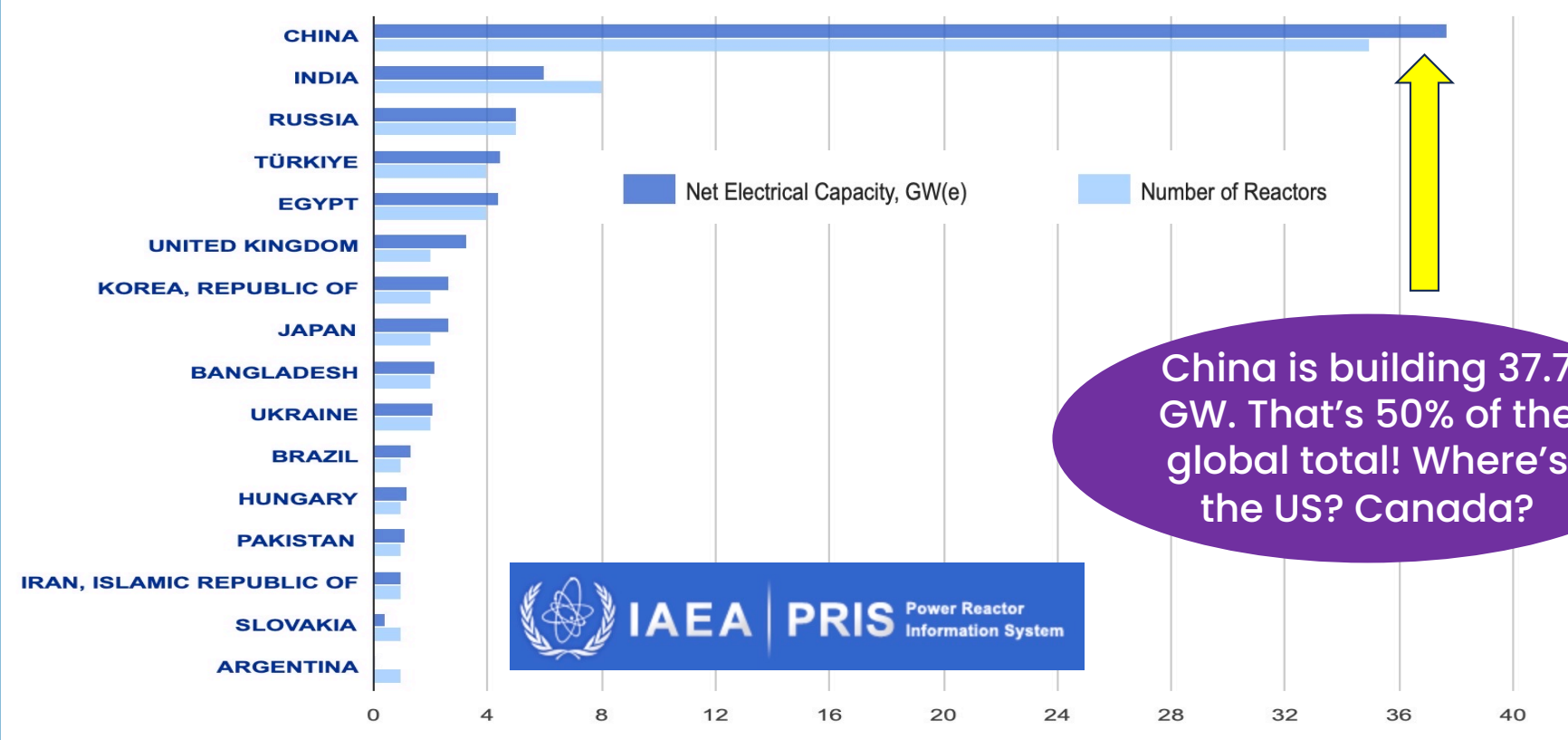


Why Nuclear?

- Needs 2,000x less land than wind, 200x less than solar
 - Low material intensity, high EROEI
 - Energy security & grid stability
 - Price hedge against hydrocarbons
- Challenges: NRC, NGOs, political risk, fuel



Nuclear Won't Power AI Anytime Soon



Reactors under construction, by country, April 2026

Sources: IAEA, <https://pris.iaea.org/pris/worldstatistics/underconstructionreactorsbycountry.aspx>, data as of 041226

SMR Intelligence US



- 42 Companies
- 47 Reactors
- Market cap of pure plays:
> \$22B
- Market cap of incumbents:
> \$208B

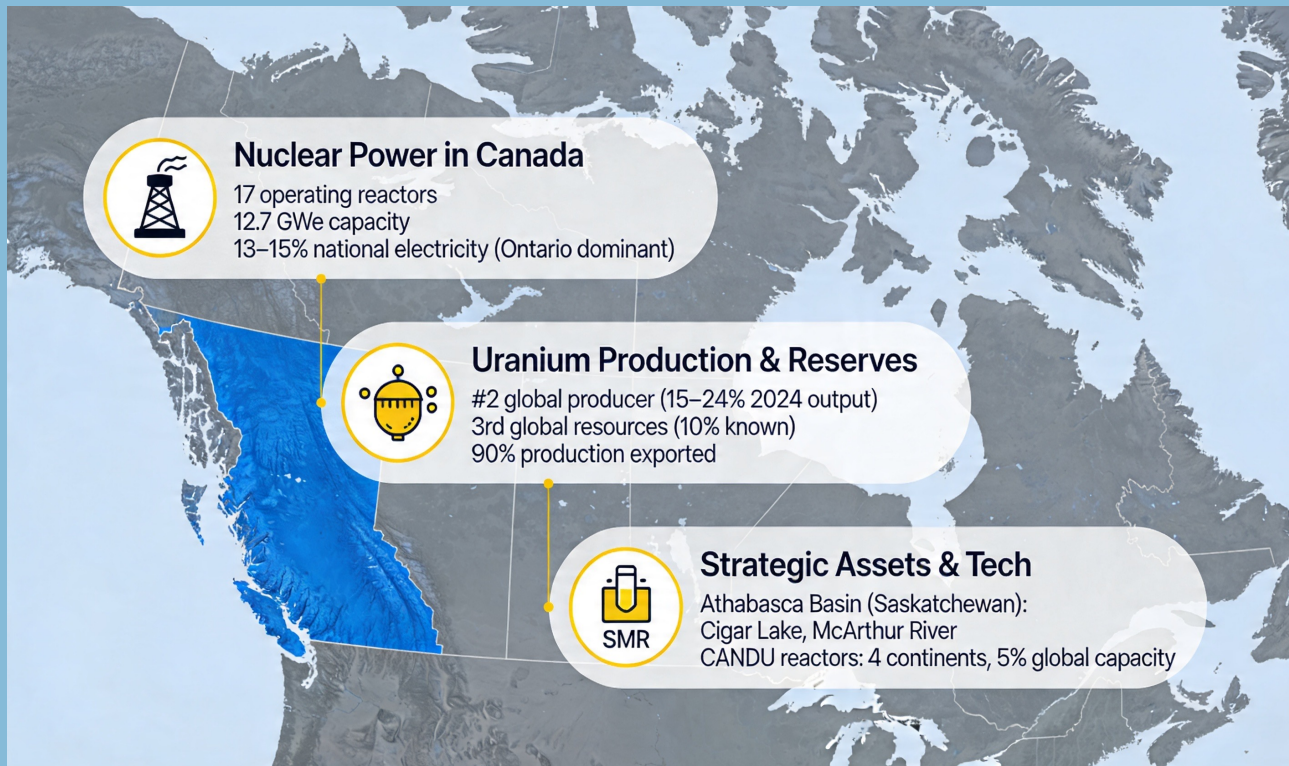
SMR Intelligence Global



- Non-US
- 19 Countries
- 55 Entities
- 72 Reactors
- Total w/US:
- 96 entities
- 119 designs



Canada CANDU Nuclear



Atomic Advantage:
Canada's generational
opportunity in a new
Nuclear Age

OPG applies for operating licence
for BWRX-300 SMR

Thursday, 2 April 2026

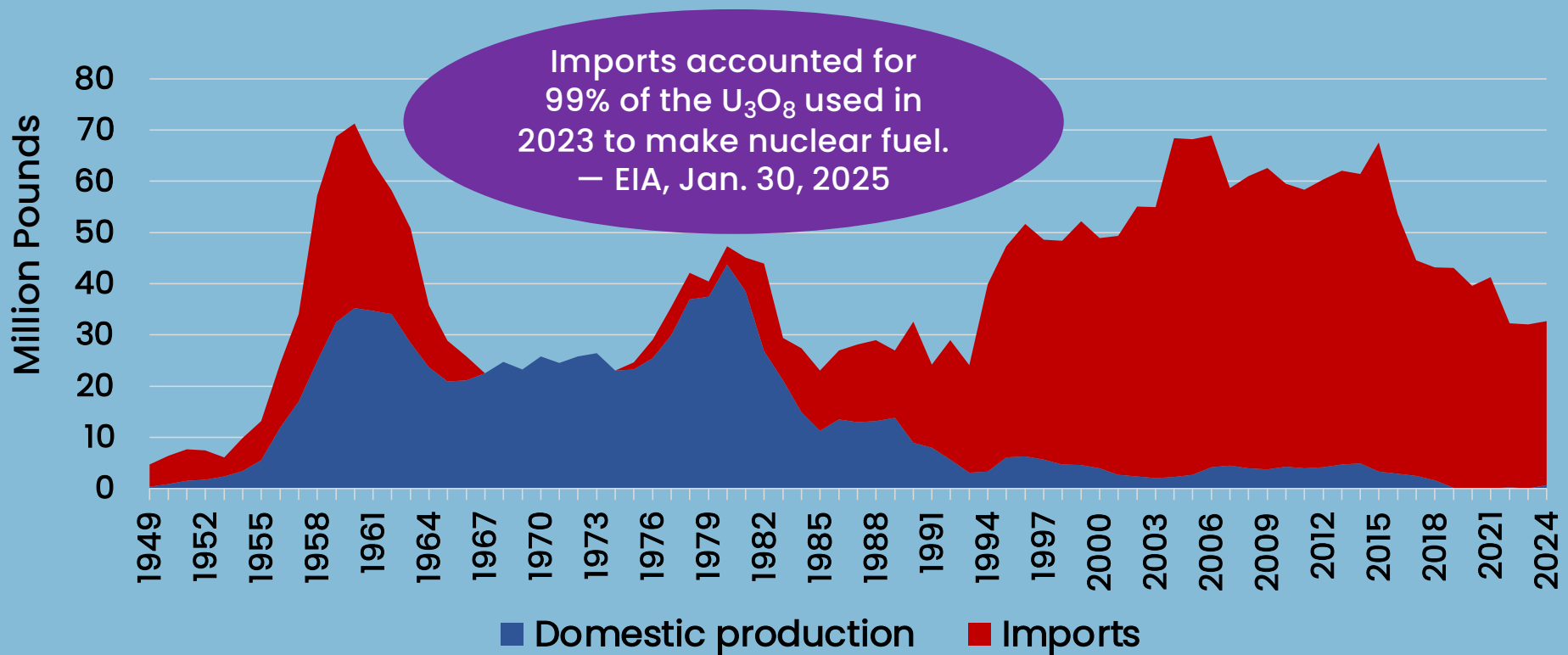


Bruce Nuclear Generating Station,
the largest nuclear plant in N. America



US Nuclear Depends On Foreign Fuel

Production Of Uranium Oxide vs. Imports, 1949 to 2024

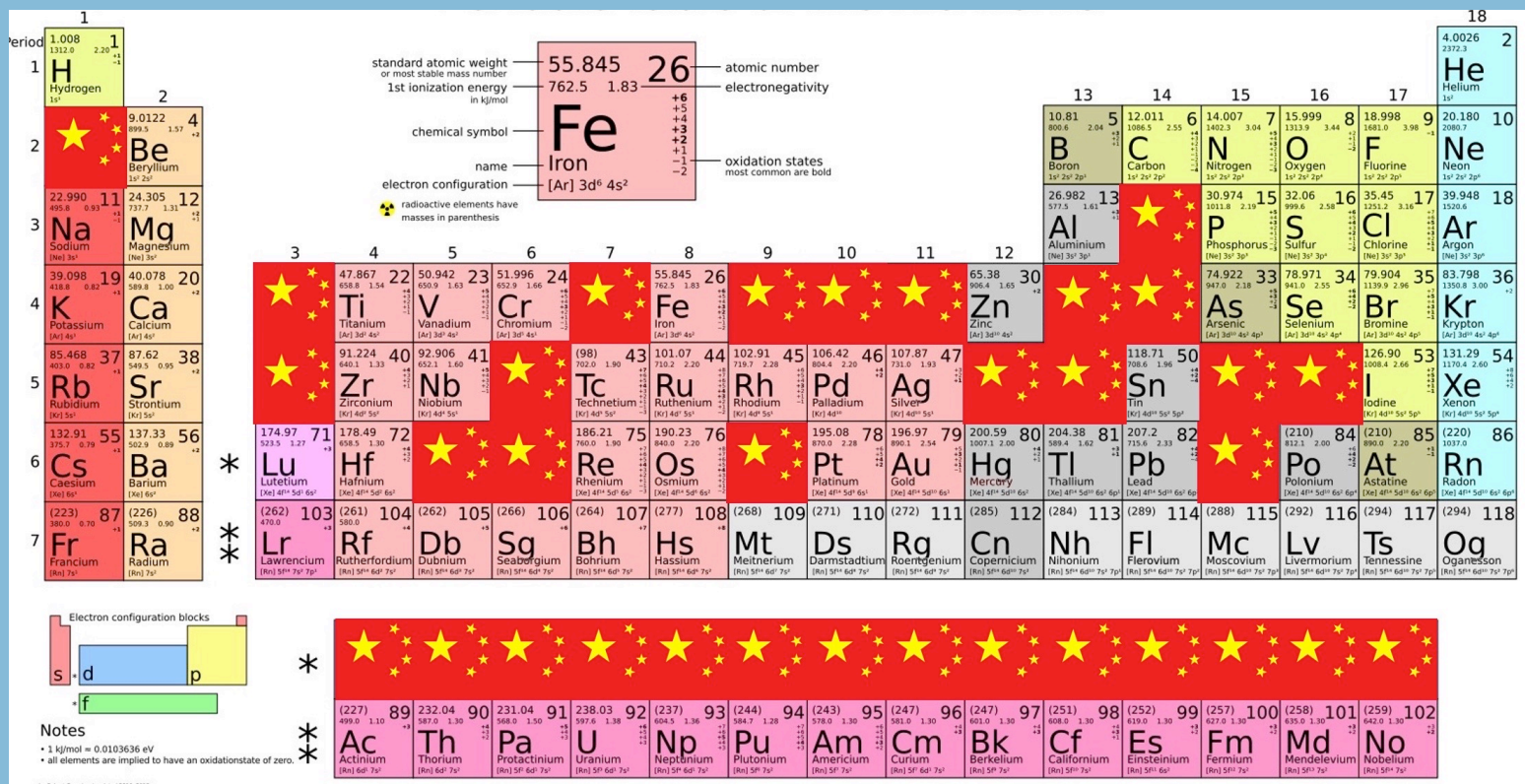


Source: EIA, EPM , <https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf Table 8.2>, <https://www.eia.gov/todayinenergy/detail.php?id=64444>

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China Has A Stranglehold On 33 Strategic Elements, Including All Of The REEs

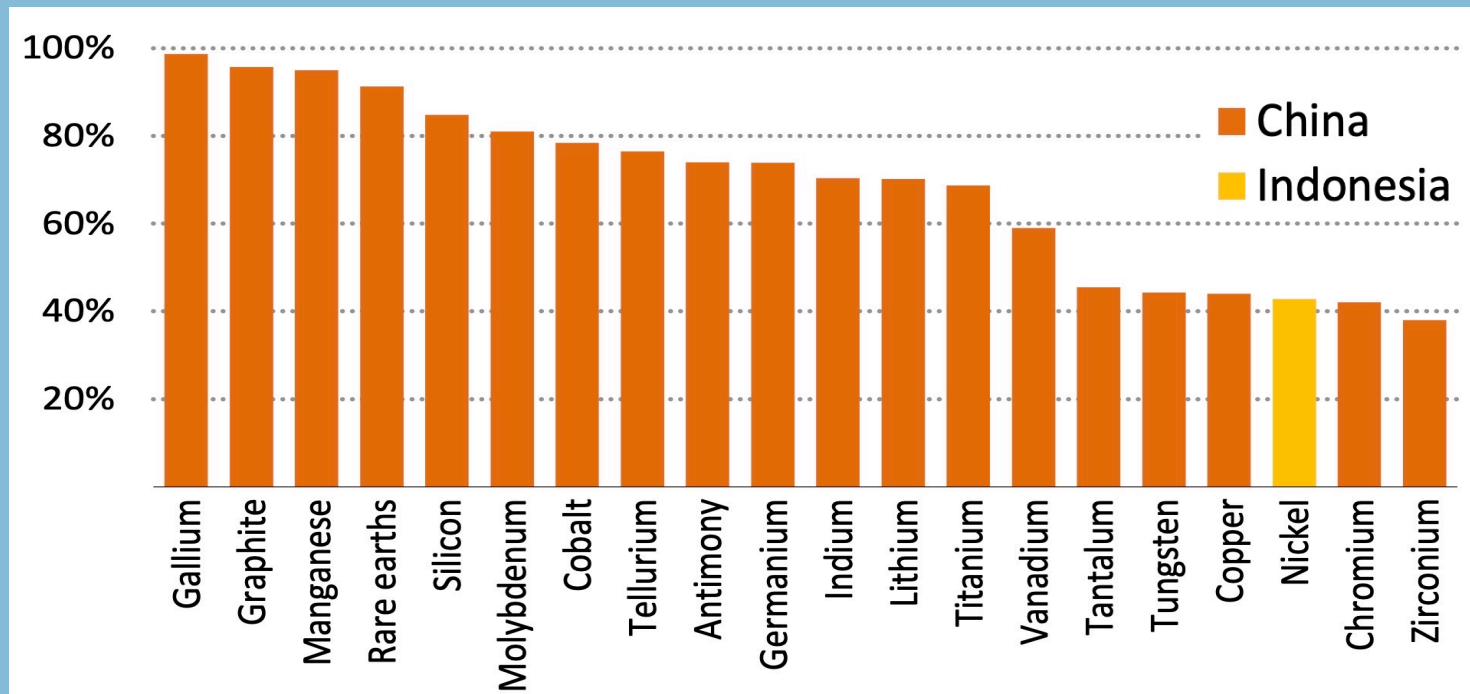


Source: IEA, author

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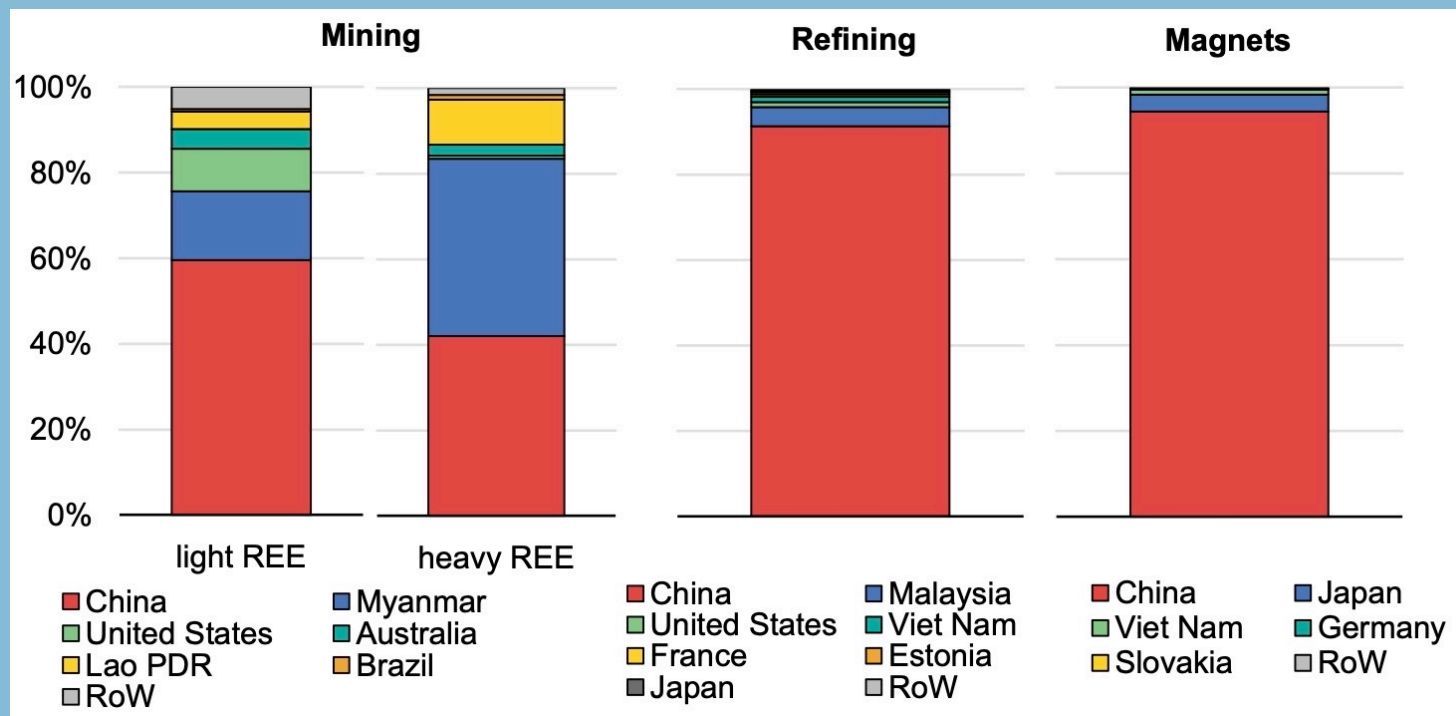
IEA: “China is the leading producer for nearly all of the 20 energy-related strategic minerals analyzed, with an average market share of around 70%.”



Top refiner share of selected energy-related strategic minerals by country



China Has A Monopoly On REE Refining & Magnets



Share of global magnet rare earths and magnet manufacturing, 2024

Source: IEA, <https://iea.blob.core.windows.net/assets/de6a7c0d-f42e-4b0d-b16a-8dd3b9afb9e0/RareearthelementsPathwaystosecureanddiversifiedsupplychains.pdf>

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Anti-Energy/Anti-Nuclear NGOs Are Spending \$1.9B Per Year

World Wildlife Fund	\$374
World Resources Institute	\$267
Environmental Defense Fund	\$299
Natural Resources Defense Council	\$204
Sierra Club	\$169
Rocky Mountain Institute	\$165
Earthjustice	\$126
League of Conservation Voters	\$159
Southern Environmental Law Center	\$58
Center for Biological Diversity	\$46
Total	\$1,867

Revenue of top 10 US anti-energy/anti-nuclear NGOs, \$Millions



Top Issues For N. American Energy & Power Sectors

- Surging gas & power demand (LNG & AI)
- Inflation, labor, & supply chains (China & Russia)
 - Permitting & land-use conflicts
 - New nuclear: How soon? How much?
- Hydrocarbons are here to stay!





SUNBLOCK

THE GLOBAL FIGHT TO SAVE
FARMLAND FROM BIG SOLAR

[YouTube.com/@RobertBryce](https://www.youtube.com/@RobertBryce)



JuiceTheMovie.com



JuiceTheSeries.com





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Thank you