

Hydrocarbons, Nuclear, & The Future Of American Power

Robert Bryce presentation to:
Western Petroleum Marketers Association
Las Vegas, NV
19 February 2026

Four Points:

- Where's that energy transition?
- Hydrocarbons are the growth story,
not solar, wind & EVs
- AI: How much gas? How much power?
 - N2N: Nat gas to nuclear



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)

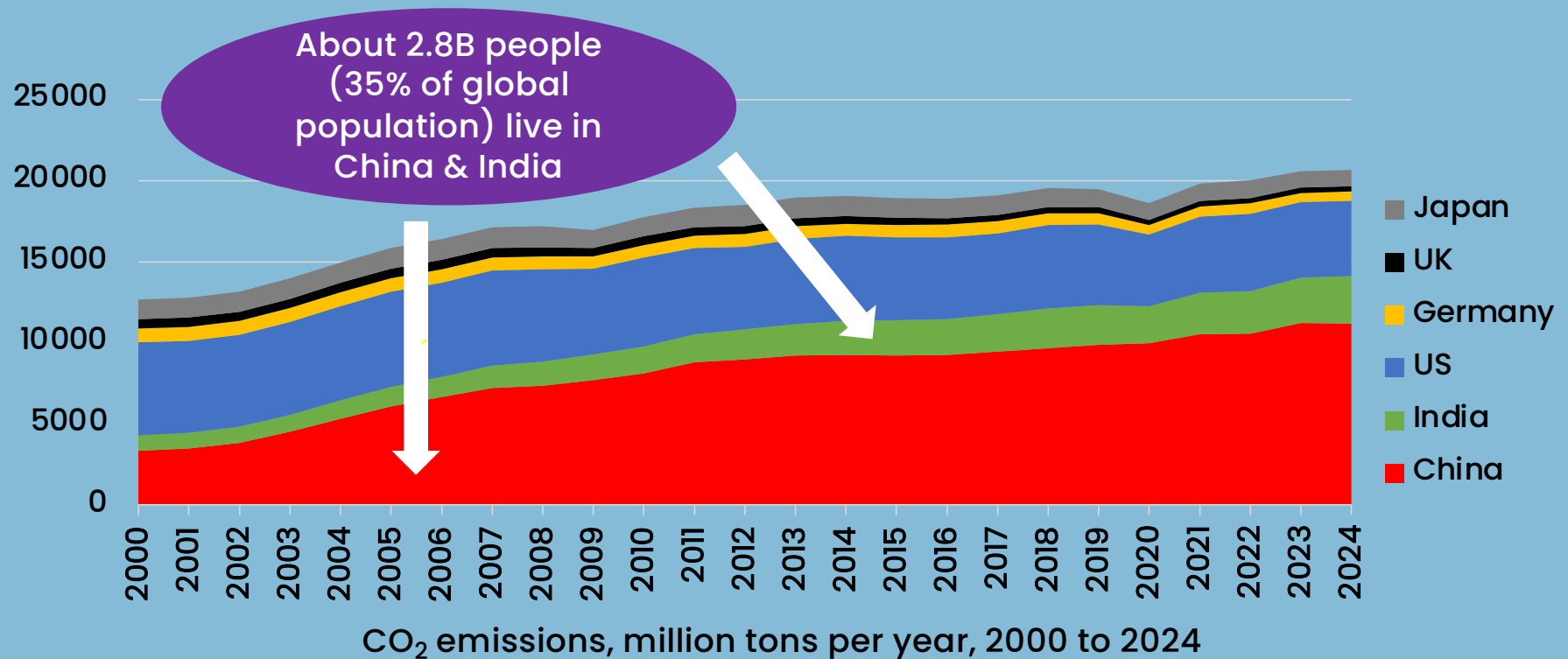


Global primary energy use, in EJ, 2024



China & India Are The Emissions Story

CO₂ Emissions In Six Largest Economies

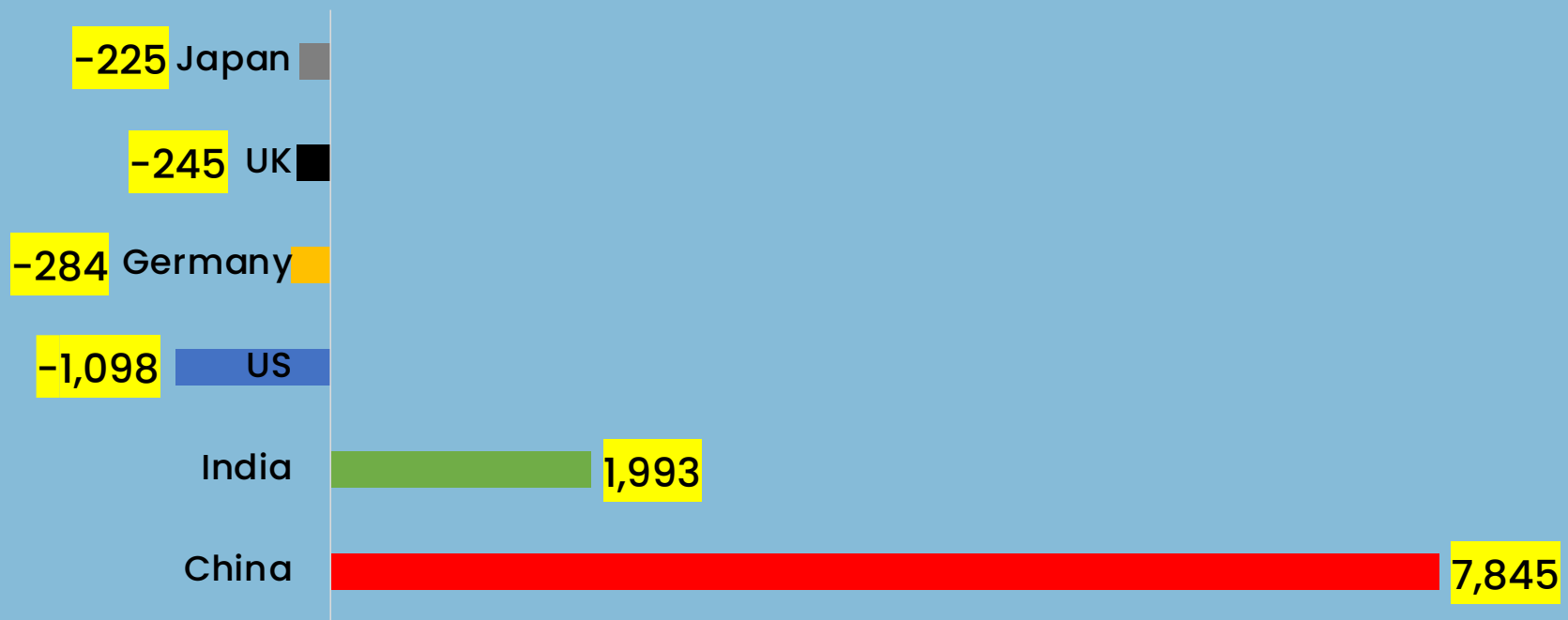


Source: Statistical Review of World Energy 2025

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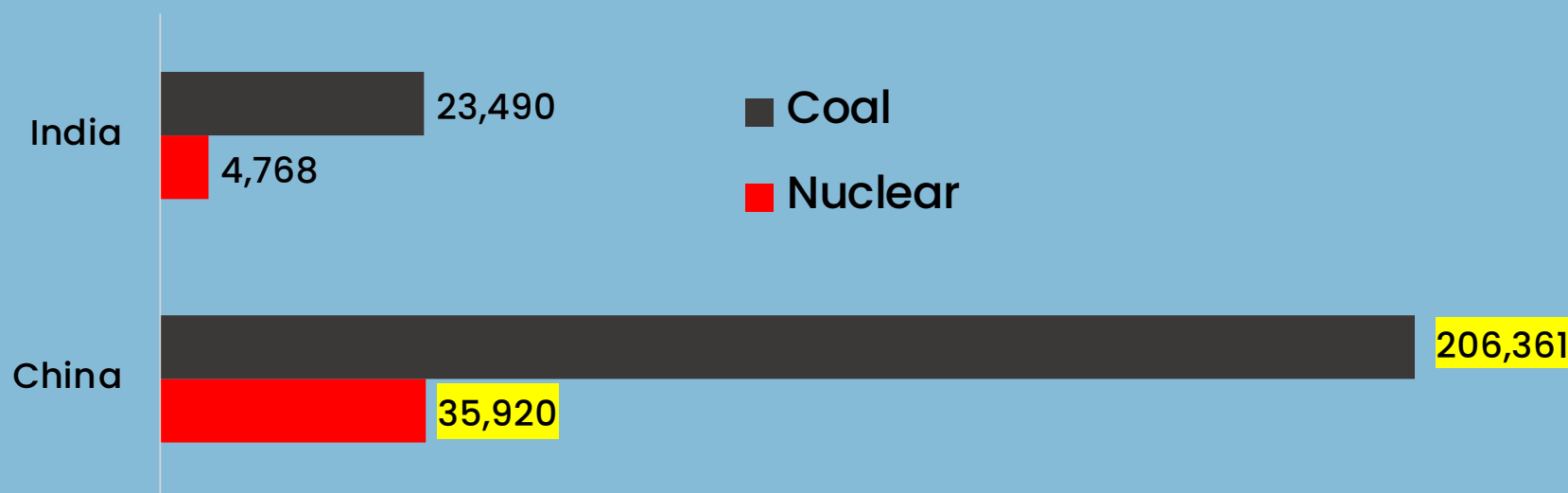
Change In CO₂ Emissions In The Six Largest Economies, 2000 to 2024



Change in emissions, million tons, 2000 to 2024



>57% Of Global Nuclear Capacity Is Being Built In China & India. But China's Coal-Fired Capacity Is Growing ~ 6x Faster Than Nuclear



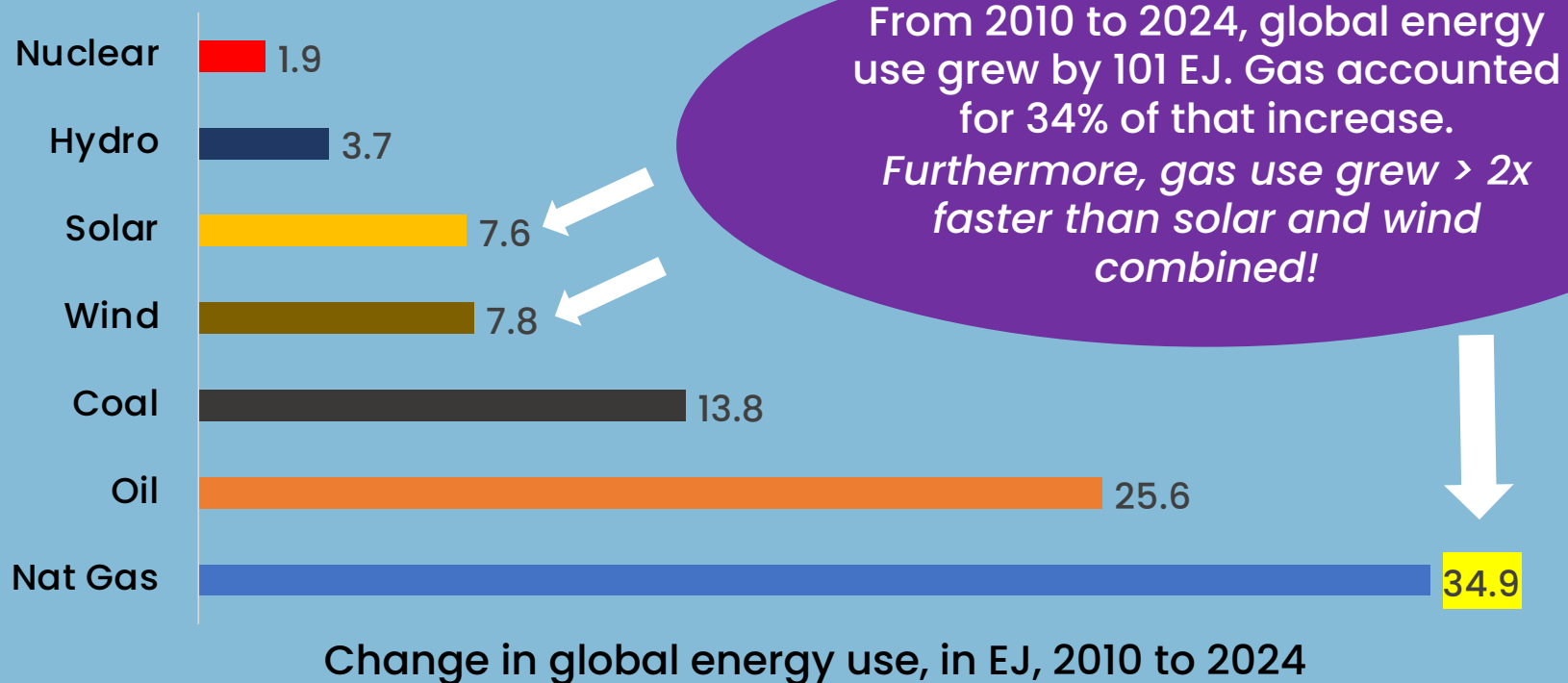
Power plant capacity under construction, in megawatts, January 2026

Sources: IAEA, <https://pris.iaea.org/pris/worldstatistics/underconstructionreactorsbycountry.aspx>
Global Energy Monitor, https://docs.google.com/spreadsheets/d/1_6AkrRZOn3ZXhSV9O6tZnX-m7aJsfG9HiQ_iEqBkbW8/edit?gid=158680629#gid=158680629

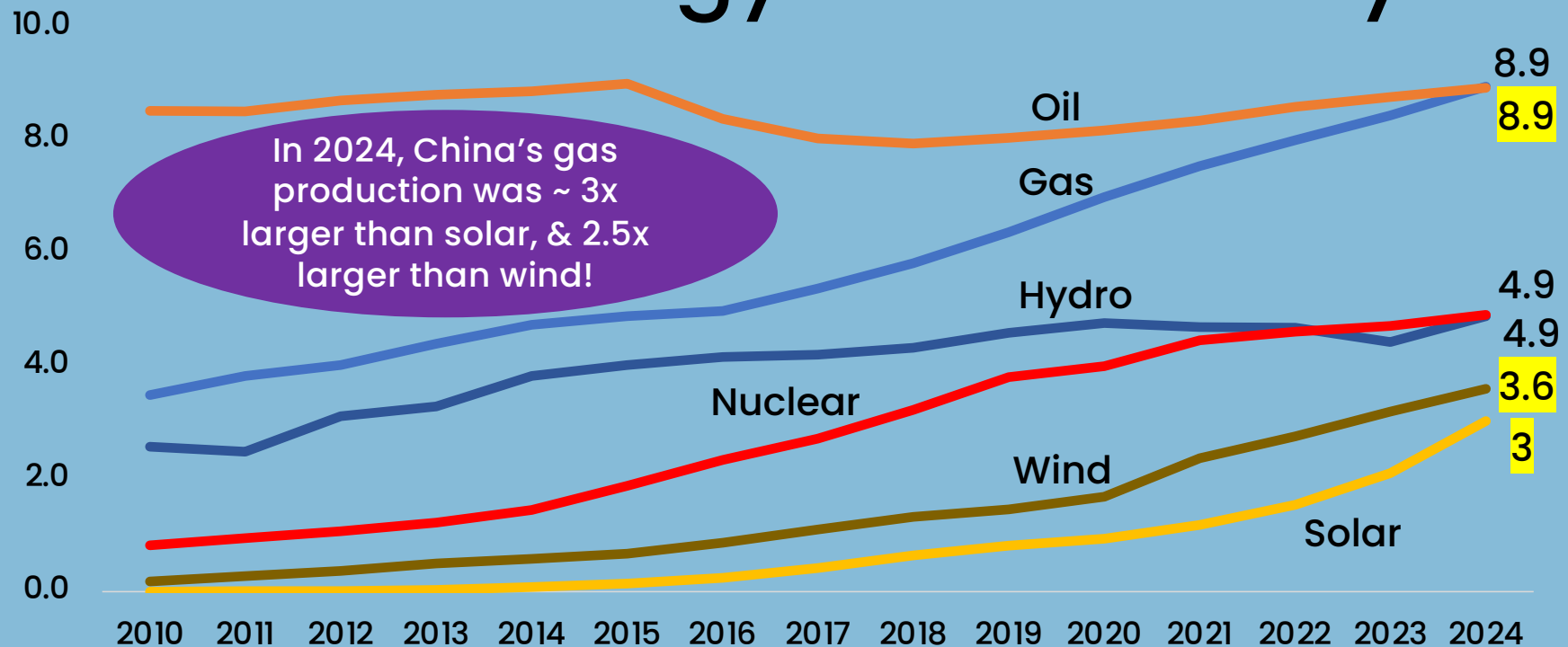
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Since 2010, Natural Gas Has Grown Faster Than Any Other Type Of Primary Energy



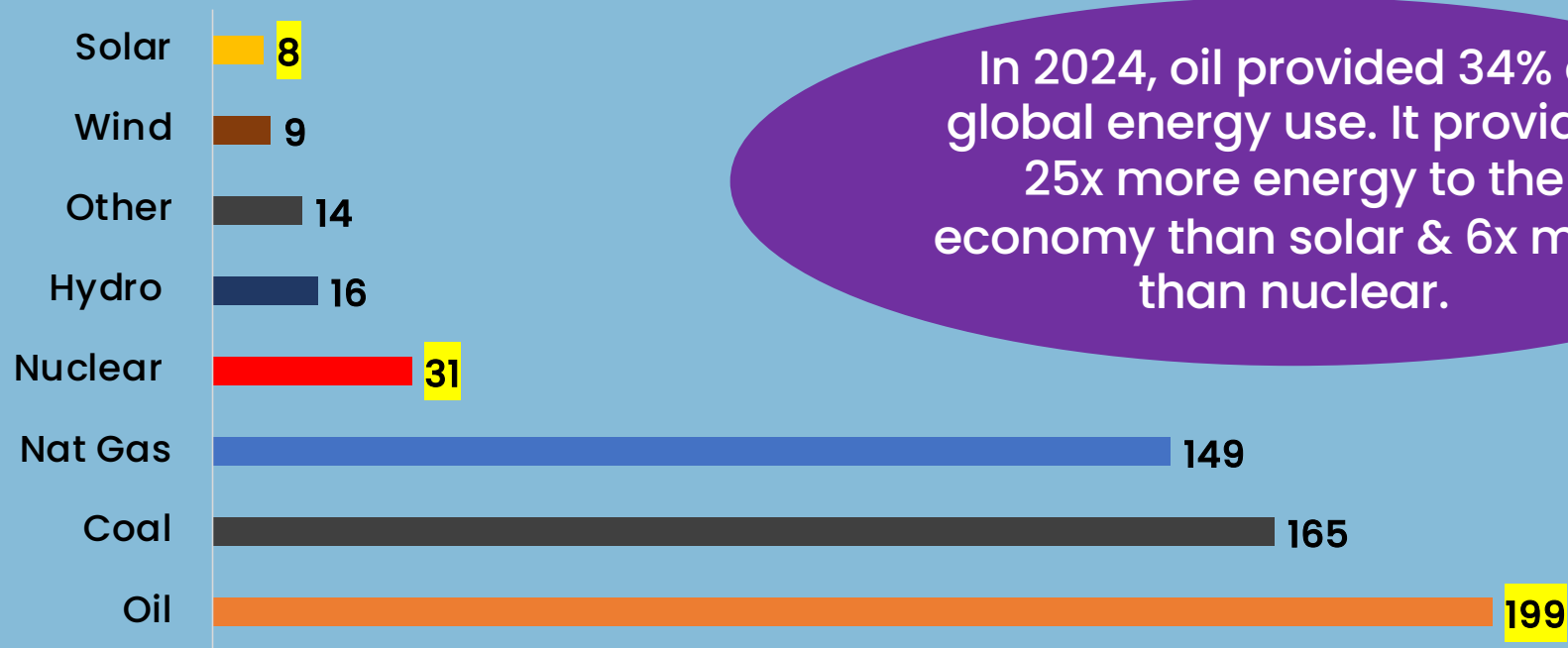
Under Xi, Gas Has Been China's Untold Energy Growth Story



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



Just Stop Oil?

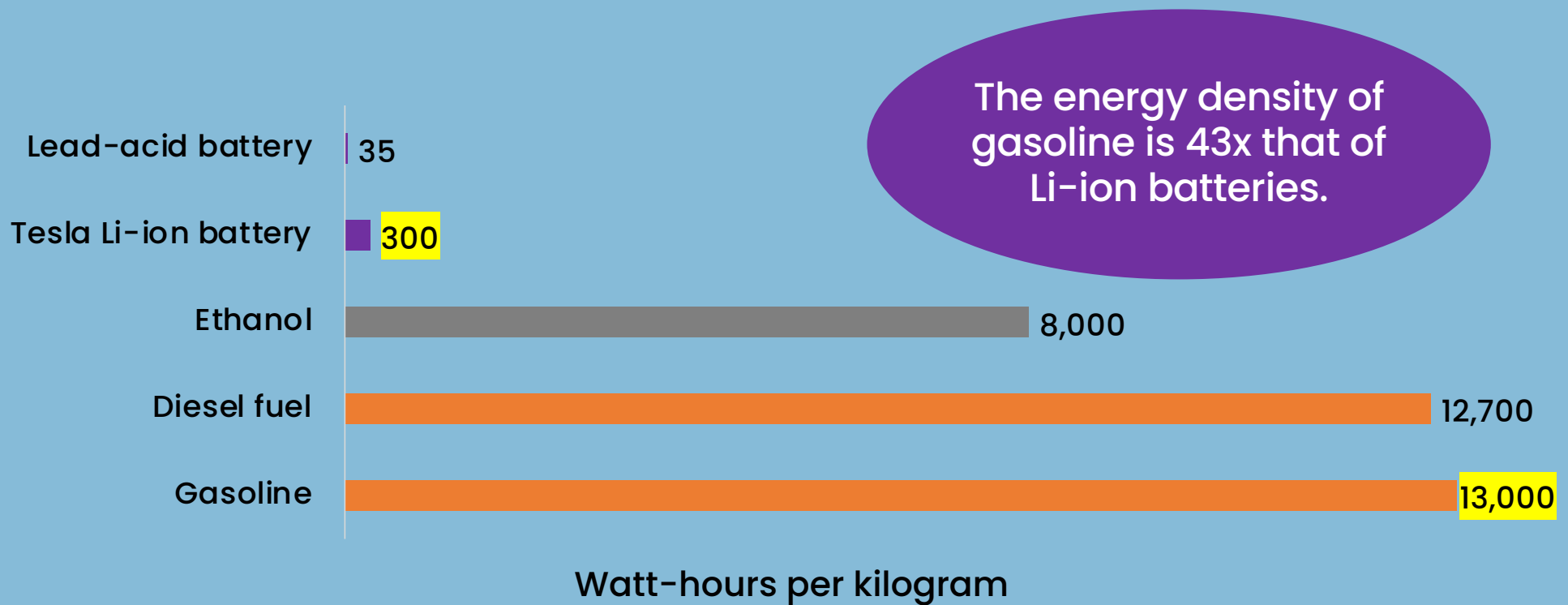


In 2024, oil provided 34% of global energy use. It provided 25x more energy to the economy than solar & 6x more than nuclear.

Global energy use by fuel, in EJ, 2024



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

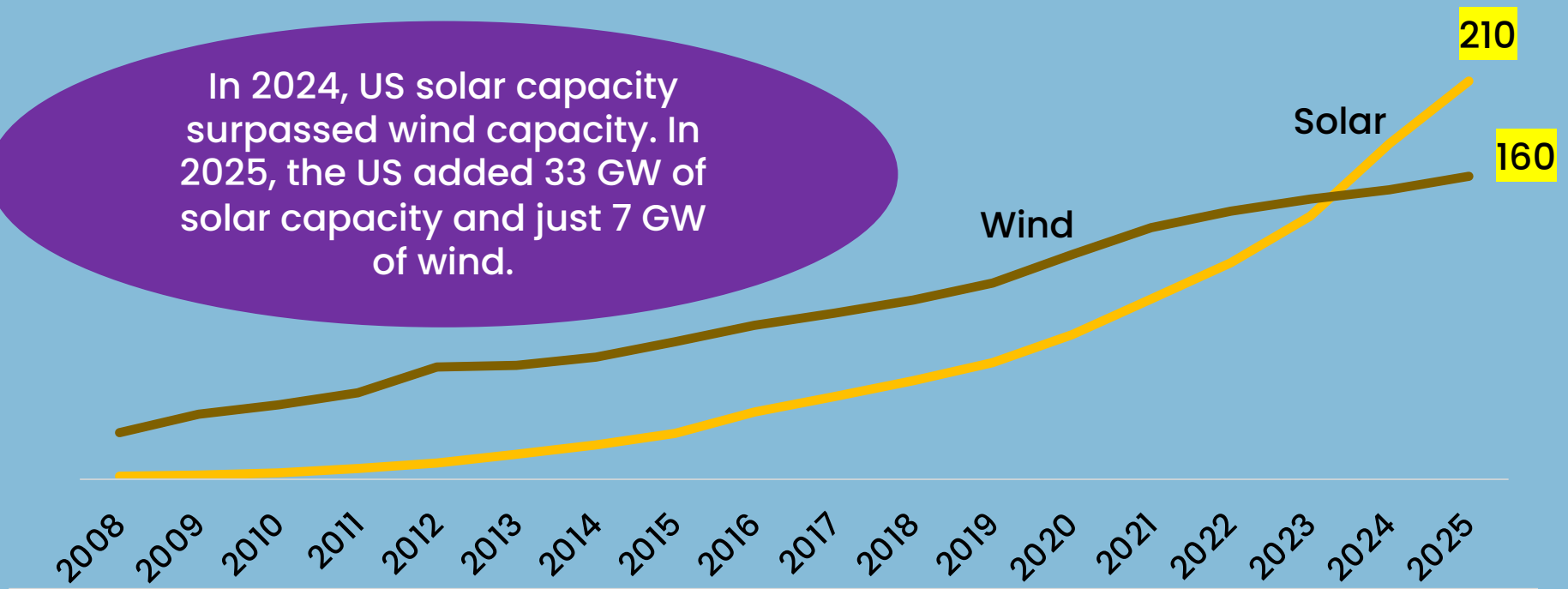


Sources: Donald Sadoway, MIT;; David J.C. MacKay, "Without the Hot Air," <https://insideevs.com/news/598656/tesla-4680-battery-cell-specs/>

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Big Wind Is Being Left In The Shade

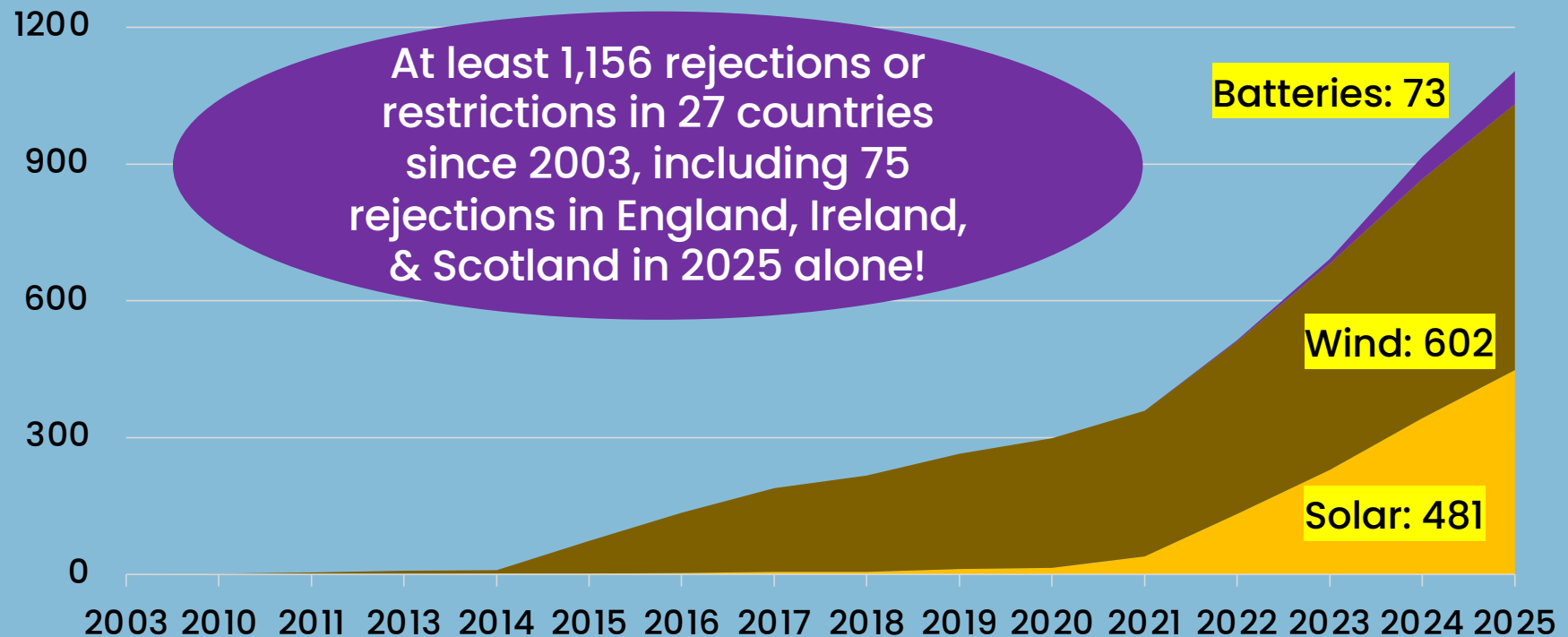
In 2024, US solar capacity surpassed wind capacity. In 2025, the US added 33 GW of solar capacity and just 7 GW of wind.



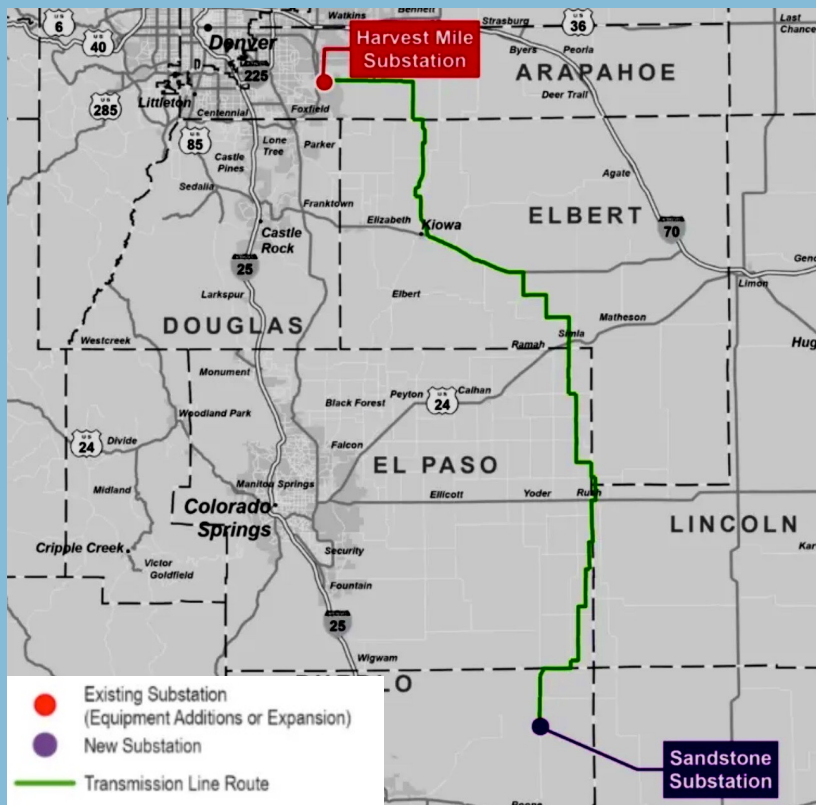
US solar and wind capacity, in GW, 2008 to 2025 (est.)



Global Rejections Of Solar, Wind, & Batteries



HV Transmission: Friction Across US



Colorado Power Pathway route map

Source: Colorado Sun, <https://coloradosun.com/2025/06/26/power-pathway-permits-denied-xcel-energy-colorado/>

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



EVs Are The Next Big Thing...



Source: Library of Congress

- The electric automobile will quickly and easily take precedence over all other kinds of motor carriages as soon as an effective battery of light weight is discovered.

— *Los Angeles Times*, 1901

- Prices on electric cars will continue to drop until they are within reach of the average family.

— *Washington Post*, 1915

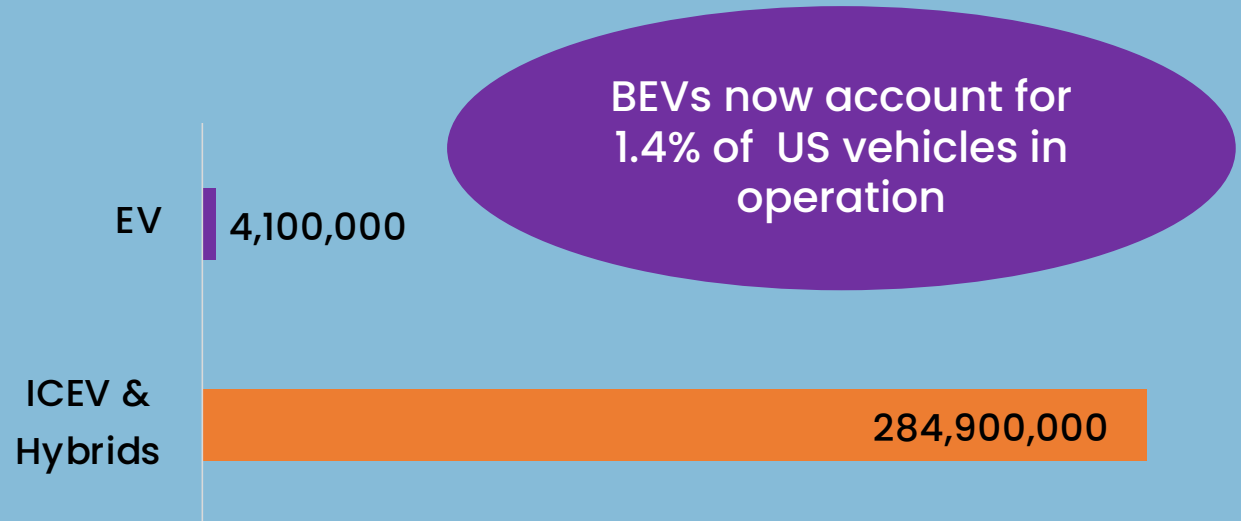
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Sales Are Growing, But BEVs Remain A Tiny Fraction Of US Fleet

The transition to full EVs has slowed, as hybrids currently appear to be the more comfortable choice for the majority of Americans seeking electrified options.

— Edmunds,
April 3, 2025

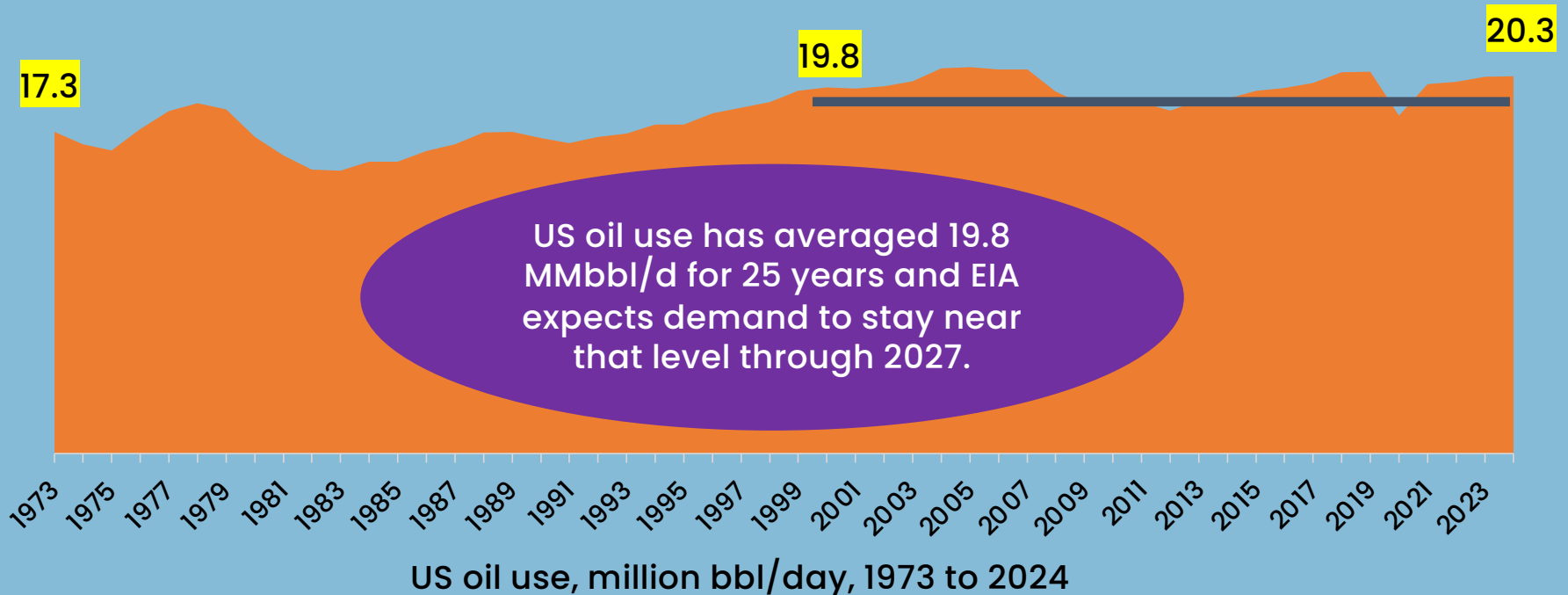


US vehicles in operation by type, 2025



“Let’s be the generation that finally frees America from the tyranny of oil.”

— Barack Obama, 2007

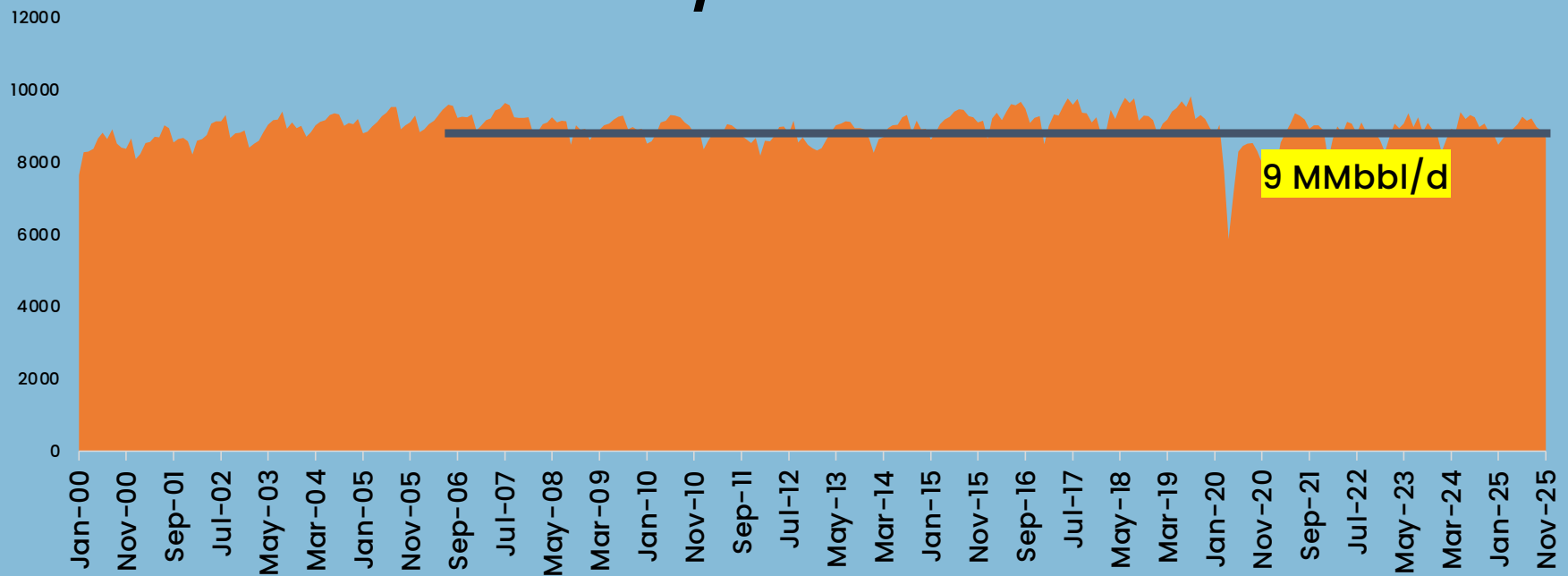


Source: EIA, <https://www.eia.gov/dnav/pet/hist/leafHandler.ashx?n=PET&s=MTTUPUS2&f=A>, <https://tinyurl.com/mryvxb42>, https://www.eia.gov/outlooks/steo/pdf/steo_full.pdf

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The Lindy Effect: US Gasoline Demand Has Averaged ~ 9 MMbbl/d For 25 Years



Gasoline supplied, thousand bbls per day, 2000 to November 2025

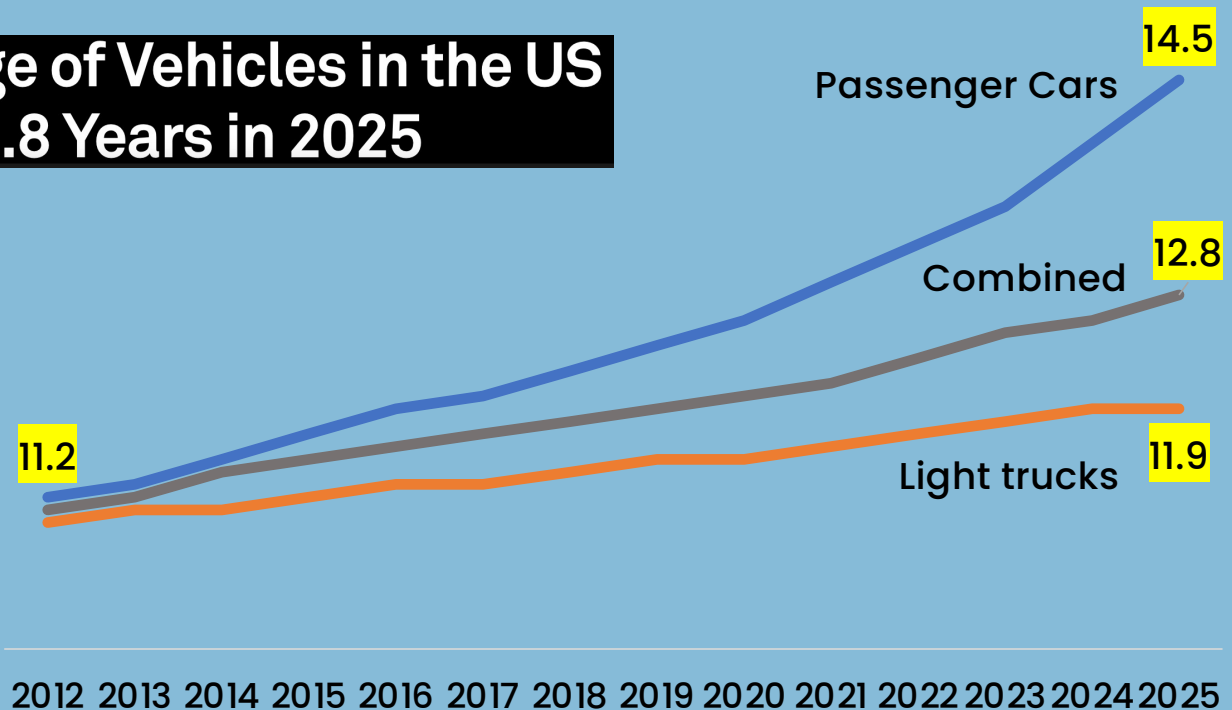


289M Vehicles In US: “Graying” Of Fleet Is “More Than A Statistic”

**Average Age of Vehicles in the US
Rises to 12.8 Years in 2025**

The average age of vehicles in the US continues to climb, reaching 12.8 years in 2025...older vehicles are staying on the road longer, steadily increasing the average age of the fleet.

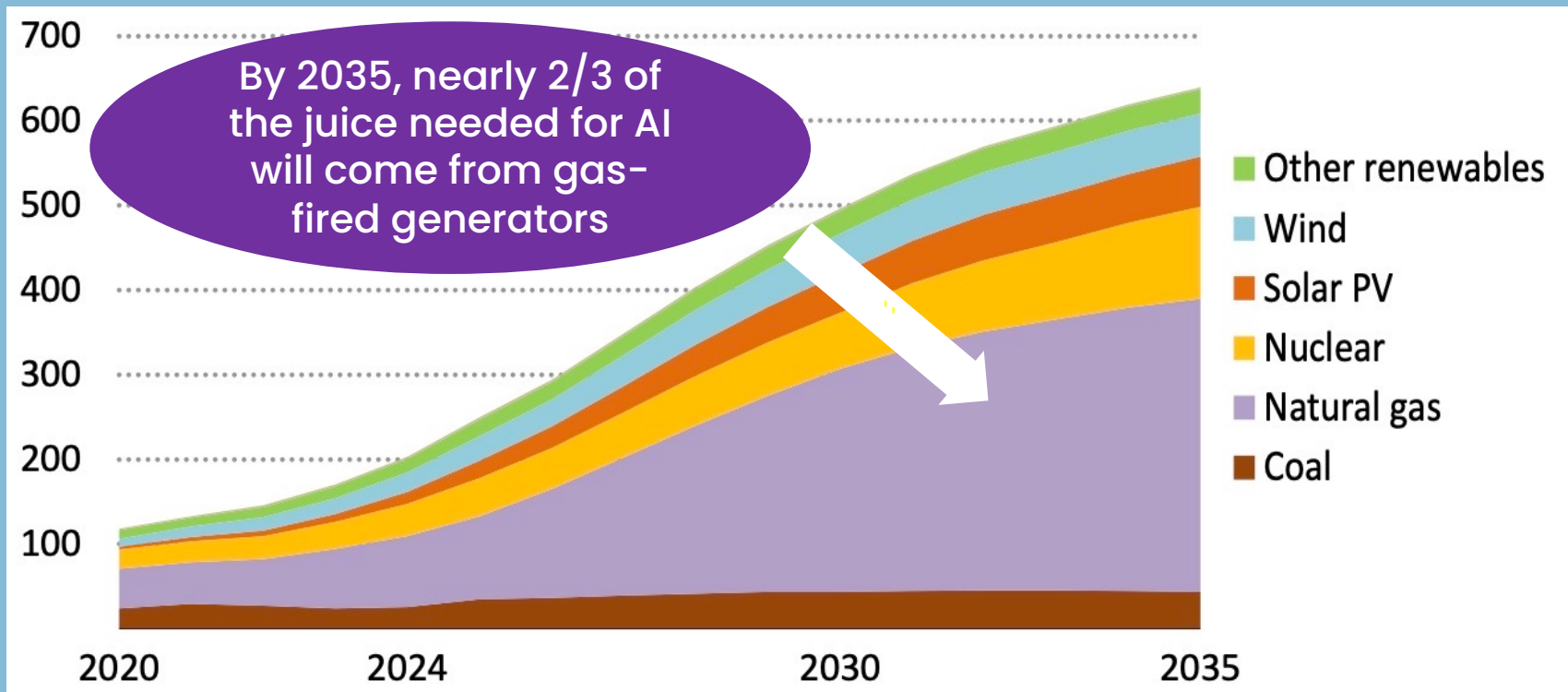
— S&P Global Mobility,
May 21, 2025



Average vehicle age in years by type, 2012 to 2025



AI Is A Gas Story



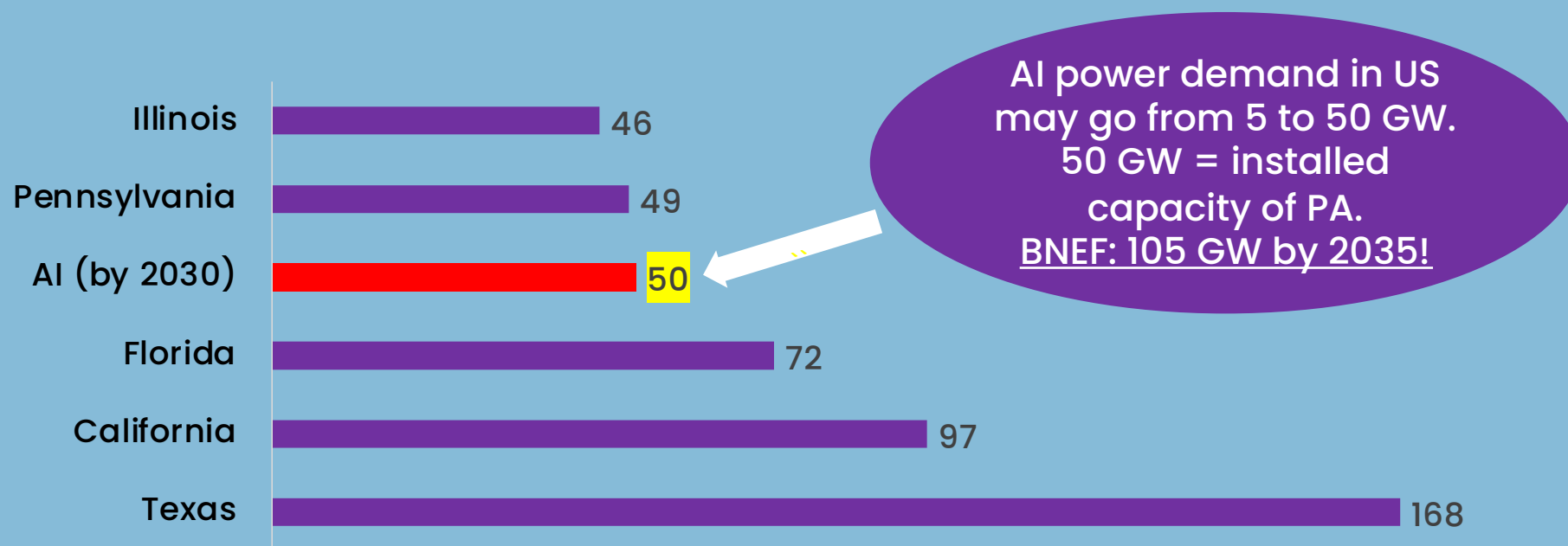
IEA: Projected electricity generation for US data centers, in TWh, 2020 to 2035

Source: IEA, World Energy Outlook 2025, Figure 8.7

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EPRI: AI Power Demand Could Reach 50 GW by 2030



Summer generation capacity by state, in GW, 2024, and EPRI estimate for 2030

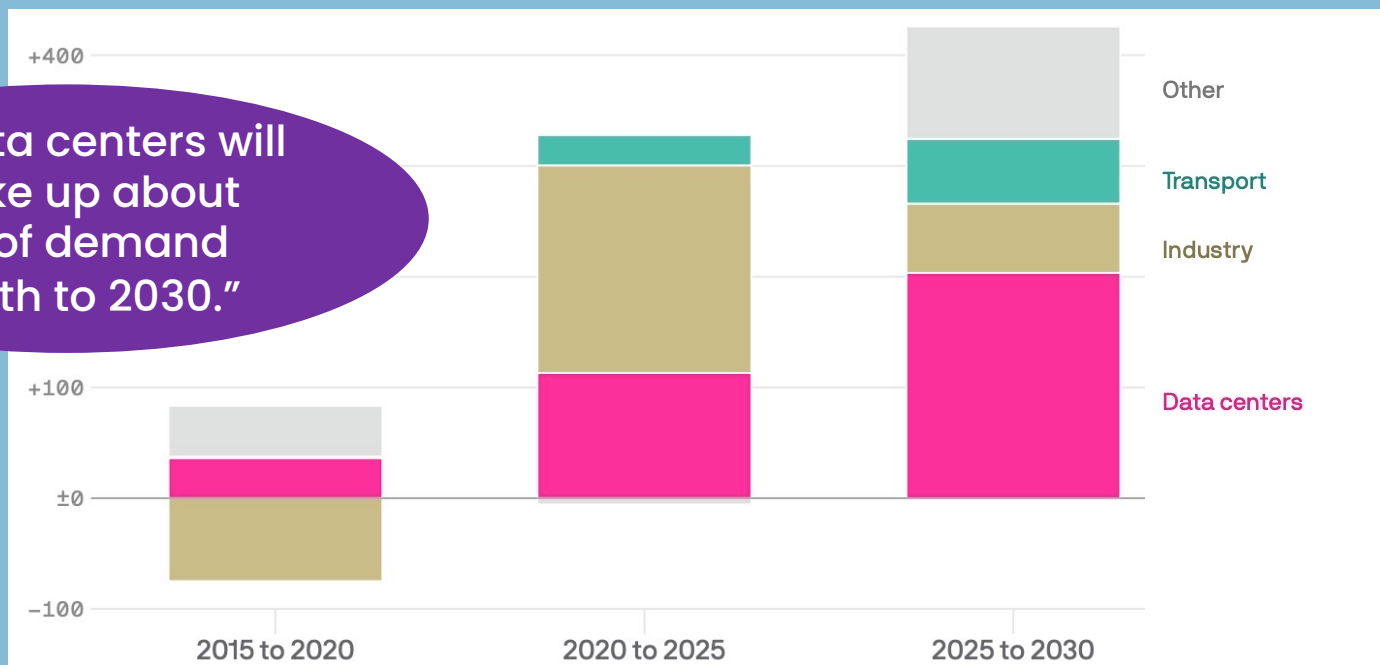
Sources: EIA, <https://www.spglobal.com/commodity-insights/en/news-research/latest-news/electric-power/081325-artificial-intelligence-power-demand-in-us-could-top-50-gw-by-2030-epri>, <https://about.bnef.com/insights/clean-energy/ai-and-the-power-grid-where-the-rubber-meets-the-road/>

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US Data Center Electricity Use Will Double By 2030

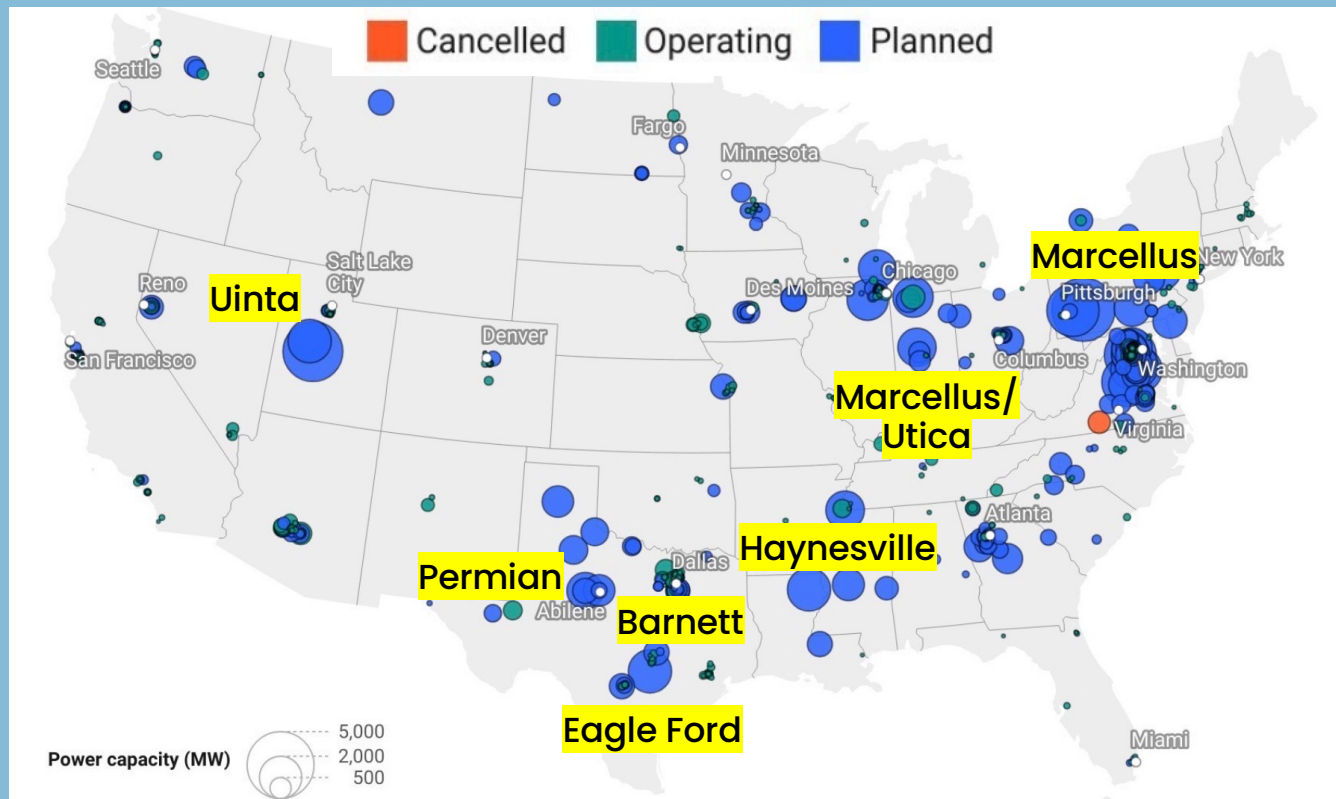
IEA: Data centers will “make up about 50% of demand growth to 2030.”



US electricity demand growth by sector, in TWh, 2015 to 2030



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



Source: AGA, author

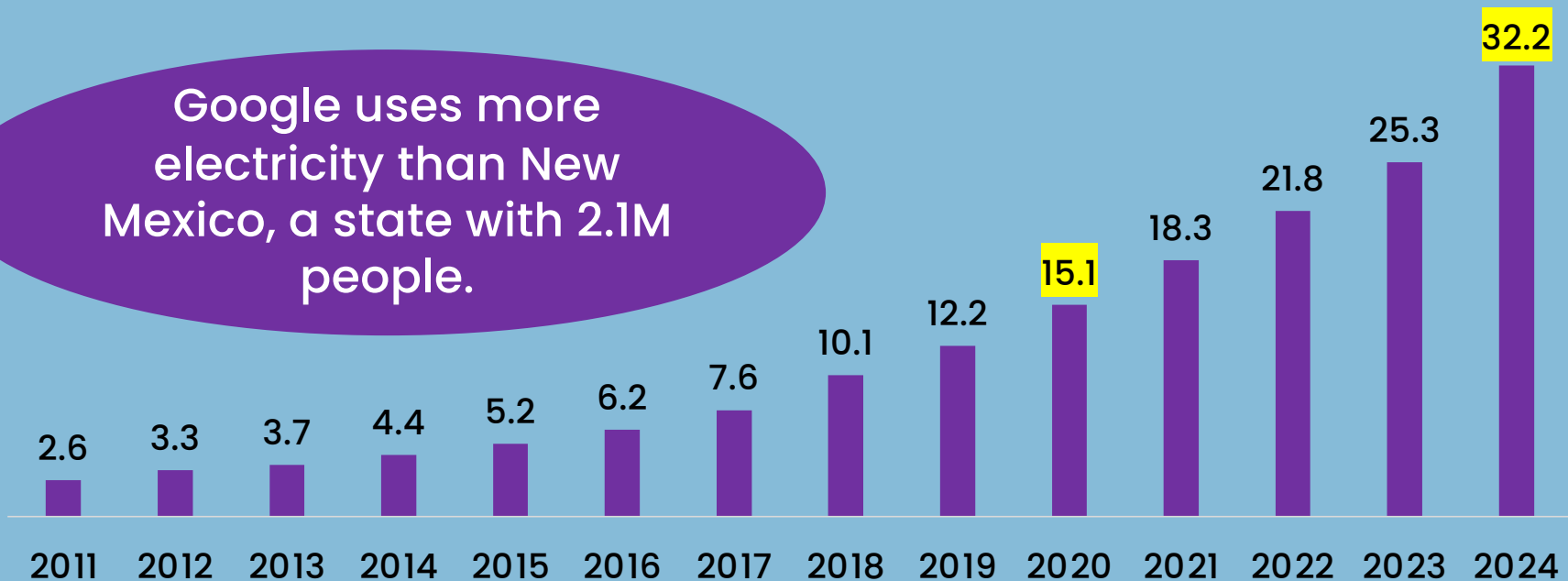
US data centers capacity expected by 2030

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Since 2020, GOOG's Electricity Use Has Doubled

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



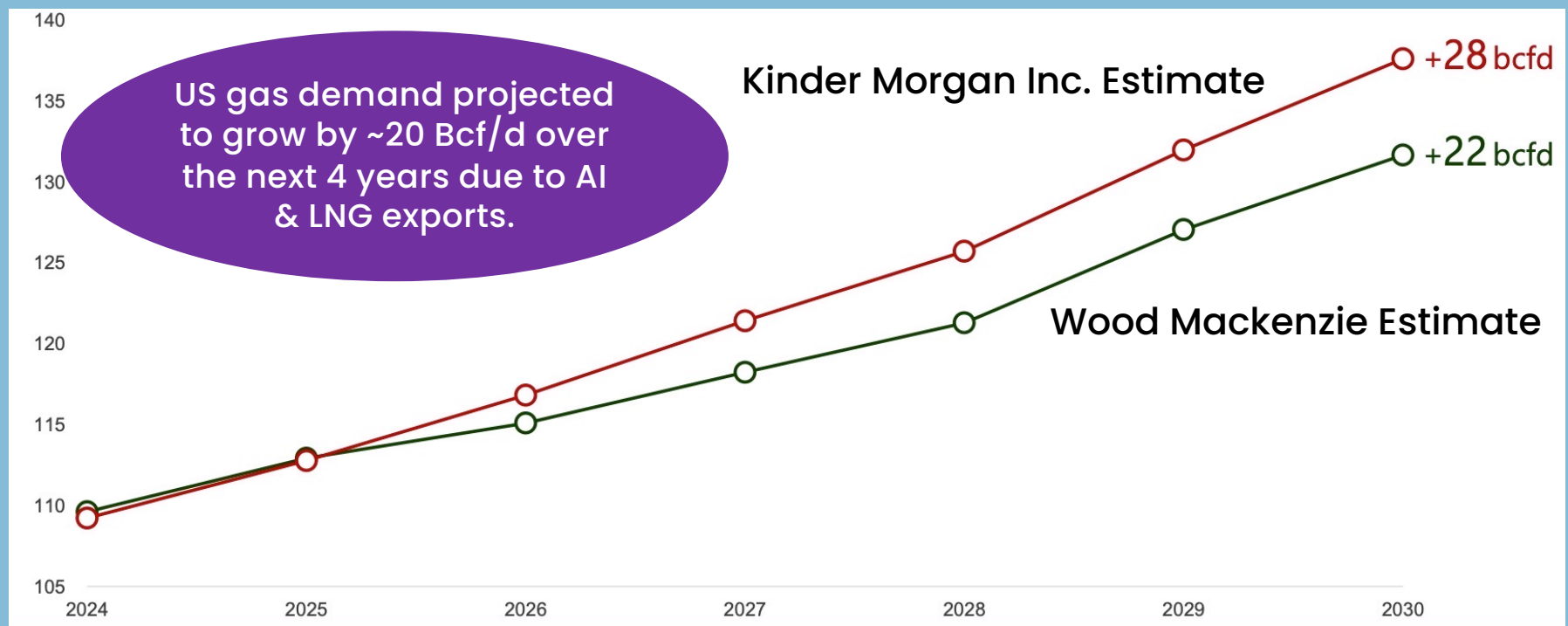
Electricity use per year, in TWh, 2011 to 2024

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>

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Gas Demand Is Soaring



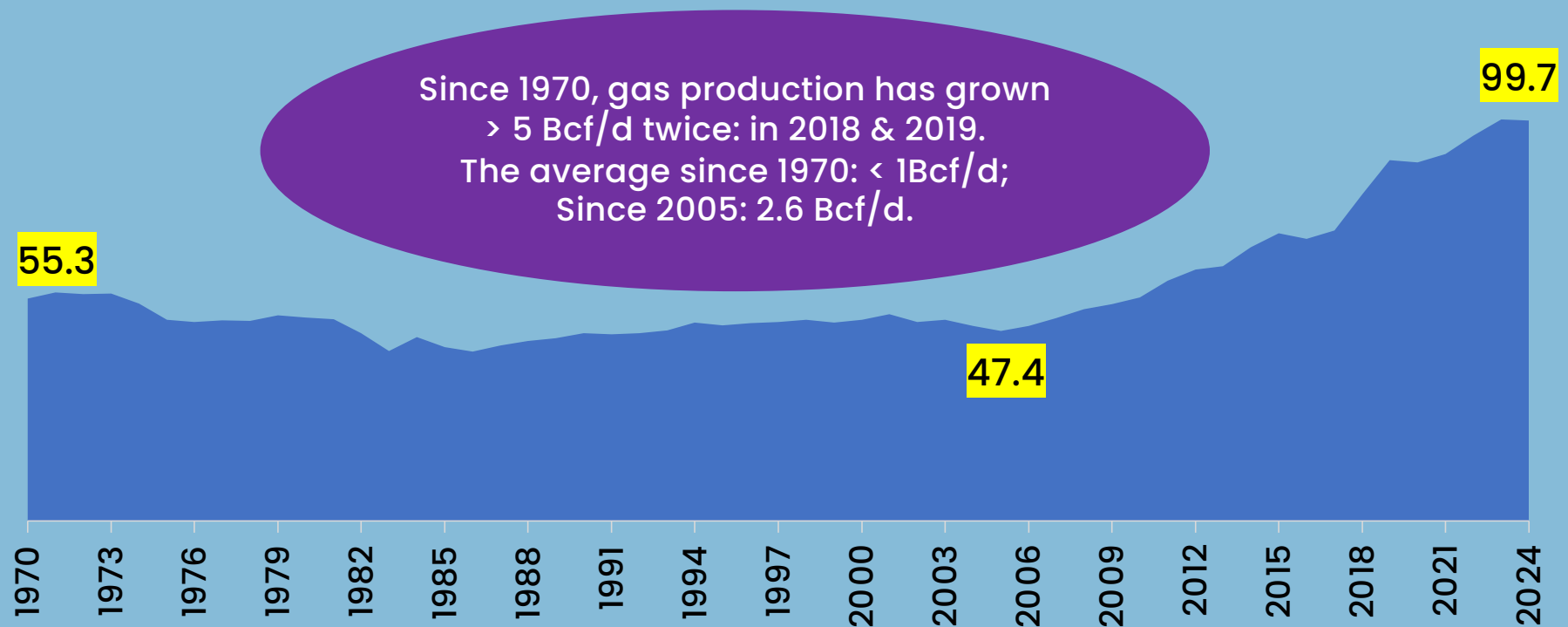
US gas demand, in Bcf/d, 2024 to 2030

Source: Kinder Morgan, 3Q2025 Investor presentation,
https://s24.q4cdn.com/126708163/files/doc_presentations/2025/Aug/07/3Q-2025-KMI-Investor-Presentation_vF.pdf

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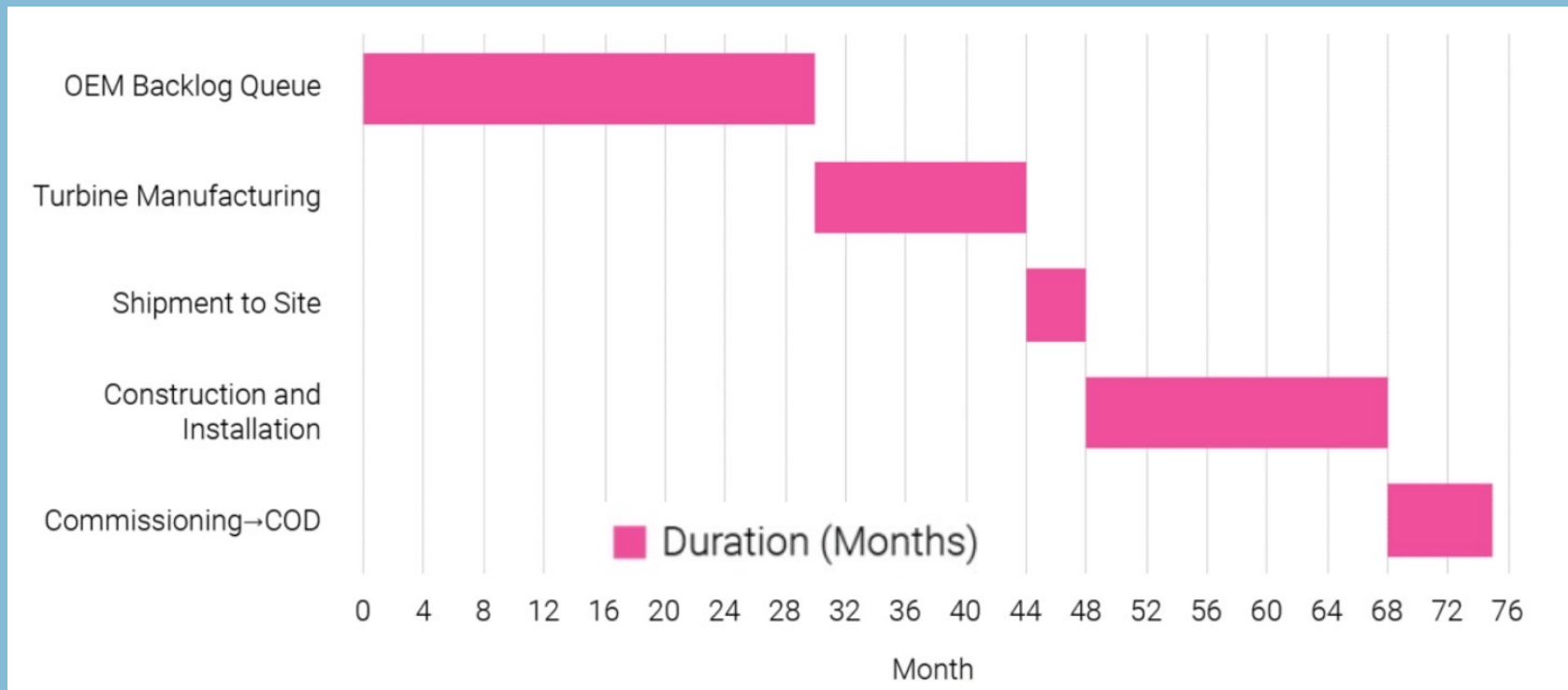
Can US Production Grow By ~ 5 Bcf/d Every Year Until 2030?



US natural gas production, in Bcf/d, 1970 to 2024



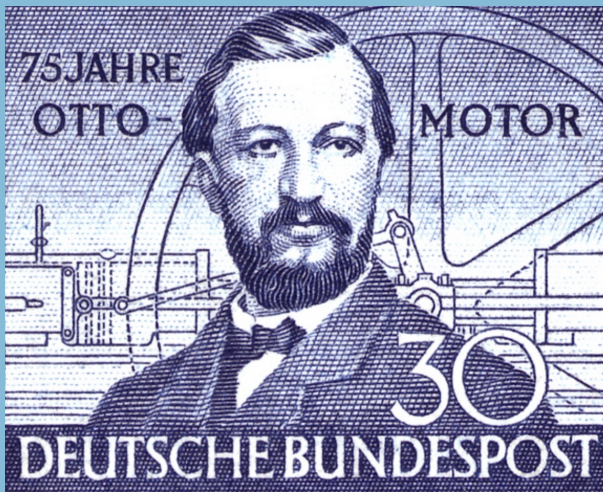
What About Supply Chains?



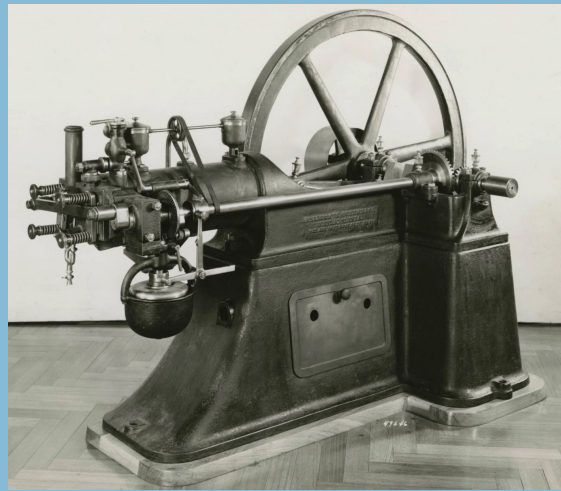
Timeline for large gas-fired generation installation



Otto-Cycle Engines: 150 Years Young & Now Powering AI



Nikolaus Otto, 1832–1891



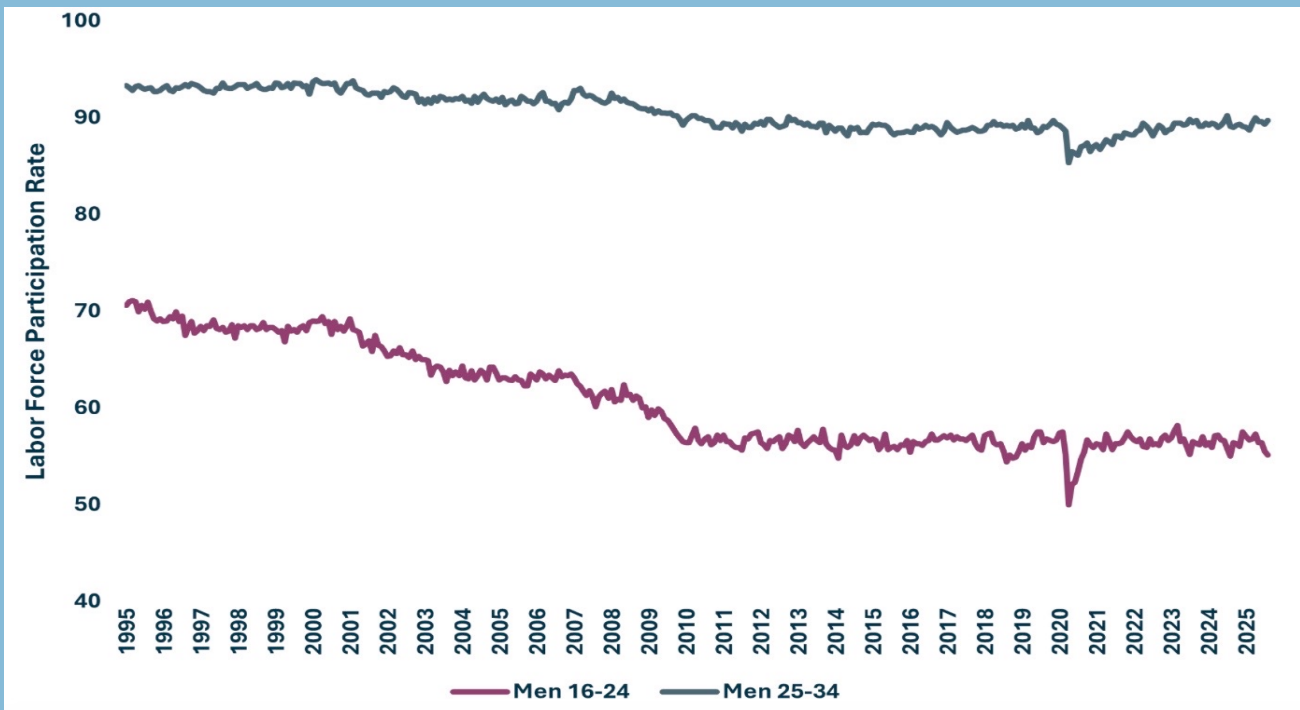
Otto engine, circa 1883.
Output: 750 W



Wärtsilä 18V50SG.
Output: 18.8 MW



What About Skilled Labor?



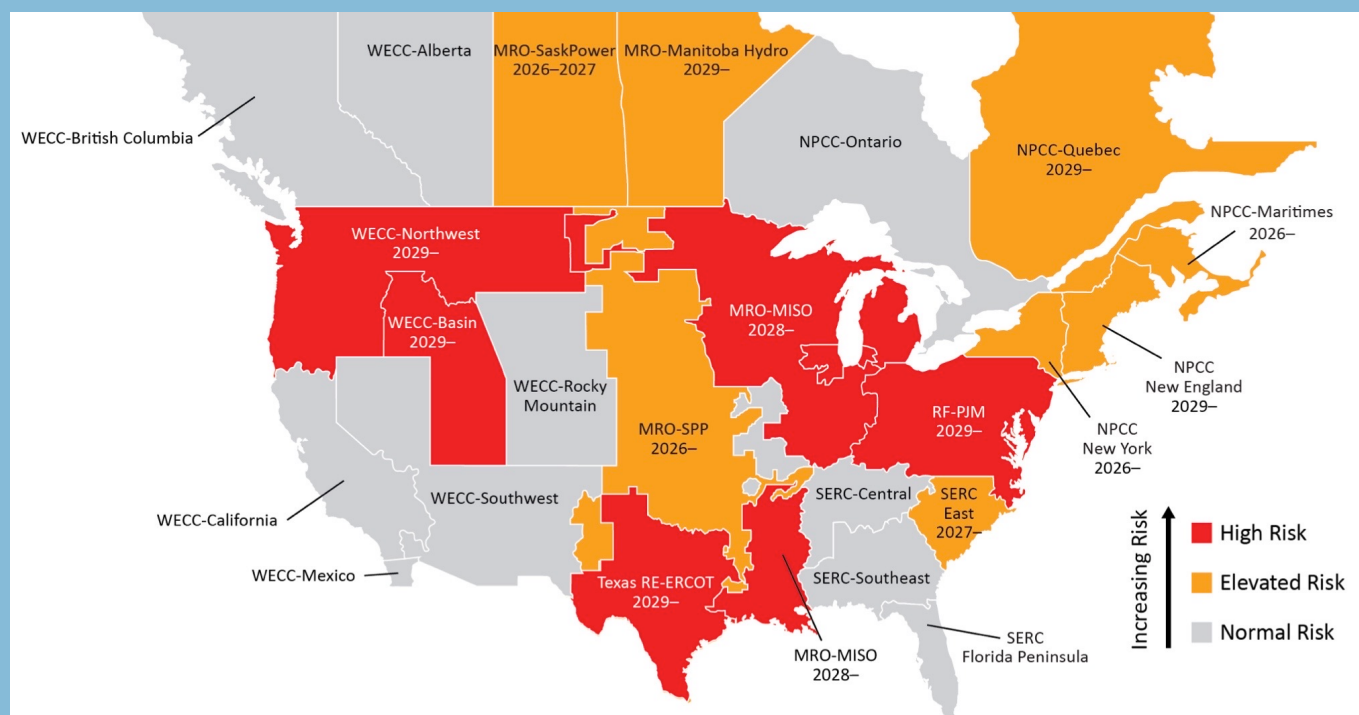
Labor force participation rates for men 16-24,
& men 25-34 years old, 1995 to 2025

Since 1995, the participation rate of men aged 16 to 24 has dropped from 71% to 55%. Along with all of the other social pathologies associated with increasing loneliness, time online, and disengagement from social groups, the decline in labor force connection promises more social and economic problems.

— Econ. Policy Innovation Ctr., Nov., 2025



What About Grid Reliability?



Risk-area summary, 2026 to 2030

Summer peak demand is forecast to rise by over 224 GW. This is 69% higher than last year's 10-year growth projection... Winter peak demand is expected to grow by 245 GW, continuing to outpace summer and exceed prior-year projections... AI & the digital economy account for most of the projected increase.

— NERC, Long-term Reliability Assessment, January 23, 2026



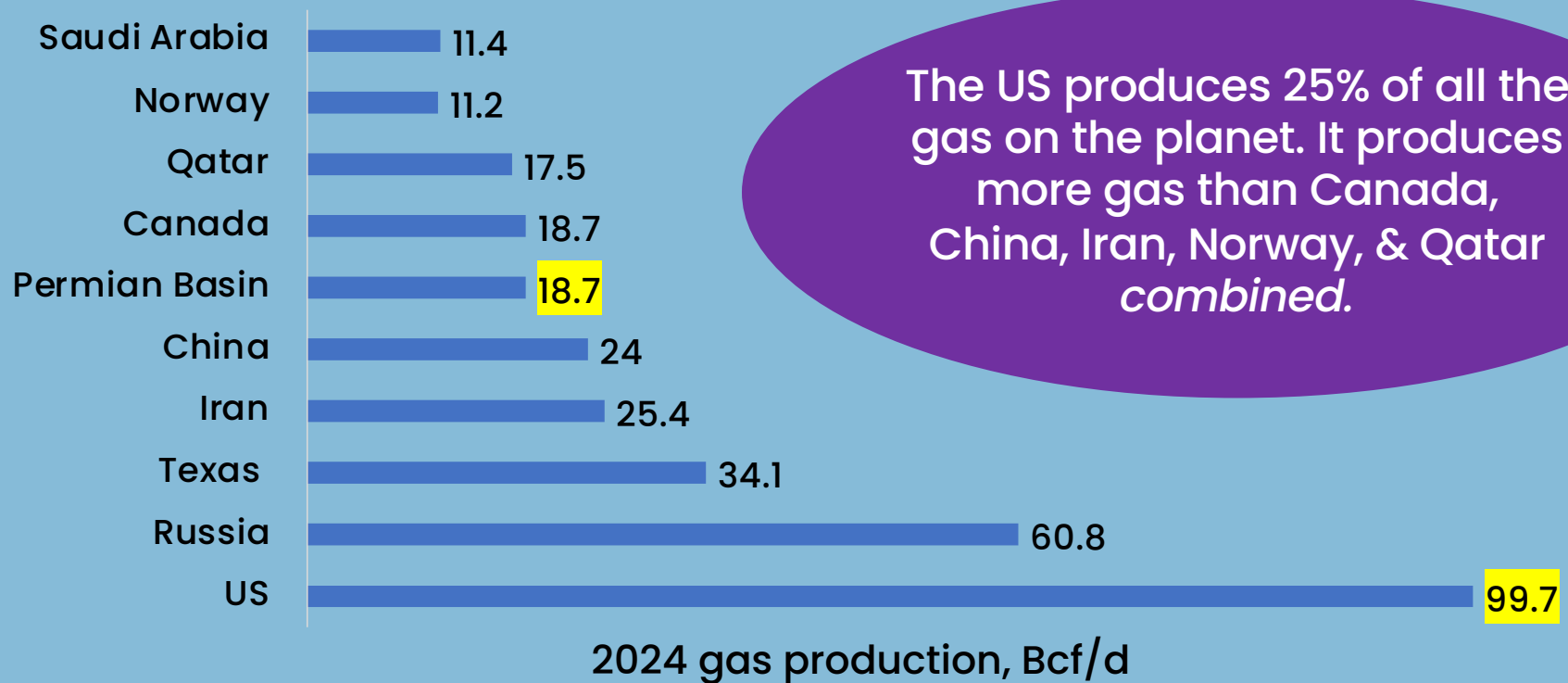
N2N: Natural Gas To Nuclear

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
 - US gas pipeline & storage network is huge



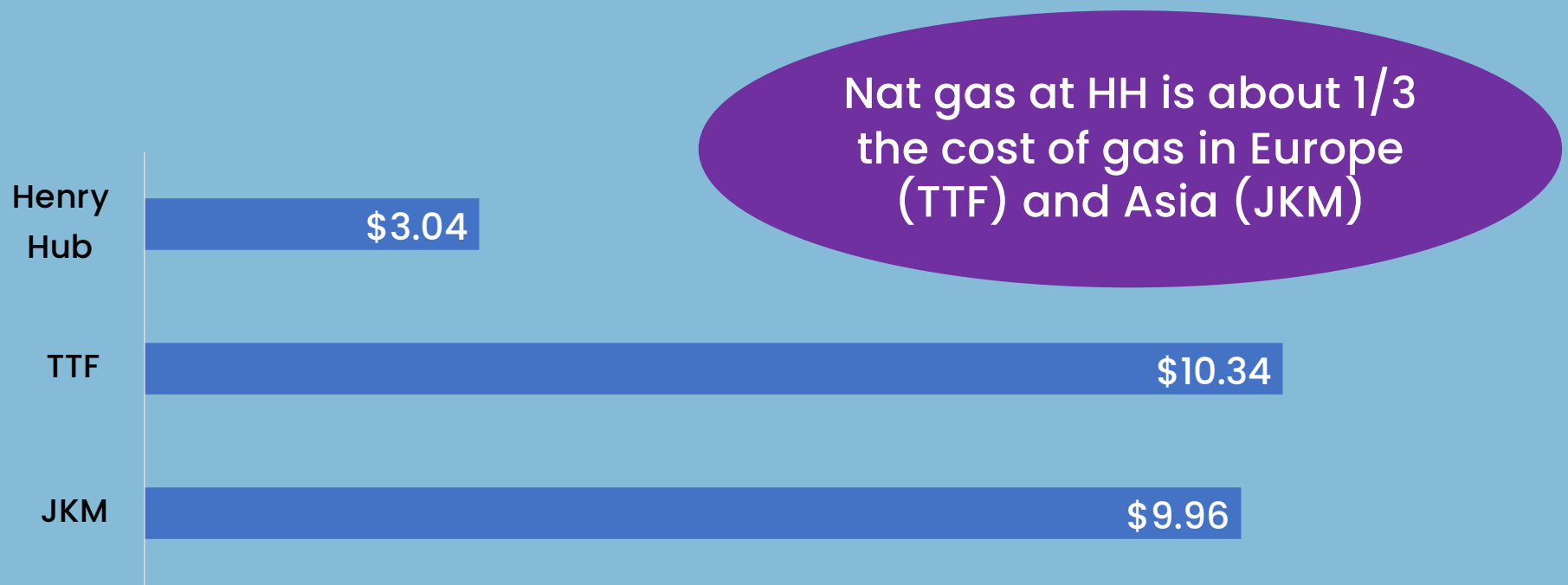
The US Is A Gas Superpower



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

US Has A Price Advantage Over ROW

Nat Gas Prices: Henry Hub vs. JKM & TTF



Front-month price, \$ per MMBtu, February 18, 2026

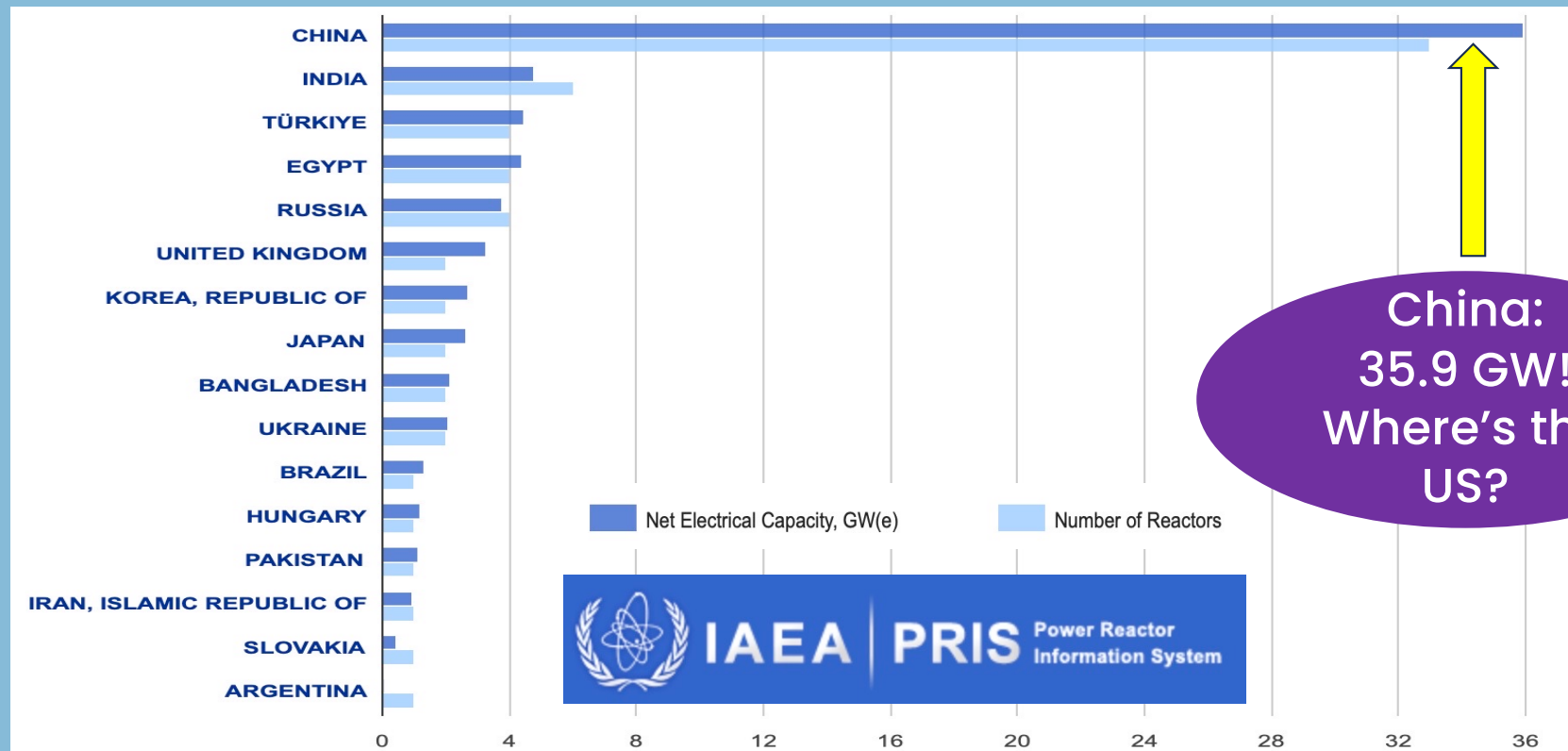


Why Nuclear?

- 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



Sources: IAEA, <https://pris.iaea.org/pris/worldstatistics/underconstructionreactorsbycountry.aspx>, data as of 021226

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SMR Intelligence US



- 40 Companies
- 46 Reactors
- Market cap of pure plays: ~ \$21.3B
- Market cap of incumbents: > \$208B

SMR Intelligence Global

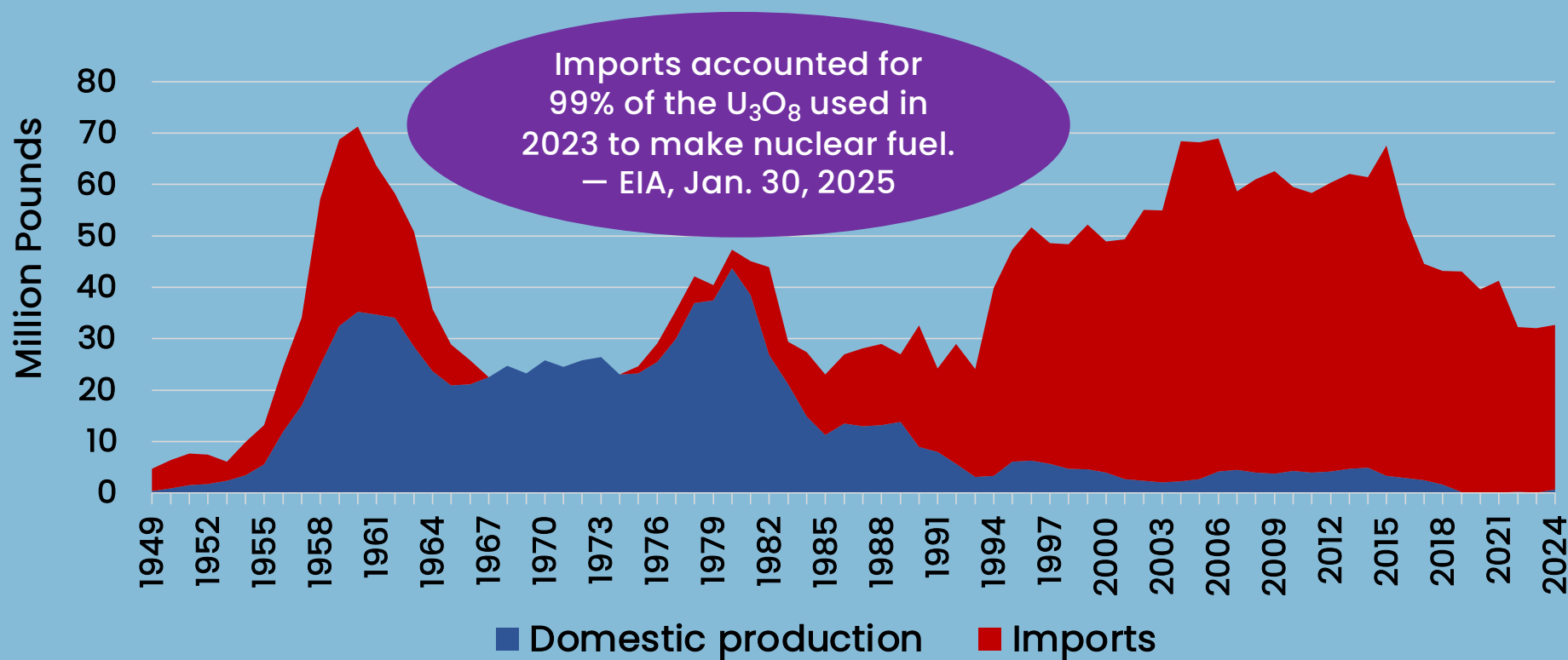


- Non-US
- 19 Countries
- 55 Entities
- 72 Reactors
- Total w/US:
- 95 entities
- 118 designs



US Nuclear Depends On Foreign Fuel

Production Of Uranium Oxide vs. Imports, 1949 to 2024

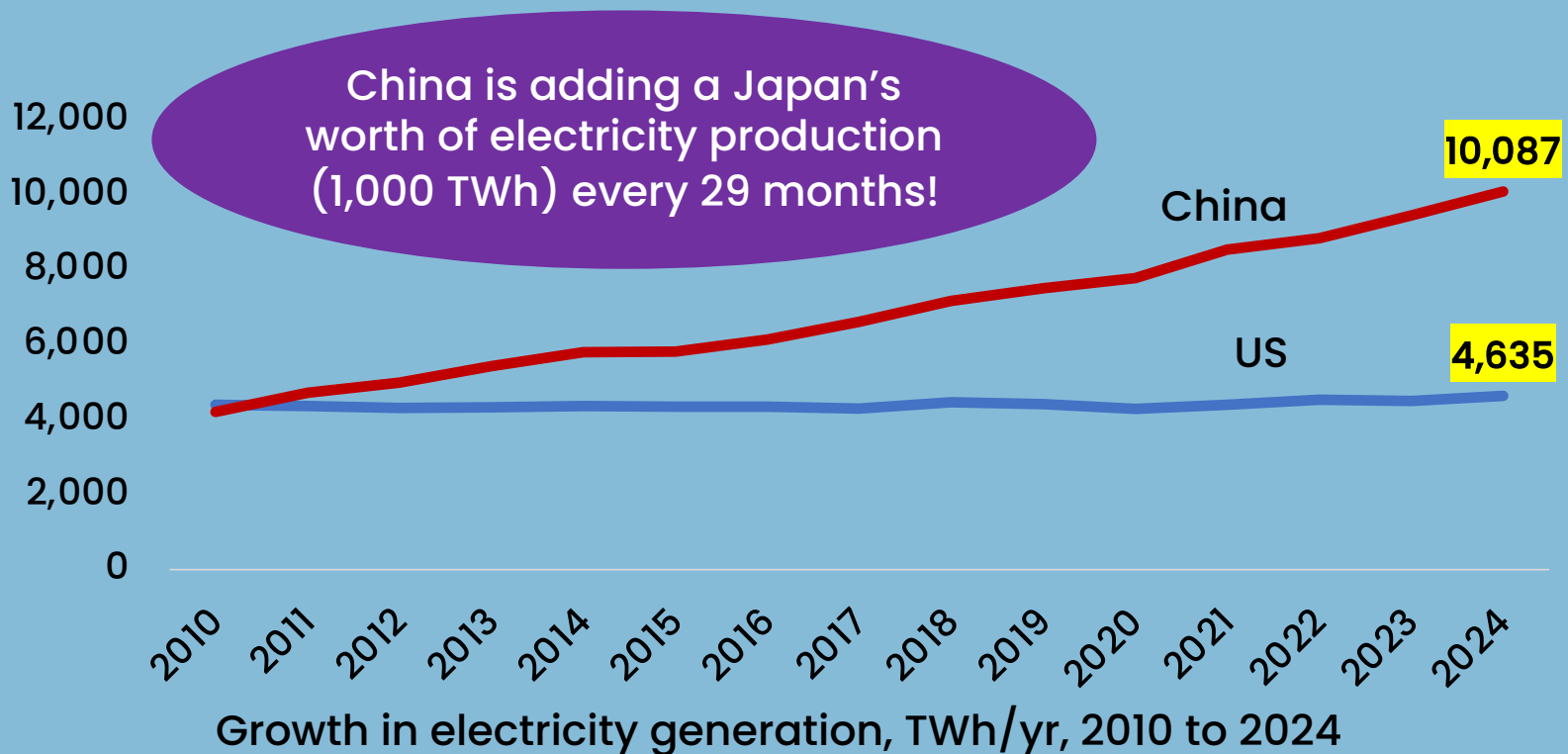


Source: EIA, EPM , <https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf Table 8.2>, <https://www.eia.gov/todayinenergy/detail.php?id=64444>

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China's Electricity Generation Growth Is Off The Chain



Source: Statistical Review of World Energy 2025

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

standard atomic weight
most stable mass number
1st ionization energy
in kJ/mol

atomic number
electronegativity

chemical symbol

name

electron configuration

radioactive elements have
masses in parenthesis

oxidation states
most common are bold

Electron configuration blocks

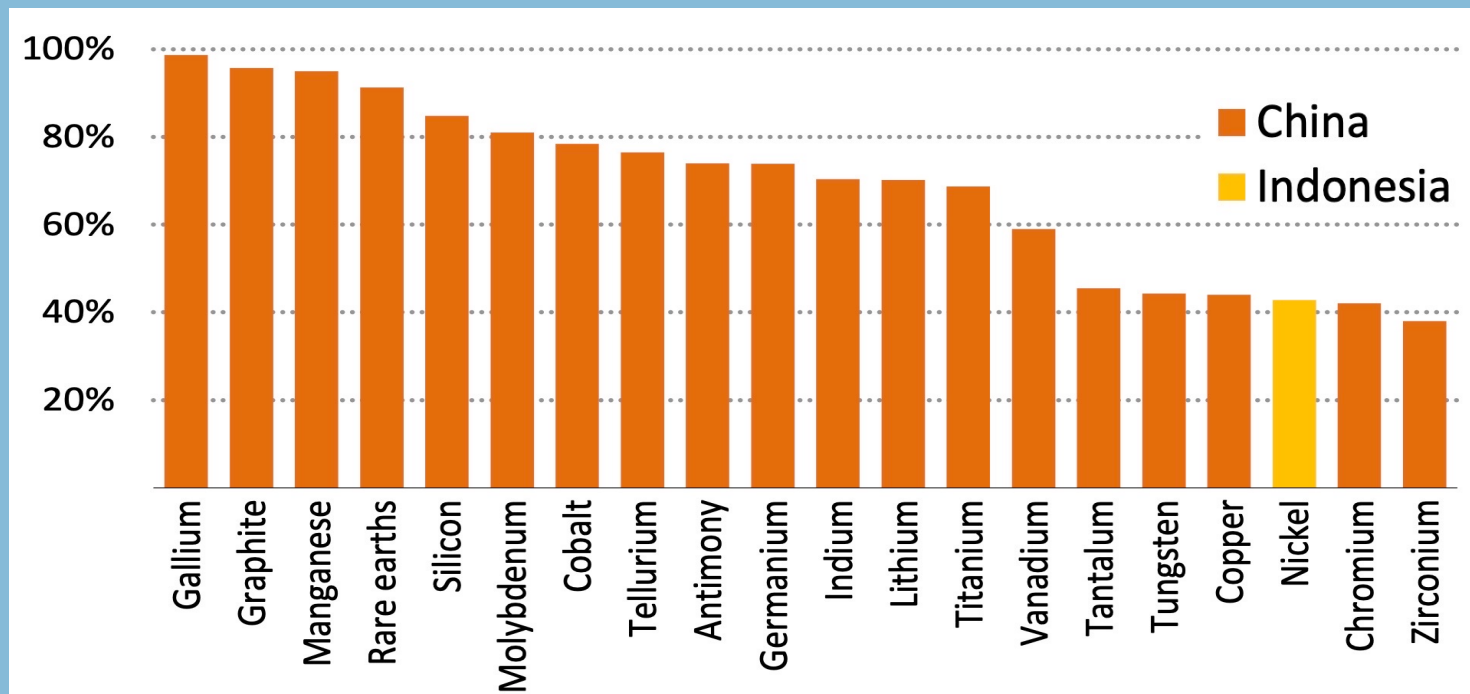
• 1 kJ/mol = 0.01036 eV
• all elements are implied to have an oxidation state of zero.

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



Top Issues For US Energy & Power Sectors

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





SUNBLOCK

THE GLOBAL FIGHT TO SAVE FARMLAND FROM BIG SOLAR

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

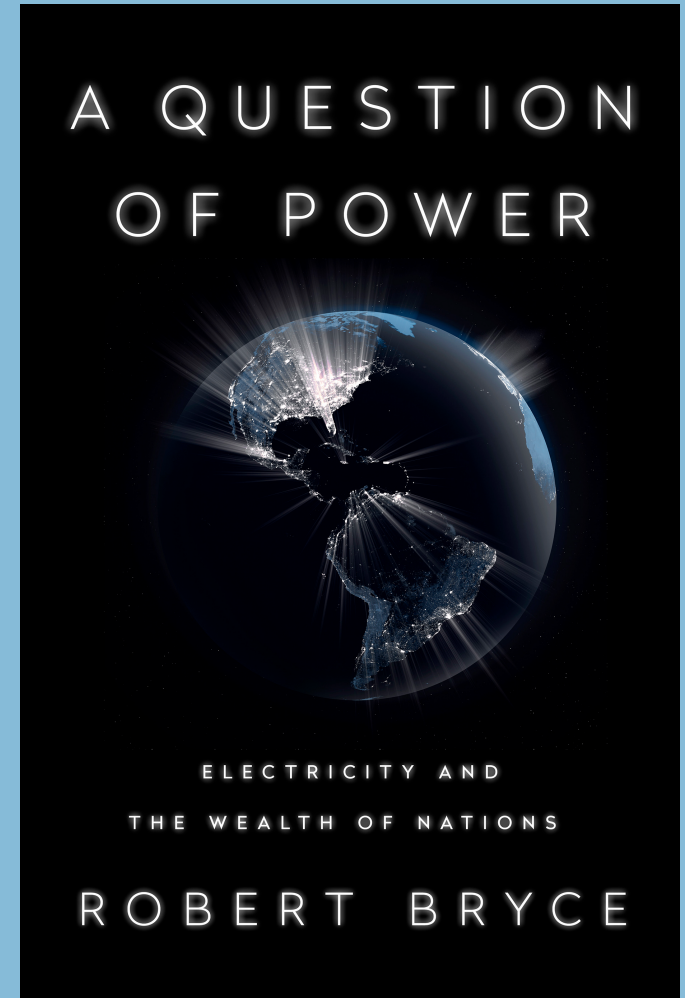
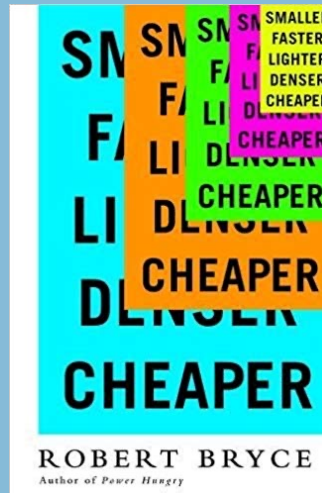
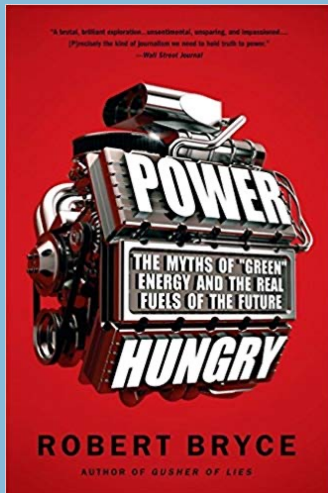
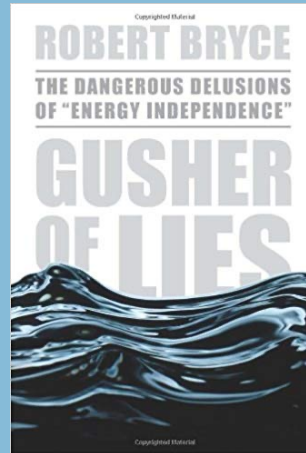
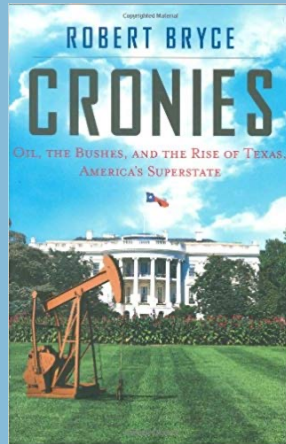
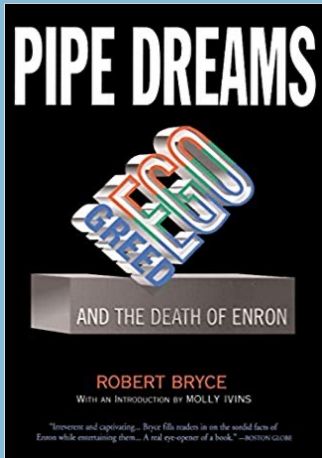


JuiceTheMovie.com



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Thank you