The $7 Trillion Battle for Global AI Supremacy

A Visual Guide to the U.S.- China AI Race

/edge
AMERICAN EDGE PROJECT

A Note from Doug Kelly, CEO of the American Edge Project

This “Visual Guide” to the U.S.–China Artificial Intelligence (AI) Race was created to make one message clear: America’s AI leadership is at risk.

While the U.S. has an early lead in AI, **America is not positioned for long-term AI leadership. China is investing trillions to win the tech race.** China is doing this by targeting the four key pillars of AI strength: energy, infrastructure, talent, and adoption.

Losing our AI edge would threaten America’s security, prosperity, and the values of freedom and openness that anchor the world’s digital future. That is an unacceptable outcome.

Lawmakers must act decisively, starting by codifying and funding President Trump’s AI Action Plan. If they do, America can secure lasting AI leadership and create new jobs, higher wages, and breakthroughs in healthcare, education, and everyday life.

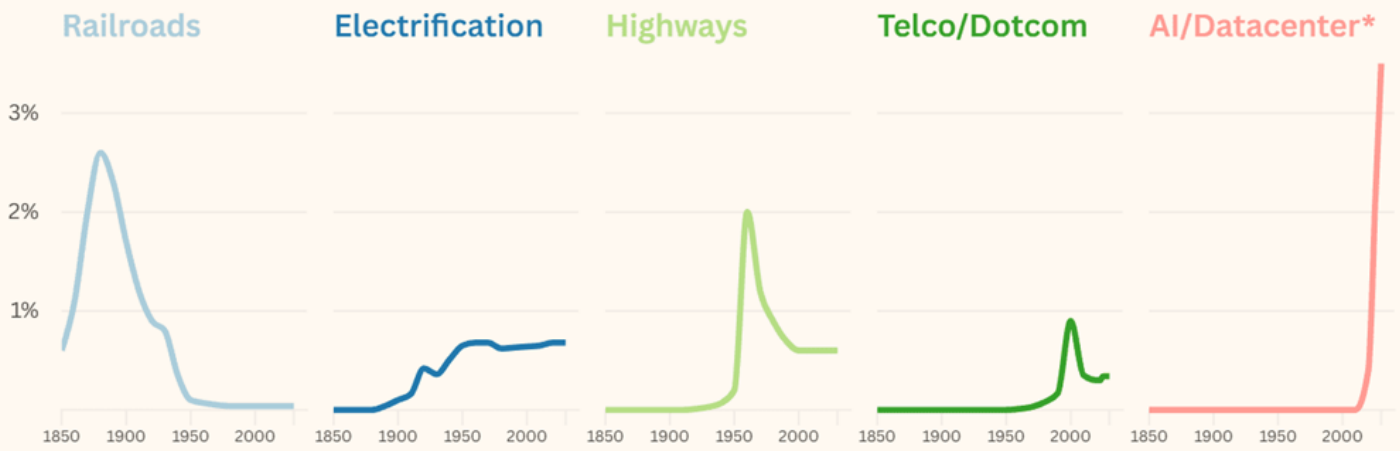
Time is running out—America must act now, and with purpose.

$7 Trillion AI Race is America's Boldest Buildout

DataCentre

"AI Infrastructure to Require $7 trillion by 2030, says McKinsey"

Annual U.S. Capex Estimates by Sector (% of GDP): Railroads, Electrification, Highways, Telecom, and AI/Datacenter (with 2025-2030 as Forward Estimates)



Source: Per Aspera Internal Research. Data from 1850–2024 sourced from NBER, BEA, FHWA, FCC, EIA, AAR, and leading sector research. Values represent annual U.S. capex as a % of GDP in each sector. Projections for 2025–2030 reflect scenario-based estimates for AI/datacenter growth, derived from Goldman Sachs, S&P Global, and industry reports. Historical values and forecasts are harmonized for comparability across eras.

Per Aspera™

Key Takeaways

- **The scale of building AI infrastructure**—energy, chips, data centers, and talent—exceeds anything the U.S. has ever built to date.
- **It's a 'peacetime Manhattan Project'** we must embark on now to secure the future.

Sources: DDN.com; Per Aspera; DataCentre Magazine.

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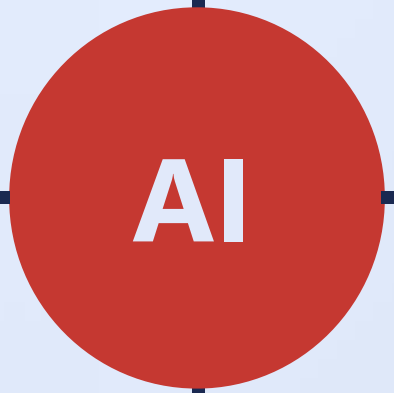
The Four Essential Drivers of AI Leadership

Power & Transmission

AI leadership hinges on whether America can power it. Exploding demand will strain our aging grid, while China races ahead with massive new generation and transmission. Without urgent upgrades, America's AI future will be capped by energy limits.

AI Adoption at Home and Abroad

The country that scales AI fastest will lead. China is surging at home and exporting its tech abroad, while U.S. adoption and diplomacy lag. Without a surge, China will seize global leadership.

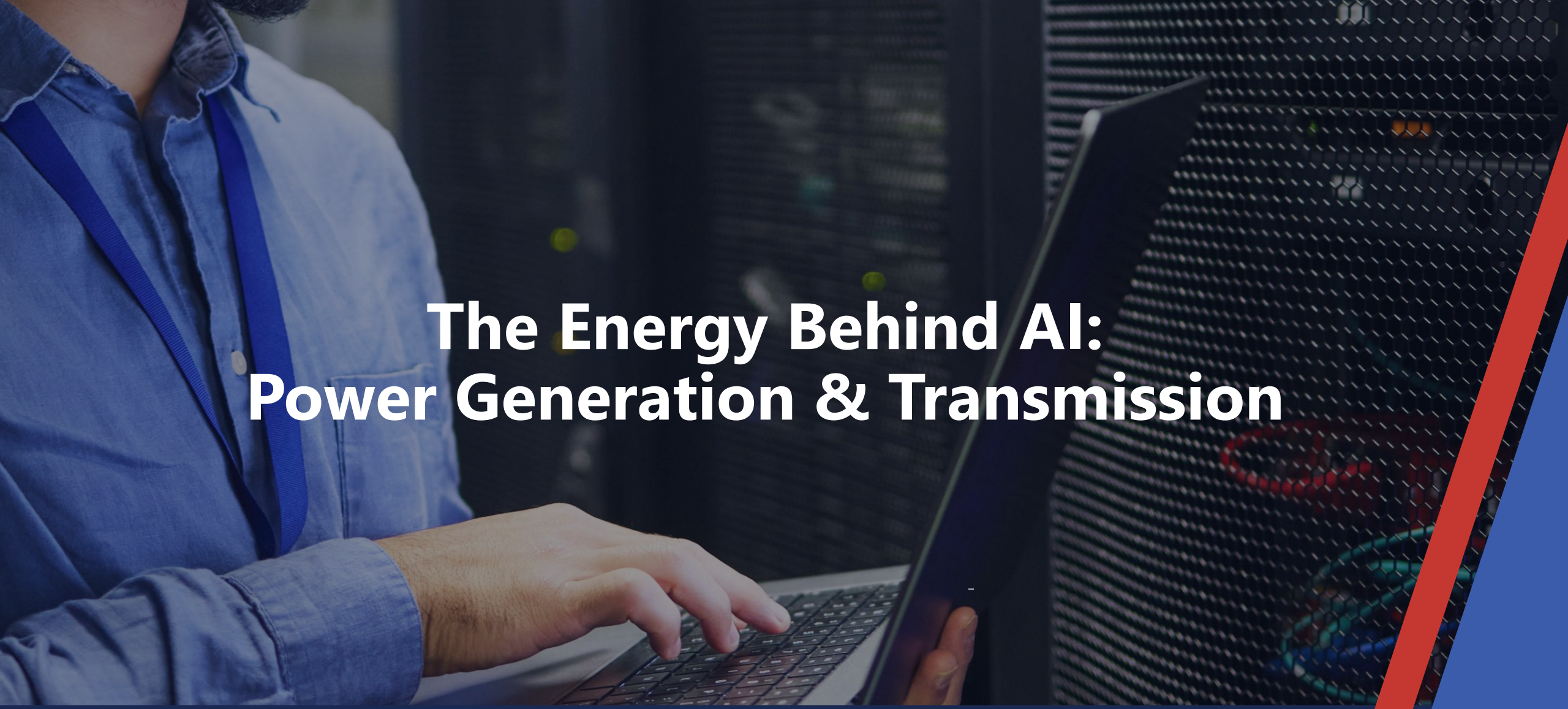


AI Infrastructure (Chips, etc.)

Leadership depends on the fastest chips and robust data centers. These engines of the AI age determine who delivers the most capable AI at the lowest cost. If America falls behind, every other advantage erodes.

AI Talent & Skills

AI is a talent race. America faces severe workforce shortages, while China invests heavily in science, technology, engineering and math (STEM) and research and development (R&D). If we don't close this gap, we'll cede both innovation and deployment speed.



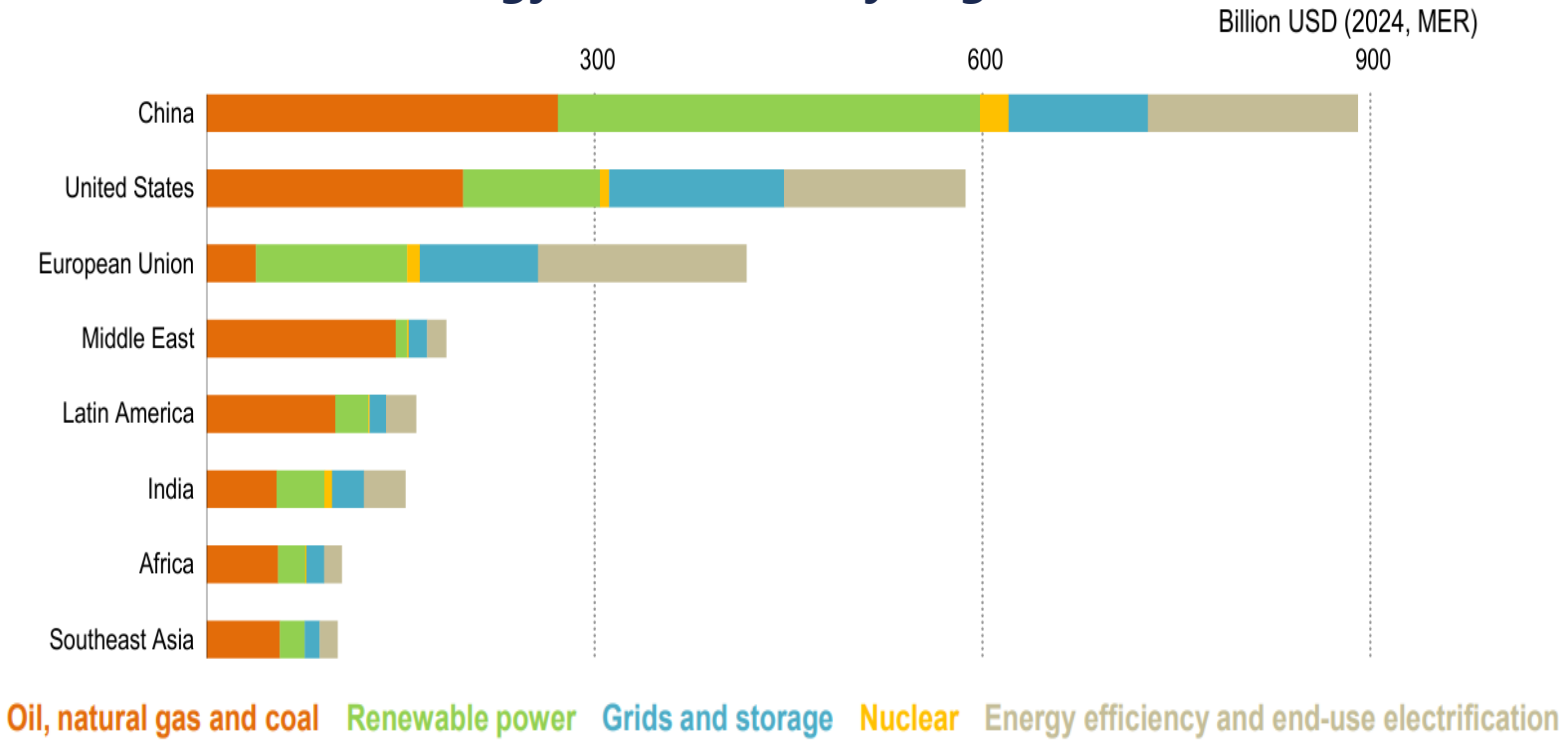
The Energy Behind AI: Power Generation & Transmission

"China is mobilizing state resources to electrify its AI ambitions. America must answer once again with speed, innovation, and market discipline. If we act now, we can power the next digital revolution... Delay, and the smartest chips on Earth will be useless in the dark."

Andrés Gluski, President & CEO, The AES Corporation

China is the Global Leader in Energy Investment

Energy Investment by Region, 2025

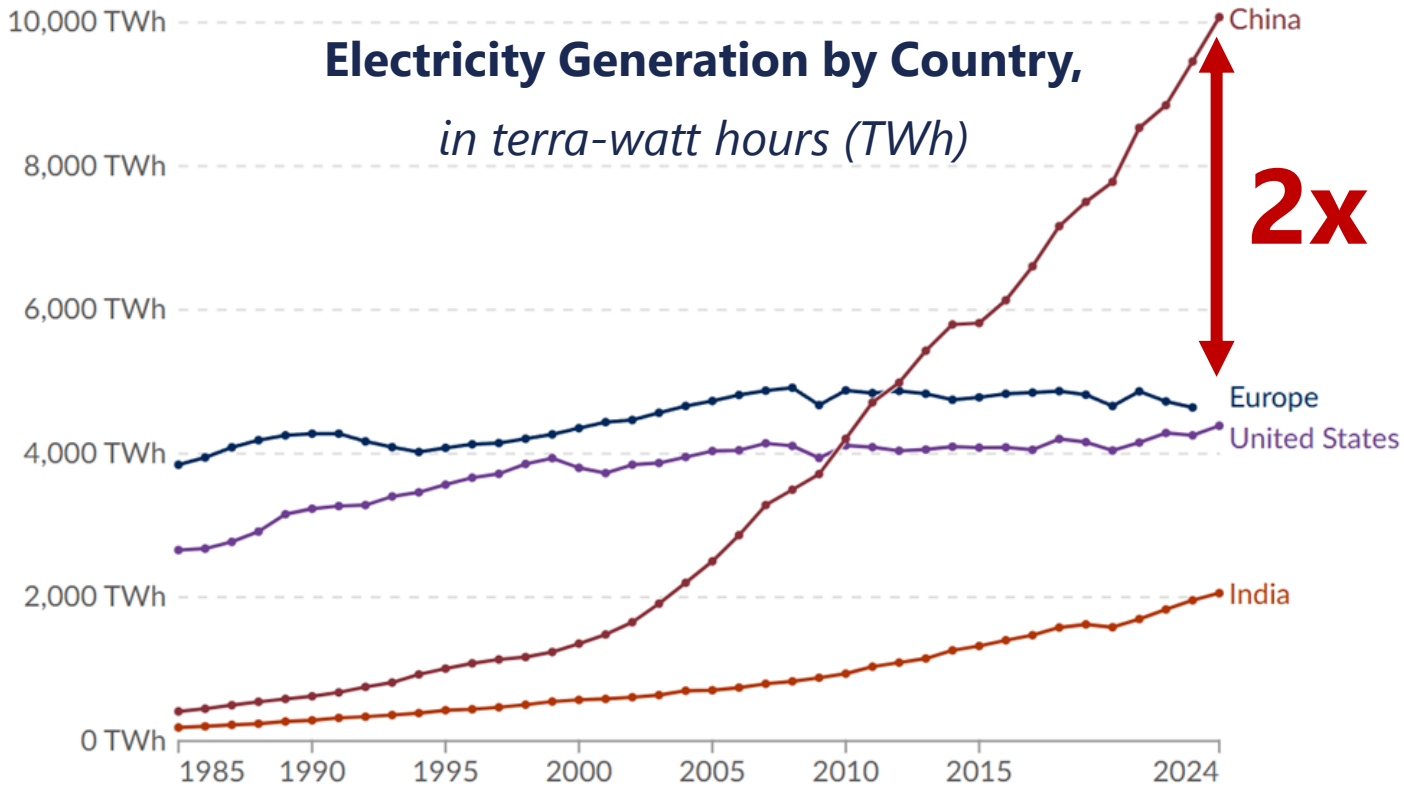


Sources: World Trade Organization

Key Takeaways

- **China will invest $300 billion more** than the U.S. in energy in 2025 and one-fourth of all global investment.
- **2025 is no exception:** China has executed a 15-year energy investment surge.

China Doubles America's Electricity Generation

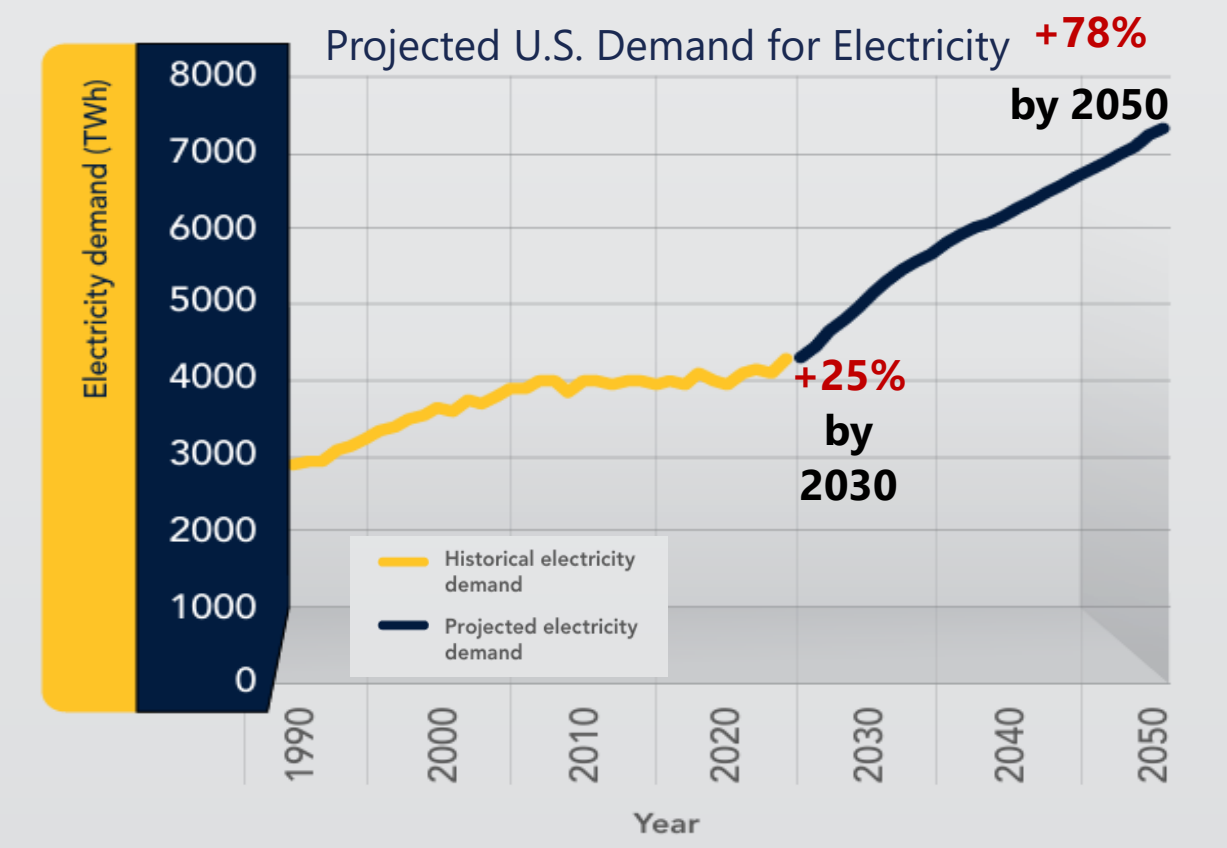


Source: Our World In Data

Key Takeaways

- **China generates two times more power than the U.S.**—and will add **60 percent more** by 2040.
- **Energy experts**: China considers AI's large energy needs a "solved problem."
- **China's modernized, high-capacity grid** moves abundant energy for AI needs nationwide.

U.S. Demand to Soar—But We're Not Ready



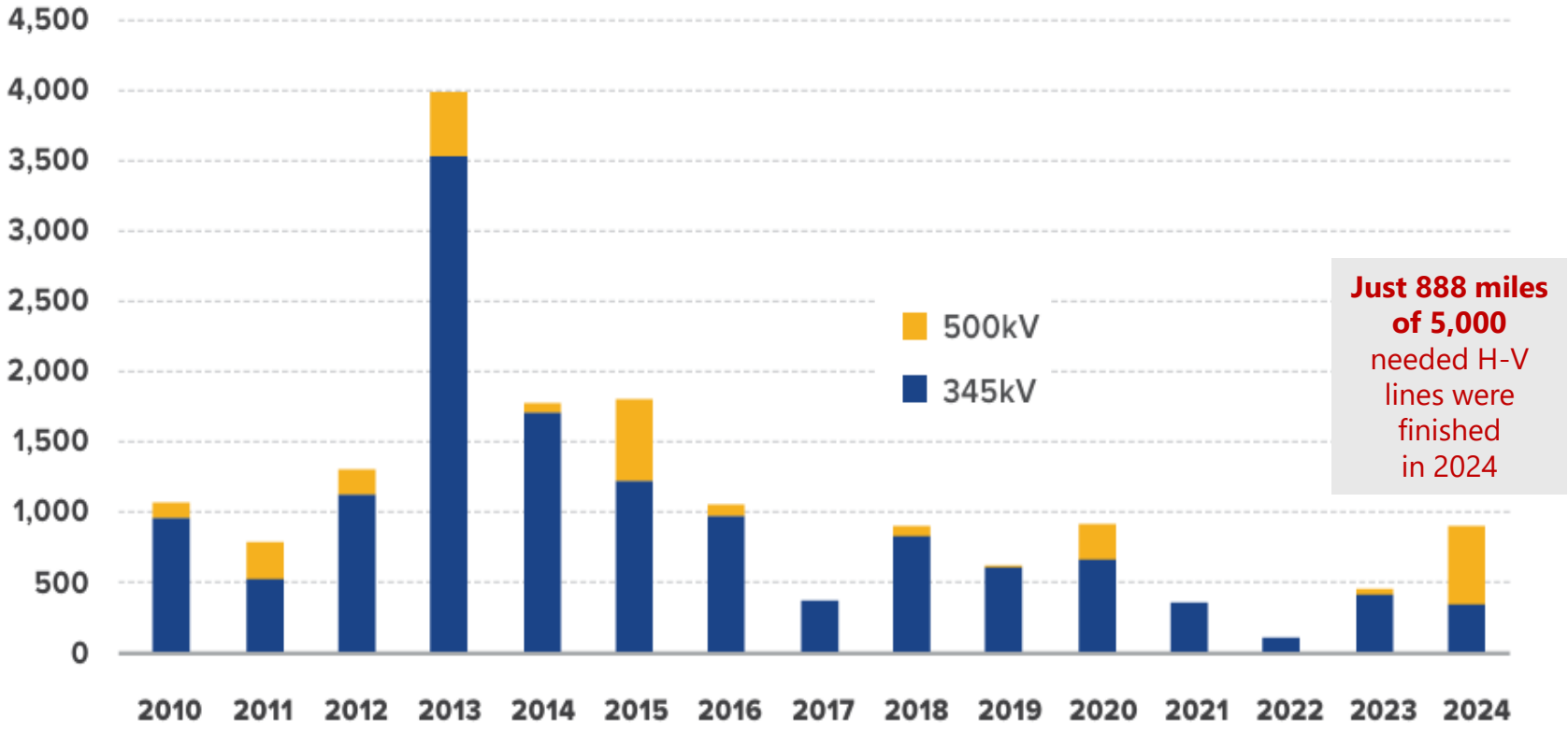
Source: ICF Energy Demand Report

Key Takeaways

- **Fastest electricity growth in decades**: **+25 percent** by 2030 and **+78 percent** by 2050.
- **Demand drivers**: AI data centers, EVs, industrial use, and other electrification.
- **Failure ahead?** This surge will test an already strained U.S. grid.

U.S. Grid: Outdated & Underbuilt

UPDATED FIGURE 1 | Miles of new 345 kV+ transmission lines built over the last 15 years



Just 888 miles of 5,000 needed H-V lines were finished in 2024

Source: Grid Strategies

Key Takeaways

- **Collapse in transmission line construction**: Down 78 percent since peak in 2013, with an average of just 536 new miles of high-voltage lines built yearly from 2020-24 (yellow bars in graph).
- **Aging infrastructure creates reliability risk:** 70% of transmission assets >25 years old while facing 100x increase in blackout risk by 2030.

What Experts Are Saying

The New York Times

There's a Race to Power the Future. China Is Pulling Away.

Source: New York Times

E&E NEWS By POLITICO

Central US grid could face power deficit by summer 2027

Source: Energy Wire

POWER

Nation's Power Operators Warn Congress of a Coming Reliability Shortfall

Source: Power Magazine

FORTUNE

AI experts return from China stunned: The U.S. grid is so weak, the race may already be over

By Eva Roytburg
Fellow, News
August 14, 2025 at 7:55 PM UTC

Add us on

Source: Fortune

UTILITY DIVE

US energy infrastructure gets a D+ from American Society of Civil Engineers

Source: Utility Dive

PowerTechnology

US DoE report warns of 100-fold increase in power outages by 2030

Source: Power Technology

Power Supply Chain Chokepoints

Turbines & Pipeline Shortfalls

S&P Global

US gas-fired turbine wait times as much as seven years; costs up sharply

LATITUDE MEDIA

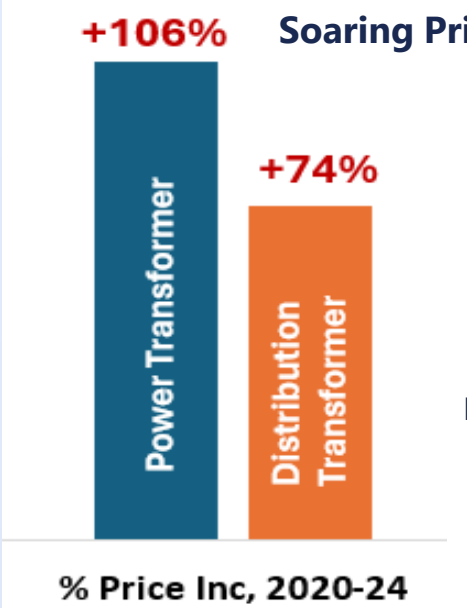
The gas turbine crunch

Energy Intelligence

US Gas Pipeline Crunch Could Thwart AI Market Pursuit

Sources: S&P Global; Latitude Media; Energy Intelligence

Power Transformers



Soaring Prices & Wait Times

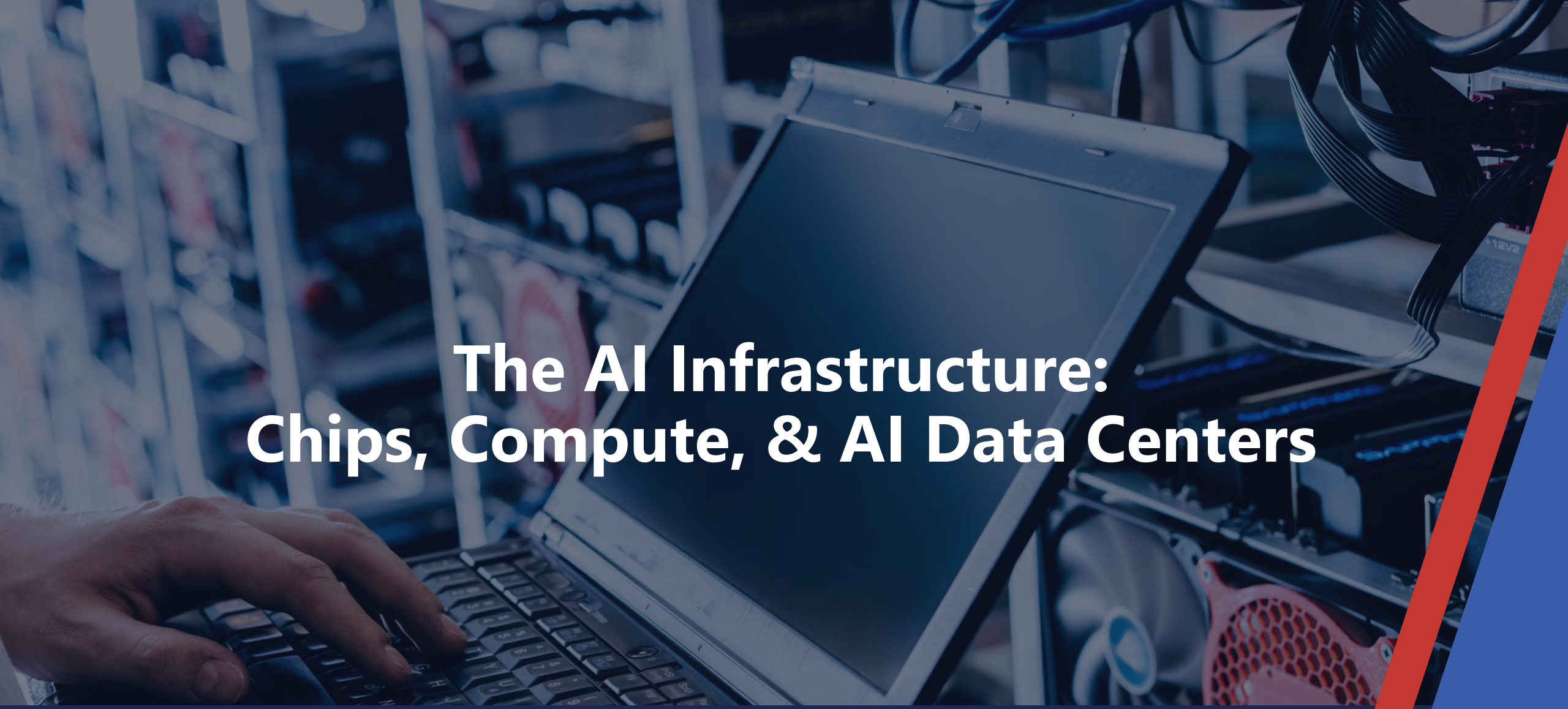
Transformer Wait Times:
2-4 years

Percent Imported by U.S.
80%

Source: Wood Mackenzie

Key Takeaways

- **Gas Turbines & Pipelines**: U.S. AI data centers could need nearly **six billion cubic feet per day** of natural gas by 2030, but a **seven-plus year wait time** on gas turbines and **inadequate pipeline infrastructure** threaten U.S. AI growth.
- **Power Transformers**: Vital for the grid and data centers, transformer prices and wait times have soared. China is the **world's largest exporter** of transformers.



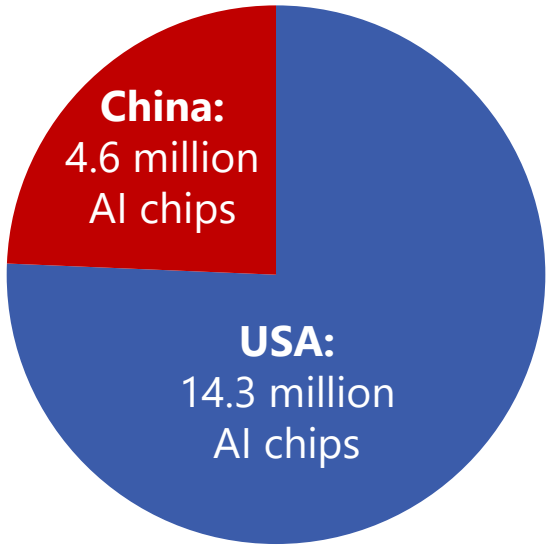
The AI Infrastructure: Chips, Compute, & AI Data Centers

"Compute alone is insufficient [to win the AI race]. With compute but no energy, datacenter hardware cannot be powered. With compute and energy but no data, models have nothing to learn from. With all three but no talent, there is no one to build, iterate on, and deploy systems."

Americans for Responsible Innovation

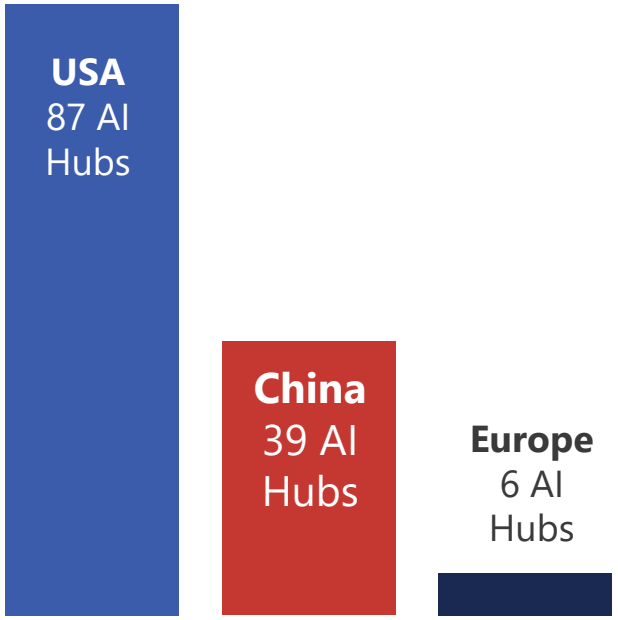
For Now, U.S. Dominates in AI Chips & Data Centers

AI Accelerator Chips



Source: CSIS Report

Specialized AI Data Centers

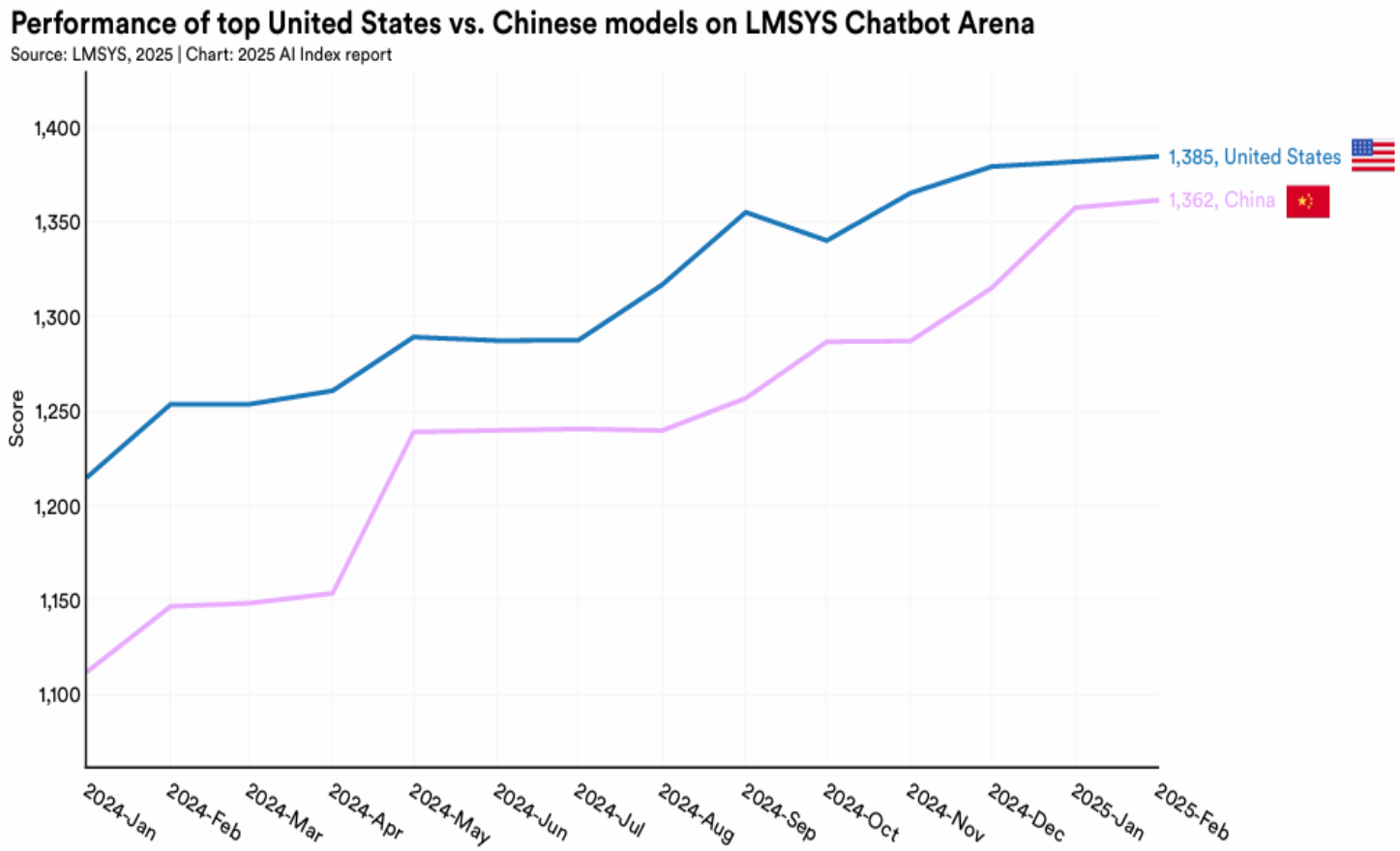


Source: TechRepublic

Key Takeaways

- The U.S. has **a three-to-one AI chip edge over China** and **controls about 75 percent of global AI computing power** vs. 15 percent for China.
- **The U.S. has twice as many specialized AI data centers than China (87 to 39).**
- **99 percent of China's notable AI models were trained on U.S. AI chips**, showing China's home-grown versions still fall short.

China’s AI Models Now at Parity with America’s



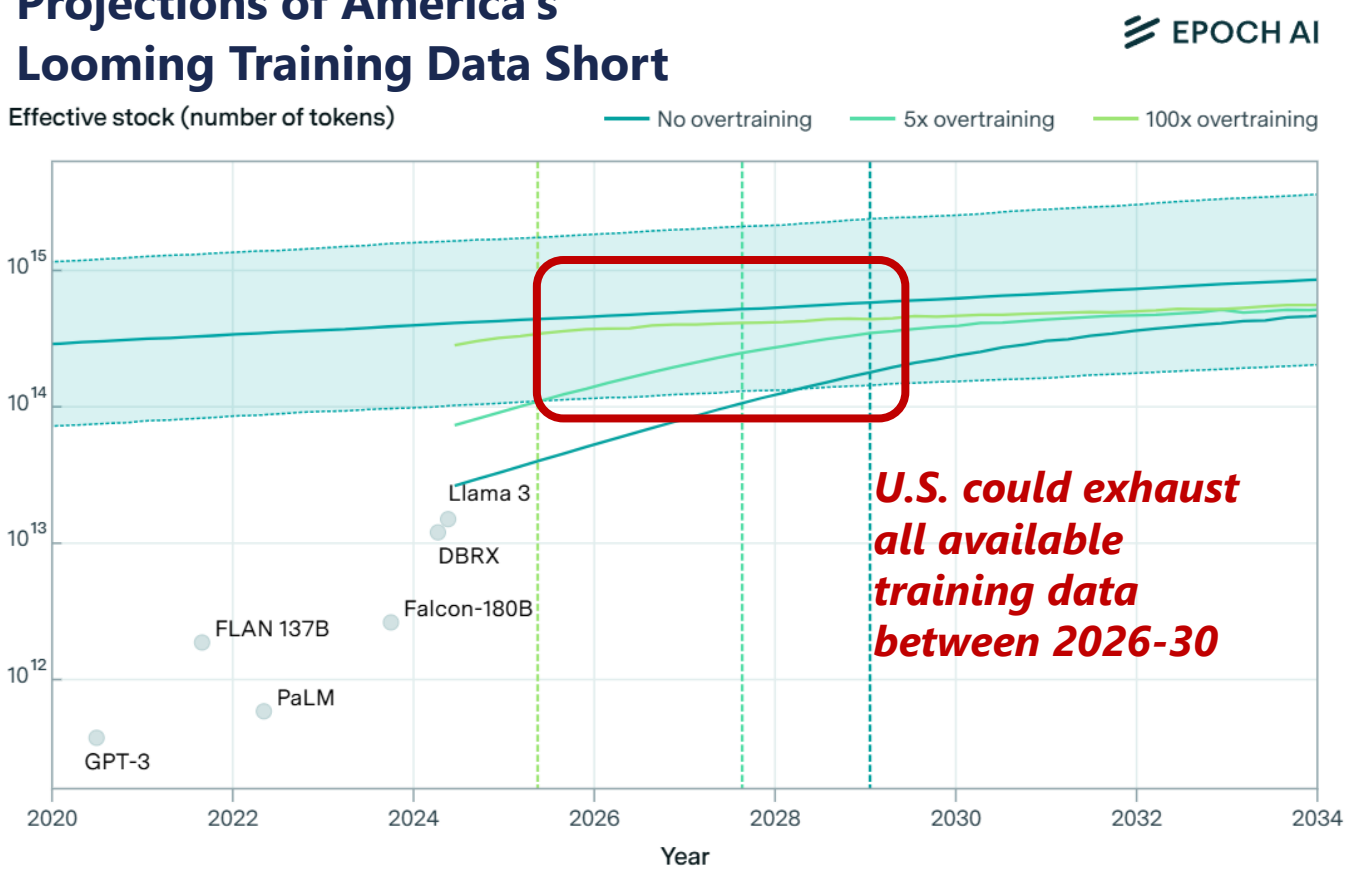
Source: Stanford AI Index 2025

Key Takeaways

- **China’s top AI models are now competing head-to-head with U.S. models** in reasoning, math, and coding benchmarks.
- **How? China creates massive graphics processing unit (GPU) clusters** to train frontier AI, offsetting the chip gap.
- **China’s dramatic surge toward parity** erodes America’s edge in innovation.

U.S. Faces Looming Training Data Shortage

Projections of America's Looming Training Data Short



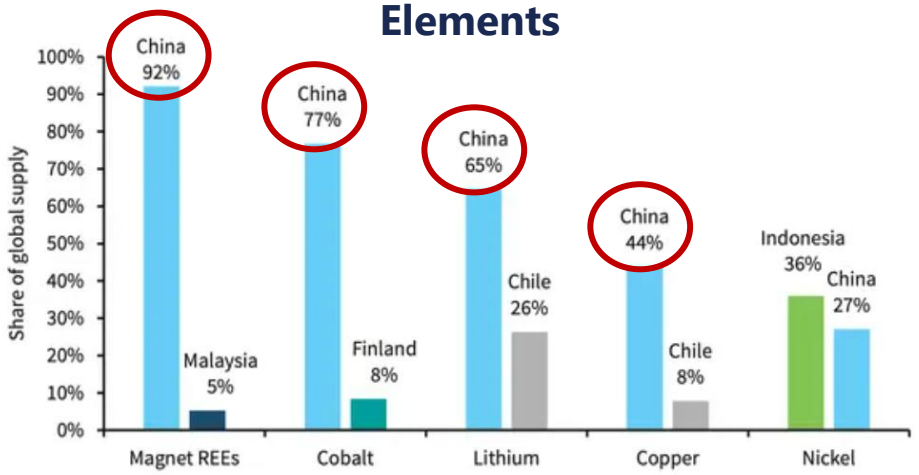
Sources: Epoch.AI

Key Takeaways

- **High-quality English text could be exhausted between 2026 and 2030**, creating a potential training ceiling.
- **Copyright lawsuits could block access** to the most factual sources, undermining AI model quality.
- **China prioritizes data as the "new oil" for AI**, creating a National Data Administration to expand access to massive troves of data.

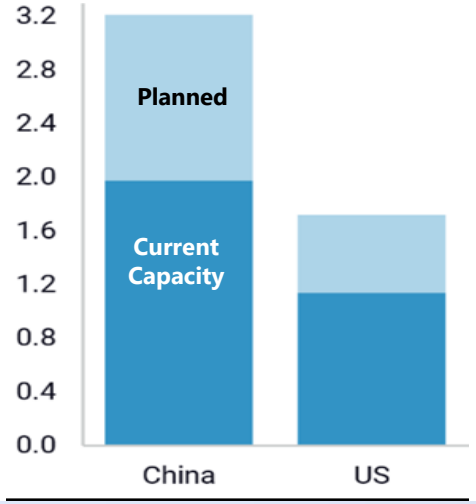
Compute Supply Chain Chokepoints

Critical Minerals & Metals



Source: Barclays, via Business Insider

Legacy Chips



Source: Rhodium Group

Key Takeaways

- **Critical minerals**:
  The lifeblood of AI tech & hardware, **China dominates 50 percent of the global market**, with near monopolies in magnets, cobalt and lithium. We are fighting back, with recent rare minerals deals with Australia and other allies, but there's still a long way to go.

- **Legacy Chips**:
  China will double U.S. capacity in chips that power everyday items, giving it critical leverage over global supply chains, including AI.

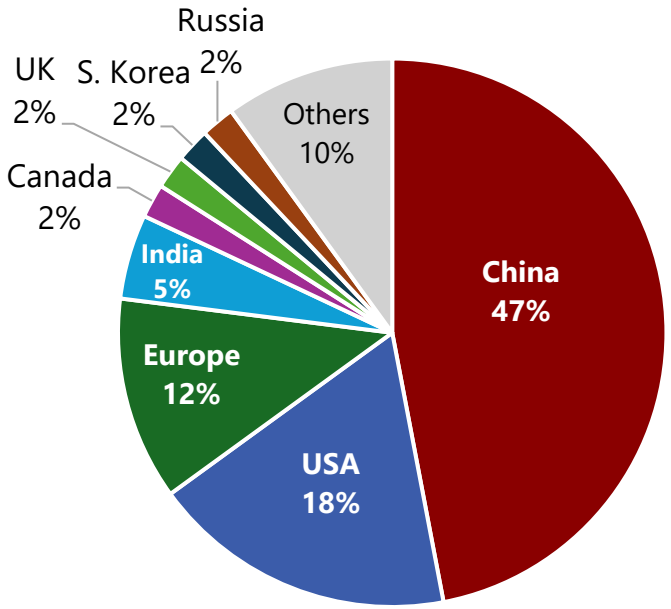
The AI Talent Race: Smarts, Skills, & Ideas

"Bain projects AI job demand could reach up to more than 1.3 million in the US over the next two years, while supply is on track to hit less than 645,000—implying the need to reskill up to 700,000 U.S. workers."

Bain & Company, AI Talent Research Report

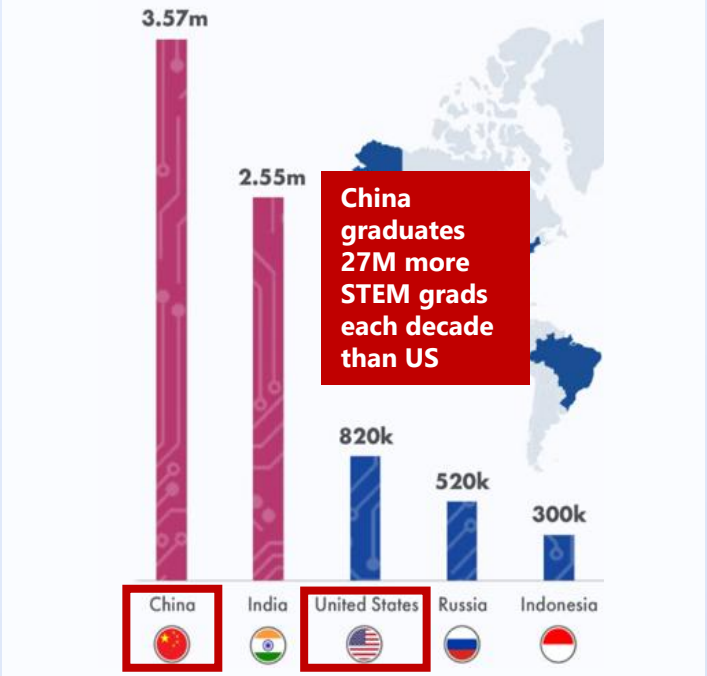
China is Producing Far More AI Talent than U.S.

Top 20% AI Researchers by Country of Origin, 2022



Source: MacroPolo Talent Tracker

STEM Grads/Year

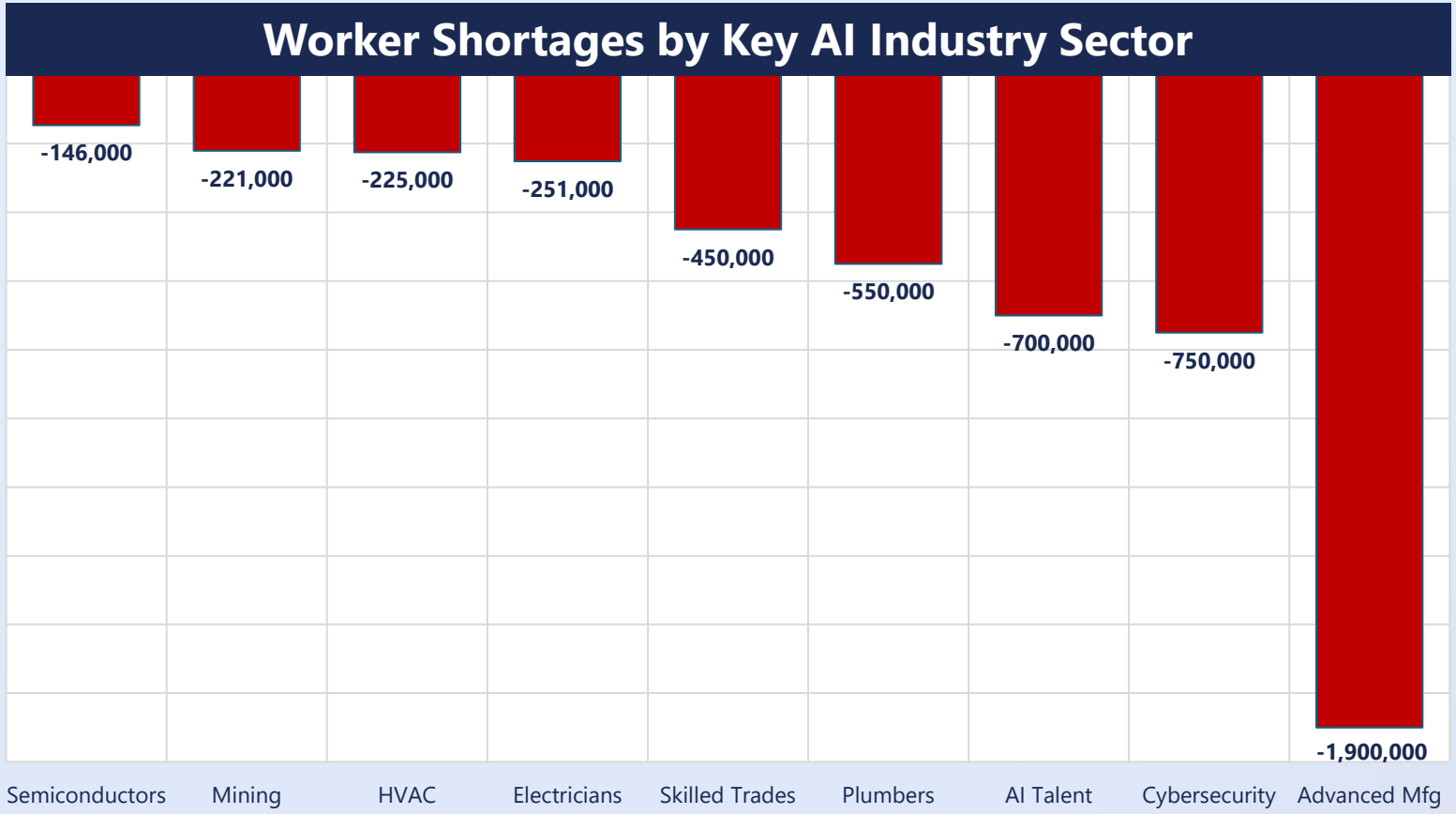


Source: Center for Security and Emerging Technology

Key Takeaways

- **China tops the U.S. handily in share of top AI researchers: 47 percent of the globe's top-tier (top 20 percent) researchers** are from China, compared to the U.S.'s 18 percent.
- **China creating a tsunami of STEM grads**: Over the next decade, China will produce **27 million more STEM graduates**, including millions more specifically focused on AI research and applications.

U.S.: Deep Talent Shortages in Many AI-Linked Fields



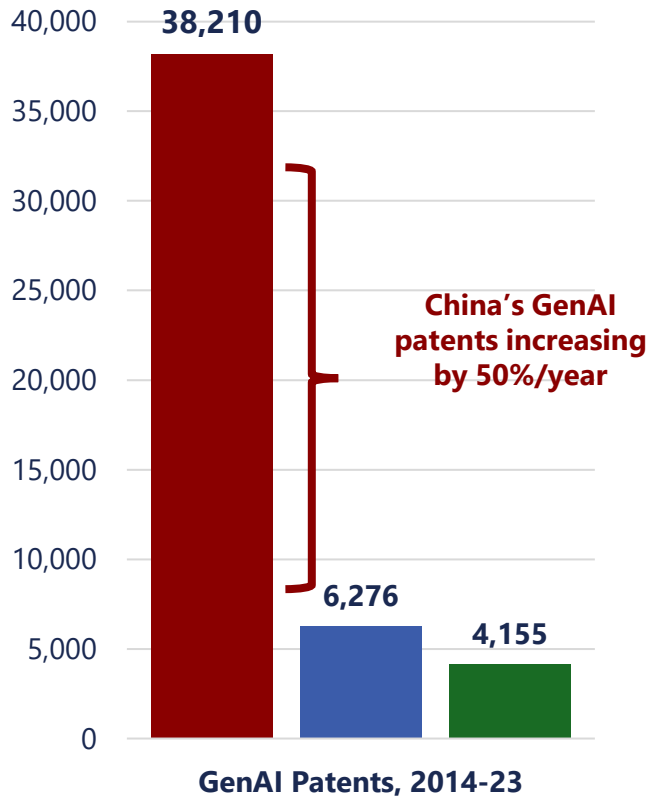
Sources: Mfg, Cyber, AI Talent, Plumbers, Trades, Electricians, HVAC, Mining, Semiconductors

Key Takeaways

- **The U.S. has a multi-million-person AI talent gap**, which will slow innovation, hinder AI buildout speed and weaken national security.
- **Advanced manufacturing shortages** undermine the supply chain and industrial base.
- **Cybersecurity gaps** leave every industry vulnerable.
- **Skilled trades gaps** slow infrastructure build-out and economic growth.
- **Semiconductor gaps** delay chip fabs, weaken U.S. tech.

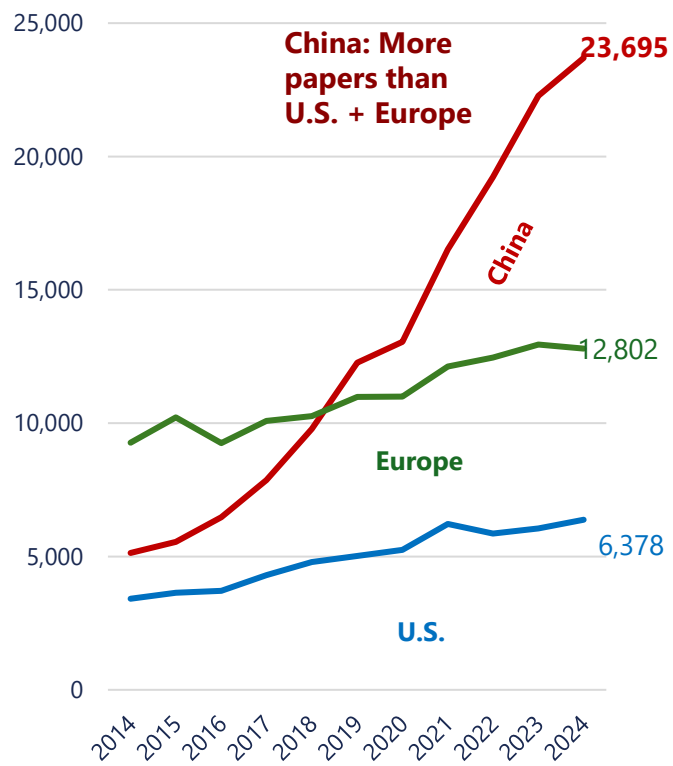
China Surging Ahead in Patents, Papers, and R&D

Generative AI Patents



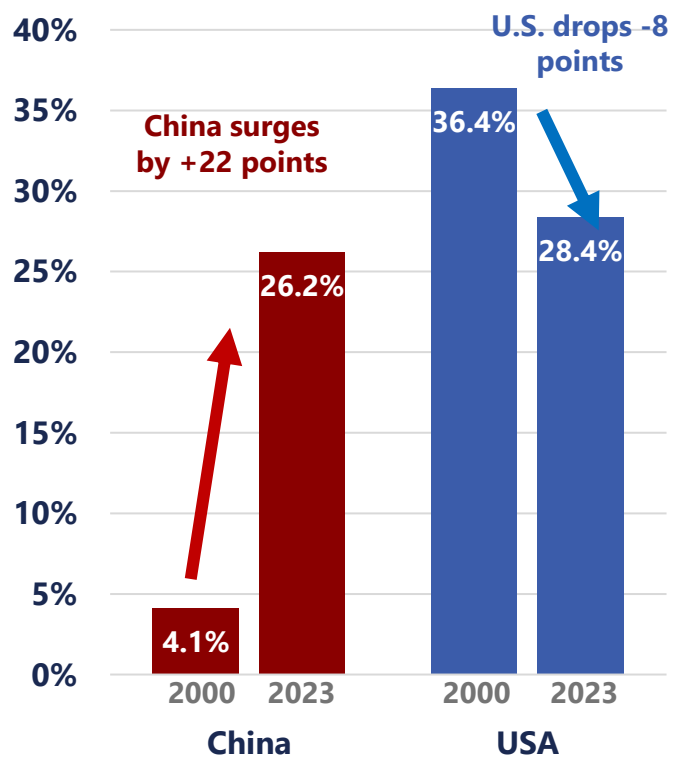
Source: World Intellectual Property Org. (WIPO)

Published AI Papers



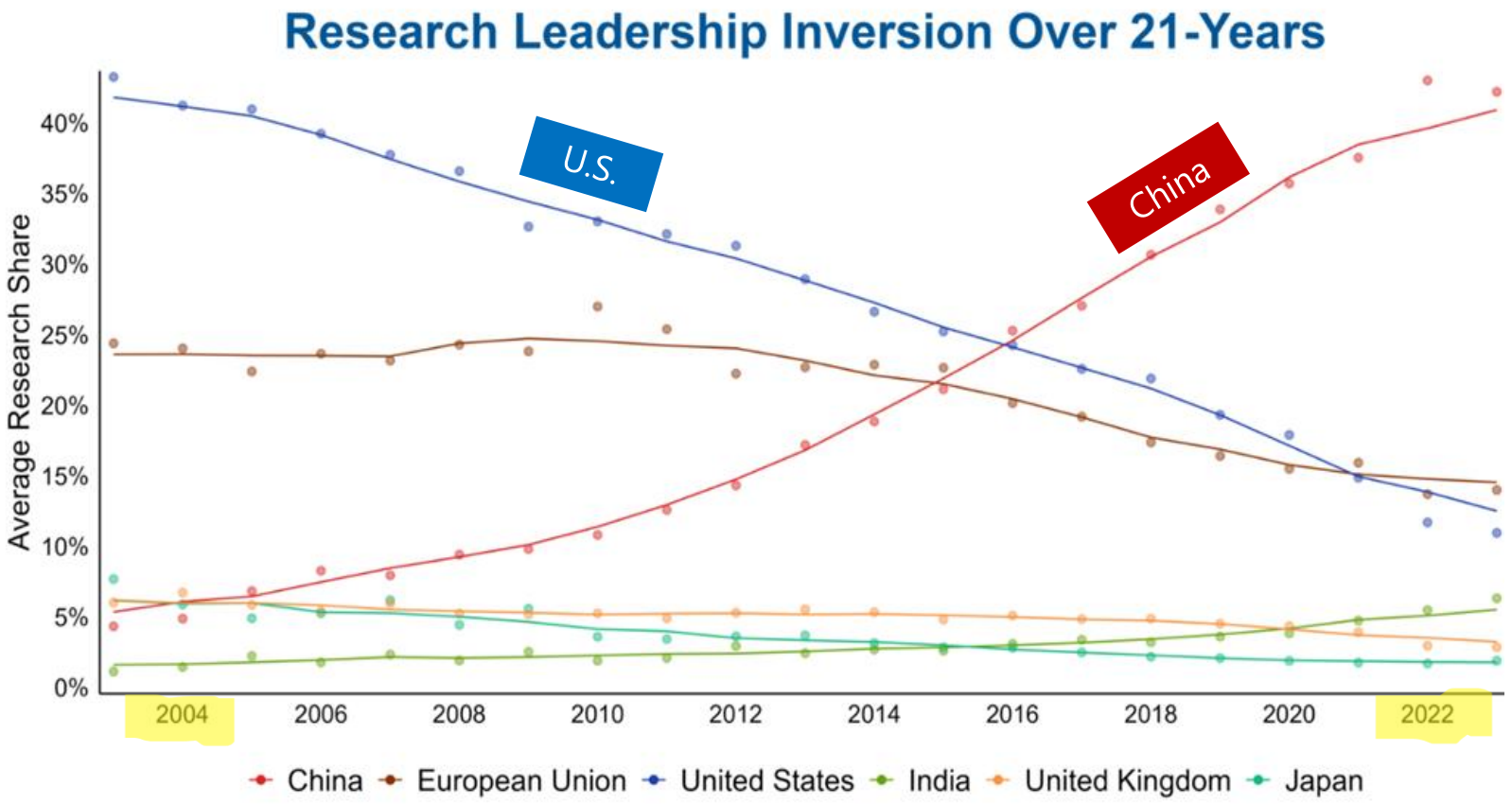
Source: Science.org; Dimensions database

Global Share of R&D



Source: World Intellectual Property Org. (WIPO)

U.S. Tech Victory is Not a Given: A 20-Year Shift



Sources: ASPI Critical Technology Tracker

Key Takeaways

- **20-year reversal**: Over two decades, the U.S. dropped from leading in 60 of 64 critical techs to **leading in just seven today.**
- **China has surged ahead in 57**, reversing decades of R&D supremacy and putting our future competitiveness at stake.

The AI Adoption Race: At Home and Global Leadership

"The number one factor that will define whether the U.S. or China wins this race is whose technology is most broadly adopted in the rest of the world… Whoever gets there first will be difficult to supplant."

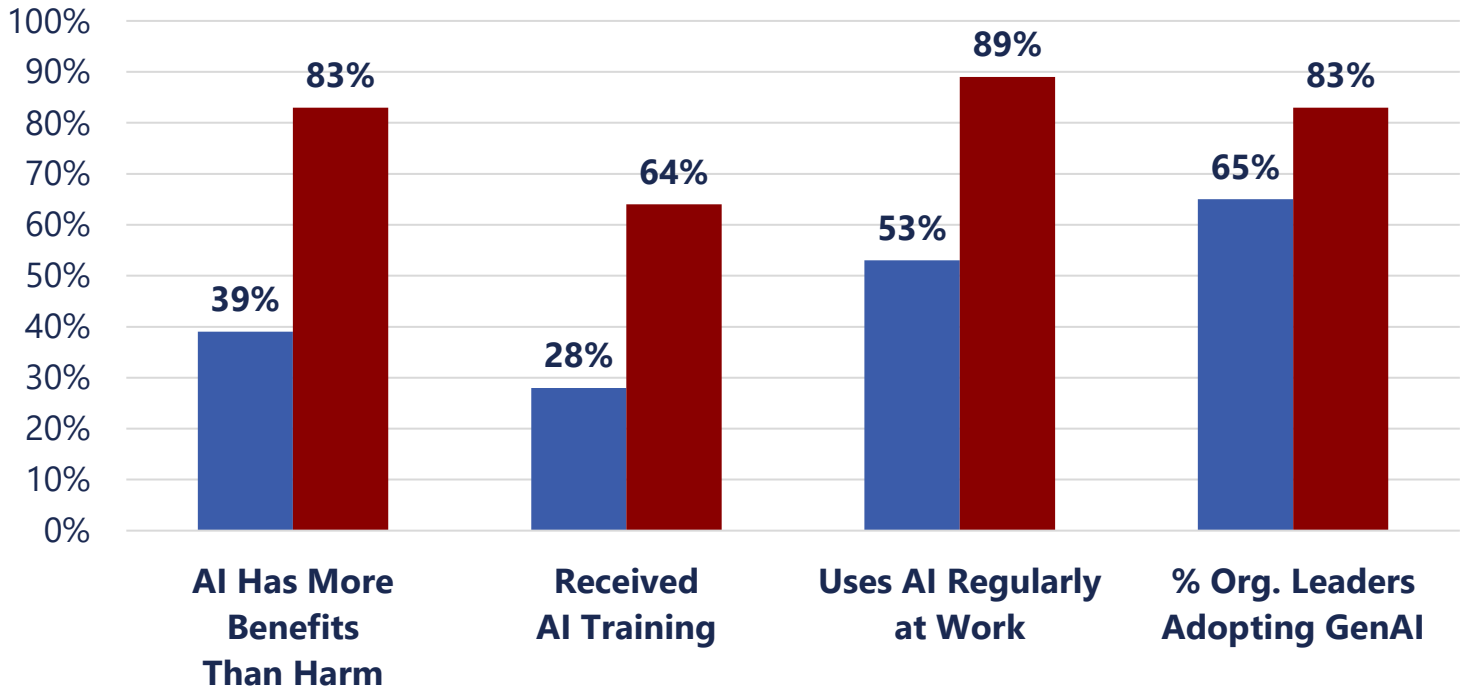
Brad Smith, President, Microsoft

China Winning Domestic AI Adoption Race

China leads the world in adoption of generative AI, survey shows Reuters

Source: Reuters

Multiple Surveys Show China Leads in AI Adoption



Key Takeaways

- **China is ahead across every adoption metric:** Trust, training, workplace use, and organizational adoption.
- **China workforce ready and firms aligned**: Almost nine in 10 in China already use AI at work, and 83 percent of Chinese organizations report using generative AI vs. 65 percent in the U.S.

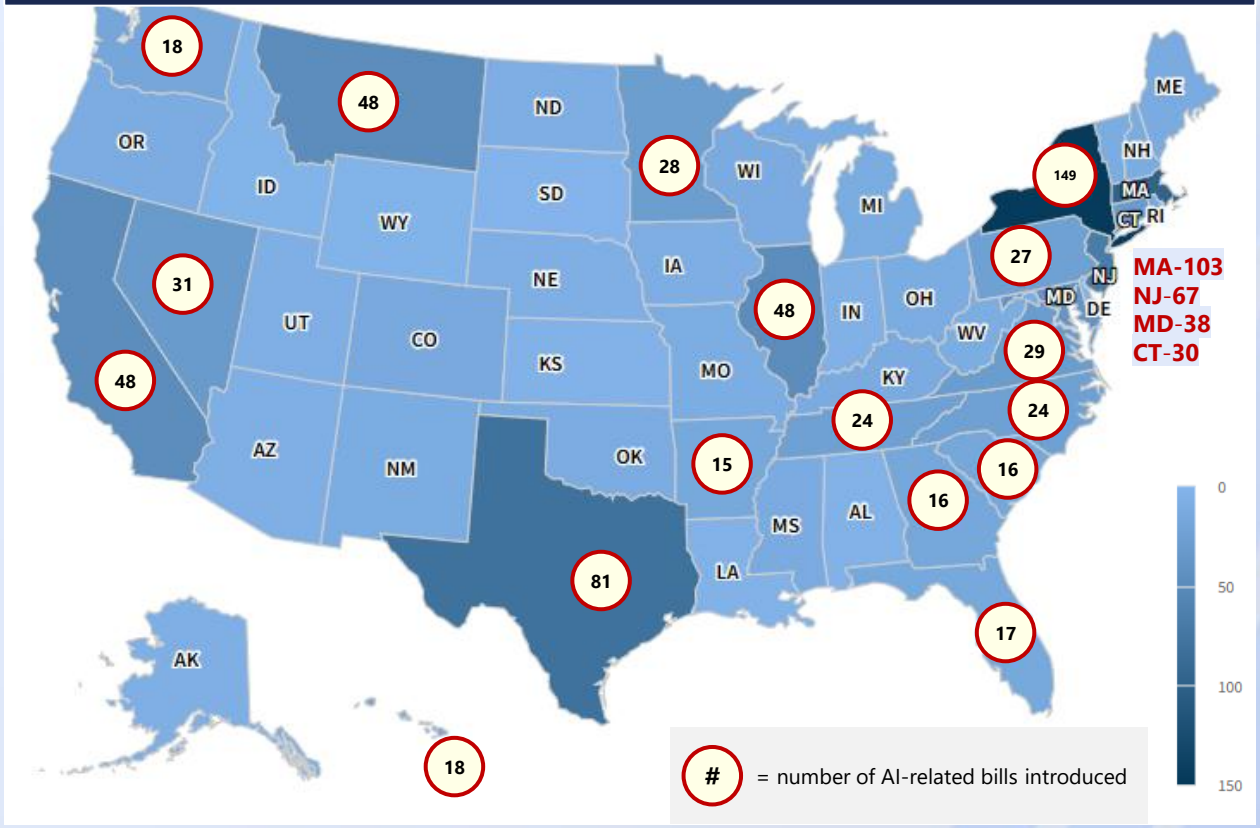
Sources: Stanford AI Index 2025; KPMG Global AI Study 2025; Reuters.

China Local Governments Aid AI Adoption; U.S. Less So

Chinese Communist Party Partners with Local Governments to Drive AI

- **20-plus local AI pilot zones**: financing and favorable regulation for start-ups.
- **GPU vouchers and compute exchanges**: to expand access to AI platforms in Beijing & Ningxia.
- **Flagship cities lead**: Shanghai, Beijing and Shenzhen are driving AI talent and public services.
- **AI and integration plans**: Numerous local governments embed AI into healthcare, education, and smart city services.

U.S. States: 1,100 Proposed AI Regulations in 2025 Alone



Map Source: Multistate.ai

The Battle for Global AI Influence

America's Strategy

- **Export America's AI stack**: Pres. Trump opened the gates for U.S. chips, models, and software to compete worldwide — allies get the best first.
- **Secure supply chains**: Partners get trusted American AI while blocking Beijing's untrustworthy AI.
- **Tech companies as ambassadors**: U.S. companies spread freedom and innovation. Meta's Llama for allies & NATO; Google lays undersea cables; Microsoft builds billion-dollar clean-energy data centers in Africa.
- **Counter China's influence on international AI bodies**: America pushes for U.S. AI standards, so the globe's future is shaped by our values of freedom, not China's values of censorship and control.

China's Strategy

- **Export its surveillance state**: Beijing is wiring up dozens of countries with AI, telecom, cloud, and surveillance systems—undermining freedom and creating long-term security risks.
- **Open-source AI as a Trojan Horse:** Use free or low-cost AI models to embed the global infrastructure with CCP values.
- **Shape the international rules**: China pushes global frameworks that tilt AI standards to its advantage.
- **Export censorship**: Chinese AI systems block terms like Tiananmen, Xinjiang, and Taiwan — spreading information controls worldwide.

Policy Recommendations for U.S. AI Leadership

As this report documents, America faces critical gaps across all four drivers of AI leadership. To secure our competitive advantage, policymakers must act quickly and decisively on the following recommendations.

Job #1: Codify and Fund President Trump's AI Action Plan. His plan addresses many challenges facing American AI leadership. Making it law creates a durable federal playbook for AI growth, prevents future administrations from reversing course, and stops state-level overreaches from sabotaging America's success.

Power and Transmission Recommendations

- **Accelerate power generation with an "all-of-the-above" approach**—nuclear, natural gas, renewables, and advanced energy sources to meet AI's massive electricity demands.
- **Onshore critical supply chains** by incentivizing domestic production of gas turbines and power transformers to eliminate multi-year wait times.
- **Modernize and secure the grid** by streamlining permitting, expanding transmission, and protecting infrastructure against cyber threats by bringing together utilities, regulators, developers, and communities to fast-track the power projects critical to America's AI future.

AI Infrastructure Recommendations

- **Maintain America's chip and compute advantage** through continued investment in semiconductor manufacturing and AI accelerator development.
- **Secure critical mineral supply chains** by developing domestic rare earth processing and diversifying sources beyond China's chokehold.
- **Prevent harmful regulation** by enacting a multi-year freeze on state AI laws, rejecting restrictive copyright theories, and resisting antitrust experiments that would weaken U.S. innovators.

More Policy Recs for U.S. AI Leadership

AI Talent and Skills Recommendations

- **Expand high-skilled immigration** by streamlining H-1B visas and creating new pathways for AI talent from allied nations to address immediate workforce gaps.
- **Build America's talent pipeline** through K-12 AI and computer science requirements, expanded STEM investments, and workforce retraining programs for AI-adjacent fields.
- **Launch a national AI talent initiative** to make AI workforce development a shared mission across government, industry, and education.

AI Adoption (Home and Abroad) Recommendations

- **Build public trust and accelerate adoption** by promoting AI literacy and transparency, incentivizing industry-led workforce training programs, and showcasing successful AI deployments across sectors.
- **Export American AI globally and set international standards** by providing allies priority access to U.S. chips, models, and cloud infrastructure while leading multilateral efforts to establish AI governance frameworks rooted in democratic values.
- **Counter China's tech exports** through public-private coordinated strategies with allies to offer superior, trustworthy alternatives to Beijing's surveillance-laden AI systems.

Taken together, these actions form a blueprint for American AI leadership.
If we move with purpose, we can unlock a new era of growth, discovery, and security — ensuring that the world's digital future reflects freedom, openness, and innovation. America has done this before in space, in technology, and in science — and we can do it again with AI. The choice is ours, and the moment is now.

For more information

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