Electrons Are Destiny

OpenAI's Infrastructure 2.0 Blueprint

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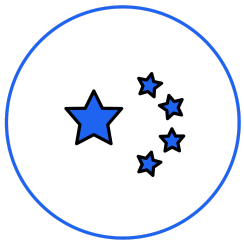
OpenAI



China in 2024

429 GW	>8 GW	⅓	>50%
in new electricity capacity	per week, on average	of the existing capacity of the *entire* US	of all global electricity growth in 2024 (vs. US at 12%)

In 2024, China added 429 gigawatts (GW) of new electricity capacity[1]—one GW being roughly enough to power a small American city. That's more than eight GW on average per week. This 1-year electricity growth is also equal to one-third of the entire existing electricity capacity of the United States: 1,251 GW.[2] It also represented more than half of all global electricity growth in 2024, while the US accounted for just 12%.[3] This "Electron Gap" is most striking in new and advanced technologies: China has 33 nuclear reactors under construction while the US has zero.[4][5]

Nations succeed when they harness their resources to ensure they are economically strong.[6] For AI, those resources are the advanced chips, data, energy, and people talent needed to generate the compute. As OpenAI CEO Sam Altman has laid out, technology brought the world from the Stone Age, to the Agricultural Age, to the Industrial Age, and from here, "the path to the Intelligence Age is paved with compute, energy, and human will."

Democracy as a competitive advantage. In free and open societies, infrastructure gets built because people want or need it. A new technology captures attention, users embrace it, and markets respond. Factories and infrastructure are built to supply more; jobs are created at home as new capacity comes online. It is how rails for railroads, the grid for electricity, and the fiber optics for the internet were funded, built, and deployed.

This ground-up cycle is how AI infrastructure—data centers, semiconductor fabs, power plants—is now rising in the US and around the world. It is how OpenAI's Stargate program is expanding opportunities. And in many ways, ChatGPT's more than 700 million weekly users, most of whom are using it for free, are powering this next transformation in industrial infrastructure.

[1] US Energy Information Administration and OpenAI analysis
[2] US Energy Information Administration
[3] International Energy Agency
[4] World Nuclear Association
[5] World Nuclear Association
[6] H/t Jared Diamond's *Guns, Germs and Steel*

Authoritarian systems build differently. They don't wait for their citizens to choose. Party leadership sets directives, orders state banks to release capital, and commands factories to be built by fiat. They decide which industries will exist. Capital is allocated not by markets but by political command. Infrastructure gets built because the central authority orders it, not because people freely demand it. This approach can build at speed, but it builds toward authoritarian objectives and thus values of control, conformity, and surveillance—not freedom, openness, and choice.

When it comes to innovation, democracy, not autocracy, is a competitive advantage. Democracies with free market-based economies have been, are, and will remain the best model for organizing societies; democratic societies are the best platforms for innovating in ways that advance humanity. AI built on democratic values will help people to scale their ability to learn, to think, to create and to build—it will scale human ingenuity itself. At OpenAI, we believe that access to AI should be a right—so that people are free to use it, with common-sense safeguards, to unlock their potential and shape their own futures. AI should be a tool to scale human capabilities, not control them.

Our great reindustrialization opportunity. But widespread access demands real infrastructure. The bottom-up demand exists: ChatGPT message volume is doubling every eight months, validating the importance of compute investment. But our industrial base lags far behind. As Sam also has observed, "The cost of AI will converge to the cost of energy." As it has always done when facing an existential challenge, the US must leverage its ability as a democracy to meet the moment by thinking big, acting big, and building big. We went big on railroads, electricity, and broadband (even when some said it would be too much)—all critical infrastructure that turned out to be a huge long term advantage for the country. History is clear: Infrastructure is destiny.

Countries around the world understand this. Today, Communist Party-led China is developing electricity resources at unmatched velocity while the US falls behind. China's immense electricity consumption underscores not only its industrial dominance but its ability to rapidly deploy AI infrastructure including new data centers, semiconductor fabs, and manufacturing hubs.

This is both a challenge and a tremendous opportunity. Recent Department of Energy estimates state that the US will have to double its transmission capacity by 2050. Put another way, we will have to build in 25 years what previously took about 100. Precise estimates vary between the Department of Energy and private analysts, but these are all big numbers.[7] Beyond creating the world's greatest semiconductor manufacturing and packaging ecosystem, in partnership with our allies, this energy infrastructure would soon give rise to robotics and other AI-powered consumer device factories that would be built in the US; directly and indirectly support US job creation; generate new revenue; and help support a more resilient supply chain.

Long-term, if we can build out this energy infrastructure, the US can transition from our current dependence on off-shore manufacturing into an on-shore manufacturing giant. (Our existing infrastructure constraints, including our challenging permitting processes, let other countries build factories at a scale and speed we can't currently match.) This transition won't happen overnight, but

[7] Sources: US Department of Energy, US Energy Information Administration, OpenAI internal analysis.

with a strategy that begins with on-shoring our energy needs, we can create the opportunity. This build-out would support hundreds of thousands of permanent, high-wage roles in operations, manufacturing, and engineering—while cutting power congestion, stabilizing prices, and anchoring a true US reindustrialization.

Beyond the direct employment gains, the multiplier effects across steel, cement, advanced materials, logistics, and services would ripple throughout the economy, revitalizing regions that have seen decades of industrial decline. Modernizing the grid at this pace would lower costs for households and businesses while improving resilience. A domestic semiconductor ecosystem would secure supply chains for everything from AI to national security.

Taken together, this level of ambition—thinking big, acting big, and building big—would not just keep pace with China's scale. It would reestablish the US as the hub of next-generation industrial growth, including being the center of the modernization of our sources of energy.

Here's how we get there.

US Reindustrial Policies

Transforming AI infrastructure into grid assets. AI consumes significant energy—but that makes it a powerful driver of new power generation and modernization. We can use AI Infrastructure to increase power availability for the grid.

Specifically, OpenAI commits to partnering with power companies to reduce electricity consumption at grid peak times (or "load management"). Since grids are built to meet demand at peak times, this flexibility reduces the need for additional infrastructure, thereby avoiding costly capital expenditures and helping to keep rates low for consumers. We're already using and designing systems that allow us to take AI training runs offline on short notice, increasing grid capacity. Goldman Sachs recently argued that "…AI datacenters can become grid assets, unlocking massive capacity currently constrained by outdated peak-demand planning." For this reason, we encourage regulators to speed up interconnection approvals for AI data centers that participate in demand response programs, and use the software and hardware upgrades that enable them to reduce power consumption at a few minutes' notice in the event of a public demand shock.

Integrating next-generation energy into AI infrastructure. AI can't scale without abundant, reliable power. At the same time, AI itself can accelerate breakthroughs in the next generation of energy technologies. This circular relationship—AI driving energy demand, and energy innovation enabling AI—must be a national priority. The US should integrate cutting-edge technologies into its infrastructure build-out, ensuring that democratic AI is powered by secure, clean, and scalable energy. Priority areas include:

- *Fusion*—advancing demonstration projects to unlock virtually limitless power.
- *Advanced geothermal*—tapping super-hot rock formations with AI-optimized drilling and processing.
- *Small modular and advanced nuclear*—provide reliable baseload power for datacenters and grids.
- *Long-duration battery storage*—ensuring stability
- *Next-generation light-powered technologies*—integrating novel materials for higher efficiency that transfers existing sun-generated light into energy.

As a catalyst for energy modernization, by analyzing complex grid dynamics and optimizing real-time supply and demand, AI can enhance resilience and reduce overall system costs. AI-optimized energy planning should be embedded into every federal deployment of all energy technologies.

To that end, OpenAI supports using federal loan programs[8] to prioritize next-generation energy projects linked to AI infrastructure; empower US national labs to act as catalysts by accelerating research and development, piloting AI-optimized energy systems, and de-risking commercial adoption; and promoting AI datacenter siting approvals for fusion, geothermal, nuclear, or advanced storage—ensuring that every AI facility is also a testbed for energy innovation. OpenAI is proud of our expanding partnerships with the Department of Energy towards this end.

Streamlining permitting. Democracies compete not just on ideas but on execution. If permitting timelines for major infrastructure projects stretch into years, America risks losing the race for global AI leadership. Authoritarian systems can order construction by fiat; democracies must prove they can build just as fast, without sacrificing transparency, reliability, or accountability.

OpenAI supports bipartisan efforts like the SPEED Act, sponsored by Chairman Bruce Westerman (R-AR) and Rep. Jared Golden (D-ME), to accelerate review processes. This can include maximizing use of AI in environmental review and a range of related applications. We've already been working with several US national labs to use AI to improve the accuracy and speed of the federal permitting process.

Credit enhancement for chips. Semiconductors are to the 21st century what steel was to the 20th: the foundation of industrial strength, national security, and technological leadership. Advanced chips power not only AI models but also defense systems, medical technologies, and global communications. Without secure and abundant supply, democratic AI remains fragile. Yet, the vast majority of the world's most advanced chips are manufactured in East Asia, exposing the US and its allies to geopolitical risk. A disruption in supply—whether by conflict, blockade, or economic coercion—would stall AI development and undermine innovation.

The CHIPS and Science Act made critical investments in domestic semiconductor manufacturing, but supply-side measures alone are not enough. To scale at the pace required, demand must also be guaranteed. AI companies are natural demand anchors, consuming the chips that power next-generation models and infrastructure. Credit enhancement is the missing link.

OpenAI supports expanding US loan guarantees to allow AI companies to confidently purchase US-made chips at scale. Credit enhancement would close the gap between fab investment and market certainty by: de-risking capital investments for manufacturers, ensuring fabs know there will be buyers; reducing financing costs for AI companies procuring high-cost chips; and accelerating volume commitments, which in turn justify expansion of US-based fabs. This approach mirrors strategies used to support infrastructure for shipbuilding, aerospace, and energy—industries where demand assurance was essential to mobilize private capital at scale.

US First-In-Line: strengthen AI infrastructure supply chains. OpenAI supports invoking the Defense Production Act (DPA) to secure timely access to the long-lead equipment essential for AI infrastructure. Building advanced data centers and the power systems that support them requires heavy industrial components that are increasingly in short supply, with delivery timelines measured in years,

[8] E.g., US Department of Energy Loan Program Office, International Development Finance Corporation, Export-Import Bank of the US

not months. Classifying AI infrastructure as critical under the DPA can unlock priority access to long-lead components and ensure that critical equipment is available when and where it is needed:

- *Natural gas turbines* to provide dispatchable backup power.
- *Large power transformers*—currently facing multi-year lead times globally.
- *Switchgear and backup generators* to stabilize grid interconnections.
- *Energy storage systems including Battery Energy Storage Systems* to balance power generation.
- *High-grade electrical steel* and other specialty materials.
- *Solar technology,* consistent with the US government's concern about polysilicon supply.

Authoritarian competitors can fast-track supply through state fiat; democracies must achieve speed through smart policy. The DPA offers a proven mechanism to reduce bottlenecks, expand domestic manufacturing capacity, and guarantee delivery for strategically vital projects.

Strategic AI infrastructure alliances. AI is not just a technology—it's a foundation for global influence. The nations that build and export AI infrastructure will shape standards, set norms, and bind partners into long-term alliances. America's AI ecosystem—its chips, data centers, software, and energy technologies – represents one of the most powerful diplomatic tools of this century. Authoritarian competitors are already exporting their AI systems abroad, embedding surveillance models and closed networks into the infrastructure of emerging economies. If left unchecked, these exports will lock countries into autocratic tech stacks that reinforce dependency and restrict freedoms.

Democratic AI must offer a compelling alternative: partnerships that deliver technology, capital, and trust. OpenAI supports a Strategic Infrastructure Alliance with like-minded nations through our new OpenAI for Countries program. These alliances would: accelerate US exports of semiconductors, AI systems, and supporting energy technologies; strengthen security relationships by embedding AI infrastructure by promoting common standards for data security, privacy, and interoperability; and mobilize joint financing through partnerships between US institutions (Export-Import Bank, International Development Finance Corporation, Treasury) and allied development banks.

Stargate workforce and education partnerships with Open AI Certifications and the OpenAI Jobs Platform. To ensure that the Stargate AI infrastructure investment translates directly into local AI literacy and opportunity, OpenAI will connect Stargate data center campuses with community workforce and education partnerships through our newly announced Certifications and Jobs Platform. We're starting with our Stargate site in Abilene, Texas in 2026. By working with community colleges, technical schools, and other community partners, this approach will ensure that in every community where we build, we are also building pathways for people to thrive in the AI-powered economy.

In conjunction with nurturing new AI talent, the US should continue to optimize for attracting the best existing AI talent by leveraging our unique value-add of freedom and opportunity—just as we did in World War II and in the building of the space program. There have been bipartisan proposals in Congress that would target AI talent to specific parts of the country to help distribute the benefits; we

have discussed our support for this goal. And, as the US government continues to evolve its policies on global talent, OpenAI is ready to provide both the resources to support the recruitment and training of the next generation of US AI builders, and financial support to ensure that the world's top builders of AI can continue to build here in the US.

OpenAI—and by extension, the US—is leading in AI innovation in part because of our community of US AI researchers complemented by a cohort of leading global AI research talent. As we move forward in the infrastructure build-out, our company will be considering the best ways to strategically deploy that talent in support of bringing manufacturing back on-shore and ensuring the US continues to lead the world in AI innovation.

The build-out of AI infrastructure around the world is an unmissable opportunity to boost productivity, innovation, and economic growth across nearly every sector. It also is a fierce competition between two very different political and economic systems. OpenAI is proud to stand with our users in building a future on democratic infrastructure.

About OpenAI

Artificial intelligence is an innovation like electricity—it will change how we live, how we work, and how we engage with one another. OpenAI's mission is to ensure that as AI advances, it benefits all of humanity. We're building AI to help people solve hard problems because by helping with the hard problems, AI can benefit the most people possible—through more scientific discoveries, better healthcare and education, and improved productivity. We're off to a strong start, creating freely available intelligence being used by more than 700 million people around the world, including 3 million developers. We believe AI will scale human ingenuity and drive unprecedented productivity, economic growth, and new freedoms that help people accomplish what we can't even imagine today.

Cover image created with ChatGPT