

Department of Energy

Artificial Intelligence Infrastructure on DOE Lands

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Introduction

The United States is currently facing a generational challenge not seen since the earliest days of the first Cold War. In addition to grappling with a fierce geopolitical rival bent on undermining America's leading global position, Washington must also confront the growing capabilities of artificial intelligence (AI), a technological revolution nearly as profound as the dawn of the nuclear age.

This challenge has emerged as China seeks to leverage its growing investments in science and technology to advance its geopolitical ambitions. Having poured millions into building a network of national AI champions, Beijing remains committed to integrating AI into its industrial sector and military, viewing the technology as the key to bolstering its economic productivity and the lethality of its armed forces.

Confronting this challenge will require solutions that harness the power of both public institutions and private firms to safeguard American technological and scientific leadership and enhance innovation. As a critical pillar of American economic and strategic power, the Department of Energy (DOE) should pursue the following recommendations to strengthen its contribution to U.S. AI leadership:

- 1) *Work with private sector developers to construct data centers on select department lands.* Doing so would alleviate pressure on local communities struggling to handle other priorities, such as housing affordability, while incentivizing developers to distribute computing resources across the country.
- 2) *Expand on-site electricity generation to power AI infrastructure.* Co-locating electricity generation capabilities with AI infrastructure would ease pressure on local grid operators struggling to manage the growing demand for electricity. This would also provide an opportunity for the department to apply cutting-edge innovation to sustainably expand America's AI infrastructure and pilot the technical, interconnective, and regulatory requirements necessary to scale up this model.
- 3) *Pursue data- and computational-sharing agreements with private firms.* Granting private firms access to high-quality data and computing resources hosted by the department's network of national labs would accelerate mission-critical AI innovation.

Work With Private Sector Developers to Construct Data Centers on Select Department Lands

As demand for ever-more complex AI models continues to increase, the department's proposal to allow private firms to build data centers on several of its campuses offers a promising and adaptable model to accelerate the pace of AI infrastructure construction across the United States.

The growing complexity of developing and deploying frontier AI models has resulted in a surge of data center construction across the United States. While this investment remains crucial for Washington to retain its scientific and technological leadership, the construction has also

generated significant pressure on current land-use regulations. The building of data centers in regions with low-cost power and a skilled workforce has driven up rent and land costs in urban and metro areas, interfering with other national and local policy priorities.

This issue is likely only to escalate over the coming years as new pressures emerge. Spurred by DeepSeek's success, China has engaged in a state-subsidized crash effort to rapidly construct computing infrastructure to harness AI to achieve its geopolitical ambitions and compete with American firms. Closer to home, leading U.S. AI firms have begun to transition from training to deploying AI models at scale, a shift that will require even more computing power across the country.

The proposal to allow developers to construct AI data centers on several DOE campuses will lower pressure on local real estate markets while offering a roadmap for other federal agencies to pursue a similar policy. By making land across the country available for construction, the department can alleviate pressures on local housing markets while distributing computing resources to accelerate firms' efforts to scale their operations. This approach will also have a positive impact on workforce development by expanding the talent pool available for construction, maintenance, and development, along with allowing small and medium-sized businesses to gain readier access to vast computing networks.

Expand On-Site Energy Development to Power AI Infrastructure

The department can provide an adaptable energy policy model designed to sustainably expand the nation's AI infrastructure without dramatically impacting both businesses and ratepayers.

AI data centers are highly energy intensive, placing a strain on America's existing energy infrastructure and complicating grid operation and management. Beyond the continually rising amount of energy required to power the training of ever more advanced frontier models, deploying these models at scale will tax the nation's aging grid infrastructure even further. Moreover, these projections do not account for newly announced investments by Microsoft and OpenAI, raising the possibility that grid operators will soon need to manage painful trade-offs between competing national priorities while being forced to raise prices.

Allowing developers to construct data centers on DOE lands can offer an adoptable path for policymakers and private firms to balance AI development and deployment with grid stability. By pairing data centers with on-site electricity generation, the department can fulfill its mission of pursuing cutting-edge research and innovation. DOE's involvement in overseeing contracts between data centers and utility operators may also present a ready-made template for future development, spurring construction at an even greater pace.

Pursue Data and Computational-Sharing Agreements With Private Firms

Lastly, the department should contribute to American AI innovation by granting private firms access to the data and computing resources hosted by the DOE network of national laboratories. This arrangement would generate significant benefits for DOE and enhance America's global standing as an AI leader.

Along with land and energy, AI development requires access to both high-quality data and vast stores of computing power. While large language models have become widely adopted across a range of industries, their applicability to more technical tasks, such as advanced mathematics or coding, remains relatively limited. To counter these limitations, major AI firms have begun releasing reasoning models, which often rely on a method referred to as a “mixture of experts” approach to problem solving — funneling queries to particular sub-models trained on more relevant data to provide greater accuracy while optimizing computing efficiency. Given their segmented design, these models require ever-greater quantities of high-quality data to train each “expert” in a particular task, such as translation, programming, or mathematical computation.

Making use of this data would also require additional computing resources, namely the construction of even more advanced supercomputers. With popular models now including billions of parameters, surpassing current capabilities would require a generational investment in computational power capable of handling complex tasks such as image recognition, natural language processing, and accelerated training.

Sharing high-quality data and computing resources with developers would accelerate the production of advanced AI models while indirectly expanding the market for American innovation. The department should consider amending its grant-funding model to further enhance data-sharing agreements among both public and private stakeholders. This approach would strengthen the contribution of frontier models to a host of technical challenges pursued by the department, including biotechnology, cancer research, and space exploration, ensuring that the United States remains at the forefront of global science and technology leadership.

Conclusion

As China continues to advance its own AI sector with the aim of displacing the United States as a preeminent global power, Washington must expand its efforts to maintain its scientific and technological edge over Beijing. The Department of Energy’s proposal to allow private firms to construct data centers on its campuses, develop on-site energy resources, and partner with its network of national laboratories is critical to U.S. national security and long-term economic prosperity.

Thank you for considering our comments, and we look forward to seeing how our input is incorporated into the department’s ongoing policy work.