ONE HUNDRED NINETEENTH CONGRESS

Congress of the United States

House of Representatives

COMMITTEE ON ENERGY AND COMMERCE

2125 RAYBURN HOUSE OFFICE BUILDING

WASHINGTON, DC 20515-6115 Majority (202) 225-3641 Minority (202) 225-2927

April 7, 2025

MEMORANDUM

TO:	Members of the Committee on Energy and Commerce
FROM:	Committee Majority Staff
RE:	Hearing entitled, "Converting Energy into Intelligence: The Future of AI
	Technology, Human Discovery, and American Global Competitiveness"

I. INTRODUCTION

The Committee on Energy and Commerce will hold a hearing on Wednesday, April 9, 2025, at 10:00 a.m. (ET) in 2123 Rayburn House Office Building. The hearing is entitled, "Converting Energy into Intelligence: The Future of AI Technology, Human Discovery, and American Global Competitiveness."

II. WITNESSES

- Dr. Eric Schmidt, Chair, Special Competitive Studies Project;
- Manish Bhatia, Executive Vice President of Global Operations, Micron Technology;
- Alexandr Wang, Founder and Chief Executive Officer, Scale AI; and,
- **The Honorable David Turk**, Distinguished Visiting Fellow, Center on Global Energy Policy, Columbia University.

III. BACKGROUND

The development of artificial intelligence (AI) technology as we think of it today began three quarters of a century ago when Alan Turing posed the question, "Can machines think?"¹ So while AI is not in this respect a nascent technology, recent advances in consumer-facing, generative AI applications such as ChatGPT² have increased awareness and widespread use of AI tools, quickly bringing greater awareness of this technology out of the lab and into the public consciousness. As a result, the demand for powerful semiconductors and electricity to power AI

¹ *The Birth of Artificial Intelligence (AI) Research*, Lawrence Livermore Nat'l Lab'y, https://st.llnl.gov/news/look-back/birth-artificial-intelligence-ai-research.

² Introducing ChatGPT, OpenAI (Nov. 30, 2022), https://openai.com/index/chatgpt/.

data centers has exploded in recent years with little sign of slowing.³ AI technologies are expected to fundamentally shape the human experience over the next century, which raises significant questions about the benefits and challenges of this incredible technology.

The Committee on Energy and Commerce (Committee) sits squarely within the debate over how to support innovation in the U.S. while implementing appropriate guardrails for these burgeoning technologies. The jurisdiction of the Committee encompasses nearly every layer of the AI technology stack, including electricity delivery and communications networks at the infrastructure layer, advanced semiconductor manufacturing and computing, data collection and modeling, and the myriad application layer products and services running on AI technologies, which also raise important consumer protection questions.⁴

It is the responsibility of this Committee to better understand these technologies, legislate where necessary, and encourage principled innovation to position the U.S. as a preeminent global leader in AI. The U.S. has traditionally been at the forefront of developing cutting-edge technologies due to a unique entrepreneurial spirit and collaboration between industry, government, and academia, but to maintain this leadership we must ensure the right balance exists between appropriate regulation and unhindered innovation.

Our nation's strongest geopolitical adversary, China, is poised to fill the void in AI leadership if we do not strike the right balance in the U.S. Chinese Communist Party (CCP) leaders have set an ambitious target of becoming the global leader in AI as soon as 2030, and they have invested billions of dollars in pursuit of this goal, seeking to challenge our nation's "innovation power."⁵ While U.S. research universities continue to attract the majority of the best minds in AI and outperform China in semiconductor design, China leads the world in AI-powered surveillance technology and leverages its "loose privacy laws, mandatory data collection, and targeted government funding" to its advantage.⁶

The U.S. cannot afford to slow development of AI technologies and cede global leadership to China, putting our nation's interests and security at risk. Since President Trump took office, AI leaders have committed over a trillion dollars in new investments here in the U.S.⁷ To win the AI race against China, the government must work with the private sector to support innovation while simultaneously protecting Americans' data and privacy.

³ See, e.g., Nathan Eddy, AI Demand Explodes, Pressuring Chip Market, TECHSTRONG GROUP (Oct. 18, 2024), https://techstrong.ai/articles/ai-demand-explodes-pressuring-chip-market/; AI to drive 165% increase in data center power demanded by 2030, GOLDMAN SACHS (Feb. 4, 2025), https://www.goldmansachs.com/insights/articles/ai-to-drive-165-increase-in-data-center-power-demand-by-2030.

⁴ See Brad Smith, *Microsoft's AI Access Principles: Our Commitments to Promote Innovation and Competition in the New AI Economy* (Feb. 26, 2024), https://blogs.microsoft.com/on-the-issues/2024/02/26/microsoft-ai-access-principles-responsible-mobile-world-congress/.

⁵ Eric Schmidt, *Innovation Power: Why Technology Will Define the Future of Geopolitics*, FOREIGN AFFAIRS (Feb. 28, 2023), https://www.foreignaffairs.com/united-states/eric-schmidt-innovation-power-technology-geopolitics. ⁶ *Id*.

⁷ The White House, *President Trump Positions U.S. as Global Superpower in Manufacturing* (Mar. 20, 2025), https://www.whitehouse.gov/articles/2025/03/president-trump-positions-u-s-as-global-superpower-in-manufacturing/.

IV. ENERGY INFRASTRUCTURE

A primary consideration for locating data centers to power AI technology is access to reliable power, including sufficient resources for manufacturing energy intensive AI chips and powerful cooling systems to protect equipment integrity. As an example, one ChatGPT query consumes ten times the electricity needed to process a Google search engine query.⁸

Over the past several decades, the electric grid experienced modest demand growth for electric power, averaging about 0.5 percent growth per year since 2015; however, recent estimates anticipate annual growth rates ranging between 3.7 percent to 15 percent by 2030.⁹ Much of this growth is expected to come from industrial facilities and data centers powering the increasing use of AI. By the end of the decade, data centers driving increases in electricity demand could consume as much as 9.1 percent of all electricity in the U.S.¹⁰

Projections of a surge in demand for reliable power for AI come at a time when the North American Electric Reliability Corporation (NERC) has repeatedly raised concerns over the adequacy and reliability of the grid. These concerns with the U.S. grid are due to a confluence of factors that have forced premature retirements of reliable generation without adequate replacement generation and electric infrastructure. The head of the NERC stated he believes the U.S. is headed for a reliability crisis.¹¹

While much of the new power generation seeking interconnection with the bulk power system consists of wind and solar, these intermittent resources cannot meet the reliability needs of hi-tech manufacturing and data centers on their own. They are not a one-to-one replacement of existing non-intermittent, dispatchable resources like coal, natural gas, hydropower, or nuclear. Without consideration of the need for such baseload and dispatchable generation, restrictions on the use and development of fossil fuels—along with regulations that lead to premature retirement of reliable power resources—threaten to strain an already taxed electric grid, and undermine long-term planning to meet AI energy demand.

NERC's 2024 Long-Term Reliability Assessment found that much of the nation's bulk power system faces mounting resource adequacy and reliability challenges. Notably, 115 gigawatts of dispatchable generation has been announced already to be retired across the U.S. over the next 10 years, while demand is estimated to increase by a staggering 151 gigawatts.¹² Absent sufficient new generating resources to meet this demand, reliability risks will grow dramatically.

¹² N. AM. ELEC. RELIABILITY CORP., 2024 Long-Term Reliability Assessment (Dec. 2024),

⁸ Electric Power Research Institute (EPRI), *Powering Intelligence: Analyzing Artificial Intelligence and Data Center Energy Consumption* (May 2024), https://www.epri.com/research/products/3002028905.
⁹ Id.

 $^{^{10}}$ Id.

¹¹ The Reliability and Resiliency of Electric Service in the United States in Light of Recent Reliability Assessments and Alerts: Hearing Before the Senate Comm. on Energy and Natural Resources, 118th Cong. (2023) (statement of James B. Robb, President and CEO of the North American Electric Reliability Corporation).

https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_Long%20Term%20Reliability%20Assessment_2024.pdf.

Regional grid operators—the Independent System Operators (ISO) and Regional Transmission Organizations (RTO)—have warned of the potential for electricity disruptions and asked their customers to conserve power.¹³ PJM, the nation's largest regional grid operator, recently warned that it could see a capacity shortage as early as 2026 or 2027 and identified public policies, permitting constraints, and supply chain challenges as key trends that are tightening supply-demand balance within the system.¹⁴ The following image from NERC's Long-Term Reliability Assessment, issued in December 2024, illustrates the risk status of certain regions between 2025-2029.



Source: 2024 NERC Long-Term Reliability Assessment

On March 25, 2025, the Energy Subcommittee held a hearing with all six RTOs and ISOs and ERCOT to examine the state of regional grid reliability. At this hearing, the grid operators highlighted the role that baseload and dispatchable generation resources need to play to meet generational energy demands from AI, the imbalances caused by an increasing reliance on intermittent generation resources, and the concerning trends of pre-mature retirements of baseload and dispatchable generating resources driven by government policies.¹⁵ Specifically, SPP CEO Lanny Nickell stated:

We need significantly more generation and more transmission to meet the growing demands, and we need it to be interconnected much quicker than we have historically seen. We will also need more of the generation being

¹³ CAISO, SPP, MISO, PJM, and ERCOT have all issued alerts to conserve power in recent years. *See, e.g.*, ERCOT, Energy Emergency Alert 2 (Sept. 6, 2023), https://www.ercot.com/energyemergtwo.

¹⁴ Mark Takahashi, PJM Letter to Stakeholders (Dec. 9, 2024), https://www.pjm.com/-/media/DotCom/about-pjm/who-we-are/public-disclosures/2024/20241209-board-letter-outlining-action-on-capacity-market-adjustments-rri-and-sis.pdf.

¹⁵ H. Comm. on Energy and Commerce, Subcomm. on Energy Hearing, *"Keeping the Lights on: Examining the State of Regional Grid Reliability"* (Mar. 25, 2025), https://energycommerce.house.gov/events/energy-subcommittee-keeping-the-lights-on-examining-the-state-of-regional-grid-reliability.

interconnected to be dispatchable so that it is available when needed to offset the variability of intermittent weather-dependent generation.¹⁶

In addition, PJM CEO Manu Asthana stated, "These generators [intermittent renewable generation] play an important role on the grid, and we want them, we want them to come online. But they are not a one-for-one substitute for the machines that they are replacing."¹⁷

V. COMMUNICATIONS INFRASTRUCTURE

A robust communications infrastructure is key to the success of AI innovation and adoption in the U.S. As consumers increase their use of different types of AI technology, especially applications running on smart devices at the edge of the network, they will need access to the advanced computing infrastructure that supports its delivery.¹⁸ For example, cloud-based AI systems rely on wireline networks along with mobile 5G and future generations of wireless networks as well.¹⁹

AI applications are also being deployed throughout communications networks to help manage traffic. Within networks, AI can use advanced analytics to determine the most efficient allocation of resources during peak usage and can also be used to automate certain processes, including troubleshooting network issues and managing routine maintenance, reducing the hands-on time needed to do these tasks.²⁰ AI is also deployed to monitor and automate core network functions, which some network operators have found to reduce the number of outages.²¹ Some internet service providers are using AI to reduce fiber cuts across their networks.²² Additionally, AI enables communications providers to improve customer service, with some providers using AI to improve the speed and quality of responses to consumer inquiries about their broadband subscriptions.²³ Across the board, companies are utilizing AI to increase efficiency, performance, and service, all of which reduce their operation and expenditure costs.²⁴

¹⁹ Dr. Tingfang Ji, *What's the role of artificial intelligence in the future of 5G and beyond?*, QUALCOMM (Sep. 20, 2021), https://www.qualcomm.com/news/ong/2021/09/whats-role-artificial-intelligence-future-5g-and-beyond;

¹⁶ *Id*.

¹⁷ Id.

¹⁸ Marsha Abarinova, *AT&T highlights network's need for speed in latest 1.6TB trial*, FIERCE NETWORK (Mar. 17, 2025), https://www.fierce-network.com/broadband/att-highlights-networks-need-speed-latest-16tb-trial.

INCOMPAS, *Developing an Artificial Intelligence Action Plan* (Mar. 18, 2025), https://aicompetitioncenter.com/wp-content/uploads/2025/03/INCOMPAS-Comments-on-OSTP-AI-Action-Plan.pdf.

²⁰ Niall Byrne, Krishnamurthy Srinivasan, *AI-powered network optimization: Unlocking 5G's potential with Amdocs* (Feb. 27, 2025), https://cloud.google.com/blog/topics/telecommunications/ai-powered-network-optimization-unlocking-5gs-potential-with-amdocs/.

²¹ Jeff Heynen, *AI's Impact on Broadband Networks*, Dell'Oro Group (Aug. 10, 2023), https://www.delloro.com/ais-impact-on-broadband-networks/.

²² Marsha Abarinova, *Verizon digs into how to prevent fiber cuts from happening*, FIERCE NETWORK (Aug. 15, 2024), https://www.fierce-network.com/broadband/verizon-digs-how-prevent-fiber-cuts-happening.

²³ Rose de Fremery, *How AI customer service can help enable better interactions*, Verizon (last accessed Apr. 1, 2025), https://www.verizon.com/business/resources/articles/s/how-ai-customer-service-can-help-enable-better-interactions/.

²⁴ Mischa Dohler, *AI and Automation Revolutionizing Telecom AI* (Jan. 23, 2025), https://mischadohler.com/ai-and-automation-revolutionizing-telecom-ai.

Cybersecurity is another critical service that AI can assist with delivering more effectively. The recent Salt Typhoon cyberattack was a clear indication of how vulnerabilities can lead to significant national security consequences and highlighted the importance of using cutting edge technologies to strengthen cybersecurity efforts against malicious actors.²⁵ AI can bolster the security of our networks by implementing systems to detect malware, run pattern recognition, and detect even the smallest unusual behaviors or specific patterns before they compromise the networks.²⁶

VI. AI MODELS, DATA PRIVACY, AND GLOBAL COMPETITIVENESS

The development and adoption of AI is expected to transform foreign and interstate commerce and support significant gains to economic growth. By one estimate, AI technologies may add up to 7 percent to global GDP and 1.5 percent to annual productivity growth.²⁷ Another estimate suggests AI could generate \$2.6 trillion to \$4.4 trillion in value across industries, including customer operations, marketing and sales, and software engineering, among others.²⁸ While economic forecasts may differ, they point in the same direction: AI technologies will be a driving force in the next wave of innovation and, by extension, global competition.

As home to the world's foremost software and cloud computing companies, the U.S. is leading the current wave of AI innovation and is well positioned to continue leading.²⁹ Recent events, however, underscore that the U.S. leadership position in AI cannot be taken for granted. In January 2025, Chinese startup DeepSeek released a frontier model that purports to have been developed at a fraction of the cost of U.S. competitors' models.³⁰ Although these claims are disputed, the mere fact of a release of frontier models and AI agents by Chinese companies since January underscores the need for the U.S. to take affirmative steps to maintain its advantage.³¹

²⁵ Devlin Barrett, Jonathan Swan, Maggie Haberman, *Chinese Hackers Are Said to Have Targeted Phones Used by Trump and Vance*, THE NEW YORK TIMES (Oct. 25, 2024), https://www.nytimes.com/2024/10/25/us/politics/trump-vance-hack.html; Chris McHenry, *Salt Typhoon and Silk Typhoon: Key Cybersecurity Lessons for Enterprise*, FORBES (Mar. 25, 2025), https://www.forbes.com/councils/forbestechcouncil/2025/03/25/salt-typhoon-and-silk-typhoon-key-cybersecurity-lessons-for-enterprise/.

²⁶ Rosalie Chan, *Cybersecurity professionals say generative AI can be exploited in cyberattacks* — *but it can also be a powerful defense*, BUSINESS INSIDER (May 7, 2024), https://www.businessinsider.com/ai-secure-5g-networks-combat-cyber-threats-2024-5.

²⁷ Goldman Sachs, Generative AI Could Raise Global GDP by 7 percent (Apr. 5, 2024),

www.goldmansachs.com/insights/articles/generative-ai-could-raise-global-gdp-by-7-percent.

²⁸ McKinsey, *The Economic Potential of Generative AI* (Jun. 14, 2023), www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-economic-potential-of-generative-ai-the-next-productivity-frontier#introduction.

²⁹ See Stanford University Human-Centered Artificial Intelligence, 2024 AI Index Report: Economy (Apr. 15, 2024), https://hai.stanford.edu/ai-index/2024-ai-index-report/economy.

³⁰ See Yasir Atalan, *DeepSeek's Latest Breakthrough is Redefining AI Race*, CENTER FOR STRATEGIC AND INTERNATIONAL STUDIES (Feb. 3, 2025), https://www.csis.org/analysis/deepseeks-latest-breakthrough-redefining-ai-race.

³¹ Beatrice Nolan, *DeepSeek used OpenAI's Model to Train Its Competitor Using 'Distillation,' White House AI Czar Says*, FORTUNE (Jan. 28, 2025), https://fortune.com/2025/01/29/deepseek-openais-what-is-distillation-david-sacks/; Zijing Wu, *How Jack Ma's Pivot to AI Rehabilitated Alibaba*, FINANCIAL TIMES (Mar. 17, 2025),

https://www.ft.com/content/df2bccee-1730-402f-bb92-9d743018324f; Alibaba Cloud, Alibaba to Invest RMB380 billion in AI and Cloud Infrastructure Over Next Three Years (Feb. 24., 2025),

https://www.alibabacloud.com/blog/alibaba-to-invest-rmb380-billion-in-ai-and-cloud-infrastructure-over-next-three-years_602007.

Moreover, the use of Chinese open-source models and AI services by American consumers and businesses may introduce new risks to U.S. national and economic security that necessitate action.³² U.S. states and foreign trading partners, for example, have already taken steps to address the risks posed by DeepSeek, including by banning its use.³³

U.S. AI leadership requires a flexible, pro-innovation regulatory environment that promotes the development and adoption of these technologies and addresses specific, well-defined harms to consumers. The misuse of generative AI applications, for example, has exacerbated the current crisis of non-consensual intimate image (NCII) abuse, which disproportionately targets women and girls.³⁴ The bipartisan *TAKE IT DOWN Act* would provide law enforcement and survivors of NCII abuse new tools to address these harms, which stem in part from the misuse of AI applications.³⁵ The bill is supported by a broad coalition of NCII survivors, victims' rights advocates, technology leaders, and the business community.³⁶ A targeted approach such as the one proposed in the *TAKE IT DOWN Act* illustrates how Congress can protect consumers without unduly burdening the U.S. position as a global AI leader.

A key U.S. advantage in the global competition for AI dominance is that U.S. businesses, especially startups, can operate in a single market to develop and use AI at scale.³⁷ The emergence of a regulatory patchwork of burdensome and conflicting requirements among different states, however, may undercut the benefits of a single market.³⁸ Nineteen states, for example, have comprehensive data privacy laws.³⁹ Each of these state frameworks regulate AI

 ³³ See Governor of New York, Gov. Hochul Issues Statewide Ban on DeepSeek AI for Government Devices and Networks (Feb. 10, 2025); Office of the Texas Governor, Gov. Abbott Announces Ban on Chinese AI, Social Media Apps (Jan. 31, 2025), https://gov.texas.gov/news/post/governor-abbott-announces-ban-on-chinese-ai-social-mediaapps; Governor of Virginia, Governor Glenn Youngkin Bans DeepSeek AI on State Devices and State-Run Networks (Feb. 11, 2025); Montana Department of Justice, Attorney General Knudsen leads 21-state coalition urging Congress to ban China-based AI platform on all government devices (Mar. 6, 2025), https://dojmt.gov/attorneygeneral-knudsen-leads-21-state-coalition-urging-congress-to-ban-china-based-ai-platform-on-all-governmentdevices/; Australian Department of Home Affairs, Direction 001-2025 DeepSeek Products, Applications and Web Services (Feb. 4, 2025), https://www.protectivesecurity.gov.au/news/pspf-direction-update-deepseek-productsapplications-and-web-services; South Korea Personal Information Protection Commission, DeepSeek Temporarily Suspends Its Application Service in Korea (Feb. 18, 2025), https://www.pipc.go.kr/eng/user/ltn/new/noticeDetail.do.
 ³⁴ See Matteo Wong, AI is Triggering a Child-Sex-Abuse Crisis, THE ATLANTIC (Sep. 27, 2024),

³² Matt Burgess and Lily Hay Newman, *DeepSeek's Popular AI App is Explicitly Sending U.S. Data to China*, WIRED (Jan 27, 2025), https://www.wired.com/story/deepseek-ai-china-privacy-data/.

https://www.theatlantic.com/newsletters/archive/2024/09/ai-is-triggering-a-child-sex-abuse-crisis/680053/. ³⁵ H.R.633, 119th Cong. (2025); S.146, 119th Cong. (2025).

³⁶ See U.S. Senate Committee on Commerce, Science, and Transportation, Sens. Cruz, Klobuchar, Reps. Salazar, Dean Continue Fight to Pass TAKE IT DOWN Act (Jan. 16, 2025), https://www.commerce.senate.gov/2025/1/sens-cruz-klobuchar-reps-salazar-dean-continue-fight-to-pass-take-it-down-

act#:~:text=in%20reintroducing%20the%20bipartisan%2C%20bicameral,within%2048%20hours%20of%20notice. ³⁷ See Ash Johnson, *How Congress Can Foster a Digital Single Market in America*, INFORMATION TECHNOLOGY AND INNOVATION FOUNDATION (Feb. 20, 2024), https://itif.org/publications/2024/02/20/how-congress-can-foster-a-digital-single-market-in-america/.

³⁸ See Daniel Castro, Luke Dascoli, and Gillian Diebold, *The Looming Cost of a Patchwork of State Privacy Laws*, INFORMATION TECHNOLOGY AND INNOVATION FOUNDATION (Jan. 24, 2022),

https://itif.org/publications/2022/01/24/looming-cost-patchwork-state-privacy-laws/.

³⁹ See U.S. State Privacy Legislation Tracker 2025, IAPP (Mar. 24, 2025),

https://iapp.org/media/pdf/resource_center/State_Comp_Privacy_Law_Chart.pdf.

tools that process personal information; most directly regulate AI by placing requirements on "automated decision making" tools.⁴⁰

Since the public release of ChatGPT 3, states have also enacted new AI-specific laws and promulgated new AI regulations. In May 2024, Colorado enacted SB 205, a first-in-the-nation comprehensive framework intended to address so-called "algorithmic discrimination," raising fears of a worsening patchwork.⁴¹ The California Privacy Protection Agency is also advancing rules to regulate "automated decision making," projected to impose significant new costs of businesses.⁴² In total, state lawmakers introduced nearly 700 AI-related bills in 2024, with more than 100 enacted into law.⁴³

This Committee has long identified the need for a preemptive federal comprehensive privacy and data security law that protects consumers, regardless of which state they live in, and preserves U.S. technological leadership. In February, the Committee launched a Privacy Working Group to explore such a framework and issued a request for information to stakeholders.⁴⁴ The intersection between privacy and data security protections for consumers, together with AI competitiveness, is a key consideration of its work.

Another consideration for U.S. AI leadership is access to foreign markets for U.S. AIenabled goods and services. Among U.S. trading partners, the European Union has stood out in using domestic regulations related to privacy, data security, competition policy, and online platforms to disadvantage or otherwise discriminate against American technology companies.⁴⁵ In 2024, the bloc finalized the *Artificial Intelligence Act*, a comprehensive law that regulates AI through a product safety framework. In addition to the significant economic costs associated with the EU AI Act, the law may be implemented and enforced in ways that inhibit the competitiveness of U.S. AI-enabled goods and services.⁴⁶

⁴⁰ See Center for Information Policy Leadership, Automated Decisionmaking and Profiling Requirements in U.S. State Privacy Laws, and Current State of Play in State AI Regulations (May 15, 2024),

 $https://www.informationpolicycentre.com/uploads/5/7/1/0/57104281/cipl_comparison_us_state_privacy_laws_dpa_feb14.pdf.$

⁴¹ See Adam Thierer, Colorado Opens Door to an AI Patchwork, R STREET INSTITUTE (May 20, 2024),

https://www.rstreet.org/commentary/colorado-opens-door-to-an-ai-patchwork-as-congress-procrastinates/.

⁴² See California Privacy Protection Agency, *Proposed Regulations on CCPA Updates, Automated Decisionmaking Technology* (Nov. 8, 2024), https://cppa.ca.gov/regulations/ccpa_updates.html.

⁴³ Multistate, *State AI Policy: 2025 Preview* (Nov. 15, 2024), https://www.multistate.ai/artificial-intelligence-ai-legislation.

⁴⁴ House Committee on Energy and Commerce, *Chairman Guthrie and Vice Chairman Joyce Announce Creation of Privacy Working Group* (Feb. 12, 2025), https://energycommerce.house.gov/posts/chairman-guthrie-and-vicechairman-joyce-announce-creation-of-privacy-working-group; House Committee on Energy and Commerce,

Chairman Guthrie and Vice Chairman Joyce Issue Request for Information to Explore Data Privacy and Security Framework (Feb. 21, 2025), https://energycommerce.house.gov/posts/chairman-guthrie-and-vice-chairman-joyce-issue-request-for-information-to-explore-data-privacy-and-security-framework.

⁴⁵ See United States Trade Representative, 2025 National Trade Estimate (Mar. 31, 2025),

https://ustr.gov/about/policy-offices/press-office/press-releases/2025/march/ustr-releases-2025-national-trade-estimate-report.

⁴⁶ See Nigel Cory and Patrick Grady, *The EU's Approach to AI Standard is Protectionist and Will Undermine its AI Ambitions*, CENTER FOR DATA INNOVATION (Feb. 6, 2023), https://datainnovation.org/2023/02/the-eus-approach-to-ai-standards-is-protectionist-and-will-undermine-its-ai-ambitions/.

VII. ENVIRONMENTAL REGULATION

Restrictive environmental regulations have the potential to inhibit investments in the infrastructure necessary to support the development of the domestic AI industry, thus jeopardizing America's ability to compete in the global AI race. For example, changes to federal air regulations by the Environmental Protection Agency (EPA) during the Biden-Harris Administration created obstacles to providing and maintaining reliable power. These changes will likely deter domestic investments in semiconductor plants and data centers. Regulations that fall into this category include:

- Mandates on coal and natural gas plants requiring plants to adopt expensive and uncertain carbon sequestration technologies;
- Mercury and Air Toxics Standards (MATS) that target coal power plants; and
- EPA's "Good Neighbor Plan," which places significant burdens on ozone-forming plants and facilities upwind of certain states.

Additional regulatory challenges make the construction of AI infrastructure difficult. One example is the unwieldy regulatory requirements for industrial facilities created under the National Emissions Standards for Hazardous Pollutants (NESHAP) rule. Another can be found in a rulemaking that lowered the National Ambient Air Quality Standards for particulate matter (NAAQs PM_{2.5}). Proposed revisions to the New Source Review (NSR) program's project emissions accounting process are another area of concern as they establish significant regulatory hurdles and delays. These regulations have the potential to undermine modernization and efficiency for American businesses.

To remain competitive globally, the industries developing and deploying AI technologies need an efficient and effective regulatory system. This is also critically important when considering the environmental benefits of building AI infrastructure in the U.S. relative to China. For example, according to the International Energy Agency, in 2023 China accounted for 35 percent of global CO₂ emissions, which was 15 percent more than those of advanced economies—included the United States—combined.⁴⁷ The environmental cost of transporting goods from China to the U.S. is also substantial, so producing goods domestically will eliminate this environmental cost. The Subcommittee on the Environment intends to examine this issue further during a hearing, "Short-Circuiting Progress: Regulatory Challenges for Onshoring American Innovation," the week of April 28, 2025.

Data centers also consume significant amounts of water, primarily for cooling IT equipment, and this water usage can be substantial, particularly in large facilities, with some using millions of gallons daily. Traditional air cooling has been the default solution for managing temperatures in data centers. However, the transition to liquid cooling is seen as a more advanced method to control data center temperatures. Direct liquid cooling is most commonly used in high-density centers as air cooling may not function at the levels required to bring down temperatures. Direct liquid cooling has superior thermal efficiency, reduced energy use as compared to air cooling, and is generally more cost efficient for data center operations. Data

⁴⁷ *The Changing Landscape of Global Emissions*, IEA (2023), https://www.iea.org/reports/co2-emissions-in-2023/the-changing-landscape-of-global-emissions (last visited April 6, 2025).

centers mainly use potable (drinking) water for operations, provided by municipal or regional water companies. Although treated or recycled water can be used, the quality of the cooling water can impact the life of equipment.

As rapid growth of AI use and data centers continues to skyrocket, the water input required for these systems will require more resources to operate. Data centers are already one of the most water consuming industries in the country.⁴⁸ Water usage for data centers varies and is dependent on the scale of operations. For example, Google's hyperscale data centers that support Gmail, Google Drive, and YouTube, used on average 550,000 gallons of water per day in 2024.⁴⁹

The expansion of AI infrastructure has also prompted concerns about how to manage the resulting "e-waste," or electronic products that are no longer in use and discarded. E-waste resulting from AI proliferation includes the high-performance computing hardware required for data centers and server farms.⁵⁰ Computing devices used for AI infrastructure have a relatively short lifespan to begin with, so when combined with rapid advances in hardware technology, e-waste accumulates quickly as this equipment becomes obsolete and must be replaced.⁵¹ Appropriate disposal of this equipment is necessary to avoid health and environmental impacts, as it can contain hazardous substances such as lead and mercury.⁵² E-waste also contains valuable metals such as copper and rare earth elements that can be recycled.⁵³

Finally, siting AI infrastructure has grown increasingly challenging as the scale and sheer number of facilities grows.⁵⁴ As such, the focus has recently shifted to opportunities to locate them on "brownfields" sites. While this is a general term, the EPA defines "brownfields" as "properties that contain or may contain a hazardous substance, pollutant or contaminant, complicating efforts to expand, redevelop or reuse them."⁵⁵ Supporters of these efforts note that brownfields sites often already have access to water electricity, and transportation infrastructure.⁵⁶ A March 11, 2025, hearing before the Subcommittee on the Environment, "Maximizing Opportunities for Redeveloping Brownfields Sites: Assessing the Potential for New American Innovation," included discussion of facilitating data center construction and permitting on properties redeveloped through the EPA's Brownfields Program.⁵⁷

⁴⁸ Md Abu Bakar Siddik, et al., *The Environmental Footprint of Data Centers in the United States*, Environ. Res. Letter (May 21, 2021), https://iopscience.iop.org/article/10.1088/1748-9326/abfba1/pdf.

⁴⁹ Mary Zhang, *Data Center Water Usage: A Comprehensive Guide*, Dgtl Infra (Jan. 17, 2024), https://dgtlinfra.com/data-center-water-usage/.

⁵⁰ Casey Crownhart, *AI Will Add to the E-waste Problem. Here's What We Can Do About It*, MIT TECHNOLOGY REVIEW (Oct. 28, 2024), https://www.technologyreview.com/2024/10/28/1106316/ai-e-waste/.

⁵¹ *Id*.

⁵² *Id*.

⁵³ Id.

⁵⁴ Maximizing Opportunities for Redeveloping Brownfields Sites: Hearing Before the Subcomm. on Env't of the H. Comm. on Energy and Commerce, 119th Cong. (2025) (statement of Jim Connaughton, Chief Executive Officer, JLC Strategies, LLC).

⁵⁵ ENVTL. PROT. AGENCY, *Brownfields: About*, https://www.epa.gov/brownfields/about (last visited Mar. 25, 2025). ⁵⁶ Blog, Nautilus Data Technologies, *Brownfields: The Next Frontier for Data Centers and Industrial Innovation*

⁽Mar. 13, 2025), https://nautilusdt.com/news-updates/brownfields-the-next-frontier-for-data-centers-and-industrialinnovation/.

⁵⁷ Maximizing Opportunities for Redeveloping Brownfields Sites: Hearing Before the Subcomm. on Env't of the H. Comm. on Energy and Commerce, 119th Cong. (2025) (statement of Jim Connaughton, Chief Executive Officer, JLC Strategies, LLC).

VIII. ISSUES

- What are the relative risks and benefits to the development of AI technology, and how will AI factor into human scientific advancement over the coming decades?
- What is the state of AI technology development globally, and how does American innovation measure up to global competitors today?
- What is at risk for the U.S. if our nation falls behind global competitors, such as China and CCP leaders, who are also seeking a leading edge in the development of AI technologies?
- How should U.S. policymakers approach crafting appropriate AI-related regulation, taking into consideration state-level actions and the EU's *AI Act*?
- What specific sector-level regulation would support or hinder AI technology development?

IX. STAFF CONTACTS

If you have any questions about this hearing, please contact Joel Miller of the Committee Staff at (202) 225-3641.