

**POWERING DEMAND:
NUCLEAR SOLUTIONS FOR AI INFRASTRUCTURE**

HEARING
BEFORE THE
SUBCOMMITTEE ON ENERGY
OF THE
COMMITTEE ON SCIENCE, SPACE,
AND TECHNOLOGY
OF THE
HOUSE OF REPRESENTATIVES
ONE HUNDRED NINETEENTH CONGRESS
FIRST SESSION

JUNE 12, 2025

Serial No. 119-15

Printed for the use of the Committee on Science, Space, and Technology



Available via the World Wide Web: <http://science.house.gov>

U.S. GOVERNMENT PUBLISHING OFFICE

60-594PDF

WASHINGTON : 2026

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**POWERING DEMAND:
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FOR AI INFRASTRUCTURE**

THURSDAY, JUNE 12, 2025

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Subcommittee met, pursuant to notice, at 10:02 a.m. in room 2318, Rayburn House Office Building, Hon. Randy Weber [Chairman of the Subcommittee] presiding.



SUBCOMMITTEE ON ENERGY

HEARING CHARTER

“Powering Demand: Nuclear Solutions for AI Infrastructure”

Thursday, June 12, 2025

10:00 a.m.

2318 Rayburn House Office Building

Purpose

This hearing will explore the role of advanced nuclear and its capacity to provide reliable baseload power for data centers. The Committee will examine the Department of Energy’s (DOE) research, development, and demonstration activities to fully unlock nuclear power as well as improve the efficiency of data centers. This hearing will inform Members about the artificial intelligence (AI) data center buildout, how the two technologies fit together, and the importance of energy security for our technological future.

Witnesses

- **Mr. Pat Schweiger**, Chief Technology Officer, Oklo
- **Ms. Kathleen L. Barrón**, Executive Vice President and Chief Strategy and Growth Officer, Constellation Energy
- **Dr. Jeremy Renshaw**, Executive Director AI & Quantum, Electric Power Research Institute (EPRI)

Overarching Questions

- What role has the Department of Energy played in the development and deployment of powering data centers with next-generation reliable baseload power sources like nuclear? Has the recent DOE request for information (RFI) from developers led to any insight on how collocating at National Laboratory sites might proceed?
- How has recent government funding helped speed up the development and deployment of Small Modular Reactors (SMRs)? Will the recently signed Executive Orders from President Trump help address issues facing the industry or are there areas that still need

to be addressed?

- What consequences do taxpayers (consumers) face when it comes to collocation? Are there adverse consequences for behind-the-meter power generation?
- What bureaucratic red tape are companies and utilities coming across when trying to bring new nuclear online? How can Congress help alleviate the issues facing collocation?

Background

With the rapid development and deployment of AI, data centers will play a critical role as the backbone of this technology, driving economic and shaping the future. Due to the vast increase in the number of data centers needed to run AI models, the United States will face a tremendous surge in power demand and consumption, significantly transforming the energy landscape.

According to Lawrence Berkeley National Laboratory's "2024 United States Data Center Energy Usage Report," published in December 2024, data centers consumed 4.4% of total U.S. electricity in 2023. That figure is projected to rise to between 6.7% to 12% by 2028.¹ The report estimates that data center energy consumption will increase from 176 terawatt-hours (TWh) in 2023 to around 325 to 580 TWh in 2028. For context, a large coal, natural gas, or nuclear power plant produces less than 10 TWh per year.² Furthermore, top-tier data center standards call for the "five 9s" uptime, or 99.999% availability—the equivalent of 5.25 minutes of downtime per year, according to a 2020 McKinsey report.³

As a result of this rapid growth and demand, the U.S. will need to greatly expand its energy infrastructure, including additional baseload power interconnects to the grid. Without this significant domestic investment, the United States risks becoming dependent on foreign energy sources. Hostile powers such as the Chinese Communist Party have already shown their willingness to weaponize energy and key materials like critical minerals.⁴

Given these long-term power concerns and the need for consistent power, technology companies and hyperscalers are taking a more proactive role in securing their own power, which is a shift from past practices. Based on their energy projections, many of these companies have made long-term strategic investments and partnerships with next-generation energy companies, including advanced nuclear designers. Active nuclear power generation facilities operate with a standard capacity factor of 92%, which is the ratio of actual power compared to if it ran continuously at full capacity throughout a year. This performance far exceeds other power options available to satisfy the needs of AI data centers.⁵ Geothermal is the next closest energy source and has a standard capacity factor of roughly 65%, with natural gas following at 59.7%.

¹ <https://eta-publications.lbl.gov/sites/default/files/2024-12/lbnl-2024-united-states-data-center-energy-usage-report.pdf>

² <https://www.wereadiagram.com/blog/rethinking-energy-in-age-of-ai>

³ <https://www.powermag.com/addressing-data-center-growth-constraints-key-to-u-s-innovation-leadership-in-ai/>

⁴ <https://www.cnn.com/2025/06/05/business/eu-china-rare-earth-export-controls-intl-hnk>

⁵ <https://www.statista.com/statistics/191201/capacity-factor-of-nuclear-power-plants-in-the-us-since-1975/>

As a result, over the last year, several high-profile partnerships have emerged: Kairos partnered with Google to provide 500 megawatts (MW); Amazon invested over \$300 million to secure 5 gigawatts (GW) of power from X-Energy; and Switch and Oklo announced plans to deploy 12 GW.^{6,7,8}

With these agreements, tech companies and nuclear companies are structuring power agreements based on their needs. The two approaches taken by industry are referred to as “front-of-the-meter” and “behind-the-meter”. A front-of-the-meter power purchase agreement involves a utility owning and operating a power plant that delivers energy to the grid, which then distributes it to customers. In this approach, the end user is not only using power from the specific power plant, but from a variety of sources that are powering the larger grid. One example is the 20-year, 835 MW front-of-meter agreement between Microsoft and Constellation to restart Reactor One at Christopher M. Crane Clean Energy Center, formerly known as Three Mile Island—the second announced nuclear recommissioning in the U.S.⁹

In contrast, a behind-the-meter power purchase agreement is where a power plant generates power directly to the customer’s asset through close proximity. This setup improves energy efficiency, lowers costs, and provides a reliable source of power. Amazon, for instance, has sought a behind-the-meter agreement with Talen Energy’s nuclear reactor in Susquehanna, PA.¹⁰ However, the Federal Energy Regulatory Commission (FERC) and its regulators initially pushed back due to concerns about reliability and increased costs on ratepayers.¹¹ Still, FERC has since limited that ruling and is working to provide clearer guidance on co-location agreements.¹²

Recognizing the importance of AI to national security and economic leadership, the Trump Administration acted quickly by issuing executive orders (EOs), such as EO 14179 “Removing Barriers to American Leadership in Artificial Intelligence,” accelerating the development of AI.¹³ In line with this order, on April 7, 2025, DOE issued a request for information (RFI) to gauge industry interest in using 16 DOE sites as locations for data centers.¹⁴ Some of these sites have the potential to host data centers powered by nuclear reactors, given that many of these communities have a long history and with DOE’s nuclear security missions.

⁶ <https://oklo.com/newsroom/news-details/2024/Oklo-and-Switch-Form-Landmark-Strategic-Relationship-to-Deploy-12-Gigawatts-of-Advanced-Nuclear-Power-One-of-the-Largest-Corporate-Clean-Power-Agreements-Ever-Signed/default.aspx>

⁷ https://kairospower.com/external_updates/google-and-kairos-power-partner-to-deploy-500-mw-of-clean-electricity-generation/

⁸ <https://www.cascadepbs.org/news/2024/11/amazon-offers-334m-nuclear-reactors-be-built-hanford>

⁹ https://www.wsj.com/business/energy-oil/three-mile-islands-nuclear-plant-to-reopen-help-power-microsofts-ai-centers-aebfb3c8?mod=Searchresults_pos3&page=1

¹⁰ <https://www.datacenterdynamics.com/en/news/aws-acquires-talens-nuclear-data-center-campus-in-pennsylvania/>

¹¹ <https://www.ans.org/news/article-6534/ferc-rejects-interconnection-deal-for-talenamazon-data-centers/>

¹² <https://ferc.gov/news-events/news/ferc-orders-action-co-location-issues-related-data-centers-running-ai>

¹³ <https://www.whitehouse.gov/presidential-actions/2025/01/removing-barriers-to-american-leadership-in-artificial-intelligence/>

¹⁴ <https://www.federalregister.gov/documents/2025/04/07/2025-05936/request-for-information-on-artificial-intelligence-infrastructure-on-doe-lands>

More recently, on May 23, 2025, President Trump signed four executive orders: (1) Deploying Advanced Nuclear Reactor Technologies for National Security, (2) Ordering The Reform of the Nuclear Regulatory Commission, (3) Reforming Nuclear Reactor Testing at the Department of Energy, and (4) Reinvigorating the Nuclear Industrial Base. These actions aim to fast-track advanced nuclear development, streamline licensing, strengthen the domestic supply chain, and boost the domestic nuclear industry.^{15,16,17,18} Together with EO 14179 and DOE's April RFI, these initiatives promote faster and more affordable deployment of nuclear power for American consumers.

Through continued research, development, and demonstration programs within DOE's Office of Science, Energy Efficiency and Renewable Energy Office, and Office of Nuclear Energy, the Department is well-positioned to guide the evolution of AI and ensure American dominance in both energy and cutting-edge innovation.

DOE's Energy Efficient Computing and Energy Efficiency in Data Centers

The DOE has long been at the forefront of computational research and development. Research funded and conducted by DOE has been critical in creating the technologies we rely on today. Within the Department, the Advanced Scientific Computing Research (ASCR) Program, the Office of Energy Efficiency and Renewable Energy (EERE), and the Advanced Research Projects Agency – Energy (ARPA-E) recently played key roles in developing energy-efficient computing and improving energy efficiency in data centers. EERE, one of DOE's applied offices, supported the Department's efforts to enhance data center efficiency. Under the Energy Act of 2020, DOE was instructed to analyze measurements, best practices, and benchmarks related to data center efficiency. EERE subsequently provided this information to the Federal Energy Management Program (FEMP), offering guidance and resources to improve the efficiency of federally operated data centers. Additional best practices and resources were also outlined by the Center of Expertise (CoE) for Energy Efficiency in Data Centers and published in its guide to design energy-efficient data centers.¹⁹

Housed under the Office of Science, ASCR leads not only the nation but also the world in supercomputing and high-performance computing (HPC). Through basic research in areas like computational hardware, algorithmic and software improvements, and workflow optimization, ASCR helped create the most powerful supercomputer in the world while not sacrificing energy efficiency. Through the Exascale Computing Project (ECP), ASCR, in collaboration with the National Nuclear Security Administration (NNSA), developed the world's first exascale computer, Frontier.²⁰ Exascale performance is achieved once a system can perform a quintillion

¹⁵ <https://www.whitehouse.gov/presidential-actions/2025/05/deploying-advanced-nuclear-reactor-technologies-for-national-security/>

¹⁶ <https://www.whitehouse.gov/presidential-actions/2025/05/ordering-the-reform-of-the-nuclear-regulatory-commission/>

¹⁷ <https://www.whitehouse.gov/presidential-actions/2025/05/reforming-nuclear-reactor-testing-at-the-department-of-energy/>

¹⁸ <https://www.whitehouse.gov/presidential-actions/2025/05/reinvigorating-the-nuclear-industrial-base/>

¹⁹ ¹⁹ <https://www.energy.gov/femp/energy-efficiency-data-centers>

²⁰ <https://www.energy.gov/science/articles/frontier-doe-supercomputing-launches-exascale-era>

(10^{18}) calculations per second.²¹ This leap in performance was made possible by advances in energy-efficient computing, which addressed the significant challenges of heat generation, power consumption, and the size of the computer needed. According to the November 2024 edition of the TOP500, which is a biannual ranking of the world's fastest supercomputers, NNSA's supercomputer El Capitan was ranked the most powerful, followed by two ASCR supercomputers, Frontier and Aurora, in second and third place, respectively.²² TOP500 also ranks the most energy-efficient high performance computer, called the Green500, where El Capitan placed 18th.²³

ARPA-E, has also advanced energy efficiency with its COOLERCHIP program. Electrical energy that goes into the data center is released as heat in the system. As a result, up to 40% of the power used by a data center goes to cooling systems to ensure the chips do not overheat.²⁴ Data center developers utilize a variety of cooling systems, including air-based cooling, liquid cooling, immersion cooling, evaporative cooling, free cooling, or hybrid cooling systems.²⁵ This program is developing transformational, highly efficient, and reliable cooling technologies for data centers, targeting cooling energy expenditures below 5% of a typical data center's IT load at any time or location in the U.S.²⁶

The Energy Act of 2020 instructed Lawrence Berkley National Laboratory (LBNL) to provide an update to its 2016 "United States Data Center Energy Usage Report," which was completed and released in December 2024.²⁷ Additionally, in the CHIPS and Science Act, Congress specifically directed the Secretary of Energy to set up a program for fundamental research, development, and demonstration of energy-efficient computing and data center technologies.²⁸

DOE's Nuclear Energy Activities

The Office of Nuclear Energy (NE), an applied office, supports DOE's mission in nuclear science and technology through its research, development, and demonstration activities. Its goal is to support the existing nuclear fleet, develop advanced reactors and fuels, and educate the next generation workforce with its university partnership programs. NE manages various programs including the Advanced Reactor Demonstration Program (ARDP), High-Assay Low-Enriched Uranium (HALEU) Availability Program, Space Power Systems, Nuclear Fuel Security Act, and Fuel Cycle Technologies.

²¹ <https://www.ornl.gov/news/frontier-supercomputer-debuts-worlds-fastest-breaking-exascale-barrier>

²² <https://top500.org/lists/top500/2024/11/>

²³ <https://top500.org/lists/green500/list/2024/11/>

²⁴ <https://www.nrel.gov/news/detail/program/2025/reducing-data-center-peak-cooling-demand-and-energy-costs-with-underground-thermal-energy-storage>

²⁵ <https://www.digitalrealty.com/resources/articles/future-of-data-center-cooling>

²⁶ <https://arpa-e.energy.gov/programs-and-initiatives/view-all-programs/coolerchips>

²⁷ Shehabi, Arman, et al. 2024 United States Data Center Energy Usage Report. Lawrence Berkeley National Laboratory, 2024. Report No. LBNL-2001637. University of California eScholarship, <https://escholarship.org/uc/item/32d6m0d1>.

²⁸ "Text - H.R. 4346 - 117th Congress (2021-2022): CHIPS and Science Act." *Congress.gov*, Library of Congress, 9 August 2022, <https://www.congress.gov/bills/117th-congress/house-bill/4346/text>.

NE oversees a robust nuclear fuels program, including the HALEU Availability Program and the Nuclear Fuel Security Act—both critical to many new next-generation (GEN IV) reactors that depend on Low-Enriched Uranium (LEU) and HALEU. Under the Energy Act of 2020, Congress authorized the HALEU availability program to support the research, development, and demonstration of HALEU, which received \$800 million in appropriations through the Inflation Reduction Act (IRA). In April, DOE announced conditional agreements to provide HALEU to five companies: TRISO-X, Kairos Power, Radiant Industries, Westinghouse, and TerraPower. These shipments are vital, as delays in HALEU availability could postpone reactor deployment by up to two years.²⁹ In a related but distinct effort, the Nuclear Fuel Security Act, authorized by Congress in response to the war in Ukraine and Russia's dominance in the nuclear fuel cycle market, received \$2.7 billion in FY24 appropriations. In the fall of 2024, DOE selected six companies—BWXT, Centrus, Framtome, GE Veronva, Orano, and Westinghouse—to support both the fuel cycle for LEU as well as HALEU.³⁰ Given these investments by Congress, Orano announced that it will build a 750,000-square-foot facility to produce low-enriched fuel, with the potential to produce HALEU as well. Urenco also recently announced a 15% expansion to its capacity to support the existing nuclear fleet.³¹

To support the development of new nuclear reactors, NE manages two major demonstration programs: ARDP and a Generation III+ (GEN III+) small modular reactor. First funded through the Consolidated Appropriations Act of 2020 and later authorized by the Energy Act of 2020, the ARDP program supports the demonstration of advanced light-water and non-light water nuclear reactors through three commercial pathways: Advanced Reactor Demos (Demos), Risk Reduction for Future Demonstration (Risk Reduction), and Advanced Reactor Concepts-20 (ARC-20). Under the Demos program, DOE selected X-Energy's Xe-100 reactor and TerraPower's Natrium reactor, which are both non-water designs. Additional selections by DOE include Kairos Power LLC's Hermes, Westinghouse's eVinci, BWX Technologies Inc. (BWXT) BWXT Advanced Nuclear Reactor (BANR), Holtec's SMR, and Southern Company's Molten Chloride Reactor Experiment (MCRE). The Risk Reduction program is milestone-based, requiring participants to meet mutually agreed upon achievements to secure funding. Lastly, DOE selected General Atomics, Massachusetts Institute of Technology, and Advanced Reactor Concepts for the ARC-20. In 2021, Congress passed the Infrastructure, Investment, and Jobs Act (IIJA), which appropriated \$2.447 billion for ARDP. Most of this funding was allocated to the Demos program, and Congress has continued to support ARDP through subsequent appropriations. Additionally, in the FY 2024 Appropriations bill, Congress appropriated \$800 million to support the deployment of a Gen III+ reactor and another \$100 million for design, licensing, supply chain, and site preparation. Currently, DOE is in the process of selecting an awardee for this program, which will be announced in the near future.

The Idaho National Laboratory (INL), DOE's applied energy lab under NE, serves as a testbed for new reactor technologies and fuels. It also hosts several important users and test facilities. One of its oldest facilities, the Advanced Test Reactor (ATR), is a 60-year-old test reactor that uses highly enriched uranium to irradiate fuels. ATR has been instrumental to

²⁹ <https://www.reuters.com/business/energy/us-backed-high-tech-nuclear-plant-wyoming-delayed-2022-12-14/>

³⁰ <https://www.orano.group/usa/en/our-portfolio-expertise/project-ike-enrichment>

³¹ <https://www.world-nuclear-news.org/articles/first-phase-of-us-enrichment-plant-expansion-starts-up>

improving fuel efficiency for both the domestic nuclear fleet and the nuclear navy. It is important to note that although Congress authorized the next-generation facility, the Versatile Test Reactor (VTR), funding has not yet been appropriated.

Authorized in the Nuclear Energy Innovation and Capabilities Act (NEICA), the National Reactor Innovation Center (NRIC), is located at INL and hosts multiple research facilities: the Demonstration of Microreactor Experiments (DOME), Laboratory for Operation and Testing in the United States (LOTUS), Helium Component Test Facility (He-CTF), and Molten Salt Thermophysical Examination Capability (MSREC). Though still under construction, the DOME facility will advance the development of new microreactor technologies such as Westinghouse's eVinci and Radiant's Kaleidos.³² DOME is vital as some industry players are interested in deploying 30 microreactors at one site to power a data center given its reliability and waste management benefits. Meanwhile, LOTUS provides a testbed for new experimental reactor concepts and may eventually host Southern Company and TerraPower's MCRE.³³ In the coming years, INL will also complete the Microreactor Applications Research Validation and Evaluation (MARVEL) Project, which will test the operational capabilities of microreactors and evaluate their real-world applications. Although still under development, these facilities are poised to accelerate the new generation of reactors—many of which could play a role in powering future data centers.

³² <https://www.energy.gov/ne/articles/doe-awards-5-million-second-phase-advanced-reactor-experiment-designs>

³³ <https://www.powermag.com/the-power-interview-does-unique-new-advanced-nuclear-reactor-test-beds/>

Chairman WEBER. The Committee will come to order; the Subcommittee on Energy is convening.

Without objection, the chair is authorized to declare recesses of the Subcommittee at any time.

Welcome to today's hearing entitled, "Powering Demand: Nuclear Solutions for AI (Artificial Intelligence) Infrastructure." I recognize myself for 5 minutes for an opening statement.

So listen, good morning everybody. We're glad you all are here. That includes the audience, by the way. Welcome to the hearing titled, "Powering Demand: Nuclear Solutions for AI Infrastructure."

Folks, with artificial intelligence's rapidly growing demand on our power grid, this hearing is going to examine the U.S. energy landscape and our capacity to meet that need. In light of recent announcements around the country, we are going to focus on nuclear energy's role as a baseload power source. We will also review the Department of Energy (DOE's) research, development and demonstration programs supporting the next generation of nuclear reactors. Much like the 1940s—most of y'all weren't here then and, just for the record, neither was I—much like the 1940s, America stood at the dawn of the atomic era, we now stand on the threshold of a new age, driven by artificial intelligence.

With promises of increased efficiency and productivity, AI has the potential to revolutionize every single aspect of our economy and our way of life. Unsurprisingly, this potential has spurred a major influx of private capital aiming to turn these very promises into our reality.

Additionally, this technology is poised to dramatically transform our electric grid and our energy sector due to the construction of those very same AI data centers. According to a recent report from a leading consulting company, data centers—do you all say data or data?

Data. There is one vote for data right there in the back. All right.

According to one consulting company, data centers are projected to consume 5.2 percent of U.S. electricity this year, with that share expected to increase to 11.7 percent by the year 2030. Their energy use would rise from 25 gigawatts to 80 gigawatts. Let's put that in perspective: 1 gigawatt of energy equates to roughly 294 utility-scale wind turbines, 1.8 million solar panels, 103 offshore wind turbines, or 1 large light water nuclear reactor, which is why we're here. I see your excitement down there.

Due to these immense energy demands, major technology companies and hyperscalers who traditionally sit on the energy sidelines are now climbing into the driver's seat to secure their long-term power supply. Nuclear has emerged as the ideal energy source, given its clean baseload power and unmatched reliability. Nuclear's capacity factor of 92.5 percent—let that sink in—is the highest of any, any energy source. This level of reliability is essential for data centers, which can afford no more than 5.25 minutes of downtime annually. No more than 5.25 minutes downtime annually.

As a result, tech companies are making substantial investments and forging strategic power purchase agreements with nuclear designers. For instance, Amazon has invested over \$300 million in X-energy. Google has signed a 500 megawatt power purchase agreement with Kairos Power, and Switch secured up to 12 gigawatts

from Oklo Energy, another witness here today, to partner with Microsoft to recommission a nuclear reactor at the Three Mile Island site.

In addition to investments and partnerships, tech firms are also redesigning interconnection agreements. Traditionally, data centers relied on the front-of-the-meter interconnection agreements, in which a utility generates, transmits, and then distributes energy to the end user. Now tech companies are pursuing behind-the-meter agreements where energy assets directly power the data center. This approach reduces transmission costs, streamlines the approval process, and provides for greater operational control to the end user.

Last year Talen Energy sold Amazon a data center and agreed to a behind-the-meter power agreement, supplying up to 480 megawatts from its Susquehanna Nuclear Power Plant. Although FERC (Federal Energy Regulatory Commission) blocked this specific agreement, I believe back-of-the-meter interconnection agreements will be commonplace when we're constructing new nuclear power plants.

As the nuclear and tech sectors deepen their collaboration, the Department of Energy, DOE, Office of Nuclear Energy plays a crucial role in AI's future success. The office manages the Advanced Reactor Demonstration Program (ARDP) which helps commercialize new nuclear technologies, including X-energy's XE-100 reactor. Just recently Dow and X-energy submitted their construction permit application for a proposed project in Seadrift, Texas, which is right south of our district—my district.

DOE also manages the Nuclear Fuel Security Program and the Advanced Nuclear Fuel Availability Program, both created under the *Energy Act of 2020*. These initiatives are critical to deploying next-generation reactors that rely on high-assay, low-enriched uranium, or HALEU, fuel. DOE recently announced it will provide help to X-energy, Kairos Power, Radiant Industries, Westinghouse, and TerraPower.

In tandem, the Trump Administration has accelerated the deployment of AI through recent executive orders (EOs). In April DOE issued a request for information, RFI, soliciting feedback on whether industry would be interested in using Federal land at DOE sites to host AI data centers. Given the strong support for DOE and its nuclear security missions, these sites are perfect, perfect for hosting data centers powered by nuclear reactors. From the atomic bomb to artificial intelligence, DOE's labs have consistently stood at the precipice of technological advancement. They continue to meet generational challenges and drive innovations that strengthen America as we enter this new area.

[The prepared statement of Chairman Weber follows:]

Good morning. Welcome to today's Energy Subcommittee hearing titled, "Powering Demand: Nuclear Solutions for AI Infrastructure." With artificial intelligence's rapidly growing demand on our power grid, this hearing will examine the U.S. energy landscape and its capacity to meet that need. In light of recent announcements around the country, we will focus on nuclear energy's role as a base-load power source. We will also review the Department of Energy's research, development, and demonstration programs supporting the next generation of nuclear reactors.

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Additionally, this technology is poised to dramatically transform our electric grid and energy sector due to the construction of new AI data centers. According to a recent report from a leading consulting company, data centers are projected to consume 5.2% of U.S. electricity this year, with that share expected to increase to 11.7% by 2030. Their energy use would rise from 25 GW to 80 GW. To put that in perspective, 1 GW of energy equates to roughly 294 utility-scale wind turbines, 1.8 million solar panels, 103 offshore wind turbines, or one large light-water nuclear reactor.

Due to these immense energy demands, major technology companies and hyperscalers, who traditionally sat on the energy sidelines, are now climbing into the driver's seat to secure their long-term power supply. Nuclear has emerged as the ideal energy source given its clean baseload power and unmatched reliability. Nuclear's capacity factor of 92.5% is the highest of any energy source. That level of reliability is essential for data centers, which can afford no more than 5.25 minutes of downtime annually.

As a result, tech companies are making substantial investments and forging strategic power purchase agreements with nuclear designers. For instance, Amazon invested over \$300 million in X-Energy, Google signed a 500 MW power purchase agreement with Kairos Power, and Switch secured up to 12 GW from Oklo, which is one of our witnesses here today. This led Constellation Energy, another witness here today, to partner with Microsoft to recommission a nuclear reactor at Three Mile Island.

In addition to investments and partnerships, tech firms are also redesigning interconnection agreements. Traditionally, data centers relied on front-of-the-meter interconnection agreements, in which a utility generates, transmits, and distributes energy to the end user. Now, tech companies are pursuing behind-the-meter agreements, where energy assets directly power the data center. This approach reduces transmission costs, streamlines the approval processes, and provides greater operational control to the end user.

Last year, Talen Energy sold Amazon a data center and agreed to a behind-the-meter power agreement supplying up to 480 MW from its Susquehanna nuclear power plant. Although FERC blocked this specific agreement, I believe back-of-the-meter interconnection agreements will be commonplace when constructing new nuclear power plants.

As the nuclear and tech sectors deepen their collaboration, the Department of Energy's (DOE) Office of Nuclear Energy plays a crucial role in AI's future success. The office manages the Advanced Reactor Demonstration Program, which helps commercialize new nuclear technologies, including X-Energy's Xe-100 reactor. Just recently, Dow and X-Energy submitted their construction permit application for a proposed project in Sea Drift, Texas, right next to my district.

DOE also manages the Nuclear Fuel Security Program and the Advanced Nuclear Fuel Availability Program, both created under the *Energy Act of 2020*. These initiatives are critical to deploying next-generation reactors that rely on high-assay low-enriched uranium (HALEU) fuel. DOE recently announced it will provide HALEU to X-Energy, Kairos Power, Radiant Industries, Westinghouse, and TerraPower. In tandem, the Trump Administration has accelerated the deployment of AI through recent executive orders.

In April, DOE issued a Request for Information (RFI) soliciting feedback on whether industry would be interested in using federal land at DOE sites to host AI data centers. Given the strong support for DOE and its nuclear security missions, these sites are perfect for hosting data centers powered by nuclear reactors.

From the atomic bomb to artificial intelligence, DOE's labs have consistently stood at the precipice of technological advancement. They continue to meet generational challenges and drive innovations that strengthen America as we enter this new era.

I look forward to our discussion here today and yield back the balance of my time.

Chairman WEBER. I look forward to our discussion today, and I'm going to yield the balance of my time to the gentlelady to my right, the Ranking Member.

Ms. ROSS. Well, thank you very much, Chairman Weber, for convening this hearing today to discuss the potential for nuclear energy solutions to power our Nation's growing artificial intelligence infrastructure.

I also want to thank our distinguished witnesses for being here to share your testimony and insights on this topic.

We've heard repeatedly from a wide range of sources about how the advancement of AI could fuel economic growth, geopolitical advantages, and the acceleration of science and technology. I'm proud to represent North Carolina's 2d District, where AI is driving a rapidly growing job market, education and workforce development, and research and innovation that could play a significant role in ensuring our Nation's competitive edge.

Just over a month ago an organization in the Research Triangle Park added a cutting-edge AI tool for clinical trial optimization, leading to fewer required patients per trial, requiring—reducing timelines and costs, and ultimately increasing success rates. However, these advancements depend on our ability to power them, and that's why we're here today.

A recent assessment from SemiAnalysis found that the energy needed to meet this infrastructure demand is projected to require 80 gigawatts of additional energy by 2030. This need is not foreign to me. Data center construction rose 15 times in North Carolina last year. AI data centers are particularly unique in their energy requirements, with some calling for 24/7 supply and massive—at a massive scale, and that scale is only projected to grow as hyperscalers invest billions of dollars toward these centers.

Much like the promise of AI, these data center investments can accelerate our economy and provide workforce benefits for years to come, but not without a cost. There are many impacts to consider in trying to meet this energy demand.

First, the environmental cost of rapid data center expansion are—that's far from negligible. We've been hearing about this in the western part of North Carolina. A report from DOE's Lawrence Berkeley National Laboratory released last year said that the total greenhouse gas emissions for U.S. data centers in 2023 was estimated to be 61 billion kilograms of CO₂ equivalent. As a former clean energy lawyer, I know firsthand that meeting this energy demand while working to build a sustainable future for North Carolina and the Nation is not an easy task. We must intentionally build a more reliable and sustainable energy supply, and we should be using any environmentally benign resources, including nuclear, available to do so at the lowest cost possible for the American people.

We must also consider using existing under-utilized sources of power, and must be intentional with our siting for data centers required for this type of development. Siting data centers near existing power generation, including in areas where manufacturing has moved away, should remain top of mind. And this has happened in North Carolina.

Now, while not directly connected to a specific data center by a dedicated power line, the Yadkin River Hydroelectric Project in western North Carolina plays a role in the overall power grid that served the data center that is in this Hickory corridor all around that part of North Carolina. This area has seen a significant investment in data centers, and the region's hydroelectric power generation contributes to the overall energy supply. We can and should

use renewable and existing energy sources to help power our data centers across the United States.

That also brings another point up: the cost passed down to the American people of constructing new energy sources, the ratepayers. They should not be first in line to absorb high risk and financially burdened with typical—with the typical rates associated with deploying a first-of-kind energy source.

Today we're here to discuss nuclear power, an energy source with immense promise, but with a very high risk of cost and schedule overruns thus far. So we must keep top of mind who will absorb this risk. I don't have to look far to see the negative impacts that the risk being absorbed by the ratepayers can—where it can arise. The abandoned VC Summer project in South Carolina experienced years of delays and cost overruns, eventually resulting in \$9 billion of sunk costs. Now, we know some other people are looking at taking that over, but that does not get rid of what the ratepayers had to absorb. I'm glad I'm seeing some nodding heads over there.

To this day, \$5.7 billion is still being paid for by customers who do not reap the benefits of a successful nuclear project. This contrasts sharply with the very positive experience in Georgia with their Vogtle project, which was enabled by strategic support from DOE's Loan Program Office, or LPO. This is exhibit A for the reason we absolutely must maintain expanded resources and capabilities to provide to the LPO through the *Inflation Reduction Act*, and those are at risk right now.

Nuclear projects are inherently challenging, but I believe we can learn from past mistakes and proceed responsibly considering the use of brownfields, Federal land, strategic capital, and, above all, the protection of the ratepayers while building a more reliable and sustainable energy supply. We have an opportunity to build long-lasting infrastructure that unlocks a more reliable and sustainable future, which I intend to continue working toward with the Chairman. I look forward to hearing from our witnesses today on how nuclear energy can help us get there, in tandem with a far broader portfolio of clean energy resources that should also be considered.

[The prepared statement of Ms. Ross follows:]

Good morning and thank you, Chairman Weber, for convening this hearing today to discuss the potential for nuclear energy solutions to power our nation's growing artificial intelligence infrastructure. I also want to thank our distinguished witnesses for being here to share your testimony and insights on this topic.

We have heard repeatedly from a wide range of sources about how the advancement of AI could fuel economic growth, geopolitical advantages, and the acceleration of science and technology. I am proud to represent North Carolina's 2nd District, where AI is driving a rapidly growing job market, education and workforce development, and research and innovation that could play a significant role in ensuring our nation's competitive edge.

Just over a month ago, an organization in Research Triangle Park added a cutting-edge AI tool for clinical trial optimization, leading to fewer required patients per trial, reduced timelines and costs, and ultimately increased success rates. However, these advancements depend on our ability to power them.

A recent assessment from SemiAnalysis found that the energy needed to meet this infrastructure demand is projected to require 80 gigawatts of additional energy by 2030. This need is not foreign to me: data center construction rose 15x in North Carolina last year. AI data centers are particularly unique in their energy requirements, with some calling for 24/7 supply at massive scale—and that scale is only projected to grow as hyperscalers invest billions of dollars towards these centers.

Much like the promise of AI, these data center investments can accelerate our economy and provide workforce benefits for years to come—but not without a cost. There are many impacts to consider in trying to meet this energy demand.

First, the environmental costs of rapid data center expansion are far from negligible. In a report from DOE's Lawrence Berkeley National Laboratory released last year, the total greenhouse gas emissions for U.S. data centers in 2023 was estimated to be 61 billion kilograms of CO₂ equivalent.

As a former clean energy lawyer, I know firsthand that meeting this energy demand while working to build a sustainable future for North Carolina, and the nation, is not an easy task. We must intentionally build a more reliable and sustainable energy supply, and we should be using any environmentally benign resources available to do so at the lowest cost possible for the American people. We must also consider using existing, underutilized sources of power and must be intentional with our siting for the data centers required for this type of development.

Siting data centers near existing power generation—including in areas where manufacturing has moved away—should remain top of mind. While not directly connected to a specific data center by a dedicated power line, the Yadkin River Hydroelectric Project in western North Carolina plays a role in the overall power grid that served the data center corridor around Hickory.

This area has seen significant investment in data centers, and the region's hydroelectric power generation contributes to the overall energy supply. We can and should use renewable and existing energy sources to help power our data centers across the United States.

That brings us to another point we must keep top of mind today: the cost passed on to the American people—the ratepayers—who should not be the first in line in absorbing the high risk and financial burden typically associated with deploying a first of a kind energy source. Today we are here to discuss nuclear power—an energy source with immense promise to be sure, but with a very high risk of cost and schedule overruns thus far.

So, we must keep top of mind: who will absorb that risk?

I don't have to look far to see the negative impacts of that risk being absorbed by taxpayers. The abandoned VC Summer project in South Carolina experienced years of delays and cost overrun, eventually resulting in \$9 billion of sunk cost. To this day, \$5.7 billion is still being paid for by customers who do not reap the benefits of a successful nuclear project. This contrasts with Georgia's Vogtle project, which was enabled by strategic support from DOE's Loan Programs Office, or LPO.

This is Exhibit A for the reason we absolutely must maintain the expanded resources and capabilities provided to LPO through the *Inflation Reduction Act*. Nuclear projects are inherently challenging, but I believe we can learn from our mistakes and proceed responsibly—considering the use of brownfields, federal land and strategic capital, and above all the protection of taxpayers while building a more reliable and sustainable energy supply.

We have an opportunity to build long-lasting infrastructure that unlocks a more reliable and sustainable future, which I intend to continue working towards.

I look forward to hearing from our witnesses today on how nuclear energy can help us get there, in tandem with the far broader portfolio of clean energy resources that should also be considered.

Thank you, and I yield back.

Ms. ROSS. Thank you, and I yield back.

Chairman WEBER. Thank you, Ranking Member Ross. I now recognize the Chairman of the Full Committee, Chairman Babin.

Chairman BABIN. Yes, sir. Thank you very much, Mr. Chairman, and thank you to our witnesses today for being here. I want to thank our Energy Subcommittee Chairman, my good friend, Mr. Weber, for holding this timely hearing on powering data centers with advanced nuclear technologies.

Artificial intelligence is advancing at a breakneck pace. Every day we see brand new, groundbreaking developments and headlines that highlight AI's expanding role in our economy, our national security, and even our daily lives. Fortunately, the United States currently leads the world in the AI race, but that lead is not guaranteed. Both friends and foes are moving swiftly to close this gap.

At the core of AI innovation are data centers, the engines that drive this technological revolution. These facilities require enormous and uninterrupted power. And when it comes to reliability, only one option consistently meets those high standards, and that is nuclear.

Industry standards for top tier data centers, especially those supporting AI workloads, require what's known as the "five-9s" uptime, or 99.999 percent operational reliability. This means that over the course of a year the data center is expected to be operational 99.999 percent of the time. That equates to just 5.2 minutes of allowable downtime per year. Few energy sources can meet that bar. In fact, nuclear power, with its 92.5 percent capacity factor, stands alone in its ability to provide the clean, constant baseload power that these systems demand. Plus, nuclear can provide much more energy per square foot than its competing energy sources, allowing nuclear to be sited nearer to its customers and be less impactful on overall land usage.

As this Administration has stated, nuclear energy will play a central role in our energy future. Thanks to executive orders from President Trump and recent actions from the Department of Energy, we are beginning to cut through the red tape that has long stalled nuclear progress, moving quickly but safely to scale nuclear power nationwide. To get to this point, the Federal Government has spent over a decade significantly investing in advanced nuclear through DOE's Office of Nuclear Energy. These early stage investments were essential to getting first-of-a-kind technologies off of the ground.

However, in today's budget-constrained environment, that support must be seen as a launch pad, not a permanent lifeline. It's time for the private sector to stand up—I should say step up. Fortunately, the market is ready. The nuclear renaissance we anticipated in the early 2000s is now within reach. As the demand for power increases, new nuclear companies have a critical partner in large technology firms that are willing to invest in and help deploy the fleet of nuclear reactors that has long been promised. However, these tech companies are not only willing to pay a premium to bring these new, first-of-a-kind power sources online, but they have also shown an appetite for current technology.

Earlier this year Microsoft and Constellation Energy, one of our witnesses today, announced plans to reactivate the Crane Clean Energy Center, and formerly Three Mile Island, marking a historic moment. Additionally, just last week Meta and Constellation announced a 20-year agreement to keep the plant operational. This isn't just good energy policy. It's good economic policy, creating well-paying jobs and generating millions in tax revenue that would otherwise be lost.

This momentum is spreading across the country, including my home State of Texas. Lawmakers are advancing pro-nuclear policies. Universities are also seeing the benefits of partnering with advanced nuclear. Texas A&M, through its Rellis Campus, announced the creation of the Energy Proving Ground Project. This project will involve Texas A&M assisting four chosen SMR (small modular reactor) companies with permitting, and providing a location to demonstrate their reactors.

Now is the time for the nuclear industry to take its next step toward unlocking its full potential. The conditions are ripe for a resounding success. We're very fortunate to have a very strong panel of witnesses with us today who bring deep expertise from across the advanced nuclear energy and artificial intelligence sectors.

I want to thank each of you for being here today, and I'm looking very much forward to hearing your testimony.

[The prepared statement of Chairman Babin follows:]

I want to thank our Energy Subcommittee Chairman and my good friend, Mr. Weber, for holding this timely hearing on powering data centers with advanced nuclear technologies.

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To get to this point, the federal government has spent over a decade significantly investing in advanced nuclear through the DOE's Office of Nuclear Energy. These early-stage investments were essential to getting first-of-a-kind technologies off the ground. However, in today's budget-constrained environment, that support must be seen as a launchpad—not a permanent lifeline. It's time for the private sector to step up.

Fortunately, the market is ready. The nuclear renaissance we anticipated in the early 2000s is now within reach. As the demand for power increases, new nuclear companies have a critical partner in large technology firms that are willing to invest in and help deploy the fleet of nuclear reactors that has long been promised.

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Now is the time for the nuclear industry to take its next step toward unlocking its full potential. The conditions are ripe for resounding success.

We are fortunate to have a strong panel of witnesses with us today who bring deep expertise from across the advanced nuclear energy and artificial intelligence sectors.

I want to thank each of you for joining us today, and I look forward to your testimony. With that, I yield back.

Chairman BABIN. With that I yield back, Mr. Chairman.

Chairman WEBER. Thank you, Chairman Babin. I now recognize the Ranking Member of the Full Committee for a statement.

Ms. LOFGREN. Well, thank you, Chairman Weber and Ranking Member Ross, for holding this hearing today, and I want to thank the witnesses for being here and for your expertise.

We have a real challenge ahead of us. We've seen incredible strides in the capabilities of artificial intelligence over the last few years and its application to research, industry, agriculture, and other sectors of our economy. However, we also know that training and running AI models can consume enormous amounts of energy. And while certainly not the only solution, advanced nuclear technologies are quite promising in their potential to meet these expected needs.

And over the past decade in particular, this Committee has developed and enacted bipartisan, comprehensive legislation to explore in advance of this research—resource. In fact, the last bill we had before this Committee on next-gen nuclear was adopted unanimously, and this is another reason why I am so disappointed with the Administration's budget proposal for 2026.

The budget also states that it—and this is a quote—“unleashes America's energy dominance through funding for nuclear energy.” But it would cut support for DOE's Office of Nuclear Energy by 21 percent, and slash funding for the flagship Advanced Reactor Demonstration Program by 51 percent.

The budget also states that it is “prioritizing fusion research,” but it proposes to cut fusion research by 6 percent. Now, this may be old fashioned, but I think words actually should mean something, especially when they come from the U.S. Government, and these words do not reflect the actual proposal.

Now, some may note that the budget request does include support for loan guarantees for nuclear technologies, and that's all well and good until you look at the rescission reconciliation bill that the Republicans in the House passed, which, of course, the President endorsed. If enacted, that bill would eliminate more than four times as much support for DOE's loan guarantee program as this budget proposal would provide. It would cut tax incentives that industries told us are critical, in tandem with a robust Federal loan program, to enabling the widespread deployment of new nuclear power plants.

So I look forward to discussing these stark contradictions and other challenges to our clean energy future with this really excellent panel of witnesses. And with that I want to thank you all for being here. And so we can get directly to your testimony, I yield back the balance of my time.

[The prepared statement of Ms. Lofgren follows:]

Good morning and thank you, Chairman Weber and Ranking Member Ross, for holding this hearing today. And thank you to the witnesses for being here this morning.

We have a real challenge ahead of us. We have seen incredible strides in the capabilities of artificial intelligence over the last few years and its applications to research, industry, agriculture, and various other sectors of our economy.

However, we also know that training and running AI models can consume enormous amounts of energy. While certainly not the only solution, advanced nuclear technologies are quite promising in their potential to meet these expected needs. And over the past decade in particular, this Committee has developed and enacted bipartisan, comprehensive legislation to explore and advance this resource.

This is another reason why I am frankly so disappointed with the Administration's budget proposal for 2026. While the budget plainly states that it "unleashes America's energy dominance through funding for nuclear energy," it would cut support for DOE's Office of Nuclear Energy by 21%, and slash funding for its flagship Advanced Reactor Demonstration Program by 51%.

The budget also states that it is "prioritizing fusion research" while proposing to cut fusion research by 6%. Call me old fashioned, but I think words actually need to mean something, especially when they come from the U.S. government, and these words are sadly hollow.

Now some may note that the budget request does include support for loan guarantees for nuclear technologies, and that's all well and good until you look at the House-passed Republican reconciliation bill, which of course the President endorsed. If enacted, that bill would eliminate more than 4 times as much support for DOE's loan guarantee program as this budget proposal would provide. And it would gut tax incentives that industry has informed us are absolutely critical, in tandem with a robust federal loan program, to enabling the widespread deployment of new nuclear power plants.

So, I look forward to discussing these stark contradictions and other challenges to our clean energy future with this excellent panel of witnesses. With that, I thank you all again for being here, and yield back the balance of my time.

Chairman WEBER. The Ranking Member of the Full Committee yields back. I now recognize Deborah Ross to the right of me.

Ms. ROSS. OK, thank you, Mr. Chairman. I ask unanimous consent (UC) that Mr. Beyer from Virginia be permitted to attend this hearing and after all Committee Members have had their opportunity to ask questions of the witness.

Chairman WEBER. Without objection.

I do want to remind something I left out earlier. Members are reminded that this Committee's practice is to submit letters and other items for the record to the Committee before seeking unanimous consent to insert such items into the hearing record. This allows the Committee to ensure that such items meet the rules of decorum, and verify their length and provenance that they do not contain sensitive, proprietary, or controlled information. The Chair reserves the right to object to any UC request to insert items in the record that are not provided in advance.

So let me introduce our witnesses.

Our first witness today is Mr. Pat Schweiger, the Chief Technology Officer (CTO) of Oklo.

Our next witness, Ms. Kathleen Barrón—am I saying that, Ms. Kathleen?

Ms. BARRÓN. Barrón.

Chairman WEBER. I can do this. Barrón, OK, Executive Vice President and Chief Strategy and Growth Officer at Constellation Energy.

Our final is Dr. Jeremy Renshaw—thank you for the easy name to say—Executive Director of AI and Quantum at EPRI.

I now recognize Mr. Schweiger for 5 minutes to present his testimony.

**TESTIMONY OF MR. PAT SCHWEIGER,
CHIEF TECHNOLOGY OFFICER, OKLO**

Mr. SCHWEIGER. Good morning, Chairman Weber, Ranking Member Ross, and Members of the Committee. Thank you for the oppor-

tunity to testify and for holding this important hearing. My name is Pat Schweiger, and I am the CTO at Oklo, an advanced nuclear technology and fuel recycling company. Prior to Oklo I worked 21 years at the Fast Flux Test Facility, an internationally recognized premier sodium fast reactor where we tested advanced fuels and materials for fusion and fission. We set performance records that no other nation has been able to achieve, even to this day.

Oklo is developing fast fission power plants known as Aurora powerhouses to provide clean, reliable, and affordable energy at scale. Oklo is at the forefront of transforming the technological basis and business model associated with nuclear power in America. In our build, own, and operate business model we plan to sell power in the form of electricity and heat directly to customers, where we believe we can allow for fast track customer adoption. Most importantly, we are commercializing fast reactor technology pioneered by the U.S. Department of Energy over 50 years ago, and have a site use permit from DOE for our commercial reactor at Idaho National Laboratory (INL).

AI has triggered a Sputnik moment, accelerating the demand for dependable domestic power. According to Goldman Sachs, AI data centers will have a significant contribution to power demand growth, driving a 160 percent increase in power demand through 2030. Our partnership with Equinix was the first commercial advanced nuclear energy deal in the data center industry that included an investment from a data center company to a nuclear company.

Energy is the foundation upon which America's AI future depends. Oklo represents a new approach to leveraging the benefits of mature nuclear power generation to meet the growing energy demands associated with emerging AI applications. The market has rewarded this approach with a pipeline of over 14 gigawatts of commitments from prospective customers, and most recently through a 12 gigawatt master power agreement with AI and data center provider, Switch, which Randy mentioned, one of the largest corporate clean power agreements in history.

Oklo's powerhouse builds on America's investment in cutting-edge nuclear technology in the first atomic age. Right now there are no fast reactors operating in the U.S., but Oklo will change that, leveraging a legacy that blossomed with research and test reactors such as the Fast Flux Test Facility and Experimental Breeder Reactor 2, which was a fast reactor that ran at INL for 30 years and a capacity of 20 megawatts of electric power.

Oklo's reactors are based on this proven liquid metal cooled sodium fast reactor technology. The reactor is self-stabilizing, self-controlling, and cooled by natural forces. This means the plant is walk-away safe, and can be sited in closer proximity to populated areas, crucial locations for data centers, and other AI infrastructure, as Ms. Ross noted, as well.

Additionally, fast reactors can derive energy from spent nuclear fuel. Thanks to U.S. innovation, spent nuclear fuel can be recycled, and is being done at our national labs today. Idaho National Lab is producing spent fuel from EBR-II into HALEU, and Argonne National Lab is advancing the technology further with support

through ARPA-E. Fast reactors are ready to be commercialized and poised to meet this moment for AI.

To meet the needs of this critical moment in our country, I want to offer the Committee a few policy changes to accelerate advanced nuclear deployment.

No. 1, unlock an abundance of nuclear fuel. Congress should continue to push DOE to accelerate its support of the domestic fuel supply chain and HALEU production, and to think creatively about new ways to enhance the domestic fuel supply, including the accelerated processing of DOE spent fuel into HALEU.

No. 2, continue investment in next-generation research. U.S. Government research is driving American nuclear innovation. Research programs in the fuel cycle, commercial fuel recycling, and next-generation core technologies are necessary to compete globally.

And then, finally, No. 3: modernize regulations around technologies with decades of proven safety. Congress should rethink how we regulate inherently safe, proven nuclear technologies, from advanced reactors to commercial fuel recycling to waste management, so that American nuclear plants can serve energy needs for AI civilian, DOE, and military installations. It's inevitable that advanced nuclear reactors will be part of the energy solution to ensure U.S. leadership in AI. Our groundbreaking approach is redefining nuclear energy, making it safer, faster to deploy, and more cost effective than ever before.

Oklo is ready to work with the Committee and Members of the House to ensure the success of both the nuclear and AI industries. I look forward to today's discussion.

[The prepared statement of Mr. Schweiger follows:]

**Testimony of Patrick Schweiger
Oklo, Inc.
Chief Technology Officer
U.S. House Science, Space, and Technology Committee
Energy Subcommittee**

***“Powering Demand: Nuclear Solutions for AI Infrastructure”*
June 12, 2025**

Good morning, Chairman Weber, Ranking Member Ross, and members of the committee. Thank you for the opportunity to testify and for holding this important hearing. My name is Pat Schweiger and I am the Chief Technology Officer at Oklo, an advanced nuclear technology and fuel recycling company that is developing fast fission power plants, known as Aurora powerhouses, to provide clean, reliable, and affordable energy at scale.

I want to start out by telling you a bit about Oklo and how we are unique. Oklo is at the forefront of transforming the technological basis and business model associated with nuclear power in America. Building upon a half century of proven technology, Oklo aims to unleash advanced nuclear power to deliver American energy dominance, to drive the AI revolution forward, and to guarantee that our post-AI future remains a thriving industrial powerhouse.

In our build, own, and operate business model, we plan to sell energy in the forms of electricity and heat directly to customers, which we believe can allow for fast-tracked customer adoption. Because what the customers truly want is to purchase the reliable, baseload, clean power that they need – not to own and operate nuclear power plants. This model also increases the efficiency of our deployments by improving access to financing and fostering a culture of operational excellence across the design, licensing, construction, and operation of our powerhouses.

Most importantly, we are commercializing fast reactor technology pioneered by the U.S. Department of Energy (DOE) over 60 years ago. We are building our first powerhouse at Idaho National Laboratory (INL) through a site use permit from DOE and have been awarded fuel material for this reactor from DOE.¹ Additionally, we are in collaboration with DOE and the U.S. National Laboratories as we develop advanced fuel recycling technologies to convert nuclear waste into usable fuel for our reactors.²

First, I will share why we believe nuclear power and artificial intelligence are deeply intertwined. Then, I will highlight how American research led the globe in advanced nuclear technology and

¹ Oklo Inc. Announces U.S. Department of Energy Site Use Permit for Idaho National Laboratory Site, Press Release, December 10, 2019. <https://oklo.com/newsroom/news-details/2019/Oklo-Inc.-Announces-U.S.-Department-of-Energy-Site-Use-Permit-for-Idaho-National-Laboratory-Site/default.aspx>

² Oklo Completes Successful End-to-End Demonstration of Advanced Fuel Recycling Process, Press Release, July 17, 2024. <https://oklo.com/newsroom/news-details/2024/Oklo-Completes-Successful-End-to-End-Demonstration-of-Advanced-Fuel-Recycling-Process/default.aspx>

why we must retake our leadership in commercializing the technology. Lastly, I will leave you with a few recommendations to ensure American energy dominance.

AI's Energy Needs

AI has triggered a Sputnik moment, accelerating the demand for dependable domestic power. According to Goldman Sachs, AI data centers are a significant contribution to power demand growth, driving a 160% increase in power demand through 2030.³ Our partnership with Equinix was the first commercial advanced nuclear energy deal in the data center industry that included an investment from a data center company to a nuclear company.⁴ Due to both the rapid growth in data center power needs and the massive anticipated increase in power required by AI, tech giants like Meta, Microsoft, Google, and Amazon are turning to nuclear energy.

In December 2023, the North American Electric Reliability Corporation more than doubled its 9-year electricity demand forecast from the prior year, from approximately 220 to approximately 560 gigawatt hours of growth.⁵ This is due in large part to high-performance computing and artificial intelligence applications at data centers, manufacturing and industrial growth, and electrification. Although data centers currently account for just 1% of electricity usage globally, this percentage is expected to drastically increase to meet demand.⁶

AI leadership is a civilization-level challenge, and we face a geopolitical imperative to achieve AI supremacy. Energy is the foundation upon which America's AI future depends. AI supremacy requires and will create an unprecedented strain on our Nation's capacity to deliver new energy generation. We will need an "all-of-the-above" approach just to manage our base case for AI needs, yet, at the same time, we have the opportunity to fundamentally reshape the global balance of power in energy dominance, the necessary condition for AI dominance.

Oklo represents a new approach to leveraging the benefits of mature nuclear power generation to meet the growing energy demands associated with emerging AI applications. The market has rewarded this approach with a pipeline of over 14 GW of commitments from prospective customers, most recently through a 12 GW Master Power Agreement with AI and data center provider Switch, one of the largest corporate clean power agreements in history.⁷

³ Goldman Sachs Investment Research, Generative AI Part X: Examining the Landscape in the Face of Open-Sourced Model Performance (27-Jan-2025).

⁴ Equinix signs deal to procure up to 500MW of nuclear power from Oklo reactors – makes \$25m pre-payment, (April 5, 2024). <https://www.datacenterdynamics.com/en/news/equinix-signs-deal-to-procure-up-to-500mw-of-nuclear-power-from-oklo-smrs-makes-25m-pre-payment/>

⁵ North American Electric Reliability Corporation. (2023), 2023 Long-Term Reliability Assessment, https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTRA_2023.pdf.

⁶ Between 2024 and 2030, electricity demand for data centers in the United States is expected to increase by about 400 terawatt-hours at a CAGR of about 23 percent. McKinsey & Company, How data centers and the energy sector can satiate AI's hunger for power (September 17, 2024). <https://www.mckinsey.com/industries/private-capital/our-insights/how-data-centers-and-the-energy-sector-can-satiate-ais-hunger-for-power>.

⁷ Oklo and Switch Form Landmark Strategic Relationship to Deploy 12 Gigawatts of Advanced Nuclear Power, One of the Largest Corporate Clean Power Agreements Ever Signed, Press Release, (December

Advanced nuclear technology, like Oklo's, is well positioned to provide the 24/7 reliable, affordable, and zero-emission energy required to meet the vast electricity needs to power AI.

Fast Reactor Legacy

To elaborate on this technology, it's important to note that what Oklo is doing builds upon America's investment in cutting-edge nuclear technology in the first Atomic Age. The fast reactor technology that operates today was innovated and pioneered in America almost 80 years ago. Right now, there is no fast reactor operating in the U.S. Oklo plans to change that by bringing the legacy of the fast reactor into the modern world, a legacy that blossomed with research and test reactors such as Fast Flux Test Facility and Experimental Breeder Reactor II (EBR-II) reactor. EBR-II was a fast reactor that ran at INL for thirty years with a capacity of 20 MW of electric power.⁸ During its history, EBR-II ran on recycled fuel, demonstrated inherent safety, achieved superior operating and maintenance characteristics to commercial light water reactors, and sold power to the grid. I personally worked 21 years at the Fast Flux Test Facility (FFTF), an internationally recognized premier sodium fast reactor, where we tested advanced fuels and materials for fusion and fission advancement. We set performance records that no other nation has been able to achieve even to this day.

Oklo's reactors are based on this proven liquid metal-cooled sodium fast reactor technology. With over 400 years of operational experience worldwide, fast reactors have been demonstrated at scale. Our reactors are inherently safe, requiring no operators, pumps, or mechanical systems to remain cool. The reactor is self-stabilizing, self-controlling, and cooled by natural forces. This means the plant is walk-away safe and can be sited in closer proximity to populated areas—crucial locations for data centers and other AI infrastructure.

Additionally, fast reactors can derive energy from spent nuclear fuel. Thanks to U.S. innovation, spent nuclear fuel can be recycled, and the recycled material can be used to power advanced reactors while reducing the cost of fuel and the burden on the fuel supply chain. It is being done at our national labs today; Idaho National Laboratory is processing spent fuel from EBR-II into HALEU, fuel which Oklo was awarded and will use in our INL deployment. Argonne National Laboratory is advancing the technology further with support through the ARPA-E program. Over the next 10 years, industrialization of recycling could reduce fuel costs by as much as 80% for advanced reactors that can leverage this recycled fuel.⁹ Recycling will not fully replace the need for a domestic supply chain of HALEU, but it will enable accelerated deployment of advanced

18, 2024). <https://oklo.com/newsroom/news-details/2024/Oklo-and-Switch-Form-Landmark-Strategic-Relationship-to-Deploy-12-Gigawatts-of-Advanced-Nuclear-Power-One-of-the-Largest-Corporate-Clean-Power-Agreements-Ever-Signed/default.aspx>

⁸ C. Westfall, "Vision and reality: The EBR-II story", *Nuclear News*, Feb. 2004. Available: <https://www.ne.anl.gov/About/reactors/EBR2-NN-2004-2-2.pdf>

⁹ Oklo Completes Successful End-to-End Demonstration of Advanced Fuel Recycling, Press Release, (July 17, 2024). <https://oklo.com/newsroom/news-details/2024/Oklo-Completes-Successful-End-to-End-Demonstration-of-Advanced-Fuel-Recycling-Process/default.aspx>

reactors to support a rapid buildout of AI capability. Fast reactors are ready to be commercialized and poised to meet this moment for AI.

Recommendations for Congress

To meet the needs of this critical moment in our country, I want to offer the Committee a few policy changes to accelerate advanced nuclear deployment.

1. **Unlock an abundance of nuclear fuel:** Congress should continue to push DOE to accelerate its support for the domestic fuel supply chain and HALEU production, and to think creatively about new ways to enhance a domestic fuel supply, including the accelerated processing of DOE spent fuel to produce HALEU.
2. **Continue investment in next-generation research:** U.S. government research is driving American nuclear innovation. Research programs in the fuel cycle, commercial fuel recycling, and next-generation core technologies are necessary to compete globally. In line with Congressional intent, DOE should continue to embrace milestone-based contracting for these programs to drive technology commercialization further.
3. **Modernize regulations around technologies with decades of proven safety.** Congress should rethink how we regulate inherently safe, proven nuclear technologies—from advanced reactors to commercial fuel recycling to waste management—so that American nuclear plants can serve energy needs for AI, civilian communities, DOE labs, and military installations.

Conclusion

In conclusion, it is inevitable that advanced nuclear reactors will be part of the energy solution to ensure U.S. leadership in AI. The technology offers an affordable, consistent, reliable, and zero-emission energy source, which are characteristics critical to the compute sector and to U.S. competitiveness. Our groundbreaking approach is redefining nuclear energy—making it safer, faster to deploy, and more cost effective than ever before—at a time when access to clean baseload energy is a civilizational priority.

Oklo is ready to work with the Committee and members of the House on ways to ensure the success of both the nuclear and AI industries. I look forward to today's discussion.

Pat Schweiger Bio:

Pat Schweiger is the Chief Technology Officer at Oklo working to design and build a 75 MWe fast fission reactor to meet current market demand for advanced reactors. This role builds on 21 years of experience at an operating 400 MWth Gen IV sodium fast reactor, the Fast Flux Test Facility. He has over 45 years of industry experience in construction, engineering, operations, maintenance, turnover, startup, project management, procurement, licensing and decommissioning. This included managing all design and testing aspects of an advanced fast reactor project teaming with an international partner. Over the years, he has held positions as Chief Engineer, Design Authority and cross-discipline Engineering Manager while also serving as part of the executive team as the Senior Vice President, Engineering at TerraPower. He also held positions as Head of Engineering and Chief Engineer at Commonwealth Fusion Systems for the SPARC tokamak project, from initial design through construction and start of commissioning activities. Recently, Pat worked as the Executive Vice President, Engineering at Fourth Power, to design and build a high temperature long duration battery system.

Chairman WEBER. Thank you, Mr. Schweiger. You have a very interesting quote, which I love, when you say AI has triggered a Sputnik moment. Is that a—I don't mean to put you on the spot, but is that original with you?

Mr. SCHWEIGER. Well, not to me personally, but original to who wrote—help me write this.

[Laughter.]

Chairman WEBER. Well, that's is a very, very good point.

Ms. Barrón, I am going to yield 5 minutes to you. Thank you.

**TESTIMONY OF MS. KATHLEEN L. BARRÓN,
EXECUTIVE VICE PRESIDENT AND CHIEF STRATEGY
AND GROWTH OFFICER, CONSTELLATION ENERGY**

Ms. BARRÓN. Good morning, Full Committee Chairman Babin, Ranking Member Lofgren, Chairman Weber, Ranking Member Ross, and Members of the Subcommittee. Thank you for the opportunity to appear before you to discuss the role of nuclear energy in powering America's artificial intelligence infrastructure.

Constellation is the largest owner and operator of commercial nuclear plants in the United States. We operate 21 reactors in Illinois, Maryland, New York, and Pennsylvania, and we have an ownership interest in four additional reactors in New Jersey and Texas. But we also have a diverse portfolio of power generation resources. All in, we make 32 gigawatts of electricity, which is equivalent to powering 16 million homes and businesses. I'd like to make three points from my testimony today.

First, there should be no debate. America must win the race for AI supremacy. And to do that we need to assure timely power supply for AI infrastructure like data centers, while at the same time securing reliable, affordable, and clean power for all customers.

Second, the Nation's existing nuclear power fleet can help meet the near-term need for power by extending the operating life of existing reactors, by increasing the output of the existing fleet of plants, and by, as has been mentioned, restarting previously closed reactors that are capable of resuming operation.

And third, advanced reactors can add enormous quantities of reliable, affordable, and clean energy to the grid in the longer term. The most logical place, in our view, to think about siting new nuclear plants is at sites that are already hosting nuclear reactors, and that's because these sites have already been proven to meet environmental and safety-related regulatory requirements, and have critical existing cooling water, rail, and electric infrastructure to host these new reactors.

You know, and the biggest thing is really these incredible communities that host the existing fleet, which is comprised of hundreds of workers and their families, are supportive of this opportunity to add new nuclear. And they also have land available where we could host sites like data centers that can collocate and minimize the need for additional electrical infrastructure and transmission.

As has been mentioned by the Full Committee chair, Constellation has been working to enable data center development in the places where we operate. Last September we announced that we will restart unit one, which is the undamaged reactor at Three

Mile Island. It was one of our best performing reactors when it closed prematurely before the end of its licensed life in 2019 due to economic factors partly caused by poor policy choices. But it will resume operation as the Crane Clean Energy Center as part of a 20-year power purchase agreement with Microsoft. When that plant is returned to service, it will provide 835 megawatts of power to the PJM grid for use at Microsoft facilities across the PJM region.

And then earlier this month, we announced another 20-year power purchase agreement with Meta, this time for the output of 1,100 megawatts at our Clinton Clean Energy Center in central Illinois, to support Meta's facilities in the Midwest region beginning in 2027. This agreement will allow us to relicense the Clinton station for another 20 years, and allow it to operate until at least 2047. And it also calls for us to uprate the plant, or increase its output by an additional 30 megawatts of power. It also allows us to evaluate strategies to extend the plant's existing early site permit at the NRC (Nuclear Regulatory Commission), or perhaps to seek a new construction permit from the NRC to pursue development of an advanced reactor at that site.

These agreements ensure that the Crane and Clinton facilities will remain on the grid for at least two decades to support economic growth and to power America's artificial intelligence infrastructure. But to ensure all of the reactors stay online and expand to meet this increased demand, supportive policies are critical.

President Trump's recent executive orders direct that the Department of Energy shall prioritize work with the nuclear energy industry to facilitate 5 gigawatts of power uprates to existing nuclear reactors, and have 10 new large reactors with complete designs under construction by 2030. These are appropriately ambitious goals. But in order to achieve them we recommend first that Congress continue the Section 45U production tax credit for existing nuclear plants, as well as the Section 45 and 48 technology neutral tax credits for nuclear generation, which is consistent with comments from the Administration and the recently passed House reconciliation measure.

Second, Congress should retain funding for the Department of Energy's Loan Program's Office for Nuclear Investment.

Third, Congress should continue to support Department of Energy programs within the Office of Nuclear Energy to support research, development, and demonstration activities related to advanced nuclear power, including the Advanced Reactor Demonstration Project.

And finally, Federal agencies like the Federal Energy Regulatory Commission should remove barriers that prevent data centers from accessing and using available sources of energy. FERC has been debating for over a year the rules for data centers to collocate with power plants. As the President has recognized, collocation is—which is when the data center is sited right at or near the power plant, as Ranking Member Ross mentioned—enables development on a quick basis. And that's because it minimizes the need for new transmission lines to deliver power over long distances, which also lowers costs for both the data centers and all customers.

Data center projects should be permitted to access the grid using the configuration that makes the most for that facility and in that location, and should not be slowed down by a lack of clear Federal rules.

So thank you again for the opportunity to appear before you today, and I look forward to your questions.

[The prepared statement of Ms. Barrón follows:]

**Testimony of Kathleen Barrón
Executive Vice President and Chief Strategy and Growth Officer
Constellation Energy
House Committee on Science, Space, and Technology
Subcommittee on Energy
June 12, 2025**

Chairman Weber, Ranking Member Ross, members of the subcommittee.

Thank you for the opportunity to appear before you today to discuss the role of nuclear energy in powering America's artificial intelligence infrastructure.

Constellation is the largest owner and operator of commercial nuclear plants in the United States, with 21 reactors in Illinois, Maryland, New York, and Pennsylvania, and a partial ownership interest in four additional reactors in New Jersey and Texas. In addition, Constellation owns and operates natural gas, hydropower, solar, and wind generation in 20 states. We are also a leading supplier of energy products and services including sustainable energy solutions to millions of homes, institutional customers, the public sector, community aggregations and businesses, including three quarters of Fortune 100 companies. Finally, Constellation is in the process of acquiring Calpine Corporation, the nation's largest natural gas and geothermal generator, further bolstering our ability to provide our customers with reliable, affordable, and clean power.

America Must Win the Race for AI Supremacy

As President Trump and bipartisan leaders in our national security and intelligence communities have noted, the global race to secure AI dominance is one that we as a nation cannot afford to lose. The importance of this race has also been recognized by some of America's most prominent competitors globally. The Department of Defense has warned that "China is a global leader in AI technology and aims to overtake the West in AI R&D by 2025 to become the world leader in AI by 2030." Russian President Vladimir Putin has put the stakes of winning the AI race more bluntly, declaring that the nation that leads in AI "will be the ruler of the world" for the next century.

Recognizing the imperative of winning this race, Federal policymakers must urgently focus their attention on how to achieve and maintain AI supremacy. Hyperscalers and chip manufacturers have identified energy supply as the critical limiter in data center and AI expansion in the years ahead. The AI community is looking for large quantities of highly reliable, 24/7 generation that is also affordable and clean. Nuclear power is uniquely suited to meet that need, both today and in the years ahead.

Nuclear energy is the nation's most reliable source of power, providing nearly 20 percent of our power needs. America's 94 nuclear reactors had a capacity factor of over 93 percent in 2024. These plants run 24/7, rain or shine, providing the power quality that data centers require. Nuclear plants run continuously between refueling outages, which occur every 18 to 24 months. Because these plants run around-the-clock, a 1,000 megawatt nuclear reactor provides as much energy as 2,800 megawatts of wind or 7,300 megawatts of solar, and it delivers that power every minute of the day.

Estimates vary, but it is clear that power demand to meet data center and other large load needs will be sizeable. While meeting that demand will be a significant challenge, it is a surmountable one that we simply must meet. Nuclear power, both existing reactors and advanced plants, are essential to winning the AI race.

Existing Nuclear Power Plants Provide Reliable Power Needed for AI

I want to focus my remarks today on the work that we at Constellation are doing to meet data center demand. There are four ways our existing nuclear fleet can meet the near-term need for reliable generation to meet this load: (1) extending the life of our existing reactors, (2) "uprating" existing reactors through upgrades that permanently increase power output, (3) restarting retired reactors, and (4) adding new reactors at the site of existing plants. Restarts and uprates provide a relatively quick, relatively inexpensive way to bring new capacity online. But the biggest impact we can make is to relicense the existing fleet for an additional 20 years, which is the lowest cost and quickest way to add capacity to the grid.

Constellation has made two announcements in the last year related to serving data center load. In September 2024, Constellation announced that we will restart Unit One of the shuttered Three Mile Island site as the Crane Clean Energy Center as part of a 20-year power purchase agreement with Microsoft. This reactor had been closed before the end of its licensed life in 2019 due to economic factors caused in part by flawed policy decisions. When the plant is returned to service in 2027 or 2028, it will provide 835 megawatts of power to the PJM grid for use at Microsoft facilities across the PJM region. Of course, it would have been better for the community, our employees and the planet if the plant had never retired, but it is a testament to Microsoft that it is coming back online and will run for an additional 20 years.

Earlier this month, Constellation announced a 20-year power purchase agreement with Meta for the output from the 1,100 megawatt Clinton Clean Energy Center in central Illinois. Under the agreement, Meta will use the output from the plant for its facilities in the Midwest Independent System Operator footprint beginning in 2027. This agreement will

allow us to relicense the Clinton Clean Energy Center to operate it through at least 2047 and calls for us to uprate the plant to produce an additional 30 megawatts of power.

Constellation earlier announced \$800 million in investments to uprate our Braidwood and Byron Clean Energy Centers in Northern Illinois by 135 megawatts, enough energy to power 100,000 average homes. Additional output at the plants is expected to begin next year and the uprates will be fully completed by 2029. We believe that we can add an additional 1,000 megawatts – the equivalent of a new large-scale reactor – of uprates to our system in the next five to six years.

It is important to understand that we were having a much different conversation about the future of nuclear power just four years ago. Companies in the United States had shuttered 13 reactors before the end of their licensed lives, primarily for economic reasons due to energy policy that valued only new renewable energy, not all clean energy. Constellation had closed Three Mile Island in Pennsylvania and the Oyster Creek reactor in New Jersey, and we were just weeks away from closing four additional reactors in Illinois before legislators in Illinois stepped in. At that time, S&P estimated that half of the nuclear plants in the country were at risk of closing early.

Supportive tax policy from the Federal government completely changed this outlook. The Section 45U production tax credit for existing nuclear plants was a carefully crafted policy that established a credit for nuclear plants but also put in place a means test. Reactors in markets with depressed power prices were eligible for tax credits, but those credits phase out if market revenues increase. This balanced approach, reaffirmed by the House in this year's reconciliation legislation, provided reactor owners with the certainty necessary to reinvest in the plants while avoiding windfalls to reactors that received sufficient income to continue operating. Similarly, the Section 45Y and 48E technology-neutral tax credits for new generation will spur nuclear plant restarts and additional power uprates. If they stay in place long enough, they will support advanced reactor construction as well.

Advanced Nuclear

Constellation has announced that we are exploring the possibility of advanced nuclear deployment, but those decisions have a longer timeline. Our Clinton Clean Energy Center has an Early Site Permit for a new reactor at the site, and we are exploring early site permits at two additional sites where we have existing plants.

We believe that the most logical place for new nuclear plants is sites with existing reactors. These sites have been proven to meet regulatory requirements with safety and environmental reviews and have critical existing cooling water, rail and electric infrastructure. The incredible communities that host these plants today—which includes

hundreds of nuclear workers and their families—are supportive of the opportunity to expand nuclear. The sites also have additional land available where loads like data centers can co-locate, minimizing the need to build out additional electrical infrastructure and transmission.

Like existing reactors, advanced reactors offer technology companies the opportunity to procure large quantities of highly reliable, 24/7 power that is emissions free, something that is important to their customers and investors. Each of the hyperscalers has taken steps to support the development of advanced reactors as part of their clean energy procurement strategies. As Meta described it, this is because of “the immense value of nuclear power in providing reliable, firm electricity, and the role nuclear projects can have in supporting local economies and strengthening America’s energy leadership.”

The Department of Energy’s Office of Nuclear Energy has several programs to support research, development, and demonstration activities related to advanced nuclear power. In particular, the Advanced Reactor Demonstration Project is aimed at testing, licensing, and building operational advanced reactors in the near term. The Department is also working to solve technical, operational, and regulatory challenges for a handful of advanced reactor technologies. The Nuclear Regulatory Commission has approved designs for the Westinghouse AP1000 reactor and NuScale’s 77-megawatt small modular reactor design, and other reactor designs have been submitted to the Commission for approval.

Commercializing first-of-a-kind technologies introduces complexity for the project timeline, regulatory uncertainty, and supply chain challenges that will require public-private partnerships, something recognized in President Trump’s recent Executive Order 14302 on Reinvigorating the Nuclear Industrial Base. The Executive Order directs that “the Department of Energy shall prioritize work with the nuclear energy industry to facilitate 5 gigawatt of power uprates to existing nuclear reactors and have 10 new large reactors with complete designs under construction by 2030.” The Order goes on to direct the Loan Programs Office to “prioritize activities that support nuclear energy, including actions to make available resources for restarting closed nuclear power plants, increasing power output of operating nuclear power plants, completing construction of nuclear reactors that was prematurely suspended, constructing new advanced nuclear reactors, and improving all associated aspects of the nuclear fuel supply chain.” As described further below, this level of support is critical to advancing new reactors in the United States.

Federal and State Policies Will Determine Whether We Succeed or Fail

Some have suggested that federal and state policymakers require data centers to adopt a “bring your own generation” policy under which technology companies would be required to build new generation before developing their data centers. Every jurisdiction that has considered this policy thus far has rejected it, for good reason. Such a policy would effectively delay AI efforts in the United States by three to five years or more and essentially hand the AI race to China.

Instead, federal agencies should be taking action to remove barriers that are preventing data centers from accessing and using available sources of electricity. The Federal Energy Regulatory Commission has been debating for over a year the rules for data centers to co-locate with power plants. As President Trump recognized in January, co-location – which is when a data center sites at or next to a power plant – enables development “on a very rapid basis.” This is because it minimizes the need for new transmission lines to deliver power over long distances, which also lowers costs for both the data center and other customers. Data center projects are being stalled because of a lack of clear RTO rules for co-location, which is solely within FERC’s jurisdiction.

Environmental Protection Agency regulations also limit the ability of data centers to use their on-site backup generation in ways that would enable the flexibility that I mentioned earlier. Those rules currently allow backup generation to only be used in grid emergencies or a small number of hours for testing. Allowing those generators to be used to avoid grid emergencies in the first place would unlock the ability of data centers and other large uses of power to help the grid instead of burden it.

Conclusion

Thank you again for the opportunity to appear before you today. Nuclear power is well positioned to play a critical role in meeting the power needs for data centers and other large load customers both now and in the future. Maintaining federal policy support both through Department of Energy programs at the Office of Nuclear Energy and the Loan Programs Office as well as tax credits in Sections 45U, 45Y, and 48E will be essential in maintaining existing reactors and in deploying new advanced reactor designs in the U.S.

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Kathleen L. Barrón

Executive Vice President and
Chief Strategy and Growth Officer

Profile

Barrón serves as chief strategy and growth officer for Constellation, the nation's largest producer of carbon-free energy and the leading competitive retail supplier of energy products and services for 2 million homes and businesses across the United States. In this role, Barrón is responsible for corporate strategy, corporate development, sustainability, communications, corporate relations, and philanthropy, as well as for co-leading Constellation's data economy business development initiatives, working to ensure that our clean energy centers are poised to power this essential industry moving forward. She also leads the company's work to identify new opportunities to bring new reliable, clean energy sources to the grid.

Professional Background

Barrón previously served as executive vice president for government and regulatory affairs and public policy, where she led the development and implementation of federal, state and regional governmental, regulatory and public policy strategies for Constellation and its predecessor company, Exelon Corporation. She was responsible for identifying and assessing key federal and state policy issues, crafting the company's position on such issues, and developing strategies for achieving public policy objectives on behalf of the company's customers and businesses. She was also responsible for managing the company's wholesale market design advocacy in each of the regional markets where the company operates.

Prior to joining Exelon, Barrón was the Deputy General Counsel at the Federal Energy Regulatory Commission (FERC), where she advised the Commission on all aspects of its responsibilities and represented the Commission before Congress, government agencies, and industry groups. Previously, Barrón was the FERC's associate general counsel for energy markets, where she led a group of about 90 lawyers on legal and policy matters related to electric power sales and transportation, electric system reliability, corporate regulation of public utilities and natural gas and oil pipeline transportation. Prior to joining FERC, Barrón was in private practice with the law firm Skadden, Arps, Slate, Meagher and Flom LLP. There, she represented utility and independent power producer clients in proceedings before FERC, U.S. Courts of Appeal, and state utility commissions.

Community Work

Barrón serves as the Executive Sponsor of the Constellation Latino Network employee resource group at Constellation. She also serves as a Board of Director for the Keystone Policy Center, Baltimore Waterfront Partnership, and the Foundation for Nuclear Studies.

Educational Background

Barrón received her B.A. from American University where she studied Political Science and Communications-Law-Economics-Government. She received her law degree from the University of Houston Law Center, and her Executive Education in Financial Analysis from the University of Chicago Booth Business School.

Chairman WEBER. Thank you, ma'am.
 Dr. Renshaw, you've got a hard act to follow. You're recognized for 5 minutes.

**TESTIMONY OF DR. JEREMY RENSHAW,
 EXECUTIVE DIRECTOR AI & QUANTUM,
 ELECTRIC POWER RESEARCH INSTITUTE (EPRI)**

Dr. RENSHAW. Thank you. Chairmen Weber, Babin, and Ranking—

[Audio malfunction.]

Chairman WEBER. Dr. Renshaw, I'm sorry. Turn your mike on.

Dr. RENSHAW. I'm sorry. Would you like me to start over?

Chairman WEBER. In a word? Heck, no.

[Laughter.]

Dr. RENSHAW. All right. EPRI has worked with AI for decades, observing rapid growth in computational needs accelerated by recent breakthroughs in generative AI. Advances in GPUs (graphics processing units) have improved compute efficiency, but these gains have been outpaced by the increasing size of AI models. AI is redefining how knowledge is created.

The Industrial Revolution used machines to turn raw materials into goods more efficiently, and now the AI revolution is using data to turn—to accelerate productivity and discovery across all industries. Thus, AI and energy industries have become intertwined, with more energy needed to support AI, and AI enabling more efficient and productive energy systems. Therefore, EPRI launched the Open Power AI Consortium to build a collaborative ecosystem between the energy and technology industries to maximize benefits to stakeholders and the public.

With over 100 organizations engaged, the consortium will focus on building more efficient and performant AI models to achieve better results with less compute and energy needs. For example, accelerating interconnection queues which have led to bottlenecks in connecting new generation, transmission, and distribution infrastructure to the grid.

Predicting the future energy needs of AI is challenging. Recent work by EPRI and others points to significant growth and uncertainty in the future power consumption of data centers from AI, which are influenced by model size, volume of training data, inference loads, adding reasoning capabilities, hardware efficiency, and more. Moreover, future innovations could alter the trajectory of energy needs including novel chip designs, advanced computing and model architectures, emerging compute modalities such as quantum computing, and software optimization.

AI is delivering value globally, driving growth in data center utilization and energy use. AI-specific data centers consume up to five times more energy than traditional data centers. The International Energy Agency predicts that global data center energy use in 2030 will double to 945 terawatt hours, more than Japan's total electricity use today. AI data centers may have highly variable loads with spikes in energy demand, compared to traditional flat loads from data centers. This variability presents a challenge and an opportunity for the grid. While data centers represent substantial

new loads, they also offer opportunities such as workload flexibility and utilizing backup generators as a dispatchable grid resource.

EPRI launched the DC Flex Initiative to explore how data centers can provide these grid services supporting utilities, operators, and consumers alike. Some perceive data centers as growing unsustainably and straining the grid. The Open Power AI Consortium and DC Flex Initiative can change that perspective and utilize data centers to accelerate productivity, knowledge generation, and innovation across all sectors while growing responsibly. Advanced forms of energy generation may support data center energy needs.

Advanced nuclear is one of several options for powering the next generation of AI infrastructure. Having worked in the nuclear industry for over 15 years, I will discuss the benefits and limitations of nuclear to support growing energy demands. No energy source is perfect, and all have benefits and limitations, and a robust energy mix combines multiple sources to improve overall system performance, reliability, and reduced risk.

Nuclear plants provide safe, reliable, and carbon-free baseload power. Nuclear power has a track record of being one of the safest forms of energy generation over the last several decades. Advanced nuclear reactors offer additional capability for flexible operation, improved safety, efficiency, and a range of fuel sources, including spent fuel, supporting high-intensity variable loads like AI data centers, and reducing waste. However, fuel and irradiated materials must still be managed. As with any technology, first-of-a-kind implementations include risks such as delays and cost overruns. Other clean, reliable generation sources can augment overall energy system performance.

In conclusion, AI is transforming our society and its energy demands are growing rapidly. Improvements in chip efficiencies reduce energy use while larger models and increased utilization increase energy use. AI is accelerating productivity and knowledge generation across all industries today, and is poised to continue. Meeting data center energy needs is a growing challenge, with many solutions being evaluated. While energy intensive, data centers can also be a part of the solution via flexible operation and grid integration.

While there is no perfect energy source, advanced nuclear is among the options that offer safe, reliable, flexible, and clean power to meet future needs. Nuclear technologies can play an important role to support the growing needs of AI and the benefits it can provide to society.

[The prepared statement of Dr. Renshaw follows:]

Written Testimony

**Hearing of the House Science, Space, and Technology Committee
Subcommittee on Energy**

United States House of Representatives

Dr. Jeremy Renshaw

Executive Director – AI and Quantum

EPRI

“Powering Demand: Nuclear Solutions for AI Infrastructure”

June 12, 2025

Chairman Weber, Ranking Member Ross, and members of the subcommittee:

Thank you for the opportunity to testify today on the evolving energy needs of artificial intelligence (AI), the role of data centers, and the potential for advanced nuclear technologies to support this growing demand. I am Jeremy Renshaw, executive director for AI and Quantum at EPRI.

Background

EPRI is an independent, non-profit, global energy research, development, and deployment (RD&D) institute organized under section 501(c)(3) of the Internal Revenue Code. EPRI's experts collaborate with more than 450 companies in 40+ countries, driving innovation to support clean, safe, reliable, and affordable access to electricity for the public across the globe.

EPRI brings together electric utility companies, scientists, and engineers, along with experts from academia, industry, and other centers of research to:

- Collaborate in solving challenges in electricity generation, delivery and use;
- Provide technical, scientific, and economic analyses to drive long-range research and development planning;
- Support multi-disciplinary, objective research in emerging technologies; and
- Help accelerate the commercial deployment of advanced electricity technologies for the benefit of the public.

The Exponential Growth of AI and Its Energy Implications

EPRI has been working with artificial intelligence (AI) technologies for decades and has accelerated activities around AI and data science over the last seven years.

AI is an exponential technology. For decades, we have witnessed rapid growth in model size, data usage, and computational needs. Recent breakthroughs in generative AI and large language models (LLMs) have only accelerated this trend. While advances in hardware, particularly graphics processing units (GPUs), have improved energy efficiency, these gains have been outpaced by the energy required to support the increasing scale and complexity of AI models.

AI is moving society into fundamentally redefining how knowledge will be created in the future. Similar to how the Industrial Revolution utilized machines to turn raw materials into goods more efficiently, the AI revolution is utilizing the volume of data collected over many years to accelerate knowledge distillation and discovery. However, the vast majority of data remains private, with estimates that ~95% of all data is not public, meaning that additional insights and discoveries could be unlocked with access to more data. AI has accelerated both productivity and knowledge discovery across industries. For example, AI is accelerating drug discovery and protein folding in healthcare, automating and optimizing various aspects of transportation and logistics, and improving predictive maintenance and grid optimization in energy.

Through recent advancements, the AI and energy industries have become significantly intertwined. EPRI has identified an opportunity to meet the needs of both industries, with more energy needed to support AI training and inference, and AI enabling more efficient and productive operations for energy applications.

For this reason, EPRI recently launched the Open Power AI Consortium [1], seeking to build connections between the energy and technology industries by supporting the development of a collaborative ecosystem and seeking opportunities for mutual benefit and maximizing benefits to the public. With more than 100 energy and technology-focused organizations already engaged, the consortium will focus on building more efficient and performant AI models to achieve better outcomes with less compute and energy needs. This effort seeks to improve utility operations, such as congestion management; balancing load and demand forecasting; generation, transmission, and distribution operations; and optimizing power flow in grids. AI tools and resources may also be able to accelerate interconnection queues [2] which have led to bottlenecks in connecting new generation and transmission and distribution infrastructure to support growing energy demands. Another key focus of

the consortium is deploying tools in a virtual sandbox to evaluate performance and then support deployment with member organizations.

While these efforts seek targeted deployment and implementation of efficient and performant AI systems, predicting the future energy needs of AI is inherently challenging. Recent work by EPRI and others [3-5] points to significant uncertainty in the future power consumption of data centers due to the increasing needs of AI. Despite this uncertainty, it's clear the energy demands from data centers are expected to significantly grow over the next several years due to increased utilization of AI. The high variability in estimated energy consumption is influenced by multiple factors, including:

- Model size and architecture
- Volume and type of training data
- Frequency and intensity of inference workloads, including limiting the number of tokens (words) generated per LLM query
- Inclusion of reasoning capabilities
- Hardware efficiency and utilization

Moreover, future innovations could significantly alter the trajectory of energy needs. These include:

- Next-generation chip designs
- Advanced computing and AI model architectures
- Emerging computing modalities, such as neuromorphic and quantum computing
- Improvements in software optimization and workload scheduling

It's important to note though that any forecast is reliant on a large number of assumptions about future needs and capabilities.

AI has been delivering value to various industries for years and with recent and ongoing advances in the technology, these advances are projected to continue. This will require intelligent and responsible use of AI, support from various energy sources, and continued growth in data center utilization.

Data Centers: Critical for AI and a Grid Opportunity

Data centers are the physical infrastructure supporting a significant portion of AI workloads for training and utilization (such as inference and reasoning). Data centers are also needed to support cloud services, streaming platforms, social media, and much more. AI-specific data centers can consume up to five times more energy than traditional data centers. The

International Energy Agency [5] predicts that global data center energy use in 2030 will double from 2024 levels to 945 TWh, largely driven by increases in AI energy consumption, which is slightly more than Japan's total electricity consumption today.

In addition, AI data centers may have highly variable load profiles. Some AI data center load profiles appear to be more similar to a steel mill or arc furnace's energy profile (which may contain spikes in energy demand as energy-intensive equipment is turned on and off) than a traditional data center, which is generally relatively flat.

This variability presents both a challenge and an opportunity for the electric grid. While data centers represent a significant new load, especially in certain regions of the world, they also offer unique opportunities, such as:

- **Workload Flexibility:** In some cases, compute workloads can be rerouted to other locations or scheduled in different timeframes, reducing peak demand in constrained regions – though it is not always possible to do so.
- **Backup Generation as a Grid Resource:** Data centers maintain backup generators to ensure high levels of reliability. These assets, which typically sit idle except during periodic testing, could be leveraged during peak loading events to reduce net demand and provide lower-cost energy to both the data center and consumers, while saving utilities money as well.
- **Flexible Generation and Storage:** In addition to the above options, flexible generation sources combined with long-duration energy storage systems can augment the ability of a utility to meet peak demand loads and enhance grid stability.

EPRI launched the DCFlex initiative [6] to explore how data centers can provide the above grid services, supporting utilities, operators, and consumers alike. The initiative has more than 40 members, including Meta, Google, Microsoft, NVIDIA, QTS, Compass Datacenters, and many more. These efforts will complement the efforts of the Open Power AI Consortium.

Many perceive data centers to be power hungry, straining the grid, and on an unsustainable growth pattern. Through initiatives like the Open Power AI Consortium, DCFlex, and other global initiatives, we can change perspectives to utilize data centers as a knowledge factory that can accelerate knowledge generation, productivity, and innovation across all sectors while growing in a sustainable fashion using advanced forms of energy generation and utilization. This is where advanced nuclear and other energy generation technologies may be able to support data center energy consumption needs.

The Role of Advanced Nuclear in Supporting Flexible Loads

Having worked in the nuclear industry for over 15 years, I can speak to both the benefits and limitations of nuclear energy to support data center energy demands. It is important to note that no energy source is perfect; each source of energy has benefits and limitations and a robust energy mix typically combines multiple sources to improve overall system performance, reliability, resilience, and reduce risks associated with over-reliance on any single source of energy. Recognizing that a diverse generation mix can improve electricity reliability and affordability and strengthen energy security, for the purpose of this hearing, I will focus this testimony on one component of the energy portfolio – nuclear.

Traditional nuclear plants provide safe, reliable, and carbon-free baseload power. Nuclear power has a track record of being one of the safest forms of energy generation over the last several decades [7]. In the U.S., nuclear power plants are not typically cycled frequently, as steady operation minimizes wear and tear and extends component life.

Advanced nuclear reactors may offer additional capability for flexible operation, supporting high-intensity, variable loads like AI data centers. This includes:

- **Enhanced Flexibility:** Many advanced designs are capable of ramping energy production to meet current needs, making them suitable for variable demand profiles. Advanced nuclear designs may utilize fuels that are more suitable for flexible operations, such as TRISO-based fuels and molten salt reactors.
- **Improved Safety:** Features such as passive safety systems and walk-away safe designs reduce operational risk.
- **Fuel Diversity:** Some reactors can utilize alternative fuels, including uranium, thorium, and other actinides or even used fuel (also referred to as spent fuel) recycled from existing plants, reducing the environmental footprint of not only advanced reactors, but also traditional plants in use today.
- **Higher Efficiency:** High-temperature reactors can achieve greater thermal efficiency and support industrial applications beyond electricity, such as district heating, hydrogen production, etc.

These characteristics make advanced nuclear one option for powering the next generation of AI infrastructure – especially in regions where clean, dispatchable power is needed to complement intermittent sources. However, as noted above, there is no perfect energy option and advanced nuclear systems are no exception. Many advanced nuclear designs have yet to be built, posing the potential for additional risks related to first-of-a-kind

construction delays and cost overruns. In addition, while used fuel inventories are generally reduced using advanced designs, used nuclear fuel and irradiated materials will still need to be managed. As with any technology, first-of-a-kind implementations may also introduce additional risks that are difficult to predict and quantify.

In addition to traditional and advanced nuclear, other clean, reliable generation sources and energy storage sources systems can be considered to further augment overall energy system flexibility, reliability, and affordability.

Conclusion

AI is transforming our economy and society, but its energy demands are growing rapidly and unpredictably. Improvements in chip efficiencies reduce energy consumption concurrently as larger models and increased utilization increase consumption. AI is accelerating productivity and knowledge generation across all industries today and is poised to continue generating additional value into the future.

Due to increased AI utilization, meeting data center energy needs is a growing challenge and many solutions are being evaluated. While energy-intensive, data centers, while can also be part of the solution when viewed through a new lens of flexible operation and grid integration. Data centers can be viewed as knowledge factories, supporting all sectors of industry in the future.

While there is no perfect energy generation technology, advanced nuclear technologies are among the options that offer potential solutions to provide safe, reliable, flexible, and clean power to meet the needs of a digital future. Traditional and advanced nuclear generation technologies can play important roles in future energy systems to support the growing needs of AI and the benefits it can provide to society.

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Jeremy Renshaw
Executive Director – AI and Quantum

Dr. Jeremy Renshaw leads Artificial Intelligence and Quantum Computing R&D for EPRI, focused on accelerating innovation across these disciplines in the energy industry and building connections between the energy industry, academia, government researchers, and technology providers. He leads EPRI's AI Center of Excellence and has been with EPRI since 2012.

Prior to leading AI and quantum, Dr. Renshaw managed EPRI's Nuclear Innovation R&D portfolio focused on advancing technology development and deployment in the nuclear industry. Previous to that, he managed EPRI's Used Fuel and High-Level Waste group, focusing on all aspects of used nuclear fuel management.

Before EPRI, Dr. Renshaw worked at AREVA (now Framatome) on advanced nondestructive (NDE) inspections, including reactor internals. Previously, he worked at Danfoss, Inc. as an engineer on the new product development team and in the materials and testing labs.

Dr. Renshaw holds a Bachelor of Science in Mechanical Engineering, a Master's degree in Systems Engineering, and a PhD in Materials Science and Engineering, all from Iowa State University where his research focused on thermal NDE methods.

Chairman WEBER. I thank the witnesses for their testimony. I now recognize myself for 5 minutes.

Mr. Schweiger, unlike regulatory bodies such as the NRC, Nuclear Regulatory Commission, the Department of Energy is an industry-facing institution advancing the commercialization of new technologies. I think we'd all agree with that.

Through DOE's programs, Oklo has secured EBR-II fuel, and selected Idaho National Laboratory for its Aurora reactor. So, in your opinion, how important is DOE to Oklo's success and its ability to provide those 12 gigawatts of power to hyperscalers like Switch?

Mr. SCHWEIGER. Thank you for the question and also for your work on the advanced program. We appreciate that, the industry.

I would say I worked with the DOE about 45 years off and on, and the Fast Flux Test Facility was in that DOE program. EBR-II and the recycled fuel that we're going to receive, I think, is essential. When my associates in the industry say, well, what's Oklo going to do for fuel, I go, well, it's handled. And I think it—I don't know this for darn sure, but I'm pretty sure it's the only SMR that's got a fuel supply ready and available—or, you know, in the process of being made available through DOE.

So that program gets us to where we want to be faster, and that's crucial right now.

Chairman WEBER. Especially in the development of AI.

Some of my colleagues on the other side of the aisle may complain that the President's Fiscal Year 2026 budget, as well as DOE's reorganization, will hurt companies like Oklo. Can you describe your interactions with the Trump Administration and any of their actions that slowed the development of Aurora?

Mr. SCHWEIGER. Mm-hmm. So as CTO, I'm not as tightly coupled with the business side, as you can imagine. But the Oklo business plan is less reliant on the Federal Government. So what Oklo is trying to do is fund, go build power plants, and then sell that power. And we're well on track for that with private funding.

So Oklo uniquely is not going to be much affected by the government policies like with the Federal loan program. So that's what I can comment to. I don't know the inner workings of the rest of it.

Chairman WEBER. OK, very few of us do. I thank you for that.

Ms. Barrón, I'm going to come to you. Over the last decade, non-regulated utilities have been at the forefront of displaying next-generation nuclear reactors. Southern Company completed the construction, as we all know, of two AP1000s at Vogtle, and the TVA, Tennessee Valley Authority, recently announced that it submitted a construction permit for GE Vernova's BWRX-300 at its Clinch River site.

Can you explain for our benefit why merchant markets are lagging in deploying next-generation nuclear reactors, compared to these non-regulated entities? What's inhibiting, for example, your company from constructing a new reactor?

I will yield the time to you.

Ms. BARRÓN. Thank you for the question, Chairman.

So as you pointed out, the—operates where—the markets where Constellation operates are competitive markets. That means that, moment to moment, a system operator chooses which asset to run

based on cost. And if you get picked because you're competitive, you run. And if you aren't, you don't. And customers, you know, get the benefit of that. Over the years customers have seen much lower costs in the competitive markets because of that dynamic. There is no guaranteed rate recovery for anyone that operates in a competitive market.

So you contrast that to the monopoly markets, where regulators will make a decision to invest in a technology. And in a guarantee rate recovery, that is the explanation for why you had seen Vogtle move forward in Georgia and in VC Summers's case in South Carolina.

I think what's changed is that there are now corporates that are looking to help fund investment in new technology. We have supportive Federal policy that is helping many reactor developers, including Oklo, come to the market. And we have an interest across the financial sector, the OEMs (original equipment manufacturers), and then ultimately the operators to work together to try to figure out how to bring these projects to bear.

So I wouldn't look to the past as an indicator of the future. I think you'll see some of these developments in competitive markets, as well.

Chairman WEBER. I wish I could train my wife not to look to my past as something about the future.

[Laughter.]

Chairman WEBER. But I want to come back to you. How many customers of y'all's would you say that that affects when you're trying to make sure the prices are the best? How many customers do you all serve?

Ms. BARRÓN. So we make enough—we're a wholesale producer of electricity, so we make enough electricity to put out into the grid to serve 16 million homes and businesses. On our competitive—the competitive side of our business, where we sell electricity in places, where that's permitted, i.e. the non-monopoly markets, we serve about three-quarters of the Fortune 100. So we have both large commercial industrial customers and then residential customers that we rely on. And we have to compete to serve those customers by providing the best price and the best product.

Chairman WEBER. Right. And the reason I ask that is for the benefit of everybody watching, you all are trying to do the best thing for the most people. We appreciate that.

I'm going to jump now to this question. With technology companies and hyperscalers taking an active role in procuring power for AI—you all have got to be watching that—do you believe that this paradigm shift will empower companies like—my writing—they wrote this “like yours,” but in Texas we say like y'all's, OK? Like y'all's. Do you believe that that will affect y'all's ability to build a new reactor into the market?

Ms. BARRÓN. You know, I think, from our perspective, we think you should do the cheapest thing first. And the cheapest thing is to ensure that the existing fleet remains in operation.

You know, unlike other sources of technology, nuclear needs to be licensed by the Federal regulator, which does a great job. And there's a finite licensed life to the existing reactors. So investing in the plants, asking for a second license extension, allowing the

plants to run another 20 years, these plants can run well past mid-century into the 2070s.

Second, we can uprate them or do modifications at the site to create more output from the same physical plant, and those are investments that we have underway. And all-in across just our fleet, if we were to do all the remaining uprates available we could make another 1,000 megawatts, so equivalent to a whole new reactor.

Chairman WEBER. Well, thank you. I've well over-stated my time, so I appreciate your diligence. And I'm now going to yield at least 5 minutes to the Ranking Member.

Ms. ROSS. Thank you, Chairman Weber. I'm going to take a little bit at the end, but not to quiz our witnesses.

Thank you all for your very insightful and comprehensive testimony.

Ms. Barrón, I'm going to go—talk a little bit about the monopoly markets, because North Carolina is a monopoly market. And while meeting the significant energy demands of AI infrastructure, we also worry about our ratepayers in the monopoly market. And as we discussed, in South Carolina the ratepayers really were on the hook.

In North Carolina there's a debate within our legislature about whether to allow construction work in progress, which we don't allow for nuclear. And so I worry that ratepayers can end up with higher energy prices like what happened in South Carolina when the project is failed or there are long delays.

And I support the need for more nuclear, but in that monopoly market it becomes difficult with the ratepayers. It also becomes difficult when the data centers want to have their own sources of energy because the monopoly market doesn't really like that very much. And I had that experience even on a military installation when I was in—when I was practicing law and trying to help get solar panels at Fort Bragg, of all things.

So can you describe how utilities can protect ratepayers from these unnecessary costs while also advancing other projects like nuclear?

Ms. BARRÓN. Thank you.

Chairman WEBER. Mike on.

Ms. ROSS. Mike on.

Ms. BARRÓN. Thank you for the question. And as I mentioned, we do operate in competitive markets. So I'm a little bit outside of my lane.

But I do think it's fair to acknowledge that all first-of-a-kind technologies have challenges with remaining on time and on budget, and we've seen that on the East Coast with a number of programs supporting offshore wind up and down the Mid-Atlantic and into the northeast, where, you know, unexpected cost increases have led to having—States having to renegotiate contracts, and the challenge that you identified being front and center, because these programs are funded by customers.

That being said, these are long-lived assets. I mean, these stations, according to the NRC, can run for 80 years, maybe longer, but they do take a long time to build. And during that period of construction—I agree it is a challenge to how you can manage those costs and make sure that the risk is shared and is not

exclusively borne by customers. In our case, in a competitive market, we would look to a customer to help support the project during development, and ultimately guarantee the offtake so that we can share that risk and not create the situation that you mentioned that you're facing in North Carolina.

Ms. ROSS. Thank you. My next question is—sorry, my next—thank you, Mr. Chairman—my next question is for Dr. Renshaw.

At the end of your testimony you talked about an energy mix, and how we can maybe use more intermittent resources in conjunction with baseload power, and actually even sell energy back to the grid, be—have this dispatchable resource that may be backup, and helping other consumers of energy. Are there any examples going on right now in the country where you can tell us this—this really works, it's a great model?

Dr. RENSHAW. Yes. So first, if you'll indulge me for a second, we can also cover where it doesn't work. And we've seen this in the past when Russia invaded Ukraine, gas prices went through the roof, and many European utilities were in a very difficult situation, losing millions to hundreds of millions of dollars per day based on the increase in gas prices because they were overly reliant on one source. That's why a mix of energy sources is important that are clean, safe, affordable, and environmentally responsible.

One thing that is exciting is EPRI just announced this morning, as part of the DC Flex Initiative, three test sites that we will be starting from locations around the world to evaluate data center flexibility in terms of using those data centers, backup generators potentially powered by clean fuels, to operate flexibly and provide power back to the grid in a way that we can either shift the time or location of workloads or use those backup generators.

Ms. ROSS. So having this backup as dispatchable and also being able to do load shifting could be a really good model? Great.

I'm going to use my remaining 15 seconds to thank Joseph, right here, for his amazing service to the SST Committee. He is going back to North Carolina to—to work in the area of—area of nuclear because, it's really so important in North Carolina. And so I'd like the Committee to give him a round of applause.

[Applause.]

Ms. ROSS. And I yield back.

Chairman WEBER. OK. The chair now recognizes the Full Committee, Dr. Babin, for 5 minutes.

Chairman BABIN. Thank you very much, Mr. Chairman.

Mr. Schweiger and Ms. Barrón, several States, including my home State of Texas, have passed legislation to help attract or develop the nuclear industry there. Texas House Bill number 14, the *Texas Advanced Nuclear Deployment Act*, has been sent to the Governor's desk to be signed into law. This bill creates a State office, the Texas Advanced Nuclear Energy Office, to identify regulatory and financial barriers, promote public education, and support the growth of a nuclear energy supply chain. It also establishes the largest state-level grant program in the Nation to develop nuclear projects.

How do actions like this support Federal investments that allow this sector to advance from DOE projects to actual electrons on the grid?

Ms. BARRÓN.

Ms. BARRÓN. Thank you for the question. And, I mean, I think the answer is leadership matters. I think the State of Texas has spent a lot of time focusing on this, starting at the commission and the task force that was formed, Commissioner Glotfelty's report. And then, obviously, the work the legislature did to enact the bill that you referenced. It makes a big difference, and it sends a signal that this is important, and that the State supports it.

And we are seeing that leadership across a number of our States. The Governor of New York has done the same thing, launched a process to figure out how the State can encourage new reactors in the State. Maryland passed a bill that supports the addition of new reactors, as well. So I think those are all tremendous signs.

Chairman BABIN. OK.

Ms. BARRÓN. To get to the nub of your question, though, you know, to get these reactors actually onto the grid is a challenge. The industry is going to need to meet this moment. And we have a lot of leadership here at the table to—to talk about that further. But I agree with the premise of your question that these actions at the State level make—make a very big difference to the industry.

Chairman BABIN. OK. And then I'm going to ask Mr. Schweiger.

I'm going to ask you a little bit different. Oklo has championed the use of milestone-based contracts to support the liftoff of advanced reactors similar to NASA (National Aeronautics and Space Administration's) Commercial Orbital Transportation Services, or COTS, C-O-T-S, which led developed commercial cargo delivery capabilities to the International Space Station. In that instance NASA required skin in the game from the contractors equal to 50 percent of the development costs, and spread the development risk across multiple contractors.

What are the benefits of a milestone approach, and should DOE continue to use this form of contracting in the future, as they did recently in their request for proposals for the Gen III+ demonstration project?

And what conditions should be included in milestone-based contracts to ensure scheduled discipline?

Mr. SCHWEIGER. OK, thank you—

Chairman BABIN. That's a two-part question.

Mr. SCHWEIGER. Yes, thank you for the question.

I'd like to add to your first question that education is so crucial. If you think back to post-Fukushima, people's desire to use nuclear was pretty low, and they just didn't understand.

Chairman BABIN. Right.

Mr. SCHWEIGER. OK. Then, for the milestone-based program, I think there's inherently value in it. The Oklo approach is going to be less tuned to that because of our business model, which is to build the plants and then sell the electricity.

When you look across the nuclear—all the—the Gen IV plants that are trying to build new reactors and all those initiatives, milestone-based—what I like about it is you have to perform to get funding, instead of just getting a tranche of money that may or may not produce something. So the milestone, presumably, would

have performance milestones in there. And then, when achieved, then more money can be released.

Chairman BABIN. Right.

Mr. SCHWEIGER. So, yes. So as far as what should be in the milestones, I'm not—

Chairman BABIN. Yes, what conditions.

Mr. SCHWEIGER. Yes, conditions. That's going to take a little bit of thought, but—

Chairman BABIN. Well, I don't have but 37 seconds left.

[Laughter.]

Mr. SCHWEIGER. I know. There we have a problem.

I think conditions for milestone-based would be do you have a technology that's viable? You know, the person seeking milestone support, is their technology actually viable? So, you know, some sort of evidence. Are you at a technology readiness level of four, five, six, somewhere in there?

And then, when you've established credible technology, then marking the progress of that. And I'm—I'm partial to that technology readiness assessment process that NASA pioneered and DOD has been using—and DOE.

Chairman BABIN. Yes. OK, thank you.

And I yield back, Mr. Chairman. I have another question, but we'll have to submit that for the record.

Chairman WEBER. Thank you, sir. The Chairman recognizes the Ranking Member of the Full Committee, Zoe Lofgren of California.

Ms. LOFGREN. Well, thank you, Mr.—

Chairman WEBER. For as much time as she may consume.

Ms. LOFGREN. Well, thank you, Mr. Chairman.

You know, when we look at the international landscape, and particularly at China, there's—we're seeing massive levels of investment toward AI infrastructure, as well as nuclear energy. And I think they're building more nuclear than anyone else in the world. Meanwhile, we're debating here whether to limit programs that provided research and loans and the like.

How would each of you rate our ability to compete with China's massive nuclear expansion, particularly in developing next-generation reactor technologies?

And specifically, do any of you think it's a good idea to cut support for the Advanced Reactor Demonstration Program by more than half, as the Administration has proposed in its budget resolution?

Whoever wants to go first.

Ms. BARRÓN. I can just make a few comments. I have some understanding of how the development is—is occurring in China. And, you know, I think when you have a centralized authority that is in charge, and you have construction crew A, B, C, D, E, and you can sort of dispatch them around the country, you can move faster. We have a different model here.

We have bifurcated authority between the Federal Government and the States over energy policy, and that, you know, keeps those of us up here in a job for a long period of time. But it does mean that it's a bit more—more complicated. So—but it allows, you know, involvement and—and appropriate input across different levels of government. And that's important.

So I think our challenge, as I mentioned a moment ago, is—is to sort of meet this moment now, and put all of our effort into trying to move forward as fast as we possibly can, and we have seen a lot of support for that of late, which I think is important.

Dr. RENSHAW. If I can add to that, I would say China is definitely moving fast. They have the infrastructure in place, manufacturing capabilities that have accelerated their ability to perform. Currently they are on pace to build reactors in about 52 months, so just over 4 years, and they're doing that on time and on budget, meaning that they are growing in credibility and trust with the people who are ordering those plants. So that's a credibility and trust that would be important to have in other regions of the world, to be able to say this is how much a reactor will cost to build, and this is how long it will take.

Ms. LOFGREN. You know, it just seems to me—I—the Chairman mentioned Fukushima, which made people around the world nervous. And the legacy systems are different than the next-generation system, which has broad support. And I'm thinking about my own State. Near Morro Bay there's a legacy nuclear plant that was going to be decommissioned because, you know, building a dam or a nuclear plant is a way to find an earthquake fault, and they found new earthquake faults near the facility. We're keeping it open because of the energy needs, but people are uneasy about it because it's a legacy system, and we don't have that unease about the next generation.

So what about the Advanced Reactor Demonstration Program and the reduction that's being proposed? Does that make a difference for our future?

Dr. Renshaw, do you have an opinion?

Dr. RENSHAW. Well, EPRI doesn't comment on government policy.

Certainly, investments in research and development can help to accelerate the processes that we have, as well as the technologies. So I would say that is—if we are investing correctly, then it helps to accelerate all forms of research and development, whether it's nuclear or otherwise.

Ms. LOFGREN. One of the things—and I'm glad that our colleague, Mr. Beyer, is here, he's the co-chair of the Fusion Caucus—but, you know, we're skating toward where the puck is going to be here. And both in terms of new energy sources, but also the energy use, there is some in the AI space who believe that the power consumption is actually going to go down as quantum comes into play and, using different algorithms, that the energy issue is going to be different than it is today. Do you have a view on that, Dr. Renshaw?

Dr. RENSHAW. Yes, I would say—I would refer back to my testimony that the future energy needs are very uncertain. Certainly, quantum computing is a technology that holds significant promise in terms of accelerating certain types of computing problems. AI may be one of those problems, as well as optimization, search materials development, and so forth. So there is the potential that future quantum computing modalities would help to significantly reduce the—the amount of energy that's required to train and test models.

But I would also point out Jevons Paradox, which interestingly came out of the coal industry, where the increases in efficiency of using a technology often results in the expansion of usage of that technology. So if we can make the use of quantum computing help AI training and inference, then there's the potential for massively increased usage of AI and other technologies.

Ms. LOFGREN. Thank you, Mr. Chair. My time has expired, so I yield back.

Chairman WEBER. Thank you, ma'am. The Chair now recognizes Lieutenant Colonel Biggs from South Carolina for at least 5 minutes.

Mrs. BIGGS. Thank you, Chairman Weber, and thank you to our witnesses for being here today.

The growing energy demand of AI infrastructure requires 24/7, 365-day baseload power generation that never goes dark. So do our American businesses and consumers. Nuclear energy is the solution. It provides clean, efficient, and resilient power that keeps the lights on and the rates low.

South Carolina is already a leader in nuclear. Over 50 percent of power generated in South Carolina comes from a nuclear plant. I'm blessed to live just a few miles from one of the largest nuclear power stations in the United States. The Oconee Nuclear Station has provided reliable power to the 3d District for over 50 years, and it was recently renewed for another 20 years.

South Carolina is an exciting place to be. We have a record economic and population growth. However, we are also reaching a point of energy criticality. South Carolina needs the kind of reliable and resilient energy production that nuclear does provide. The newly formed Palmetto Nuclear Coalition was launched with the goal of bringing the nuclear renaissance to South Carolina, whether that is in the form of traditional reactors or small modular reactors. So my question is to Mr. Schweiger.

The energy demand from data centers and manufacturing is only increasing, while American baseload has stagnated over the last 20 years. What Federal policies could help scale nuclear capacity fast enough to meet and exceed the growing energy demand?

Mr. SCHWEIGER. OK, thank you for the question. That's a bit of a toughie.

I think that—so I grew up in Washington State. There were five nuclear plants that were under construction. Only two—actually, one—got built. Four were canceled. And so, when you look at what happened, it was—at the State level they didn't have the funding duration to support all five reactors.

So I think what's crucial is that the U.S. industry moves at pace. We've heard other panel members here talk about—or witnesses here talk about how quickly we can get a plant built. So the industry has to move faster in America. And then there has to be the money to back the initiatives.

Mrs. BIGGS. Thank you.

For Ms. Barrón, how could the licensing process be simplified to allow for quicker project initiation to power generation?

Ms. BARRÓN. Thank you, Representative Biggs, for that question. And, thankfully, that has been a subject of much attention of late,

with the President's executive orders focusing on streamlining the relicensing and licensing timeline.

There is no question that we need a very competent and very responsible Federal regulator to be overseeing the industry, but we also need to move as quick as we possibly can, making sure that we meet all, you know, regulatory and safety requirements and we reduce unnecessary regulation.

Like, for example, for us to get an early site permit renewed at our Clinton site costs about \$35 million, take a couple of years to evaluate whether that site is suitable for nuclear power when it already has a reactor on the site. Like, these are the kinds of things we're trying to point out that we could reduce the unnecessary work, focus on the necessary work, and do our work as quickly as possible. We can achieve the goal of getting the reactors online faster.

Mrs. BIGGS. Great. So we're on a roll. I'm just going to continue with you. What is the most effective role for the Federal Government to aid in the production and scaling of small modular reactors?

And how might they be useful for building out AI infrastructure and keeping our rates low?

Ms. BARRÓN. Well, in my testimony I mentioned some critical policies including 45Y and 48E tax credits to support investment in—in new—new reactors. I mentioned the Loan Programs Office, which is another very important tool. And then there are some grant programs that are underway, both for SMRs and, ideally, for other large-scale, new reactors, as well. Depending on the use case you might prefer to have a larger reactor, as opposed to a smaller reactor. And of course, the larger reactor, the AP1000, has already been successfully deployed in Georgia, and so it doesn't have to go through that same sort of licensing as—as the newer reactor designs.

But all of these programs obviously have to work together.

Mrs. BIGGS. Thank you so much for your insight.

And with that I yield back.

Chairman WEBER. I thank the gentlelady. The Chair recognizes the gentlelady from Oregon for at least 5 minutes.

Ms. SALINAS. Thank you, Mr. Chair, and thank you to our Ranking Member and our witnesses for being here today.

Whether we're using nuclear on different power sources, I think we need to make sure that we also maintain focus on efficiency, and this kind of goes to the question that our Ranking Member of the Full Committee was having.

If we can limit data center power needs in the first place, that will make it easier to lead the world in AI while keeping costs under control for our electric grid. For example, in Oregon, the Corvallis Microfluidics Tech Hub is a consortium tackling R&D to make chips more efficient and easier to cool.

Dr. Renshaw—and again, you had a little bit of this conversation—you alluded to this in your testimony. Can you elaborate on the R&D being done in this space, and how energy demand projections change depending on what we are able to accomplish in that efficiency space?

Dr. RENSHAW. Yes, so great question. I would say there are many opportunities in this space.

So you had mentioned advances in chip designs, which we've seen significant improvements in efficiency, thousands of times of improvements of the number of tokens or word portions that we can generate per unit of energy. Additionally, what we've seen is that as new models, new model architectures for AI are developed, they're often more efficient and more performant.

One of the things that we're doing at EPRI right now is partnering with others in industry to look at how can we use domain-specific models, so models that are customized for a particular task to be able to not only get better performance, but use less energy in combination.

So we think that all of these together will help to at least blunt the growth of artificial intelligence energy needs.

Ms. SALINAS. Thank you.

Ms. Barrón—and again, teeing off of the conversation with Ms. Biggs—while meeting the significant energy demands of AI infrastructure is important, I too worry that ratepayers could end up with higher energy prices along the way. Past examples of nuclear energy construction projects have either failed or were completely after long—completed after long delays and cost overruns. And while I support the need for clean energy to be added to the grid, I want to make sure that ratepayers are not flipping the bill and subsidizing the costs as risks of powering these data centers continue.

Can you describe how Constellation is protecting ratepayers from unnecessary costs?

Ms. BARRÓN. Thank you for the question. And, you know, I—as we talked about earlier in response to Ranking Member Ross, there's no question when you're deploying a first-of-a-kind technology that there are going to be challenges. And we've seen that with, for example, the offshore wind development over here on the East Coast. But—but once the resources reach nth-of-a-kind, and you can get some more predictability, then it's easier to manage the cost, of course.

I mean, I think it's true that, if you look at the Georgia example, Vogtle Unit 4 was 30 percent cheaper than Vogtle Unit 3. And so when you can get an order book in place and you can get to that nth-of-a-kind spot, obviously this is all easier. But in the short term it is challenging.

In our case, given that we don't have captive ratepayers and we're in competitive markets, what will likely happen is that we will have some corporate off-taker, likely some type of data economy customer, who will say I want to work with you to develop that resource, and I will take the power when it's done. And so there will be no ratepayer impact of that technology investment if it happens. But there still is a lot of work to get to that point. And that's what we're working hard to do.

Ms. SALINAS. All right. And just as a follow up, are you worried that a reduction in LPO's ability to provide loan guarantees for large energy infrastructure projects, whether as a result of staff reductions or funding recisions, will inadvertently lead to an increase in ratepayer costs?

Ms. BARRÓN. I mean, there's no question that the LPO, when it provides loans, can help bring down the costs of these new technologies, and that has benefits across the country for all ratepayers when you have a technology that can get commercialized at a lower cost. So we have been pleased to see the focus on continuing the investment through the LPO, both in small modular reactors and larger reactors through that program.

Ms. SALINAS. Thank you.

I yield back.

Chairman WEBER. The gentlelady yields back. The Chair now recognizes the gentleman from Indiana for 5 minutes.

Mr. BAIRD. Thank you, Mr. Chairman and Ranking Member, and thank the witnesses for being here today.

Ms. Barrón, I'm going to start with you. And Constellation was among the first major utilities to invest in grid scale small reactor technology. And with this backing from Rolls Royce, the SMR in 2020, this endorsement from a credible nuclear utility served to inspire investment in the space, unlocking capital flow into several other SMR designs.

And with the President last month setting a goal of expanding America's nuclear capacity and capability from 100 gigawatts to 400 gigawatts by 2050, the moment again calls for major credible first movers to help America win the race and drive deployment commitments from small modular reactors.

So my question really comes—since we're in this race, what policy hurdles or other impediments that inhibit or prevent major nuclear operators such as yourself from transitioning investment in SMR designs to the actual deployment of these SMRs?

Ms. BARRÓN. Thank you for the question, Representative. And you're right. We did make an early equity investment in the Rolls Royce SMR, and that might be confusing to some because, of course, we're here in the United States. And why did we do that? But we did that because the UK government made an investment in that technology and launched a process to seek input and bids to award contracts to a large number of SMRs for use by the UK citizens. And we saw that as a signal that the government was supporting that technology, and that there was a future for Rolls Royce and potentially other SMR developers in the UK. And we're pleased to see that that has borne out the case, that the UK has selected Rolls Royce to move forward.

So, you know, what's happened in the intervening years since we made that investment is that we've had tremendous support here in the U.S., and we have a lot of very promising designs that are underway. And so we're—we're hopeful that the U.S. will—will see that same level of investment both in the work that Oklo is doing with the military and with commercial customers across—across the country.

Mr. BAIRD. So I'm going to continue on somewhat in that vein. In April, Representative Harrigan, Tenney, and I introduced the *Small Modular Reactor Commercialization Act*, and that was aimed at securing United States' preeminent position to industrialize grid scale small modular reactor technology. The bill amends the outdated, arbitrary 300 megawatt threshold for SMRs, which has really disadvantaged the U.S., and established a working group to con-

tinuously recommend policy that protects American status as the most competitive Nation for reactor companies to base manufacturing beyond first-of-a-kind demonstrator volumes.

So from your perspective, would you elaborate on what it takes and on this bill in order to move and have the workforce that we need to commercialize these SMRs?

Ms. BARRÓN. Did you want to cover that?

Mr. SCHWEIGER. Who are you directing the question to?

Ms. BARRÓN. I'm happy to answer, but—

Mr. BAIRD. Now that we've taken this time, all three of you. But I'm going to start with Ms. Barrón.

Ms. BARRÓN. I'm not—I'm not familiar with every provision of the bill, but I understand that it's designed to help the SMR industry. So I, you know—and sort of modernize the code in order to—ensure that it can be commercialized. So that's an important step.

I think there's also steps that the industry needs to take on the workforce question to make sure that we're helping support certification programs, bringing students into—from high school, through the trades, through the 4-year schools, into industry to—to power it moving forward. And we are doing that at Constellation.

Mr. BAIRD. Mr. Schweiger?

Mr. SCHWEIGER. So when I was young, which was a few years ago, at the plant I worked at what became crucial is that the plant design was basic enough where you didn't have to have a Ph.D. to run it. So I think one of the keys in getting these SMRs to market beyond first-of-a-kind is to make sure the designs are as simple as possible so they're cost effective, easier to build, easier to run.

Mr. BAIRD. Dr. Renshaw.

Dr. RENSHAW. Yes, I would agree with what has been said so far.

If I can add one piece of additional knowledge, I would say that training is an important area, and the workforce that we would need in the future for supporting nuclear is significantly larger than what it is today. This might be an opportunity to utilize AI to accelerate training proficiency, to be able to help this—the new generation to understand the technologies in these areas faster, to be able to get up to speed, to be able to replace the current workforce—or not replace, but augment the current workforce.

Mr. BAIRD. I thank all of you and I yield back. My time is up.

Chairman WEBER. The gentleman yields back. The Chair recognizes the gentlelady from California for at least 5 minutes.

Ms. FRIEDMAN. Thank you very much, Chair Weber and Ranking Member Ross, and for the witnesses coming here today.

My constituents in California are really struggling with surging electrical rates: 1 in 5 ratepayers are behind on their power bills as of last year, and rates are more than 80 percent higher than the national average. Our State is home to more than 270 data centers, with 70 in Los Angeles alone and two in downtown—and in downtown Los Angeles, real estate developers are racing to build even more data centers to keep up with demand.

As AI-driven data centers and that demand surges, it's really important that we make sure that our ratepayers can also pay for the cost of electricity. Given how data intensive or how energy intensive these AI centers are, and given that California is one of the

homes of a lot of this technology, how do we make sure, No. 1—well, my question is, are we building new power capacity, really, to satisfy the demands of data centers more than of ordinary citizens and their homes and their businesses?

And how do we ensure that none of those costs are being passed along to ratepayers?

[Pause.]

Ms. FRIEDMAN. And I don't know if you can speak to that, because I think maybe you're more on the technical side, but yes, go ahead.

Ms. BARRÓN. I'm happy to try. I'm not an expert on California, per se, but I do think—and there was a prior question about, you know, are we going to see this sustained level of—of demand growth as the AI industry evolves, and I think that is—that is a good question.

But I also think, if we are going to continue to electrify our economy, if we're going to continue to try to onshore more manufacturing, and if we are going to continue to lose coal plants that go off the system, we are going to need to find new technologies to bring onto the grid. And—and all of that is going to benefit California and the country if we can do that successfully.

But we should be choosing the lowest-cost solutions. We should not be choosing things that we prefer because we like those technologies. We should be choosing the things that can achieve the goal of clean and reliable electricity at the lowest cost. And, you know, I think that's what we're all up here trying to do, and so that's what I would say to that question.

Ms. FRIEDMAN. Right now we—you know, in California I don't think that new nuclear is even allowed by law at this point.

Ms. BARRÓN. That's right.

Ms. FRIEDMAN. We have Diablo Canyon, which is an older plant, which is—whose life has been extended recently through legislation which is actually tremendously costly to continue to operate.

But in terms of other parts of the country where new nuclear is allowed, you know, we hear a lot about permitting and how difficult permitting it is. And I can only imagine for a nuclear plant how many layers of safety review you have to do, and different levels of permitting. I'm curious as to whether anyone has ever done an analysis as to how much of that permitting may be repetitive, if there is permitting requirements that are—that could be streamlined, that are more low-hanging fruit to get things moved along more quickly and in a more cost effective way without sacrificing safety, community input, siting issues, that kind of thing.

Are there—if we're interested in making the permitting a little bit—have more sense to it and be easier for those communities who want to add new advanced energy and nuclear, where would we look at that?

And have you seen these kinds of—I mean, are—when you're doing the permitting, are you pulling your hair out saying I've already done this analysis, why do I have to do it again?

Ms. BARRÓN. Well, I mean, I gave the example of the early site permit that we have, where we have to evaluate the environmental and other seismic issues associated with the new reactor, even though we're looking at the exact same site where we have existing

reactors. So those kinds of things clearly are in focus to make sure that those are not things that we're wasting time on when we should be spending time on—on trying to get these newer designs certificated.

But I also think it's one of the reasons why using an existing site makes some more sense. You already have a cooling lake there, you don't need to build a new one. You have rail, you have electrical infrastructure, and those can bring down the cost and shorten the time of bringing on new reactors.

Ms. FRIEDMAN. Does anyone else have any thoughts as to what you would look at for anyone here who's looking at any kind of permitting, streamlining or reform?

And it's OK if you don't know.

Mr. SCHWEIGER. Well, I think—so I've worked in fusion and fission, and the U.S. has policies in place that are making fusion permitting go faster. And so, you know, the fresh look at how to go get a nuclear-related technology to market, you know, to power the grid, there's already an example where the U.S. is—is moving faster with permitting.

So—and in fission there is some momentum gaining here, but I think it's important to support that and give it impetus.

Dr. RENSHAW. And if I could add just two thoughts on this, as well—I know we're close on time—the Nuclear Regulatory Commission has already performed internal reviews on how they can streamline their own processes and procedures. That's been ongoing for several years now.

One thing that we could also utilize—not to beat a dead horse—but AI. AI is very good at streamlining and distilling large volumes of information. You may have hundreds of pages in a report. The person who's reviewing that report may only need certain key pieces of information. So instead of reading the entire report, could you utilize AI to accelerate the reviews of—of the permitting processes and so forth to be able to streamline on both sides of the review and preparation?

Ms. FRIEDMAN. Thank you, I yield back.

Chairman WEBER. The gentlelady yields back. The Chair now recognizes gentleman from Colorado, Mr. Hurd, for 5 minutes.

Mr. HURD. Thank you very much, Mr. Chairman, for convening this meeting on a very important topic.

The Trump Administration has signaled that nuclear energy is a key part of achieving energy dominance. The President's executive orders on nuclear energy, I think, send a strong message that America must lead the world in nuclear energy. And his executive orders focus on the nuclear supply chain, existing reactors, new reactors, and much more. However, what will matter is how they are implemented. We have to make sure that they're implemented in a way that creates predictability for companies so that they can raise private capital, but also allows projects to be built faster.

Mr. Schweiger, Oklo's CEO (Chief Executive Officer) was at the executive order signing ceremony, if I'm correct. How do these EOs impact Oklo's plans to build your reactors?

Mr. SCHWEIGER. Well, they'll certainly help. Again, going back to the business model where Oklo is—is raising their own capital, building their own plants, and then selling that power, the EOs

don't have a direct impact on Oklo as a company. I think there are—to the nuclear industry in general, it's great to have some tailwinds moving it along.

Mr. HURD. Good. I'm happy to hear that.

Ms. Barrón, I think Constellation's CEO was also at that executive order signing ceremony. Similar question: how do these executive orders impact Constellation's plans related to maintaining your current nuclear fleet and also for building new reactors?

Ms. BARRÓN. Thank you for the question. That is true, my boss was there.

And I think the—the focus on the timelines, both for license extensions, which we talked about, how important they are to allow the existing fleet to continue operating for 20 years, streamlining that process, and looking at the reactor oversight process and the reactor security rules which haven't been updated in a long period of time, those are some important pieces of this executive order, although there are many that relate to workforce and other things, as you mentioned.

We are not currently developing a new reactor at this point, but we're looking at what that would take. And so having this streamlining in the EOs is going to make a—*a*—is going to be a big help.

Mr. HURD. What do you think is the most challenging part of the EO to implement? Does anything come top of mind, Ms. Barrón or Mr. Schweiger or Mr. Renshaw?

Ms. BARRÓN. Well, as I mentioned in my testimony, there are some ambitious goals. I mean, 10 new large reactors under construction by 2030. It's ambitious, it's appropriately ambitious, but we have a lot of work to do to make that happen.

Mr. HURD. Mr. Schweiger, the most challenging part of these EOs to implement, any thoughts?

Mr. SCHWEIGER. None at the moment.

Mr. HURD. OK, Mr. Renshaw, how about you? Anything to contribute here with respect to the President's executive orders?

Or maybe what role should Congress play in making these executive orders successful and impactful?

Dr. RENSHAW. I'll go back to EPRI generally doesn't comment on policy or directions that Congress should take, so I will refrain from answering.

Mr. HURD. OK, fair enough.

I want to ask—this is a question for all of you, so let's see who wants to answer. Given the bipartisan support for expanding our nuclear energy generation fleet and the taxpayer money that's gone into developing and fostering this industry, what barriers is the industry facing, and how can Congress help remove them so we can start building more reactors and putting electrons on the grid?

Mr. SCHWEIGER. Thank you for the question.

I think the one barrier I see right now is just fuel supply, you know, having enough fuel. There's a lot of plants that need HALEU that are in the works. And so whatever can be done to get that fuel released for use, and then funding the research to be able to undergird what these—the new generation plants are trying to bring to market.

Mr. HURD. Can I ask—do you see a future—do any of you see a future where spent fuel could be reused or reprocessed economi-

cally and securely in the United States, or is that not something that you see on the horizon?

Mr. SCHWEIGER. So Oklo is doing that. We're working with Idaho National Lab right now to recycle the EBR-II fuel. And then one of the next objectives at Oklo is to go to the commercial spent fuel and recycle that. So it's very much in our program. We're seeing support from Congress, the U.S. Government, and we think it's a wonderful thing because there's a lot of spent fuel that could be used before it's buried.

Mr. HURD. Ms. Barrón, do you see any—with advanced reactors coming online, do you see any role that spent fuel inventories might play in fueling those systems?

Ms. BARRÓN. I'm learning along with you about the Oklo design and the promise of that potential. I know that that is occurring overseas, like, for example, in France, but we haven't done that here in the U.S. And it would be a great development if that could be a source of power for a new reactor design, yes.

Mr. HURD. Something to consider, indeed.

Mr. Chairman, I see my time has expired. I yield back.

Chairman WEBER. The gentleman yields back. The Chairman recognizes the gentlelady from North Carolina for at least 5 minutes.

Mrs. FOUSHEE. Thank you to our witnesses for being here today and for—to our Chair and Ranking Member for holding this hearing.

Dr. Renshaw, recent research published by Caltech and UC (University of California) Riverside looks at the fact that AI's environmental footprint can be disproportionately higher in certain regions, and raises questions about how we should fairly balance AI's rapid expansion with its regional environmental impact. Can you discuss how AI's environmental impacts can vary by region, and how—and should Congress consider addressing potential environmental inequities posed by AI's infrastructure?

Dr. RENSHAW. So that is a very deep question, so we'll only scratch the surface on that today. But certainly there are disproportionate impacts, especially on under-privileged communities, because they're often sited in less desirable areas that may be close to power generation, facilities that may be more higher polluting or otherwise. And so we often look at the benefits of AI, but this is looking at kind of what is the flip side. So looking at the water use, the energy use are all things that we need to take into account.

I would say, on the positive side, as we continue forward on the path of research and development of these technologies to utilize advanced chips, more performant model architectures, domain-specific models, and advanced computing modalities such as neuromorphic and quantum computing, I think we can blunt some of that energy demand from data centers.

And we also have to remember on the environmental side that while the largest impacts are in the immediate area, certainly pollution can expand to greater regional areas, and pollution can, of course, cross cities and State lines. So we have to be cognizant that it affects all of us.

Mrs. FOUSHEE. Thank you for sharing that insight.

Ms. Barrón, I'm proud that our AI task force report from last Congress dedicates an entire chapter to discussing AI's energy and environmental impacts. As I've mentioned before, I'm concerned about how the environmental demands like water and local land resources needed to support AI's rapid arrival are affecting prior and recent commitments of our Nation's leading technology firms to become net zero emissions by the year 2030.

As we move into the second half of this decade and approach 2030, how do you assess the current capabilities of our Nation's clean energy infrastructure to support AI's continuing expansion today?

And what should technology firms and Congress be doing now to ensure that AI technology development into the future is sustainable? I think you touched on a bit of that earlier.

Ms. BARRÓN. I did, but I appreciate that question. And in response as well to your last question, I guess I would I would say two things.

One is, you know, we've talked about this notion of collocation. You know, our plants tend to be very remote from population centers, and they have enormous land buffers. In most cases we have thousands of acres of land around the plant, and people don't even know that the plants are there. But that does make it an ideal location for locating a data center, which likely, you know, may cause some of the same concerns in that people don't usually want to look at that all day long, or hear it in some cases.

But to your exact question, addressing that land use issue by collocating with an existing plant and addressing the water issue, as well—as you may know, we have to create cooling lakes or cooling ponds to—to have water to cool our reactor. And in some cases it may be the case that the data center can use some of the water that we have already created for use by the plant. Sort of discharge water that we use for cooling they can also use for cooling. So there will be no impact on the local community for the water side, as well.

And then just to the last question on the potential for using AI to help with clean energy infrastructure development, one example I can give you is in addition to our nuclear reactors we own the largest hydro dam east of the Mississippi at the Conowingo up on the Susquehanna. And we also own a pumped storage facility that's right nearby. And these two facilities both use the water from the river to create electricity. But using AI, we've been able to optimize the use of the water in a way that we haven't been before that allows us to make 250,000 megawatt hours from that plant, which is enough to power 25,000 homes. That's more renewable energy we didn't have before we used this technology.

So a small example, but we're hoping those kinds of things—we can come back to you with—with—with even more impactful examples in the future.

Mrs. FOUSHEE. Thank you, and my final question to Dr. Renshaw.

As a fellow North Carolinian, you know my district is a leader in researching and developing emerging technologies like quantum and AI. What opportunities are there in the upcoming reauthorization of both the *National Quantum Initiative Act* and the *National*

AI Act of 2020 to advance U.S. leadership at the intersection of technologies like quantum and AI?

Dr. RENSHAW. Yes. So I would say that AI and quantum are two of the most exciting technologies today. They are both exponentially growing technologies. AI is one that everyone in this room and pretty much around the world is aware of. Quantum is still a little bit under the radar, but it is growing very rapidly and very quickly. Certainly in the Research Triangle area of North Carolina, here in the D.C. area there are top notch universities, as well, as well as many other areas around the country and around the world.

So I would expect that as we continue to advance research and development in the areas and then move to practical applications, we will start to see not only the benefits of AI and the benefits of quantum, but the benefits of merging these two technologies together for both more performant systems, tools, and models, as well as more energy efficient systems, tools, and models.

Mrs. FOUSHEE. Thank you.

That's my time. Thanks, Mr. Chair.

Chairman WEBER. You bet. The Chair now recognizes the gentlelady from Maryland for at least 5 minutes.

Mrs. MCCLAIN DELANEY. Thank you to the Chair and the Ranking Member, and thanks to our witnesses. And I know it's been a—already a very weighty morning, but incredible testimony so far.

So many of you highlighted earlier in your testimony and your answers about how the U.S. is obviously barreling toward this energy—I hate to use the word “crisis,” but it's really something that we've got to address—and that our consumption is increasing, driven by AI and our data center expansion. And without additional power generation from a variety of sources, including nuclear, many of us really are concerned about how costs will increase substantially for consumers and companies.

As we look to the 2030s, one way to drive down costs and increase nuclear power generation is the next generation of nuclear reactors deployed at scale. And as was noted by our Chair, one of the companies highlighted in the preparatory materials is my own 6th District's X-energy headquarters. And with the Department of Energy's Advanced Reactor Demonstrations Project and program, X-energy has partnered with Dow Chemical to provide a first-of-its-kind deployment of an advanced reactor that will generate both electricity and steam for Dow's chemical production behind the meter.

This initial demonstration was deemed critical to attract the next customers, and it's an approach that is working as Amazon has stepped up to partner with X-energy based on the ARDP to invest another \$334 million in a second plant and target 5 gigawatts of new power. So a couple of things.

Dr. Renshaw, it appears that the new business models that are helping to deploy these small modular reactors at a rate that will bring down the initial capital investment needed for new generation of energy. How does the collaboration between high-need energy consumers and nuclear energy producers like X-energy's partnerships with Amazon and Dow Chemical meet the needs of AI companies while keeping energy prices down for U.S. consumers?

And we talked about that a little bit earlier, but kind of delving a little bit into it because I was very impressed with X-energy.

Dr. RENSHAW. Yes, if we can maybe peel the onion back one more layer to get a little bit deeper, I would say one of the key things that's holding us back today is really the financing aspect. The cost of financing for all of—

Mrs. MCCLAIN DELANEY. I completely agree with that.

Dr. RENSHAW [continuing]. These projects is really the largest driver.

So as we can move from pilot phases to demonstration and then production—I heard nth-of-a-kind earlier—we can reduce the cost, build that trust and credibility as we take the fundamental R&D to applied R&D into production, and that will help everyone—not only X-energy, but other reactor vendors—to be able to build advanced nuclear, as well as other technologies that are clean, safe, affordable, and reliable, and put those on the grid for the benefit of all.

Mrs. MCCLAIN DELANEY. So building on that, would you say that would be something that would be through a public-private partnership? Do you see it in terms of private equity markets getting into it? Or do you think it's something that we really need to step up, as—you know, Congress, and looking at funding it, you know, more from a government level as we look at it ahead? Because I think that's incredibly important.

Dr. RENSHAW. Yes. In this case I would say all of the above are important and helpful. I would say the people who are building these systems, they—they would need support and collaboration partnerships to be able to make them happen. I think my—my co-witnesses can testify to that. And in fact, I might defer to them if you want more details on what would be important—

Mrs. MCCLAIN DELANEY. No, I would love to hear from them and—briefly. Then I want to get on to research for a second, as well.

Ms. BARRÓN. Yes, I think that's exactly right. I mean, I think the stability of the government policy is important, and knowing what tools are available is sort of what everyone is looking at at this moment in time.

But—but once you have that certainty, then you are going to need to go to capital markets, you're going to have to bring other investors along, you're going to have to understand what their cost of capital is and how you're going to share the risk. And then you put it together and then you go. I mean, that is—that is there's a lot of folks working on how to make that happen right now.

But, you know, the oftaker matters, the government—the government policy matters. But we are going to need to look to third party capital, as well.

Mr. SCHWEIGER. OK. Finally, Oklo's perspective, the Loan Programs Office, this is an important financial tool for Oklo, we want to see it presented. Secretary Wright supports this program, as well.

Mrs. MCCLAIN DELANEY. So thank you all. I'm just going to submit for the record a question that, you know, the budget request cut DOE—the President's budget cut DOE's ARDP program by 51 percent, totaling \$161 million. And I'm really concerned about the

implications of reduced research funding and nuclear power generation, that fundamental research. So I'll submit for the record.

But thank you all, and very informative.

I yield back.

Chairman WEBER. The gentlelady yields back. The Chair now recognizes the gentleman from Illinois for at least 5 minutes.

Mr. FOSTER. At least? I'd like to understand the legal reading of that, and what—the penalties involved for—anyway, one of—

Chairman WEBER. Ms. Barrón is an attorney, if you're interested.

Mr. FOSTER. OK. Well, since I haven't yet been assigned a Subcommittee here, I think you have considerable leverage in that negotiation over me.

One of the areas where AI is going to have a real impact, I hope, is on the compliance and engineering costs for—for nuclear that—you know, I was talking to a guy who actually runs a company that builds a lot of these data centers. And when you deliver the civil construction for a data center, it's accompanied by just a telephone book full of documentation on how your, you know, tornado resilience is, and you name it.

And so—and he's in the process of replacing a very large group of engineers and—and so on that produces that phone book with AI, because once you've done that for one data center, trained it on things, you can very rapidly make the minor modifications in this.

And so in the case of, you know, nuclear, if you—if you train your AI on every site evacuation plan that's ever been written, and say I need a site evacuation plan for one more place, you can imagine that that's an instance where the engineering costs associated with a new nuclear emplacement may go down.

Also, the regulatory delays if that same level of AI is used by the government to evaluate this telephone book that you've just submitted to them, then you could imagine a very rapid turnaround in that. I was wondering. Are you starting to use, you know, AI to generate any of the paperwork or—the electronic paperwork so far for your regulatory things?

Mr. SCHWEIGER. So we have an AI protocol that's in writing for Oklo, and we're starting to use AI in expanding capacity. When you start looking at design of a first-of-a-kind plant, I think you can use AI to a limited capacity. But there is a lot of details that go into how, for example, a heat exchanger is designed.

Mr. FOSTER. OK, but I was referring to the site-specific details.

Mr. SCHWEIGER. OK.

Mr. FOSTER. That when you have—OK, I have one of these—

Mr. SCHWEIGER. Oh, yes.

Mr. FOSTER. You know, because one of the messes that you have in, like, all the Constellation plants is that they're all somewhat different and, you know, the cooling scenario is different and the ponds are different. But that is something where, once you had the fundamental engineering understood by the AI, you could rapidly make a new site-specific plan. And it would, I think, change a lot of the economics. And if the government would go—move along with you, you know, the approval of that could be a lot faster.

And so anyway, I just urge you to keep your eye on that, because I think that—you know, the—it also means that the workforce planning will be a lot—you know, the—the group that is antici-

pated by this guy that makes the AI data centers was about 5 percent of this current group size—could produce all of that paperwork using AI trained on—on projects that have already been completed.

Let's see, one—all right. Another thing, you know, I worked at Fermilab for many years. We're a very good customer. And one of the deals that we had was that we would get a call from the, you know, control room, and said, hey, it's—you know, it's a hot afternoon. We're getting in kind of trouble on our capacity. Can you guys, like, do some preventative maintenance instead of drawing power? And that got us a much better rate, power rate. Are you seeing that same sort of thing out of the data centers?

Because the data centers, in principle, you know, they're doing a mixture of 2 week-long projects to do—to train models, and then rapid response to people that type in queries. The—the queries could be routed to any data center, you know, in the continental United States so that that load can be moved around. And you can certainly just say, OK, it's going to take 2 weeks and 2 days because we had an ice storm in Texas. And is that sort of—are you getting that sort of negotiation out of the data centers at this point?

Yes.

Dr. RENSHAW. Yes, so I'll take maybe the first part and then defer to Ms. Barrón for the second part.

So we are looking, through our DC Flex Initiative, of data center flexibility, how we could do exactly what you're talking about, utilizing the ability to delay AI training or move it to different sources or different locations. In some cases you're able to do that. In other cases you're not. So we want to be realistic about what can and can't be done.

On the flip side, there's also the opportunity, as discussed earlier, to be able to use backup generation sources. Now, currently many of those are diesel and can only be operated so many hours per year, which could still be a good resource, even for the top 40 highest peak load hours during the year. If cleaner energy sources were used such as hydro-treated vegetable oil, hydrogen sources, or other, then you could potentially use that backup generator as a grid resource more frequently.

So maybe I'll defer to Ms. Barrón to talk more about that.

Ms. BARRÓN. Well, I don't have anything to add. I think EPRI has shown tremendous leadership in helping the industry get to exactly your question, where is the untapped flexibility that we can use so that we can understand what they can do, and then we can design market rules that will provide the right incentives so that they do dial back at times when the system needs the power.

Mr. FOSTER. Yes. Well, the other thing I worry about is if you just look at it from a CapEx point of view of the data center operators, you know, you're asking them—they've put all this money into their GPUs, and you're asking them to let that CapEx sit idle for some period of time. And so there's a calculation that, in principle, you could do right now is—you know, at what point they say I don't care, you know, I don't care if I get a lower rate. It's—electricity isn't that big a deal for me. And that—so that part of the calculation I think we can understand now as to whether this is going to be a winning game for leveling the load on this.

Anyway, this is—I'm glad to see you're thinking about it, because this is, you know, sort of the first—the challenge that nuclear has, frankly, is \$0.10 a watt Chinese—that's the spot price for Chinese solar panels. I recall, you know, 15 years ago, when we were arguing about cap and trade, we had these U.S. solar startups optimistically projecting a dollar a watt, which I was skeptical of. And now it's \$0.10 a watt. And, you know, Goldman Sachs has done a big analysis of these and they find that at current prices the winner by far is a collocated solar field and battery and a—and a data center.

Chairman WEBER. The gentleman's 15-year memory time has expired.

[Laughter.]

Chairman WEBER. I now recognize the gentleman from Virginia for 5 minutes.

Mr. BEYER. Mr. Chairman, Mr. Chairman Weber, thank you so much for allowing me to waive on. It's—it's fun to be back here.

And to the witnesses, thank you very much for sitting in with us. I apologize for beating a dead horse, but I'm just extraordinarily concerned about the future of our country with the retraction in our investment in science and technology.

And Mr. Schweiger, I read you're head of engineering at Commonwealth Fusion Systems (CFS). We're very excited about everything that CFS is doing. I've been to visit a couple of times. We have our congressional Fusion Caucus. I'm a co-chair with another Democrat and two Republicans, and every—virtually everyone on this Committee is part of the Fusion Caucus.

So we were—and we're thrilled that Commonwealth Fusion has cut the deal with Dominion Power to build the first arc power plant in the history of humankind here in Virginia, but we're also concerned that China last year allocated \$1.5 billion to fusion. We were at \$790, the new budget is down 6 percent to \$744 million. It's a 6-percent cut. In the *CHIPS and Science Act* we authorized \$1.04 billion, which is still way short of where we need to be.

We met with Secretary Wright, our caucus co-chairs. The Secretary was very supportive, it was a great meeting. But we also know he doesn't control the budget. And it's not just the fusion budget. It's also National Science Foundation has been cut 55 percent, for example. What's happening at NIH (National Institutes of Health) is very sad, in Congresswoman Delaney's district, the—the so-called Bethesda declaration.

Mr. Schweiger, how do we ensure that fundamental enabling science that will propel energy technologies is actually prioritized, even in the current constrained funding environment?

Well, what do we do to make sure that we're putting our money where our dreams are?

Mr. SCHWEIGER. OK, thank you for the question. It's a great one.

So I had the—I'll call it privilege—to go to China for 8 years off and on, and learned—learned a lot about how the Chinese think and how they run their programs. And I'd say—this is my view—but America is—is recognized as the premier country for ingenuity, thinking of new things and ways to do it. And so when you think about how we're going to implement—whether it's fission or fusion,

my high bias is that Americans are the ones that are going to do it because we're ingenious.

And so to the question, the—I think fusion has a ways to go, right? There has not been a commercial fusion plant put together. It's a good thing, we're supporting that. The—the technology I'm representing is ready now. And so when you look at implementing technologies that will help, whether it's AI or just the power grid, I think America needs to step up. As my fellow witness said, you know, let's use what we already have. I think that's super important. And then let's get the new technology moving forward as fast as we can, by whatever means. As Dr. Renshaw said, everything above.

Mr. BEYER. Yes, yes. I think we all agree with as much as we can.

Dr. Renshaw, to you specifically, one of the cases that we made to Secretary Wright is, although we've seen an enormous amount of private-sector investment in fusion and in fission and others, which we—which we celebrate—I mean, TAE just raised \$150 million over the weekend, which we're excited about—we still recognize that there are fundamental engineering and science problems that would serve the entire industry that can only likely be done by a Federal Government approach.

For example—and Mr. Schweiger, you know this from your CFS days—the high energy neutrons that are thrown off from a DT reaction, you know, dissolve metal. We need some way to—to figure out the—this—the engineering and the science that will allow us to deal with the largest single downturn.

Isn't that, Dr. Renshaw, the most appropriate place for Federal Government investment?

Dr. RENSHAW. So I'll say that EPRI doesn't comment on what the policy should be, but I can comment on where is the technology going, and how can we get to an end state that is beneficial to all.

So we're looking at how can we bridge the gap between where we are now and where we need to be to be able to develop large-scale fusion plants. I would say that, similar to the other technologies that we mentioned in energy, there is no perfect energy technology, fusion included. But there are some significant benefits to deploying fusion.

So in—the ways that we can get there are similar to how research and investment has been done in the past, where the government is able to fund research and development programs to be able to foster that innovative culture that Mr. Schweiger had mentioned earlier. Some of the things that we're doing at EPRI are looking at how can we advance the state-of-the-art in fusion materials, as well as fusion plasma control. We actually recently completed a challenge for this, and we brought in organizations from around the world to compete on the best concepts for developing and deploying fusion technologies.

Mr. BEYER. By the way—and Mr. Chairman, just—one of the reasons we're so excited about milestones is because it emphasizes competition. You know, we're rewarding the entrepreneurs and the scientists and the engineers who can figure the problems out. Mr. Chairman, I yield back. Thank you.

Chairman WEBER. The gentleman yields back. I thank the witnesses for your very valuable testimony and the Members for their questions.

The record will remain open for 10 days for additional comments and written questions from Members. The hearing is adjourned.

[Whereupon, at 11:58 a.m., the Committee was adjourned.]

Appendix

ANSWERS TO POST-HEARING QUESTIONS

ANSWERS TO POST-HEARING QUESTIONS

*Responses by Mr. Pat Schweiger***U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY****Subcommittee on Energy
Powering Demand: Nuclear Solutions for AI Infrastructure**

Mr. Pat Schweiger, Chief Technology Officer, Oklo

Questions submitted by Chairman Brian Babin, Committee on Science, Space, and Technology

1. The Department of Energy has invested billions in the development and deployment of next-generation reactors, including over \$800 million for NuScale through the Clean Free Power Project, over \$2.4 billion for X-Energy and TerraPower through the Advanced Reactor Demonstration Program, and \$800 million for the GEN III+ (GEN-three-plus) reactor. Although it is great for the federal government to support the next generation of nuclear reactors, it is important that the taxpayers see a return on their investment with the construction of these reactors. Do you agree that for these federal programs to succeed, it requires mass deployment and not just the construction of a shiny new object?

Yes, I agree that mass deployment is required for these federal programs to succeed and that tax payers need to see a return on their investment. While there is a place for federal dollars to help new nuclear get off of its feet - like preserving the Investment Tax Credit and Loan Program's Office - billions of dollars in funding will not lead to mass deployments on their own. Two policy challenges impacting the ability to scale are having regulatory certainty and creating a reliable, domestic fuel supply.

It is worth noting that Oklo has taken a different approach to ensure that we can scale to large numbers over the next decade. In one example, Oklo has taken a different approach than others in our field with our business model. In our build, own, and operate business model, we will be selling power, not power plants, directly to customers under long-term contracts. This will provide recurring revenue and profits that will allow us to scale towards mass deployment. We also have made strategic reactor design decisions and will recycle spent nuclear fuel to use as fuel in our reactors. This will result in low capital and operating costs and low levelized cost of energy (LCOE). In addition, building small-scale plants will reduce complexity, costs, and construction time.

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
Subcommittee on Energy
Powering Demand: Nuclear Solutions for AI Infrastructure

Mr. Pat Schweiger, Chief Technology Officer, Oklo

Questions submitted by Representative Nick Begich, Committee on Science, Space, and Technology

1. Mr. Schweiger, Oklo's selection to deploy a microreactor at Eielson Air Force Base is a major development for both advanced nuclear and Alaska's energy security. Could you walk us through the timeline, scale, and intended capabilities of this project, and how Oklo is addressing the unique environmental and logistical conditions of the Interior?

Oklo, Inc. submitted a proposal to provide a microreactor to support Eielson AFB in January 2023. Due to contract protests, the Notice of Intent to Award (NOITA) was delayed approximately 2.5 years, with the NOITA being issued to Oklo on May 30, 2025. While the original proposal included an estimated completion date of 2027, the protest process delayed the siting, permitting, and construction of the project, and we are in discussions with the Department of the Air Force (DAF) and the Defense Logistics Agency (DLA) Energy to determine updated timelines.

Oklo's proposal included a 40 MWth design to be paired with a power conversion system configured to produce 5 MWe, with the remaining thermal power (~20 MWth) used for steam generation. Oklo's proposal demonstrates a comprehensive approach to the unique environmental and logistical challenges of Interior Alaska—particularly for deployment at Eielson Air Force Base (AFB). Just a few of Oklo's considerations include siting flexibility, seasonal constraints, modular transport, and cold weather design.

2. What lessons from the Eielson deployment can be applied to Alaska's remote communities and critical installations beyond the military, particularly those that currently rely on high-cost diesel generation and are off-grid?

Oklo is committed to working with the U.S. Department of Defense and all stakeholders to share information regarding lessons learned while we proceed with the project. The Eielson AFB Aurora powerhouse deployment will provide lessons learned not only for deploying reactors at military installations but also to potentially support other remote communities.

3. How is Oklo engaging with local Alaskan stakeholders to ensure that this deployment delivers long-term benefits to the region and builds local support for future projects?

Oklo is actively engaging with local Alaskan stakeholders to ensure that the deployment of its Aurora powerhouse at Eielson AFB delivers long-term benefits to the region and builds local support for future projects through several targeted strategies. Oklo has engaged with the community throughout the bid process, in particular as part of the Council for the Alaska Microreactor Pilot (CAMP) briefing process in which Oklo has presented to community stakeholders, and in visiting Fairbanks in 2023 after the first NOITA. Oklo is exploring partnerships with Alaska Native Corporations to perform environmental characterization and remediation in support of the project. Local Alaska Native Corporations with prior experience with environmental efforts at Eielson AFB enhance results and support local economic engagement.

4. Considering the national interest in demonstrating microreactor capability, does Oklo see Eielson as a springboard for broader Arctic deployment, and what benchmarks or data points will define success for this pilot in your view?

Yes, Oklo views the Eielson AFB deployment as a high-profile demonstration project—one that could catalyze broader Arctic and remote community deployment of microreactors. To that end, the Eielson AFB project will be a potential springboard for broader microreactor deployments across all environments, to include the Arctic.

Oklo notes that this site will be critical for showcasing our “power-as-a-service” business model, particularly in rugged, mission-critical environments where diesel

dominance is being challenged. Benchmarks that can define success for the project will include effective stakeholder engagement in Alaska, regulatory execution across the Federal government, and demonstrating energy resilience.

5. From a policy standpoint, what federal actions, whether on licensing, fuel cycle support, or infrastructure, would best support the replication of your Eielson model across other Alaskan and Arctic regions?

From a Federal policy standpoint, there are several policy levers that will support both the Eielson AFB deployment and future deployments in Alaska, the Arctic, and across the United States. The first is ensuring an adequate fuel supply for advanced reactors. Oklo's fast fission reactors are unique in that they can create energy from a few different fuel sources, including high-assay low-enriched uranium (HALEU) and recycled used nuclear fuel. The recent nuclear energy Executive Orders positively address building out a domestic fuel supply chain for advanced reactors both from HALEU and from recycled fuel. Implementing these EOs will be important for scaling Oklo deployments. Second, continuing to reform and modernize the U.S. Nuclear Regulatory Commission for licensing reactors and fuel recycling facilities. And third, continuing to support the DOE Loan Programs Office as a financial tool for first-of-a-kind deployments of advanced reactors.

Responses by Ms. Kathleen L. Barrón

Ms. Kathleen L. Barrón, Executive Vice President and Chief Strategy and Growth Officer,
Constellation Energy

Responses to Questions for the Record

**U.S. House of Representatives
Committee on Science, Space, and Technology
Subcommittee on Energy
Powering Demand: Nuclear Solutions for AI Infrastructure**

Response to Question submitted by Chairman Brian Babin, Committee on Science, Space, and Technology

- 1. The Department of Energy has invested billions in the development and deployment of next-generation reactors, including over \$800 million for NuScale through the Clean Free Power Project, over \$2.4 billion for X-Energy and TerraPower through the Advanced Reactor Demonstration Program, and \$800 million for the GEN III+ (GEN-three-plus) reactor. How have these investments reduced the risk of the deployment of next-generation reactors? How has this informed your future decisions regarding their completion?**
 - a. Although it is great for the federal government to support the next generation of nuclear reactors, it is important that the taxpayers see a return on their investment with the construction of these reactors. Do you all agree that for these federal programs to succeed, it requires mass deployment and not just the construction of a shiny new object?**

Thank you for the opportunity to testify before you on June 12, 2025, and to provide further information here on the role of nuclear energy in powering America's artificial intelligence infrastructure.

Constellation shares your and the Department of Energy's goals of achieving commercial adoption of new nuclear generation and is committed to support the development of new nuclear reactors, particularly in regions with competitive power markets where we operate.

The Department's investments in nuclear energy – both existing and next generation – have been instrumental to the nuclear industry overall.

Federal policy support through DOE programs at the Office of Nuclear Energy and the Loan Programs Office, as well as applicable tax policy, are essential in maintaining the existing reactors and deploying new nuclear generation. In particular, the Advanced Reactor Demonstration Program will facilitate the licensing and deployment of GEN III+ technologies, improving the chances for that technology to be deployed commercially.

**Ms. Kathleen L. Barron, Executive Vice President and Chief Strategy and Growth Officer,
Constellation Energy**

Responses to Questions for the Record

**U.S. House of Representatives
Committee on Science, Space, and Technology
Subcommittee on Energy
Powering Demand: Nuclear Solutions for AI Infrastructure**

Response to Question submitted by Chairman Randy Weber, Committee on Science, Space, and Technology

- 1. As the Vice Chairman of the Energy Subcommittee on Energy and Commerce, co-location has become an important issue due to its possible impact on reliability and cost to ratepayers. Recently, FERC rejected the Talen Amazon interconnection service agreement, which would have provided up to 480 MW of power to Amazon's data center. Although FERC limited this ruling to this specific agreement, how important are behind-the-meter agreements for tech companies and nuclear operators like Constellation?**

As you state, behind-the-meter arrangements are important options for both technology companies and nuclear operators and behind-the-meter configurations should not be unduly restricted by Federal, regional, or state policies.

There are numerous benefits of co-located load connection arrangements, including fewer transmission upgrades, reduced costs and quicker connections of critical new data center and other load. Given the importance to economic and national security of winning the AI race, customers should have access to all connection options and decide based on the reliability, cost, and timing of the different options.

For clarity regarding FERC's actions and the status of the referenced Talen Amazon agreement, in 2023, FERC accepted the initial 300 MWs co-located arrangement between Talen and Amazon. FERC later denied Talen's amendment to increase from the 300 MWs to 480 MWs. Due to lengthy delays in resolving related litigation around these configurations, uncertainty remains as to how FERC will consider co-located behind-the-meter arrangements going forward. Meanwhile, Talen, AWS and PPL have recast their arrangements as front of the meter.

Responses by Dr. Jeremy Renshaw

**U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY**

**Subcommittee on Energy
Powering Demand: Nuclear Solutions for AI Infrastructure**

Dr. Jeremy Renshaw, Executive Director AI & Quantum, Electric Power
Research Institute (EPRI)

Questions submitted by Chairman Brian Babin, Committee on Science, Space, and Technology

1. The Department of Energy has invested billions in the development and deployment of next-generation reactors, including over \$800 million for NuScale through the Clean Free Power Project, over \$2.4 billion for X-Energy and TerraPower through the Advanced Reactor Demonstration Program, and \$800 million for the GEN III+ (GEN-three-plus) reactor. Although it is great for the federal government to support the next generation of nuclear reactors, it is important that the taxpayers see a return on their investment with the construction of these reactors. Do you agree that for these federal programs to succeed, it requires mass deployment and not just the construction of a shiny new object?

Answer:

This is an important question. The long-term success of federal investments in next-generation nuclear technologies hinges on achieving large-scale deployment, not merely the construction of demonstration or pilot projects.

That said, it's important to recognize that these early-stage deployments serve a critical role beyond their immediate goal or output. They help to de-risk advanced technologies, establish regulatory frameworks, build domestic supply chains, and cultivate a skilled workforce. These are foundational steps that enable broader deployment beyond the initial target application and help the U.S. continue to be a leader in nuclear innovation.

While mass deployment is the goal, these initial projects are not just symbolic, they are strategic. They lay the groundwork for a robust, scalable, and economically competitive nuclear sector that can strengthen U.S. national energy security and be part of a balanced energy portfolio, benefiting society.