

Testimony of Dr. Kathryn Huff
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Introduction

Thank you, Chairman Fallon, Ranking Member Bush, and distinguished Members of the Subcommittee. It is an honor for me to appear before you today and represent the Department of Energy (DOE) at this hearing related to the commercial nuclear energy industry in the United States, and I appreciate the Subcommittee’s attention today on the programs and policies shaping our nuclear energy future.

Nuclear Energy

The United States is home to 93 currently operating nuclear power reactors across 54 facilities in 28 states. They are responsible for generating about 20% of the electricity on the U.S. power grid. The existing nuclear fleet has a remarkable safety and performance record and represents our largest zero-emission energy source. Nuclear energy remains one of the safest and most reliable generation sources. Our newest reactor is the Plant Vogtle Unit 3 located in Georgia, which entered commercial operation in July 2023. The Department supported the construction of Plant Vogtle with a series of loan guarantees through its Loan Programs Office. The average age of U.S. commercial nuclear power reactors is about 42 years, and Plant Vogtle is the first new nuclear power plant to be licensed and begin construction in the U.S. in more than 30 years.

Nuclear energy provides emissions-free, firm power necessary to fundamentally underpin the transition to a carbon-free energy electric grid by 2035. To swiftly reduce our carbon emissions and rebuild U.S. leadership globally, the Biden-Harris Administration is prioritizing activities that keep the existing fleet of nuclear power plants in operation, deploy advanced reactor technologies, secure and sustain the nuclear fuel cycle, strengthen nuclear safety, security, and safeguards, and expand international nuclear energy cooperation and nonproliferation. To this end, in 2021, President Biden signed the Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law, into law, which includes \$6 billion for the Civil Nuclear Credit (CNC) program. Under this DOE-led program, owners or operators of commercially operating U.S. reactors that are at risk of closure for economic reasons can apply to bid on credits to support their continued operations and credits can be allocated until September 30, 2031. DOE has completed two award cycles and will open the application period

for the next award cycle in the spring. In addition, the Inflation Reduction Act (IRA) of 2022 introduced historic clean energy prevailing wage tax credits including the section 45U zero-emission nuclear power production tax credit, which will support the continued operation of our 93 nuclear reactors through this decade.

We have an opportunity to reestablish U.S. global nuclear leadership and meet our Net Zero goals by 2050 through deployment of new nuclear technologies. Through this effort we will strengthen our energy and national security, create and maintain good jobs while allowing for an equitable energy transition and simultaneously bolstering our economic interest abroad. To realize this vision, we must establish a secure and reliable source of fuel for today's nuclear power plants and those of tomorrow. To reinforce this commitment, at the December 2023 United Nations Climate Change Conference (COP28), the U.S. and more than 24 other countries launched the Declaration to Triple Nuclear Energy.¹ The Declaration acknowledges the necessity of working together to advance towards tripling nuclear energy globally by 2050 and invites shareholders of international financial institutions to encourage the inclusion of nuclear energy in energy lending policies. The Office of Nuclear Energy, in close partnership with the National Laboratories, has supported for many decades the development of new reactor technologies through research, development, and demonstration activities. In addition, the Department's Office of Clean Energy Demonstrations (OCED) is managing the approximately \$3.2 billion in government investment under the Advanced Reactor Demonstration Program (ARDP) help accelerate the demonstration of new advanced reactor technologies through cost-shared partnerships with U.S. industry. DOE has made two primary funding awards through the demonstration pathway of this program:

- X-energy seeks to demonstrate its high-temperature, gas-cooled Xe-100 Reactor design to provide process heat and electricity at an industrial facility in Seadrift, Texas.
- TerraPower seeks to demonstrate its sodium-cooled Natrium Reactor near a retiring coal plant in Kemmerer, Wyoming.

As with all our financial assistance, DOE is ensuring stringent oversight of the federal investment in the ARDP awardees. Together with its industry partners, DOE has developed appropriate terms and milestones that the ARDP projects must satisfy in order to receive DOE reimbursement for allowable costs. Funding for projects is evaluated near the end of each budget period to ensure maximum insight into project progress. DOE has also undertaken independent reviews of each of the ARDP projects, to ensure accuracy in project costs and timeline expectations. These projects will also be monitored by the Department's Demonstration and Deployment Advisory Board (DDAB), which provides advice to ensure risk management and accountability for large projects that DOE supports.

Civil Nuclear Supply Chains

¹ <https://www.energy.gov/articles/doe-awards-26-million-support-consent-based-siting-spent-nuclear-fuel>

The Administration has taken several actions to secure our civil nuclear supply chain and continues to lead on the international stage to ensure our allies and partners are no longer dependent on our adversaries. The Department values the continued interest and support of Congress relating to the civil nuclear supply chain.

The Russian Federation's brutal invasion of Ukraine has demonstrated the grave threat to global energy security posed by dependence on Russian-supplied fuels. Russia, the largest global enricher of uranium, currently supplies a significant portion of the nuclear fuel supply chain to the United States and our international allies and partners. Conversion and enrichment services from trusted sources are insufficient to replace current U.S. imports from Russia. Without expansion of domestic and international allies' and partners' fuel cycle capacity, the United States cannot reliably make sufficient low enriched uranium (LEU) or high-assay LEU (HALEU) available to support the needs of today's power reactor fleet, advanced reactors, future needs for research reactors, and medical isotope production facilities. This strategic vulnerability is unsustainable.

In addition, Russia's military attacks at, and subsequent seizure of, Ukraine's Zaporizhzhya Nuclear Power Plant (ZNPP) and the associated heightened risks of a nuclear incident underscore the nuclear safety, security, and nonproliferation concerns of doing business with Russia in the nuclear energy area.

The Administration is working to address these energy security challenges in the face of ongoing global events. As noted, the United States currently purchases a significant amount of enriched uranium from Russia. In 2022, 24% came from Russia. We cannot continue to infuse the Russian state with this source of income and must begin to reduce and ultimately eliminate U.S. reliance on Russia in the nuclear energy area, especially as Russia irresponsibly engages in strikes that disregard nuclear safety and security, risking a nuclear incident in Ukraine.

To decouple U.S. dependence on Russian enriched uranium, in October 2023 President Biden requested \$2.16 billion in supplemental funding to improve our long-term, domestic enrichment capabilities for low-enriched uranium and high-assay low-enriched uranium.² This funding in conjunction with a long-term ban on enriched uranium product imports from the Russian Federation into the U.S. is essential to reestablishing U.S. civil nuclear energy security.

On November 28, 2023, DOE issued a request for proposals (RFP) for deconversion services to help establish a reliable domestic supply of fuels for advanced reactors using HALEU.³ DOE plans to award one or more contracts to deconvert high-assay low-enriched uranium hexafluoride gas to various chemical forms, such as metal or oxide, used to fabricate fuels required by many advanced reactor developers including the ARDP participants TerraPower and X-energy. The Department issued a second RFP earlier this month, which focuses on acquiring, storing, and

² <https://www.whitehouse.gov/briefing-room/statements-releases/2023/10/25/fact-sheet-white-house-calls-on-congress-to-support-critical-domestic-needs/>

³ <https://www.energy.gov/ne/articles/us-department-energy-issues-haleu-deconversion-request-proposals>

transporting enriched uranium hexafluoride gas to the deconverters. The Energy Act of 2020 authorizes DOE to establish and carry out a program to support the availability of HALEU, while the Inflation Reduction Act of 2022 provided \$700 million to the HALEU Availability Program. The program will prioritize addressing long-standing and persistent environmental justice issues and comport with President Biden's Justice40 Initiative.

In recognition of the urgency of this issue, Congress included the Nuclear Fuel Security Act in the 2024 National Defense Authorization Act (NDAA). The newly passed provision provides important authorities to the Department to establish and expand programs to increase domestic supplies of LEU and HALEU. These new authorities, while essential to establish a program to reconstitute domestic enrichment and conversion capacity, must be funded at appropriate levels to cut off our dependence from Russian enriched uranium.

There is no quick, easy path to reduce our dependence on Russian-supplied fuels. Expanding our domestic fuel capacity will require strategic investments coupled with import restrictions that protect those investments well into the future. We must act swiftly to support domestic enrichment capabilities and prepare our industry for this transition. The Department welcomes the opportunity to work with Congress to address this national security vulnerability.

Working with Allies

The United States and our allies share common visions of democracy as well as safe and secure global economic and energy systems. In the June 2022 Group of Seven Leaders' Communique, the United States and our G7 partners made clear our collective intent to reduce reliance on civil nuclear and related goods from Russia, including working to assist countries seeking to diversify their nuclear fuel supply chains.

To this end, the United States, Canada, France, Japan, and the United Kingdom have identified potential areas of collaboration on nuclear fuels to support the stable supply of fuels for the operating reactor fleets of today, enable the development and deployment of fuels for the advanced reactors of tomorrow, and ultimately eliminate our dependence, and that of our allies and partners, on Russian nuclear supply chains across the board. In December 2023, to further advance this collaboration, this group announced plans during the Net Zero Nuclear Summit to mobilize \$4.2 billion in government-led investments to develop a secure, reliable global nuclear energy supply chain.⁴

Price-Anderson

As noted in the Department's 2023 Price-Anderson Report, we recommend that the broad and mandatory coverage of the DOE indemnification remain unchanged and undiminished with

⁴ <https://www.energy.gov/articles/cop28-us-canada-france-japan-and-uk-announce-plans-mobilize-42-billion-reliable-global>

respect to contractual activity within the United States and be expanded to include additional contractual activity by DOE contractors on behalf of DOE outside the United States to reflect changed circumstances. The PAA expires on December 31, 2025. In DOE's Report to Congress on the need for continuation or modification of the PAA, the Department recommended that: (1) the PAA should continue; (2) the DOE indemnification of our nuclear enterprise should continue and expand upon its broad and mandatory coverage; and (3) the PAA should continue in effect in a manner compliant with the Convention on Supplementary Compensation for Nuclear Damage. The extension of the Price-Anderson Act is essential for the continued civil nuclear and defense nuclear activities.

Used Nuclear Fuel

After several years of operation, the enriched uranium fuel rods that power nuclear reactors deplete and must be removed. The heat and radioactivity associated with spent nuclear fuel must be managed by reactor operators and stored safely. The existing U.S. reactor fleet generates about 2,000 metric tons of spent fuel each year and is being stored at more than 70 reactor sites across the country. Over the last 55 years, [more than 2,500 cask shipments](#) of spent fuel have been transported across the United States without any radiological releases to the environment or harm to the public.

The promise of new advanced reactors can most responsibly be realized in conjunction with progress on the management of their spent nuclear fuel. The Department believes a consent-based siting process should be used for developing interim storage and disposal options to fulfill our obligations to safely and securely dispose of spent nuclear fuel and high-level radioactive waste generated by these reactors. Consistent with direction provided by Congress in the Consolidated Appropriations Act, 2023 report language, DOE is making progress on consent-based siting for one or more Federal consolidated interim storage facilities under existing authority.

In December 2021, DOE issued a request for information on consent-based siting and received over 200 responses. A summary of those responses was published in September 2022 and is available at [Energy.gov/consent-based-siting](https://www.energy.gov/consent-based-siting). The feedback DOE received recommended that funding and technical assistance be provided to enable communities and Tribal Nations to build internal capacities to meaningfully engage with DOE in a consent-based siting process. In September 2022, DOE issued a \$16 million funding opportunity to provide resources for communities and other stakeholders interested in learning more about consent-based siting, management of spent nuclear fuel, and interim storage facility siting considerations. On June 9, 2023, DOE announced \$26 million in funding for groups of university, nonprofit, and private-sector partners that will work with communities interested in DOE's community-centered approach to storing and disposing of spent nuclear fuel.⁵

⁵ <https://www.energy.gov/articles/doe-awards-26-million-support-consent-based-siting-spent-nuclear-fuel>

While the Department is working to make as much progress as it can under existing authorities, additional Congressional authorization would be required before DOE can construct and operate a federal interim storage facility and begin removing spent nuclear fuel from nuclear power plant sites.

Conclusion

Thank you for the opportunity to appear before the Subcommittee today. I look forward to continuing to work with you toward a more sustainable, equitable, reliable, affordable, safe, and secure energy system for our nation. I look forward to your questions.