NUCLEAR INNOVATION ALLIANCE

Securing America's Energy Future with Domestic Uranium Enrichment

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As the world grapples with energy security challenges and the urgent need to transition to cleaner energy sources, advanced nuclear energy stands out as a reliable, clean, and affordable solution. However, the "core" of this promising energy solution – **the reliable supply of uranium fuel for nuclear reactors – is dependent on a global supply chain now dominated by a small number of foreign state-supported and state-controlled entities.** It is imperative that the United States fortify its energy security by catalyzing a robust, domestic commercial uranium fuel supply chain to support current and future nuclear reactors.

The United States and its allies currently rely on a small number of companies involved in the nuclear fuel supply chain to meet their uranium fuel needs. Key international companies supplying commercial uranium enrichment and conversion services include Orano (majority controlled by the French government), Urenco (majority controlled by the UK and Dutch governments), Cameco (publicly traded Canadian company), and TENEX (a Russian state-owned enterprise).

While international agreements and free markets have historically supported commercial agreements between nations and these companies, there is growing concern since the 2022 Russian invasion of Ukraine that **reliance by the United States and its allies on the Russian state-owned enterprise TENEX for nuclear fuels is a diplomatic and energy security risk.** The United States currently relies on TENEX to supply the enriched uranium for about 25% of U.S. reactors, but Russia's use of other energy exports as weapons of war and international coercion creates a significant vulnerability for both the United States and its allies. Additionally, TENEX is the only commercial supplier of High-Assay Low-Enriched Uranium (HALEU), which is a more highly enriched type of uranium that is needed to fuel many advanced nuclear reactor designs. Without domestic or allied HALEU production, the future of nuclear innovation and many advanced reactors in the U.S. is subject to geopolitical uncertainty.

The U.S. Department of Energy (DOE) is taking steps to reduce U.S. nuclear energy dependency on Russia by supporting expansion of the domestic nuclear fuel supply chain and creating new domestic HALEU production capacity, but until recently, DOE did not have sufficient funding to execute such a task. Analysis from the Nuclear Innovation Alliance in December 2023 found that additional federal funding of up to $2.9 billion was needed for DOE to successfully catalyze private investment in commercial HALEU production. Since then, Congress has recognized the

importance of this issue and enacted legislation to provide DOE with the funding they need. In March 2024 the Consolidated Appropriations Act of 2024 provided $2.72 billion to DOE's HALEU Availability Program for increasing U.S. domestic enrichment capacity to meet the needs of U.S. operating nuclear reactors and future reactor designs.

DOE now has the full funding it needs, totaling $3.4 billion[1], to reduce our reliance on Russian uranium, create strong market signals for private investment in domestic uranium supply chain infrastructure, and pave the way for a robust domestic supply chain. Nevertheless, many challenges still lie ahead. **DOE now needs to work effectively and efficiently with commercial industry, without delay,** to kickstart the public-private partnership needed to accomplish our goals. DOE has already awarded contracts to several companies in the HALEU supply chain, but this is just the start of a long complex road to success, and much further action is needed to reach the finish line.

Time is of the essence, and any delay could jeopardize efforts to reach our energy security and climate goals. Numerous advanced reactor developers are relying on DOE to deliver on its commitments. Even small delays could send ripple effects throughout the developing nuclear fuel supply chain, disrupting deployment schedules and burdening developers with additional costs as they seek to navigate these setbacks. Given these risks and the urgency of securing our energy and climate future amidst geopolitical tensions, **it is critical that the DOE works swiftly** to partner with industry, and that Congress provide the oversight needed to ensure DOE is moving apace.

Advanced nuclear reactors can help the world address the challenges of energy security and the urgent need to transition to cleaner energy sources while providing reliable and affordable energy that complements other clean energy sources. Creating a pathway to this clean and secure energy future, however, relies on having a robust, domestic commercial uranium fuel supply chain to power current and future nuclear reactors. Recently enacted funding reflects a promising direction, showcasing a collective bipartisan recognition of the urgency and importance of securing our nuclear fuel supply. We have an unprecedented opportunity to reshape our energy landscape, making it more secure, sustainable, and capable of meeting our pressing climate and energy demands. However, to fully realize this potential it's essential that we not only harness this opportunity with the urgency it demands but also keep a clear focus on the next steps that must be taken to achieve a reliable, affordable and clean energy future.

[1] This includes $2.72 billion from the Consolidated Appropriations Act of 2024 and $700 million from the Inflation Reduction Act