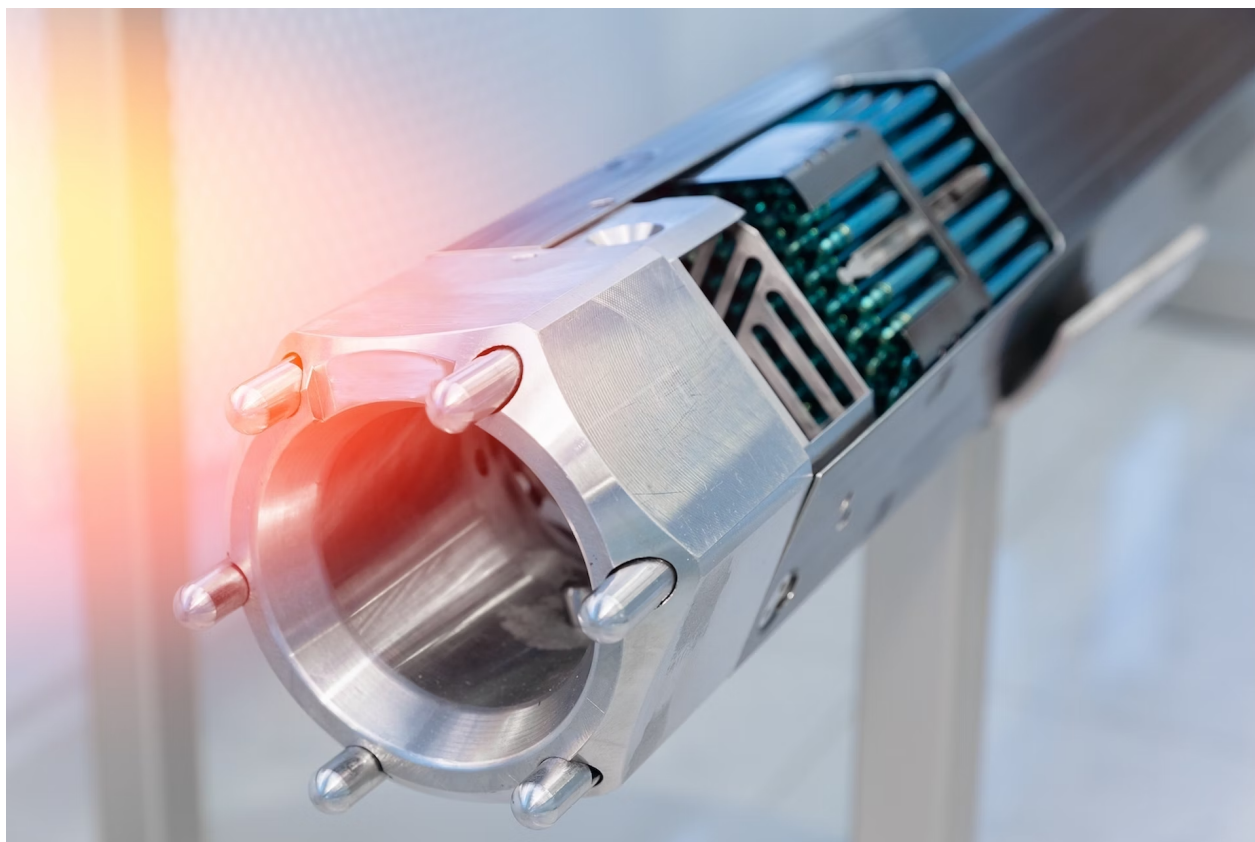


Nuclear Fuel is a National Security Imperative



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Takeaways

- Nuclear fuel represents a point of alignment among US energy, climate, foreign policy, and national security priorities: nuclear fuel not only powers our nuclear plants and transition to a clean energy economy, but is a *key foundation upon which our national security rests*.
- Regarding nuclear fuel as merely an energy or economic issue is an egregious oversight, a view that fails to consider the immense geopolitical and national security stakes for the US.
- Expansion of nuclear fuel infrastructure is foundational to our international competitiveness and reliable nuclear fuel supply around the world, both of which are key factors affecting our leverage in upholding the highest global standards in nuclear security and nonproliferation.
- Russia and China both have robust nuclear fuel capabilities which give them a competitive edge, and the US can level the playing field in a big way by building out our nuclear fuel supply chain.

Building out our nuclear fuel infrastructure is a pressing and urgent issue given our significant dependence on uranium fuel from Russia. Russia's use of energy exports as a geopolitical weapon is well-documented—the country has historically used the threat of supply cutoffs to

influence client states and make them more pliant to Russian interests. Continued reliance on Russian nuclear fuel is, as a result, a threat to the sovereignty of the US and democracies around the world.

Energy security is itself a national security issue, but the national security implications of nuclear fuel go well beyond that. Third Way is currently collaborating with partners and subject matter experts on a white paper, exploring the diverse ramifications that a reliable and strong nuclear fuel supply chain has for our defense, national security, geopolitical, and nonproliferation interests.

Here are Third Way's initial takes on the white paper effort thus far:

Nuclear fuel is...

...typically framed as a domestic energy and commercial issue. However, a healthy nuclear fuel sector (or lack thereof) has profound impacts on our foreign policy and national security goals.

Not Just an Investment for Security of Supply, but an Investment for our Security

Exporting American technology is crucial to our civil nuclear leadership internationally, and the global deployment of nuclear energy will be vital to meeting our climate goals. But allowing uranium enrichment technology to spread widely would significantly increase nuclear security and weapons proliferation risks.

Strengthening international confidence in reliable nuclear fuel supply is not just an energy security issue, it serves as a linchpin to US policies in countering the spread of nuclear weapons and the means to produce weapons-usable material. As the US works to reduce its reliance on Russian fuel, the buildout of nuclear fuel infrastructure should be sufficiently flexible to meet not only domestic needs, but also the needs of our allies and partners around the world.

Accordingly, nuclear fuel exports both generate revenue and strengthen international peace and stability by mitigating proliferation risks. A substantial down payment into the nuclear fuel supply chain is, therefore, more than an investment in our economic and industrial objectives. It's a true investment in maintaining and strengthening US national security.

Increasingly Vital to our Global Leadership and Presence in Nuclear Energy

US competitiveness in the global civil nuclear market is as much a national security priority as it is a commercial one. Our international leadership and presence in nuclear energy is essential so that we can set the highest standards on nuclear safety, security, and nonproliferation around the world.

The federal government has already invested *billions of dollars* into the development and deployment of innovative US advanced reactor technologies, including significant forward funding for the DOE Advanced Reactor Demonstration Program (ARDP) Pathway 1 demonstrations (X-energy's Xe-100 and TerraPower's Natrium) in the Bipartisan Infrastructure Law. Both Pathway 1 projects, as well as many other designs supported by ARDP, will require high-assay low-enriched uranium (HALEU) as fuel—commercial supply of which is currently dominated by Russia.

The innovative features of these advanced reactors represent a potential competitive edge for the US in the international reactor market. But reactor designs with uncertainties around fuel supply will clearly be less competitive overseas, and the general lack of commercial HALEU infrastructure outside of Russia currently puts US advanced reactor technology at a disadvantage. Case in point: of the six technologies recently selected for the Great British Nuclear Small Modular Reactor (SMR) competition, not a single HALEU-fueled reactor design was chosen.

While US global leadership in nuclear energy is broadly important to our national security, at a more granular level, new and emerging competitors are now offering technologies, components, and materials that are outside the purview of US export controls—meaning that such transactions do not require US export licenses, bilateral nuclear cooperation agreements with the US, etc.

Under these circumstances, a robust nuclear fuel supply chain not only supports the competitiveness of American reactors, but through enabling the export of competitive US nuclear fuel services and products, can help generate new avenues to reestablish our market presence and authority over international nuclear trade and commerce. This would be a *win-win* for both our commercial and national security interests.

Crucial to Leveling the Playing Field Against Russia and China

Our competition against Russian and Chinese state-owned nuclear enterprises has particularly heightened national security implications for many reasons. Both Russia and China have a track record of weaponizing energy exports to project geopolitical influence, and there are major concerns about their capacity and willingness to serve as responsible stewards of international civil nuclear norms and practices—Russia's unprecedented actions around the Zaporizhzhia Nuclear Power Station in Ukraine provide a very recent and terrifying example of Russian recklessness and negligence around civilian nuclear facilities and infrastructure.

Compounding these worries is the fact that both of these countries have been highly aggressive in engaging and courting international nuclear energy markets. Third Way and Energy for Growth Hub recently released a map of US, Russian, and Chinese nuclear cooperation agreements,

showing that both Russia and China lead the US in the number of “hard” MOUs—bilateral agreements with sales of actual hardware, materials, or services attached. Russia and China had hard MOUs with 45 and 13 different nations, respectively, while the US only concluded 12 such agreements.

In large part, Russia and China’s competitive edge comes from their all-in-one export packages. These often include training, financing, construction, operation, decommissioning, and other concessions, with fuel supply often a part of these comprehensive offers. For some countries, there is significant allure in the fuel provisions, ensuring a steady and reliable supply of nuclear fuel, often for the entire lifespan of the reactor. Russia provides official commitments *guaranteeing fuel for the life of exported reactors*, sometimes with additional agreements to take back spent fuel. Similarly, China is supplying all of the fuel needs for the reactors it exported to Pakistan, and while the primary focus now is addressing growing domestic demand, their ambitious efforts to expand fuel cycle infrastructure mean that they will be in a position to offer comparable assurances to international customers in the future. These types of offers on fuel supply can be particularly attractive for new nuclear states and embarking nations, as they simplify the process of starting nuclear energy programs.

Building out nuclear fuel production capacity at home is an important step towards evening the odds.

A robust domestic nuclear fuel sector can support critical defense capabilities and the readiness of our strategic forces.

Unobligated uranium—meaning uranium fuel produced domestically using only US technology—is required for critical defense applications, some of which (including the production of tritium and naval reactor fuel) have a direct bearing on the readiness of US strategic forces. A US commercial nuclear fuel supply chain can be a source of unobligated material, thereby supporting US strategic readiness and, by extension, the credibility and reliability of America’s extended defense and deterrence commitments abroad.

Why We Must Act

Recent debates around [the possibility of US–Saudi civil nuclear cooperation](#) have broadly highlighted both the importance of and challenges in implementing effective barriers to the proliferation of sensitive technologies, including uranium enrichment. With geopolitical turmoil and conflicts emerging in various parts of the world, it is more important than ever for the United States to fully embrace its role as a force for global peace and stability. A part of this charge is to ensure that nuclear technology and materials are not misused and remain under effective and rigorous control throughout the world.

Our leverage in upholding and negotiating—both bilaterally and multilaterally—the highest global standards for security and nonproliferation, including effective measures to contain the spread of enrichment and other sensitive technologies, hinges on the different factors outlined above:

- Our ability to assure countries of reliable nuclear fuel supply;
- Our commercial presence and competitiveness in the global nuclear market, particularly against China and Russia;
- And the strength and credibility of our extended deterrence commitments to our international friends and allies.

Without nuclear fuel, the proverbial rug will be pulled out from under all of these, threatening to collapse our international leverage and influence on these matters *like a deck of cards*.

And as Russia’s brutal campaign of aggression against Ukraine rages on and tensions escalate in the Middle East, reinforcing the firmness of our overseas commitments and maintaining strong nonproliferation principles will be essential *so that these crises do not destabilize further*.

Answering the Call: Policy and Legislative Recommendations

There is no way around it: the *most immediate task* in front of policymakers and lawmakers is authorizing, sufficiently funding, and rapidly implementing federal programs to kickstart the buildout of nuclear fuel infrastructure—in particular, the expansion of uranium conversion and enrichment capacity, given that they represent the key bottlenecks in the nuclear fuel supply chain.

- **Legislation:** Passing supportive legislation like [the Nuclear Fuel Security Act \(NFSA\)](#) would provide firm Congressional direction and authorities for the federal government to move forward on nuclear fuel programs. NFSA provisions were included in the Senate FY24 National Defense Authorization Act (NDAA). Maintaining these provisions in conferencing is consistent with the overall security and defense objectives of NDAA.

- **Funding:** Adequate funding is required so that federal offtake agreements with fuel producers are sufficient to incentivize investments into infrastructure expansion and buildout. Third Way and other NGOs have aligned on the need for \$2 to \$3.5 billion in additional upfront appropriations as necessary to achieve meaningful progress.
- **National Security Supplemental:** While the White House recently submitted a Domestic Supplemental funding request that includes \$2.2 billion for nuclear fuel, the likely funding vehicle for fuel is the national security supplemental currently being deliberated in Congress. Considering the national security ramifications of nuclear fuel, including such funding in a security-related supplemental appropriations bill is wholly justified.
- **Implementation:** With funding and authorities secured, the federal government must expeditiously issue requests for proposals (RFPs) and start the procurement process for fuel as soon as possible.

The US can also pursue enhanced multinational partnerships on the nuclear fuel supply chain, in accordance with a broad agreement with the UK, Canada, Japan, and France that was reached during the Nuclear Energy Forum at the G7 meeting in Sapporo. A multinational approach to building out nuclear fuel infrastructure could increase available funding through pooled investment. Moreover, diverse international partners and stakeholders in such an endeavor can increase both transparency and inclusion, potentially making the security and nonproliferation benefits more sustainable. Such a solution highlights, again, the strong alignment between commercial and national security priorities on nuclear fuel.

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