An Allied Approach to the Nuclear Fuel Cycle

Achieving Energy Security, National Security, and U.S. Global Leadership

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Recent concerns regarding the development of uranium processing capabilities abroad underscore the urgency of revitalizing the U.S. nuclear fuel cycle sector as proposed by the Nuclear Fuel Working Group (NFWG). However, a pathway towards achieving assured fuel supplies for the U.S., its allies, and potential export markets can be more viably executed by leveraging partnerships and allied resources. This reality raises broader considerations about the importance of international civil nuclear cooperation and the nature of U.S. global leadership.

Viability of the U.S. Front-End Fuel Cycle: Impact on Exports and National Security

The Nuclear Fuel Working Group's Strategy to Restore American Nuclear Energy Leadership highlights the importance of supporting a vibrant domestic front-end fuel cycle, primarily emphasizing the U.S. uranium industry's crucial role in preserving energy security, protecting against intentional market disruptions by geopolitical adversaries, and meeting impending defense needs. However, the report appears to understate the potential significance that a robust nuclear fuel sector would have for two other strategic priorities that the NFWG identified:

- **Export Competitiveness** - The capability to provide assured fuel supply to client states would increase the attractiveness of export offerings, especially as part of comprehensive packages involving training, regulatory and institutional support, financing, construction, operations, decommissioning and waste management, etc.
- **National Security (via Nonproliferation)** - Ensuring fuel supply security would disincentivize the development of fuel cycle capabilities abroad, as well as increase transparency regarding the objectives of foreign fuel cycle activities.

In light of these strategic merits, recent concerns surrounding Saudi Arabia's reported cooperation with China on the development of a uranium milling facility should only increase the urgency of implementing the NFWG's recommended actions to support U.S. nuclear fuel cycle capabilities.

However, although the NFWG report set a relatively aggressive timeline for the procurement of domestic uranium mining, milling, conversion, and enrichment services in support of its near-term step of establishing a uranium reserve, the reserve met a roadblock in July as House appropriators deferred funding for the program, pending the provision of additional details.

Moreover, the NFWG report stated that "no commitment has been made to take action beyond the Uranium Reserve proposed in the FY21 Budget, which addresses the sectors most imminently at risk." Timeframes regarding the procurement of uranium enrichment, considering that no U.S.-origin capacity presently exists, would thus arguably entail a degree of uncertainty.

Leveraging the Capabilities of U.S. Allies

In response to immediate issues associated with emerging civil nuclear markets and foreign fuel cycle development, in view of present challenges in implementing the NFWG's vision for revitalizing U.S. uranium fuel production, one sensible solution may involve a coordinated uranium supply chain arrangement among the U.S. and its allies. The NFWG report expressed that the "ultimate goal of the Administration's actions [in establishing a uranium reserve] is to create an appropriate safeguard for the United States and our allies against unfair market intervention by foreign states or other disruption..."

An enhanced international uranium supply chain, both benefiting and leveraging the capabilities of U.S. allies and partners, would provide a sufficient hedge against market intervention and disruption, in addition to the following advantages:

- **Increased Prospects for Success and Timeliness** - An international fuel reserve or bank supplied by multiple countries—one arrangement could involve uranium mined and milled in Canada, converted in the U.S., enriched in France, fabricated in the U.S. (eventually using technology developed under the DOE Accident Tolerant Fuel program)—could be executable and available in the near-term, without the development of new infrastructure or capabilities. An allied consortium would also be better positioned to provide cradle-to-grave fuel cycle solutions—deployment of certain U.S. advanced reactor designs and identification of a third-country multinational repository could theoretically address U.S. and allied back-end management challenges, and also establish the foundations for the provision of spent fuel take-back services to new nuclear markets.
- **Credibility in Encouraging Reliance on International Fuel Supply Mechanisms** - Establishment of a more internationally-inclusive nuclear fuel cycle and uranium reserve would provide enhanced credibility in encouraging nuclear newcomers and aspiring entrants to also rely upon international arrangements for their nuclear fuel requirements.

Conclusions

An international uranium fuel supply chain and reserve as described above would not provide a source of unobligated uranium for U.S. defense needs. Thus, in accordance with U.S. law, such an arrangement does not necessarily obviate the need for actions to support U.S. industries across the entirety of the front-end nuclear fuel cycle.

Nevertheless, discussions about an international fuel reserve do elicit further thinking and conversation about the importance of U.S. international civil nuclear engagements more broadly. A recent report by Columbia University's Center on Global Energy Policy (CGEP) argues: "Deeper cooperation with like-minded allies would... allow the United States to better compete against other supplier countries that have different commercial and geopolitical objectives." The report delves into a historical examination of U.S. nuclear power, revealing the critical role of the U.S. in kick-starting civil nuclear programs in allied countries and how such activities have fundamentally shaped the global nuclear energy market and supply chain of today.

Perhaps now, more than ever, the U.S. must reap what it has sowed. Unlike America's geopolitical rivals, U.S. strengths do not necessarily lie in rapid industrial mobilization or the monopolization of resources and technologies. U.S. generosity and the liberal international order it created have formed the basis of U.S. global leadership, not only in civil nuclear but in many other areas and issues.

Moving forward, the U.S. must look to its past and form its strategies, in nuclear energy or otherwise, around the principles that have been fundamental to its international leadership.

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