

**IN RE: U.S. CLEAN TECHNOLOGIES EXPORT COMPETITIVENESS STRATEGY, ITA-2021-0005,
86 FED. REG. 48,400 (AUG. 30, 2021)**

**COMMENTS IN SUPPORT OF INCLUDING ADVANCED NUCLEAR ENERGY IN A U.S. CLEAN
TECHNOLOGIES EXPORT COMPETITIVENESS STRATEGY**

The Nuclear Innovation Alliance (NIA) strongly supports the International Trade Association’s activities to inform the Department of Commerce’s “U.S. Clean Technologies Export Competitiveness Strategy.” American advanced nuclear energy, supported by domestic innovation and public investment, is poised to offer new clean energy solutions to reduce global emissions during the next several decades. Reactor projects are beginning licensing now, with the first commercial advanced reactor expected to reach operation by 2025. As the Department considers how to promote clean energy export competitiveness, advanced nuclear energy should be a prime part of its overall strategy.

The Nuclear Innovation Alliance (NIA) is a non-profit think tank working to enable nuclear power as a global solution to mitigate climate change. We are dedicated to promoting innovation in nuclear energy technologies and business models to increase the affordability and availability of nuclear energy as a tool for addressing critical global environmental and development needs. In collaboration with environmental organizations, academic institutions, private sector innovators, and other stakeholders, we work to inform innovation strategies, like that proposed by the Department, across federal agencies.

Advanced reactors are a clean energy technology that represents the fourth generation of commercial nuclear power technology. Whereas previous commercial reactors were primarily large (1,000+ megawatt) light-water reactors, advanced reactors feature multiple different fuel cycles and coolants, from sizes below 10 megawatts to greater than 1,000 megawatts. Detailed information about American advanced reactor innovators and technologies can be found in NIA’s “Advanced Nuclear Reactor Technology: A Primer.”¹ U.S. companies, utilizing public-private partnerships, are starting multiple demonstration projects that represent the first step in commercializing advanced reactors.

The potential trade and export opportunities from advanced nuclear technologies are significant. As a reliable and clean energy source, advanced reactors can contribute significantly to global decarbonization. Recent analyses from the International Energy Agency, the Intergovernmental Panel on Climate Change, and many other research bodies have identified nuclear power as a valuable tool in meeting the global demand for electricity within and outside the OECD while limiting carbon emissions to levels consistent with a stable climate. The U.S. economy stands to benefit directly from the export of advanced nuclear technology. The U.S. is the locus of most of the world’s nuclear energy innovation effort and expertise, and dozens of companies are developing promising new designs. US-based companies stand ready to design, manufacture, and construct key components of overseas advanced nuclear projects, and to employ thousands of US citizens in the process. Many of these jobs are among the highest paying of any energy sector. However, as described in a blog that NIA recently coauthored,

¹ <https://nuclearinnovationalliance.org/advanced-nuclear-reactor-technology-primer>

countries around the world are also pursuing advanced nuclear energy projects and the U.S. faces stiff competition to securing market leadership.² Government support will be critical to ensure that American companies are able to compete fairly with state-owned enterprises in Russia and China.

In February 2021, NIA collaborated with the Partnership for Global Security to publish the “U.S. Advanced Nuclear Energy Strategy,” which we have attached and is available online.³ This strategy was the result of an intensive stakeholder process involving leading advanced reactor developers and nuclear innovators in the United States. Among other recommendations, Section 3 of the strategy proposed an American export strategy for advanced reactors. As the Department considers a broader clean energy strategy, we highly recommend that the ITA review the strategy for insights into how to incorporate advanced nuclear energy into a broader national strategy.

Recommendations the Department should explicitly consider include:

- Considering new financing approaches and financial modeling scenarios that can support effective project structuring and execution
- Identifying pathways and funding programs to provide early-stage programmatic and project-specific support to customer countries, including human resources development and training programs
- Coordinating with existing allies and democratic trading partners to build multinational deals for newcomer countries
- Using data-driven tools and analysis to understand the short- and long-term growth of the global civil nuclear market to identify policy priorities
- Supporting the creation of a trusted information repository (including advisory capabilities) that can provide new nations with “off the shelf” documents, guidance, service providers, and related items
- Lifting prohibitions on nuclear energy finance by regional and international development banks and multilateral financing institutions
- Supporting competitive global energy markets that fairly meet the needs of emerging economies and including nuclear energy within trade agreements
- Promoting clean energy, including advanced reactors, as an essential development and economic growth strategy
- Promoting consideration of advanced nuclear energy as a critical energy source for industrial heating, desalination, and hydrogen production
- Intensifying engagement and cooperation with U.S. allies on technology collaboration, export financing, regulatory and licensing harmonization
- Empowering the Department of Commerce and other export control agencies with knowledge about the specific characteristics of advanced nuclear technologies

² <https://www.advancednuclearenergy.org/product/advanced-reactors-turning-the-corner>

³ <https://nuclearinnovationalliance.org/us-advanced-nuclear-energy-strategy>

Beyond these general comments, NIA offers the following specific responses to ITA’s request for public comments with a focus on advanced reactors:

“1. Is there an established methodology for designating particular technologies as clean technologies or additional factors that the Government should consider for purposes of scoping this strategy?”

There are multiple approaches to designate particular technologies as clean technologies. The Department of Commerce should designate advanced nuclear energy as a clean technology because:

- Operations do not produce greenhouse gas emissions or other air pollutants
- Flexible operations of advanced reactors can complement other clean energy technologies like variable wind and solar, enabling complete decarbonization of energy systems
- New technologies can greatly reduce water withdrawals and consumption from the power sector
- Many advanced reactor designs can reduce volumes or radioactivity of spent nuclear fuel, or even recycle it
- It reduces energy system land use due to energy density and smaller reactors requiring smaller sites than conventional reactors
- Nuclear power produces much less waste than other energy technologies

Critics of nuclear energy may argue nuclear energy is not a clean technology due to legacy issues in mining and waste management. However, these concerns arose primarily from weapons activities, not commercial activities. Further, the modern uranium mining and nuclear industries have exceptionally high standards that avoid the mistakes of the past. Uranium mining to support advanced reactors generally is performed by companies with environmental management plans and meets remediation standards on par with or better than other mining activities (such as polysilicon). Commercial spent fuel storage in the United States and abroad has an excellent record of safety and environmental management, with no major incidents in the history of the U.S. industry.

“2. What clean technologies offer the most significant immediate opportunities for U.S. exports of associated goods and services?”

Advanced reactor technologies offer immediate opportunities for U.S. exports of goods, services, and technologies. Many advanced reactor vendors are currently exporting to our trading partners and have done so for years. The most mature advanced reactor designs are ready for construction now and vendors are seeking international clients to build first-of-a-kind facilities or second-of-a-kind facilities to follow near-term demonstration projects in the U.S. Notably, the long lead times for reactor construction mean that even projects with online dates in the 2030s represent immediate export opportunities as projects must go through licensing in importing countries as well as multi-year construction. Reactor vendors can earn export revenue across the entire lifecycle of such a long-term project. In addition to reactor designs, vendors often export proprietary technology and other specific nuclear goods and services.

“3. What clean technologies do not currently offer significant immediate opportunities for U.S. exports of associated goods and services but may offer such opportunities within the next five to ten years?”

As a sector featuring continuing innovation, the amount, type, and scale of U.S. advanced nuclear goods, services, and technologies available for export will grow greatly over the next five to ten years. Particular promising areas including high-assay low enriched uranium, fabricated fuels, manufactured reactor modules, special nuclear-quality materials, and American engineering expertise.

“5. For sectors or technologies in which the United States currently has a competitive domestic industry, what are the main factors (*i.e.*, economic, technical, regulatory, etc.) that could pose a significant risk to the U.S. industry's competitive position?”

Internationally, the U.S. advanced nuclear industry faces significant competition from state-owned enterprises in Russia and China. Drawing upon the resources of the state, these entities are able to employ a “build-own-operate” model that, augmented by government level regulatory and trade support, can create unfair trade conditions for U.S. private sector entities. Accordingly, including advanced nuclear energy within a broader clean energy export competitiveness framework is essential to establishing strong federal support for private sector innovators.

“6. For sectors or technologies in which the United States does not currently have a competitive domestic industry, what are the main factors (*i.e.*, economic, technical, regulatory, etc.) inhibiting U.S. industry competitiveness?”

When it comes to advanced reactor technologies, the U.S. faces two particular technology barriers. We currently do not have the capability to produce high-assay low enriched uranium and we do not have a national fast reactor testing environment. Congressional action and industry plans are focused on addressing this in the next 5-10 years, but success is far from guaranteed. Any clean energy competitiveness strategy should focus on supporting these national capabilities to ensure American nuclear energy competitiveness.

“9. What are the most impactful existing tools or resources offered by the Government to reduce or remove challenges, risks, and barriers in order to help position U.S. clean technologies industries for competitiveness in the global market?”

Per the recommendations from our advanced nuclear energy strategy, the Department of Commerce can remove challenges, risks, and barriers by streamlining export controls, ensuring advanced nuclear technologies have fair access to development project funding, and by providing information about global market opportunities and competitors. Further, the Department should support efforts to enable exports at other agencies, especially the Department of State as it negotiates 123 Agreements and memoranda of cooperation.

“11. What are the most impactful new actions the Government could take domestically to reduce or remove challenges, risks, and barriers in order to help position U.S. clean technologies industries for competitiveness in the global market?”

Per our response to #6, establishing private-sector capabilities to produce high-assay low enriched uranium and public sector research capabilities with the Versatile Test Reactor are central domestic actions. Further, an all-of-government effort is needed to support the success of the vendors in the Department of Energy’s Advanced Reactor Demonstration Program.

“12. What are the most impactful new actions the Government could take through engagement with foreign countries to reduce or remove challenges, risks, and barriers in

order to help position U.S. clean technologies industries for competitiveness in the global market?”

The highest priority is to open up markets for U.S. nuclear technologies in countries that have not used nuclear energy. Many of these countries, particularly in Africa, face the greatest projected demand growth. Deploying clean technologies in support of their development is essential to meet global climate and poverty reduction goals. U.S. innovators are in the best position to support these countries and federal government support to facilitate trade, negotiate nuclear cooperation agreements, and establish foreign regulators are an essential step.

“13. Which foreign countries or regions present the greatest market opportunities for U.S. exports of clean technologies and/or should be prioritized for engagement by the Government?”

Existing U.S. trade partners that use nuclear energy, including Canada, United Kingdom, South Korea, and Japan represent the greatest near-term opportunity for advanced reactor exports. However, the greatest market opportunities are in countries that do not currently use commercial nuclear energy, particularly in Africa (especially Nigeria and Ghana), South America, and Southeast Asia.”

“15. How do U.S. trade policies impact the development and deployment of clean technologies in the United States and abroad?”

As a technology that is reaching the early stages of maturity, advanced reactors need scale in order to reduce costs and continue leadership in innovation. The more market opportunities that American innovators have, the more reactors they can build as soon as possible. The more reactors they build, the quicker they can reduce overall costs, for both domestic reactors and international customers. Accordingly, highly conducive trade policy for advanced reactors is likely to be a major factor that can accelerate American nuclear innovation and competitiveness, reducing national and global emissions in time to contribute to global climate mitigation goals.

Again, we strongly support and thank the ITA for its efforts to support the Department of Commerce’s “Clean Technologies Export Competitiveness Strategy.” As our comments highlight, advanced nuclear energy is a clean technology, it has significant export opportunities, and is a central component of 21st century U.S. leadership. Concerted government action is needed to maximize trade and deliver high-paying domestic jobs.

Thanks for your consideration,

Alex Gilbert and Victor Ibarra, Jr., on behalf of the Nuclear Innovation Alliance