

THE GLOBAL NUCLEAR MARKETPLACE: A CASE FOR ENGAGEMENT

A UniStar Issue Brief



Although the United States' nuclear energy industry has invested billions of dollars to reinvigorate the commercial nuclear energy sector, this is not enough to guarantee the U.S. a significant role in the international nuclear marketplace, except as a customer for other countries' goods.

The federal government must establish clear policy positions, buttressed by concrete actions, that will substantially accelerate the construction of nuclear generating facilities in the United States. Such policies and actions will provide greater certainty for industry to invest in an expansion of nuclear energy manufacturing capabilities in this country. In turn, this increased manufacturing capacity will generate more opportunities for U.S. companies to supply nuclear energy products and services to domestic and international markets.

EXPANDING DOMESTIC NUCLEAR MANUFACTURING CAPACITY

Countries and governmental entities around the world are aggressively pursuing nuclear energy. American utilities are at risk of being shut out of the global-supply-chain queue for new nuclear energy components, because they are competing with sovereign nations or government-backed organizations. The global supply chain will become more strained as China and other countries pull further ahead in building even more new nuclear energy facilities.

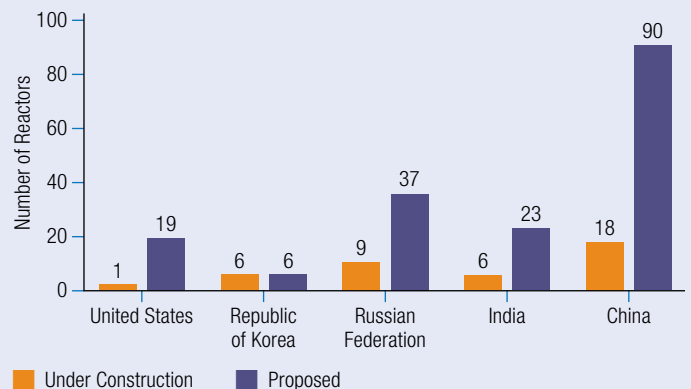
The United States must commit to new, advanced, nuclear energy technology and re-establish our nuclear manufacturing capabilities. We have the know-how—we provided the expertise in the 20th century that facilitated the safe, effective use of nuclear energy commercially around the world.

Yet today, foreign companies are the main suppliers of "big steel" to the global nuclear energy industry. Currently, Japan Steel Works, China First Heavy Industries, and Russia's OJSC Izhora are the only facilities with the capacity to supply ultra heavy

forgings, although additional facilities are under construction in South Korea and planned for the UK and India. AREVA's Chalons/Saint Marcel plant in France supplies additional, slightly smaller heavy forgings for reactors. These massive steel forgings, such as the reactor pressure vessels that house the reactor cores, are the very hearts of nuclear energy facilities.

Straining the Supply Chain

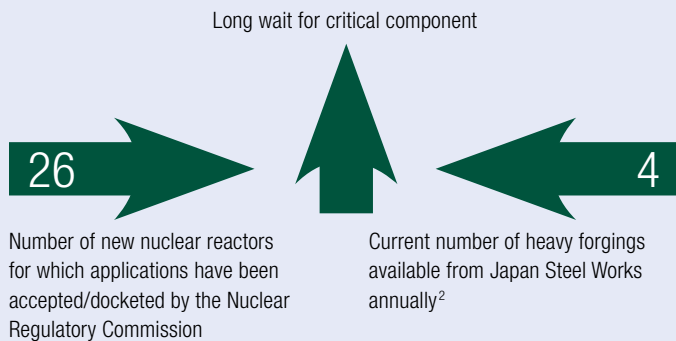
As countries build more nuclear energy facilities, the increased construction will intensify competition for components.



Source: "World Nuclear Power Reactors & Uranium Requirements," December 1, 2009. World Nuclear Association.

Ultra heavy components are precisely manufactured, and their enormous size requires special equipment to handle them. Only a few facilities, all of them foreign owned, are capable of producing such components. Nothing in North America currently approaches the scale of these enterprises, according to Steve Kidd, director of strategy and research for the World Nuclear Association.¹ The result is an extremely limited supply of critical components on the global market. The U.S. has the technological capability, the know-how, and the security incentive to reestablish itself in a leading role in nuclear component manufacturing, not just domestically, but globally.

Tight Supply Equals Added Delays and Higher Costs



The United States also has lost much of its domestic capacity to mine and enrich uranium to produce commercial nuclear fuel. Ninety-two percent of the uranium purchased for non-military nuclear energy facilities in the United States came from foreign sources in 2007.³ However, we can produce nuclear fuel domestically using uranium from other sources. For example, under the Megatons to Megawatts program, highly enriched uranium (HEU) from Russian warheads is blended with low-enriched uranium (LEU) here in the United States to make commercial nuclear fuel. “On average, one in 10 American homes, businesses, schools, and hospitals receive electricity generated by fuel fabricated using low enriched uranium (LEU) from the Megatons to Megawatts program,” according to USEC, Inc.⁴

In 1984 alone, the U.S. had 37 nuclear plants under construction, 100 percent manufactured in the USA. What we could do before, we can and must do again.

When the Megatons to Megawatts program ends in 2013, the United States will lose a substantial source of enriched uranium for its nuclear reactors. In response, we must expand our uranium enrichment capacity to fuel existing reactors and ensure a reliable supply for new nuclear energy facilities. In an opportunity similar to that in critical component manufacturing, expansion of U.S. mining, enrichment, and fuel-fabrication capabilities would not only increase certainty of domestic supply, but also provide opportunities to expand the U.S. business presence in the global nuclear energy marketplace.

In 2009, UniStar’s partner, AREVA, organized Supplier Days in Baltimore, Md. and Columbus, Ohio to educate and inform potential suppliers about the needs and requirements for building an EPR™ nuclear facility in their respective regions. Supplier interest exceeded expectations, and more than 100 companies from around the country attended each Supplier Day.⁵

CAPITALIZING ON EXPORT OPPORTUNITIES

Today, there is a large international market for nuclear parts and fuel. More than 30 countries have nuclear energy programs, and 53 nuclear reactors are under construction around the world.⁶ Further, the World Nuclear Association predicts that more than 10 additional countries will build their first nuclear energy facilities by 2030.⁷ Here is a clear opportunity to rebuild a manufacturing capability in the United States to service a burgeoning international market.

The good news is that re-investment in the nuclear energy supply-chain infrastructure in the United States has already started. There are several manufacturing facilities either planned or under construction in the United States to provide commercial nuclear fuel.

- In January 2009, AREVA submitted a license application to the U.S. Nuclear Regulatory Commission to construct and operate a uranium enrichment facility in Idaho.
- USEC applied to the U.S. Department of Energy's Loan Guarantee Program to seek funding to complete a uranium enrichment facility in Piketon, Ohio.
- LES is constructing a uranium enrichment facility near Eunice, N.M., which is expected to open in early 2010.

Nuclear component manufacturing in the United States is also being expanded. In December 2007, Alstom announced plans to construct a manufacturing facility to provide components to power plants, including steam turbine generators for nuclear reactors. And, in July 2009, AREVA and Northrop Grumman broke ground on a facility in Newport News, Va. that will manufacture heavy components for new commercial nuclear reactors.

U.S. Nuclear Energy Business Cycle: Customer or Supplier?

Customer of the Global Marketplace	Supplier to the Global Marketplace
Short-term solution for parts and services needed to build, operate U.S. reactors	Long-term solution for supplying components and services domestically
Purchase nuclear fuel from Russia and France	Invest in U.S. uranium mining and enrichment capabilities
Buy ultra heavy forgings from Japan	Develop capacity to produce ultra heavy forgings for U.S. and global markets

“...more than 200,000 manufacturing jobs will be created to supply the needed parts and components for the 30 nuclear reactors that are currently planned here in the U.S., and that’s not even taking into account the jobs associated with export opportunities to Europe, China and India.”

The facilities being built by AREVA, Northrop Grumman, and Alstom provide more than just domestic manufacturing capabilities and good jobs for U.S. workers. They provide increased capacity for American-made nuclear components that can be sold in the global nuclear energy marketplace.

THE CONSEQUENCES OF INACTION

A significant global expansion of nuclear energy occurred while the United States sat on the sidelines, having last ordered a new nuclear energy facility in the late 1970s. As a result, America lost much of its nuclear energy supply-chain capacity and manufacturing infrastructure and continues to fall behind other nations that have complete nuclear fuel cycles.

The United States needs to aggressively pursue advanced nuclear technologies to maintain leadership on international nuclear energy and security issues.

Country	Number of Reactors Under Construction
China (mainland)	18
Russia	9
India	6
Republic of Korea (South Korea)	6
Canada	2
Japan	2
Slovakia	2
Taiwan	2
Argentina	1
Finland	1
France	1
Iran	1
Pakistan	1
United States	1

Source: “World Nuclear Power Reactors & Uranium Requirements.” December 1, 2009. World Nuclear Association.



By hesitating to join the global nuclear energy renaissance, the United States puts itself at risk of losing influence over wider nuclear issues, such as preventing the proliferation of nuclear weapons. Rogue states and unstable governments are trying to acquire such weapons. If we have nothing to offer, we lose a great deal of leverage on this and other international nuclear issues, increasing our own national security risks.

MOVING FORWARD BY COMMITTING TO NUCLEAR ENERGY

At UniStar Nuclear Energy, we are doing our part to spur on the rebuilding of America. Our investments in new nuclear facilities have fueled the U.S. expansion plans of Alstom, AREVA and Northrup Grumman, among others. And we have already created almost 600 new jobs!

UniStar Nuclear Energy believes that the United States needs to become a full partner in the nuclear energy renaissance that is underway worldwide. This requires engagement not only on proliferation issues, but also in the supply chain and commercial nuclear energy development. Reviving the nation's commercial nuclear energy manufacturing capacity will allow us to export materials and knowledge. It will provide us with economic benefits, and present an opportunity to support the expansion of emissions-free nuclear energy and strengthen our influence on nuclear energy issues worldwide.



If you want to look closer at the research behind the information in this publication, please visit our web site at www.unistarnuclear.com. There you will find an annotated version of this Issue Brief with links to the original research and other data behind this publication as well as all of the other publications in the Issue Briefs series.

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