

WHAT ADVANCED REACTORS HAVE TO OFFER

There are numerous advanced nuclear technologies under development in the United States, forming a continuum of innovation and offering the following benefits:

LOWER COSTS AND FASTER CONSTRUCTION

Developers are creating simpler designs, incorporating modular and factory construction, and advancing innovations that will contribute to lower overall capital investments and operating costs to be more competitive with other forms of energy generation.

VARIABLE SIZE

Advanced nuclear reactors will come in a wide range of sizes, from a few megawatts-electric (MWe) to more than 1,000 MWe. This will allow owners to tailor their capacity additions to their energy demands and budgets. This is particularly important for smaller companies, rural electric cooperatives or municipal agencies and for isolated and distributed applications.

MORE FLEXIBLE OPERATION

Advanced nuclear reactors are being designed to more quickly adjust their energy output to match demand, making them particularly suited to stabilizing grid loads in systems with high concentrations of intermittent renewable generation. Some

designs will attain extremely high levels of reliability—through the combination of multiple modules or operation for as long as 20 years or more between refueling—making them well suited for mission-critical loads and areas without robust electricity grids.

MEETING DIVERSE ENERGY NEEDS

Many advanced nuclear reactors will operate at higher temperatures, enabling them to supply process steam heat for industrial uses such as fertilizer manufacturing, petroleum refining and desalination. Currently, no emissions-free sources serve these applications.

ENHANCED SAFETY

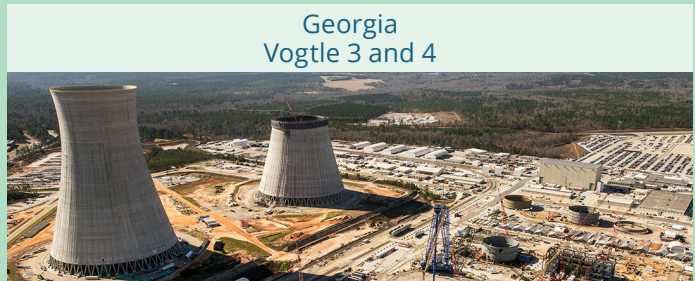
Many advanced nuclear reactors will use natural circulation and gravity as motive forces, and some designs will operate at atmospheric pressure. These innovations result in simpler designs with fewer systems and components, minimizing or eliminating the need for human actions to shut the reactor down, and significantly reducing the risks of an accident.

CONTINUUM OF NUCLEAR INNOVATION

2021 AND BEYOND

TWO REACTORS UNDER CONSTRUCTION

The long-term dynamics of rising electricity demand, more stringent clean air requirements, and concerns about U.S. energy security remain drivers for nuclear energy expansion.



MID-2020s AND BEYOND

SMALL MODULAR REACTORS (SMRs)

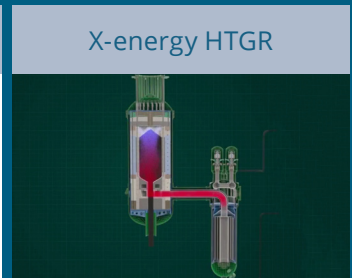
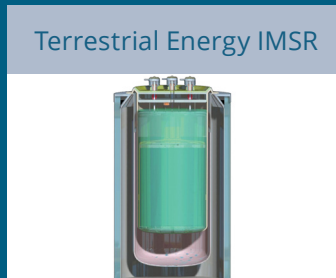
These reactors are light water designs, much the same as the current generation but typically with a generating capacity of fewer than 300 megawatts.



2030s AND BEYOND

LIQUID METAL, MOLTEN SALT, AND HIGH TEMPERATURE GAS REACTORS

Almost 60 companies and research institutions are developing advanced reactors for a wide array of capabilities to meet the energy needs of the future.



HOW NUCLEAR ENERGY MAKES AMERICA STRONGER, SAFER, WEALTHIER, AND HEALTHIER

Nuclear energy has been a cornerstone of U.S. infrastructure for more than 60 years and is critical to the nation's long-term energy independence, national security and global influence. As technology evolves, needs change and existing nuclear plants move closer to eventual retirement, the imperative to commercialize advanced nuclear reactor technologies is becoming increasingly urgent.

U.S. ENERGY LEADERSHIP AND SECURITY

U.S. nuclear technologies and research and development capabilities are envied around the world, and the U.S. enjoys close political and commercial relationships with many countries forged over decades through the construction of U.S.-origin nuclear plants. Exports of U.S. nuclear technology allow the U.S. to set global standards for nuclear security, safety and nonproliferation.

CREATING AMERICAN JOBS

The nuclear energy industry directly supports more than 100,000 high-paying American jobs, and nearly 400,000 additional indirect jobs across the economy. Internationally, the global market for nuclear technologies is estimated to be nearly \$750 billion over the next 10 years. According to the U.S. Department of Commerce, every \$1 billion of exports by U.S. companies represents 5,000 to 10,000 jobs.

DECARBONIZING THE ENERGY SECTOR

Nuclear energy provides 20 percent of all U.S. electricity, while producing more than 60 percent of America's carbon-free electricity. Nuclear energy is the only carbon-free electricity source that can provide large, baseload amounts of electricity around the clock. An average nuclear energy facility's life-cycle carbon footprint is comparable to wind, and lower than solar and hydro power plants.

WHAT IS NEEDED TO ENJOY THESE BENEFITS

The future of nuclear energy globally depends on American leadership and substantial progress in the funding, development and commercialization of advanced fuel and reactor technologies. U.S. nuclear innovators face challenging international competition from state-owned enterprises that receive government backing.

In order for the United States to maintain its leadership in nuclear energy, domestically as well as globally, the U.S. must support public-private partnerships, modernize the regulatory process, eliminate barriers to commercialization and export, and ensure fair electricity markets that fully value nuclear energy's benefits.



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