



Nuclear energy is one of the most **resilient, environmentally sustainable**, and **reliable energy** sources on the grid today. The nation's fleet of more than 90 reactors supports nearly half a million American jobs and supplies 20% of the electricity generated in the United States. Nuclear also produces **more than half of the clean energy** in the U.S. — making it essential to meeting the nation's ambitious climate goals of reaching net-zero emissions by 2050.



What We Do

The Office of Nuclear Energy (NE) is an applied energy research and development (R&D) organization solving the crosscutting challenges facing the nuclear sector today. NE invests in R&D that the private sector or other non-government stakeholders are unable to perform due to the cost, scale, or timeframe required.

NE funds and creates opportunities for world-class researchers in industry, academia, and the national laboratories to collaborate and solve pressing scientific and engineering challenges.

By leveraging private-public partnerships and our national laboratory system, we are:

- * Making nuclear energy more cost effective
- * Accelerating advanced reactor deployment
- * Making nuclear fuel cycles more sustainable
- * Encouraging a resilient supply chain
- * Promoting a strong nuclear workforce.

Areas of Focus

OPTIMIZING THE EXISTING FLEET

Maintaining access to carbon-free electricity supplied by our current fleet of nuclear reactors is essential to helping our nation cut its carbon emissions in half by 2030. NE is supporting research to maintain and extend the operating lives of existing reactors by improving their performance and efficiency, developing advanced fuel technologies, and expanding to markets beyond electricity.

These improvements could significantly reduce operating costs, improve economic competitiveness, and help decarbonize markets beyond the energy sector.

(continued on reverse)



BUILDING ADVANCED REACTORS

Advanced nuclear energy systems hold enormous potential to lower emissions, create high-paying union jobs, and build an even stronger economy. Dozens of U.S. developers are pursuing advanced technologies that will make nuclear energy more efficient and affordable to construct, operate, and maintain.

NE is supporting all stages of development to bring new, more flexible advanced reactor systems to market this decade. This includes the deployment of new fuels, sensors, and modeling and manufacturing processes that support these designs.

Through R&D activities, bolstered by private-public partnerships, NE is supporting the demonstration of at least two U.S. advanced nuclear reactors by 2028 and is working with several companies to lower the risk of additional promising technologies that can be commercialized in the 2030s.



U.S. microreactor developers are currently focused on gas and heat pipe-cooled designs that could debut in the mid-2020s.

DEVELOPING FUEL CYCLES FOR ADVANCED REACTORS

As we develop technology to help sustain the existing fleet and deploy advanced nuclear reactors, we need to pursue advanced fuel cycles to fully take advantage of modern nuclear technology.

NE is developing sustainable fuel systems that will reduce spent nuclear fuel and waste, improve performance, and further enhance safety.

The office is also investigating multiple options to provide high-assay, low-enriched uranium to help support the demonstration and commercial deployment of advanced reactor systems, while also addressing current gaps at the front end of the U.S. nuclear fuel cycle.

Dry storage casks at the Idaho Nuclear Technology and Engineering Center at Idaho National Laboratory

470 MILLION METRIC TONS

= the amount of carbon emissions avoided each year in the United States by nuclear energy.

This is the equivalent of removing 100 million cars off the road.

Source: Nuclear Energy Institute

MANAGING SPENT NUCLEAR FUEL

Nuclear energy is essential to tackling climate change, but to make nuclear truly sustainable, we need to manage the back end of the fuel cycle. NE is committed to a consent-based approach to siting and a waste management system that builds in equity and environmental justice.

NE is currently focused on using a consent-based siting process to identify federal interim storage sites. The office is also developing high-tech railcars to transport the fuel and supporting research on high-burnup fuel to help fully manage the nation's spent nuclear fuel.

