

Advanced Nuclear Energy Recommendations

The current landscape of advanced nuclear reactors (including light-water small modular reactors, non-light water advanced reactors, and micro-reactors) features technologies and designs that expand the capabilities of today’s U.S. large light water reactor fleet. In addition to the potential to supply large volumes of carbon-free generation with a high-capacity factor, advanced reactor systems offer potential new benefits, such as additional inherent safety features, decreased waste production, more efficient use of fuel resources, and reduced material inputs. Advanced fission technology has the potential to help achieve deep carbon reductions in not only the electric power sector, but also the transportation, building, and industrial sectors due to its heat production capabilities, which can contribute to district and process heat, desalination, and hydrogen production.

In the United States, multiple vendors are pursuing the licensing and demonstration of advanced reactor designs. Despite some marked progress, developers are still several steps away from demonstrating the first-of-a-kind (FOAK) advanced nuclear reactors needed to enable broad commercial deployment. Challenges to commercial-scale demonstration and deployment of advanced reactors include risk aversion by potential customers, an insufficient fuel market, and the need for increased funding for research, development, and demonstration.

Continued support is necessary for advanced nuclear fission and fusion research and development in the next five years as these challenges are navigated. New funding to support demonstrations, deployment, and infrastructure will be critical in subsequent years so that advanced nuclear technologies can be commercially deployed during the time frames required for decarbonization of the electric power sector.

FY22 (Authorized Funding Levels and Programs)	FY22 (Recommended Funding Levels for Current and New Program Authorizations)	FY22-25 (Cumulative Recommended Funding Levels for Current and New Program Authorizations)
\$1,040,000,000	\$2,230,000,000 (\$25,000,000)*	\$9,145,000,000 (~\$125,000,000)*

**bracketed numbers represent funding levels that do not have corresponding authorizations*

A federal policy agenda for advanced fission and fusion should include action on research and development, demonstration, deployment, and infrastructure.

Research & Development

- Double appropriations to at least \$340 million per fiscal year for five years for the R&D of nuclear fission technologies that include the light water sustainability reactor program, advanced reactor technology program, and used nuclear fuel disposition program.
- Launch a Nuclear Affordability Initiative.
- Provide continued and expanded funding, up to \$900 million per fiscal year for the next 5 years, to ensure that the Versatile Test Reactor (VTR) will come online by 2026.
- Direct the Department of Energy (DOE) to provide grants to conduct studies for replacement and/or repowering of coal-fired power plants with advanced nuclear reactors.
- Ensure adequate funding and implementation of the applied fusion program at \$1.2 billion per fiscal year for the next five years within Fusion Energy Science in the Office of Science at DOE, as included in the Energy Act of 2020. (This recommendation is not captured in the above table).

Demonstration

- Establish multi-year funding sufficient to continually support the existing Advanced Reactor Demonstration Program (ARDP) as outlined by DOE.
- Provide continuing rounds of risk reduction awards to the projects granted awards under the first phase of the ARDP.
- Expand ARDP (ARDP 2.0) to fund additional projects, including additional awards for the commercial demonstration of three Generation IV reactor designs and a separate award for the commercial demonstration of two micro-reactor technologies that can be commercially deployed by 2027.
- Maintain funding for existing DOE programs benefitting advanced reactor development (e.g., advanced SMR cost-share).
- Support early development within these demonstration programs, including through access to national laboratory infrastructure.

Deployment

- Authorize the federal government to enter into virtual power purchase agreements of 10-30 years with advanced reactors.
- Authorize the federal government to support advanced reactor projects in competitive, organized wholesale markets where the offtaker is not a federal entity through a contract for difference (CfD) or virtual power purchase agreement (VPPA) mechanism.
- Extend existing tax credits or establish a new tax incentive for advanced reactor deployment that is authorized through at least 2035, is eligible for monetization, is transferrable, and allows project owners to take an investment tax credit (ITC) or production tax credit (PTC).
- Provide additional support under the loan guarantee program.
- Establish enterprise zones, grant or cost-sharing programs, and workforce retraining and infrastructure repurposing pilot programs that incentivize deploying advanced reactors at former coal plant sites.
- Support a High-Assay Low Enriched Uranium (HALEU) fuel market.

Infrastructure

- Provide additional and consistent funding (at least \$150 million per year for at least 5 years) to the Nuclear Regulatory Commission for advanced reactor licensing.
- Establish a new version of the standby support mechanism (Standby Support 2.0) for license reviews related to advanced reactors.
- Provide at least \$20 million per year in funding for at least 5 years to support ongoing activities and future infrastructure builds through the National Reactor Innovation Center (NRIC) and similar programs.

About the Carbon-Free Technology Initiative

The Carbon-Free Technology Initiative (CFTI) is focused on implementation of federal policies that can help ensure the commercial availability of affordable carbon-free, 24/7 power technology options by the early 2030s to help the electric power industry meet net-zero carbon reduction commitments. Participants in the CFTI include the Edison Electric Institute (EEI) and its member companies, Clean Air Task Force, Bipartisan Policy Center, Center for Climate and Energy Solutions, ClearPath, Great Plains Institute, Information Technology & Innovation Foundation, Nuclear Energy Institute, and Third Way.

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