

# Nuclear Power

## Background

Nuclear power is the nation's largest source of emissions-free electricity, accounting for 50.4 percent of domestic emissions-free electricity generation and 19.7 percent of total electricity generation. There are 93 reactors in 28 states. It is a reliable source of baseload (i.e., available most of the time) energy, operating with an average capacity factor greater than 90 percent. Given these characteristics, nuclear plays a significant part in ensuring reliable, zero-emissions electricity service.

In 2020, public power utilities generated 17 percent of their electricity from nuclear power. Public power utilities both own and operate nuclear reactors outright, or partner with other utilities to co-own a facility. In addition, public power utilities receive power from nuclear power plants through bilateral contracts, indirectly through electricity markets, or in the case of those located in the Tennessee Valley, by purchasing power generated by the Tennessee Valley Authority (TVA), which owns and operates several nuclear power plants.

The American Public Power Association (APPA) supports the continued use of nuclear power, a key source of baseload, emissions-free electricity. APPA believes the federal government should make the construction of an interim storage facility for nuclear waste in a willing host community a priority. The Department of Energy (DOE) must also follow its statutory obligations and construct a final repository for nuclear waste, whether at Yucca Mountain, or another location. APPA also believes that federal policies should continue to facilitate the construction of new nuclear facilities and further the development of advanced nuclear technologies, including small modular reactors (SMRs).

## Spent Nuclear Fuel

The United States has long searched for a solution to address the back end of the nuclear fuel cycle (also referred to as spent nuclear fuel or nuclear waste). In 1982, Congress passed the Nuclear Waste Policy Act (NWPA), which assigned responsibility to DOE to site, construct, and operate a final repository for spent nuclear fuel. In 1987, Congress amended the NWPA and designated Yucca Mountain as the sole site for DOE to consider, after conducting studies of nine potential sites.

As part of the NWPA, a surcharge of one-tenth of one cent was placed on electricity produced from nuclear power plants to fund the federal government's efforts to construct the final repository. Nuclear energy consumers, through this surcharge, paid a total of \$30 billion into the nuclear waste fund, or more than \$750 million per year. In 2008, DOE began pursuing a license with the Nuclear Regulatory Commission (NRC or Commission) to construct a facility at Yucca Mountain. However, despite spending nearly \$15 billion dollars on the project, in 2009, the Obama Administration eliminated funding for the project, and a year later, DOE moved to withdraw its license.

Due to the federal government's failure to fulfill its obligations under the NWPA to construct a repository, the U.S. Court of Appeals for the D.C. Circuit in 2013 ordered DOE to stop collecting the nuclear waste fee. Since 2013, there have been several efforts, both in Congress and through administrative actions, to move forward on the Yucca Mountain facility. These efforts have not been successful and both the issue of Yucca Mountain specifically, as well as the federal government's general obligation to create a permanent repository for spent nuclear fuel, remain unresolved.

The Biden administration does not support long-term storage of nuclear waste at the Yucca Mountain site and instead plans to pursue a consent-based siting process for interim spent fuel storage. In December 2021, DOE announced a request for infor-

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mation seeking public input on the best approaches to siting an interim storage facility for spent nuclear fuel. Given the lack of support from the Biden administration, as well as the opposition of the Nevada congressional delegation, it is very unlikely the Yucca Mountain site will ever open.

### Small Modular Reactors

SMRs are small nuclear reactors that will be able to generate up to 300 megawatts of power and be linked together to provide incremental power as load grows. SMRs could yield significant economic, energy security, and environmental benefits. They are expected to be an attractive option for generating electricity from a non-greenhouse gas emitting energy source and could provide utilities with flexibility through scalability and plant siting. Because of the potential benefits of SMRs, DOE has provided funding for the accelerated development and commercialization of this technology.

Several public power utilities are directly involved in the development of SMRs. The Utah Associated Municipal Power Systems (UAMPS), as part of its Carbon Free Power Project (CFPP), is working with NuScale Power to develop an SMR power plant at the Idaho National Laboratory in Idaho Falls, Idaho. In 2020, the NuScale Power SMR, called the VOYGR, became the first ever SMR to receive design approval from the NRC. It is expected that the first modules of the VOYGR-6 plant in Idaho will begin operation in 2029. Additionally, in May 2021, NuScale Power and Grant County Public Utility District (PUD) announced a memorandum of understanding to evaluate the deployment of NuScale's SMR technology in Washington.

In December 2019, TVA became the first utility to receive an early site permit to build and operate two or more SMR modules at the Clinch River Nuclear Site near Oak Ridge, Tennessee. In May 2021, TVA announced plans to provide engineering, operations, and licensing support to help Kairos Power develop its fluoride salt-cooled demonstration reactor in Oak Ridge, Tennessee. Additionally, in February 2022, TVA announced it would invest in a major advanced nuclear program, including formally exploring the construction of multiple advanced nuclear reactors, starting with the GE-Hitachi BWRX-300 SMR at the Clinch River Site.

In May 2020, DOE launched the Advanced Reactor Demonstration Program (ARDP) to demonstrate advanced nuclear reactor technology. Using cost-sharing partnerships with the private sector, the ARDP will provide \$160 million to build two advanced reactors that are operational within five to seven years. The program has awarded TerraPower and X-energy \$80 million

each to demonstrate the Natrium reactor, a sodium-cooled fast reactor, and the Xe-100, a high temperature gas-cooled reactor, respectively. Energy Northwest, a joint operating agency composed of 27 public utility districts and municipally owned public power utilities in Washington state, is a utility partner on the TerraPower project. Additionally, in April 2021, Energy Northwest, Grant County PUD, and X-energy signed a memorandum of understanding to evaluate and support the goal of siting, building, and operating an advanced nuclear power plant at an existing Energy Northwest site near Richland, Washington.

### Congressional Action

Provisions to support advanced nuclear power, including research on advanced fuels, advanced reactors, and fusion energy became law as part of the Energy Act of 2020, which passed in December 2020 as part of an omnibus appropriations and COVID-19 relief package. The law also appropriated \$250 million for the ARDP for fiscal year (FY) 2021.

The Infrastructure Investment and Jobs Act (P.L. 117-58), signed into law in November 2021, established a \$6 billion financial support program for existing nuclear reactors in competitive wholesale electricity markets that are projected to close due to economic factors. The law also authorized additional funding for the ARDP and appropriated \$2.4 billion to fund existing ARDP awards through FY 2025. In April 2022, DOE released more information about the financial support program for existing nuclear reactors, called the Civil Nuclear Credit Program (CNC). The first CNC award cycle will be available to nuclear reactors that had previously announced plant retirements. Future CNC awards, however, including a second award cycle planned for the first quarter of FY 2023, will not be limited to nuclear reactors that have already publicly announced intentions to close.

Both President Biden's FY 2022 budget request and H.R. 5376, the Build Back Better Act, which passed the U.S. House of Representatives in November 2021, included the creation of a production tax credit (PTC) for electricity generated from existing nuclear power plants. The Build Back Better Act would specifically allow for the refundable, direct payment of the nuclear PTC, making it available to public power utilities, which APPA strongly supports.

On nuclear waste, Representative Doris Matsui (D-CA) introduced H.R. 2097, the Storage and Transportation of Residual and Excess (STORE) Nuclear Fuel Act in March 2021. The STORE Nuclear Fuel Act would allow DOE to take title of commercial spent nuclear fuel for the purpose of transferring it to a consolidated interim storage location, developed either by a private entity or DOE. The bill would also establish a process for

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creating a consolidated interim storage site using consent-based agreements. In March 2021, Democratic members of the Nevada delegation, led by Senator Catherine Cortez Masto (D-NV) and Representative Dina Titus (D-NV), introduced the Nuclear Waste Storage Informed Consent Act (S. 541/H.R. 1524) to require the consent of Nevada's governor, impacted local governments, and impacted tribes before a permanent repository could be constructed at Yucca Mountain.

Finally, in December 2021, Senators Joe Manchin (D-WV) and John Barrasso (R-WY) introduced S. 3428, the Fission for the Future Act, which would require DOE to create a program to support the deployment of advanced nuclear technology to communities with retired or retiring fossil fuel generation resources.

## APPA Position

APPA supports the construction of a consolidated interim storage facility in a willing host community and the construction of a final repository for nuclear waste, including, but not limited to, Yucca Mountain. In addition, APPA supports federal efforts to further the development and deployment of SMRs and other advanced nuclear reactors, including the licensing and commercialization of such technologies, which will be needed to generate baseload, emissions-free electricity. Finally, APPA believes that tax-based incentives for energy, including a nuclear production tax credit, must be available to public power utilities.

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The American Public Power Association is the voice of not-for-profit, community-owned utilities that power 2,000 towns and cities nationwide. We represent public power before the federal government to protect the interests of the more than 49 million people that public power utilities serve, and the 96,000 people they employ. Our association advocates and advises on electricity policy, technology, trends, training, and operations. Our members strengthen their communities by providing superior service, engaging citizens, and instilling pride in community-owned power.