

ISSUE BRIEF June 2021

Nuclear Power



Background

Nuclear power is the nation's largest source of emissions-free electricity, accounting for 52.8 percent of domestic emissions-free electricity generation and 19.6 percent of total electricity generation. There are 94 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 2019, public power utilities generated 16.4 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 be enacted 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. Instead, Energy Secretary Jennifer Granholm said DOE will follow the recommendations of the 2012 Blue Ribbon Commission on America's Nuclear Future, including using consent-based siting to create interim spent fuel storage in a willing host community. Given the lack of support from the Biden administration, as well as the opposition of the Nevada congressional delegation, it is very unlikely the 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, is working with NuScale Power to develop an SMR power plant at the Idaho National Laboratory (INL) in Idaho Falls, Idaho. In 2017, NuScale Power, working in conjunction with UAMPS, submitted its design application to the NRC to approve its SMR commercial power plant design. This was the first-ever SMR design certification application to be submitted to the NRC. In August 2020, NuScale's SMR design became the first in history to receive NRC design certification approval. It is expected that the first NuScale SMR will begin operation in 2029. In May 2021, NuScale Power and Grant County Public Utility District 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. Additionally, 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.

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. In October 2020, DOE announced the program would award 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.

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.

In addition to a 25 percent increase for non-defense related nuclear programs at DOE, President Biden's FY 2022 budget request includes a proposal to create a production tax credit (PTC) for electricity generated from existing nuclear power plants. To qualify, the facility would have to demonstrate that



it is facing financial operating losses, have a good operational and safety record, and show that carbon dioxide would increase if a facility ceased operations. There is congressional interest in a nuclear PTC as well: during a Senate Finance Committee hearing to consider energy tax legislation on May 26, 2021, Senators Ben Cardin (D-MD), Sheldon Whitehouse (D-RI), and Bob Casey (D-PA) offered, but withdrew, an amendment to create a PTC for existing nuclear plants. The proposal may be revived later in the legislative process.

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. 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 establishing a consolidated interim storage site using consent-based agreements. Also in March, 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.

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 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.

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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 93,000 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.