

# 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, in 2013, the U.S. Court of Appeals for the D.C. Circuit ordered DOE to stop collecting the nuclear waste fee. Separately, on August 13, 2013, the court also ordered the NRC to use already obligated funds to resume its review of DOE's Yucca Mountain license, which the Commission had stopped doing in 2010.

In 2014, NRC staff finished a five-volume safety evaluation report and found Yucca Mountain to be a safe location for the long-term storage of spent nuclear fuel. However, the report recommended against NRC approval of the site until land and water rights were acquired and a supplement to DOE's environmental impact statement (EIS) was completed. While the NRC completed its own EIS in 2016, it is unlikely that other necessary actions for approval will be completed without DOE cooperation or congressional action.

The Trump Administration sought to revive the Yucca Mountain site for three years. However, in 2020, the President's fiscal year (FY) 2021 budget request did not include funding for Yucca Mountain and instead requested \$25 million for an interim storage program for spent nuclear fuel. The Consolidated Appropriations Act, 2021, included \$27.5 million for interim storage, of which \$7.5 million will come from the Nuclear Waste Fund. President Biden, while a candidate in 2020, stated

that he opposes storing spent nuclear fuel at Yucca Mountain. Given a lack of support of 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 have the potential to be an important addition to America's energy mix. They 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.

On February 19, 2016, DOE announced an agreement to support possible siting of an innovative SMR project at its Idaho National Laboratory (INL). The Site Use Permit allowed APPA member Utah Associated Municipal Power Systems (UAMPS) to access the INL site to analyze environmental, safety, and siting conditions to identify potential locations suitable for building its Carbon Free Power Project. 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 (DCA) to be submitted to the NRC. In August 2020, NuScale's SMR design became the first in history to receive NRC design certification approval.

Also, 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 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 Sodium reactor, a sodium-cooled fast reactor, and the Xe-100, a high temperature gas-cooled reactor, respectively.

### Congressional Action

Nuclear energy and nuclear waste policy remained important topics in the 116th Congress. In April 2019, Senators Lisa Murkowski (R-AK), Lamar Alexander (R-TN), and Dianne Feinstein (D-CA) introduced S. 1234, the Nuclear Waste

Administration Act. The bill would have established an independent agency to manage the country's nuclear waste program, implemented a consent-based process for consolidated storage facilities and a new long-term repository, and authorized the siting of a pilot storage facility for priority waste. A legislative hearing on the bill was held in June 2019, at which Chairman Murkowski lamented the stalemate on Yucca Mountain and suggested policymakers need to consider next steps on the disposition of nuclear waste. However, the bill received no further consideration.

Similarly, the Senate Environment & Public Works Committee held a hearing in May 2019 on a draft bill, the Nuclear Waste Policy Amendments Act of 2019, that aimed to advance the development of a permanent repository at Yucca Mountain and promote temporary nuclear waste disposal sites. Sponsored by Committee Chairman John Barrasso (R-WY), the legislation (S. 2917), was formally introduced in November 2019. The bill was similar to legislation introduced by Representatives Jerry McNerney (D-CA) and John Shimkus (R-IL) in May 2019 (H.R. 2699). In November, the House Energy & Commerce Committee approved H.R. 2699 by voice vote. Unfortunately, it was not considered by the full House. APPA supported this legislation because it is important that a permanent repository is established for the safe storage of spent nuclear fuel.

Bills designed to bolster advanced nuclear technologies also received bipartisan support during the 116th Congress. Most notable was S. 903, Nuclear Energy Leadership Act (NELA), authored by Senators Murkowski and Cory Booker (D-NJ). The bill aimed to promote the development of advanced nuclear reactors through investments in research and development, extending the maximum length of a federal power purchase agreement from 10 to 40 years, and requiring DOE to enter into at least one power purchase agreement with a commercial reactor by 2023.

NELA was approved by the Senate Energy & Natural Resources Committee in July 2019 and a companion bill (H.R. 3306) was introduced in the House in by Representatives Elaine Luria (D-VA), Denver Riggleman (R-VA), Connor Lamb (D-PA), and Rob Wittman (R-VA) in June 2019. APPA supported NELA because advanced nuclear reactors will be needed to generate emissions-free electricity and address climate change. Unfortunately, it was not enacted into law. However, the Consolidated Appropriations Act, 2021 included several provisions supporting advanced nuclear, including authorizing research on advanced nuclear fuels, advanced nuclear reactors, and fusion energy.

Finally, in December 2020, the Senate Environment & Public Works Committee passed the American Nuclear Infrastructure Act (S. 4897), a bipartisan bill authored by Committee Chairman John Barrasso (R-WY) and Senators Sheldon Whitehouse (D-RI) and Cory Booker (D-NJ) to establish an

Environmental Protection Agency (EPA) program to support existing nuclear reactors and prevent premature closure due to economic reasons. The bill would have also established a domestic uranium reserve and required the NRC to use previously reviewed information when licensing a proposed nuclear facility at the site of an existing nuclear facility. Later in December 2020, Representatives Adam Kinzinger (R-IL) and Mike Doyle (D-PA) introduced legislation similar to S. 4987, the Preserving Existing Nuclear Energy Generation Act (H.R. 9015), to establish an EPA program to support existing nuclear power plants.

### APPA Position

APPA supports the construction of a consolidated interim storage facility in a willing host community. The association also supports the creation of a congressionally chartered federal corporation dedicated to implementing the waste management program and 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.