

Massive Subsidies Support Advanced Reactor Design While Protecting Traditional Nuclear Plants

Advanced reactor technologies are gaining traction as nuclear energy is envisioned to play a key role in the clean energy movement.

Industry Insight

Policy developments around nuclear energy continue to evolve driven by new reactor technologies and the need for carbon-free power to support clean energy goals. Nuclear operators can **have their yellowcake and eat it too** as massive federal and state subsidies protect traditional nuclear power plants while underwriting the development of advanced reactors.

Illinois lawmakers have passed a **measure to repeal the existing ban on the construction of nuclear plants**. The state ranks first in the U.S. in nuclear generating capacity with 11 operating reactors, which produced 53 percent of the state's electricity net generation in 2021. Legislation enacted in 2021 puts the state on the path to 100 percent clean energy by 2050 and provides financial support for the states' existing nuclear plants at risk of closure due to market conditions.

The Nuclear Regulatory Commission (NRC) has issued a license allowing Holtec International to build and operate a consolidated **interim storage facility for spent nuclear fuel in New Mexico** despite the state's opposition. Holtec commended the move, which follows an eight-year process, underscoring that the license is the first in the nation for a below-ground storage system for consolidated interim storage. The state enacted legislation in March to ban the construction of such a facility without the state's consent. New Mexico Governor Michelle Lujan Grisham has voiced opposition to the project fearing that the state would become a dumping ground for the nation's spent nuclear fuel as the federal government has not yet identified a permanent disposal solution for commercial nuclear waste.

NRC has begun the process of **creating a regulatory framework for fusion energy systems**, building on the existing process for licensing the use of byproduct materials. Commission staff previously determined that fusion systems fall outside of the requirements to be regulated as nuclear reactors. Fusion systems would generate electricity from the energy released when hydrogen atoms are combined to form helium. Current nuclear reactors use the splitting, or fission, of uranium atoms. The fusion industry applauded the move as it would give fusion developers the regulatory certainty they need to innovate and develop the technology into a viable new energy source.




The U.S. Department of Energy (DOE) has issued application guidance for **the second award cycle of the \$6 billion Civil Nuclear Credit program (CNC)** established by the 2021 Infrastructure Investment and Jobs Act (IIJA) to prevent the premature retirement of nuclear reactors due to economic factors. With applications due by May 31, the second round of funding is available to reactors that are at risk of closure by the end of the four-year award period, including plants that stopped operations after Nov. 15, 2021. The first award cycle, which resulted in the selection of the 2.2-gigawatt (GW) Diablo Canyon nuclear power plant in California, limited eligibility to power reactors that had announced intentions to close within the four-year award period.

The **share of nuclear generation decreased from 20 percent in 2021 to 19 percent in 2022**, following the closure of the Palisades nuclear power plant, which could qualify for funding under the CNC's second award cycle.

The Virginia Department of Energy has announced a **study finding that southwest Virginia is an ideal location to develop advanced nuclear technology**. The department serves on the project team working toward the state's goal of having a small modular reactor up and running within ten years. The state has also enacted legislation supporting nuclear power including the creation of a nuclear innovation hub.

The Internal Revenue Service has issued guidance to establish a program for the allocation of credits for qualified investments in eligible qualifying advanced energy projects pursuant to the 2022 Inflation Reduction Act. **Examples of eligible advanced energy properties include specialized components and equipment for nuclear power reactors or their fuels**. The law established tax credits for nuclear power plants and zero-emission generating facilities placed into service after 2024. Eligible plants can receive a 10-year electricity production tax credit of up to 2.6 cents/kilowatt-hour or a 30 percent investment tax credit.

Key Takeaways

-  Illinois lawmakers have passed legislation to repeal the existing ban on the construction of nuclear plants.
-  Holtec International has received a federal license to build and operate an interim spent nuclear fuel storage facility in New Mexico despite the state's opposition.
-  NRC has voted to create a regulatory framework for fusion energy systems, opting to separate fusion energy regulation from nuclear fission.

Key Statistics



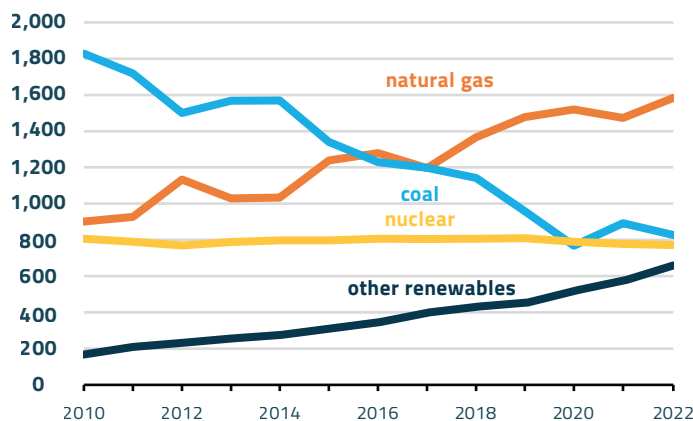
Losing Base

Nuclear-powered generation has remained relatively steady during the past decade because uprates at existing facilities have offset the retirement of several reactors. However, in 2022, nuclear electricity generation fell to its lowest level since 2012.

Generation from nuclear totaled 771 million MWh in 2022, according to the U.S. Energy Information Administration (EIA).

Net generation, United States, all sectors, annual (2010-2022)

million megawatt-hours



Sources: EIA, EnerKnol

Recent Actions: State-Level



IL Illinois Lawmakers Pass Legislation to Lift Ban on Nuclear Plant Construction

May 19, 2023 - The Illinois legislature passed a bill ([SB0076](#)) to repeal the state's ban on the construction of new nuclear power plants. The legislation would amend the Public Utilities Act to delete language, which states that there will be no new nuclear power plant construction or issuance of certificate or authorization until the Environmental Protection Agency has determined that the U.S. government has approved a technology or means for the disposal of high-level nuclear waste or until the general assembly approves such construction by statute.

ME Maine Bill Would Require Study of Nuclear Power Plant Construction

April 5, 2023 - Maine lawmakers are considering legislation ([LD689](#)), which would establish a working group to study and report on the opportunity for and the benefits of and barriers to the construction of a nuclear power facility in the state to provide a source of clean and reliable energy.

VA Virginia Study Identifies Potential for Advanced Nuclear Technology

May 22, 2023 - The Virginia Department of Energy [announced](#) a study, which finds that southwest Virginia is an ideal location to develop advanced nuclear technology. The department serves on the project team working toward the state's goal of having a small modular reactor up and running within ten years. The Virginia Energy Plan, [released](#) in October 2022, calls for the deployment of the nation's first small, modular reactor in Southwest Virginia within the next 10 years and the creation of a nuclear energy innovation hub. The plan calls for an "all of the above" approach that taps nuclear, natural gas, renewables, and new energy sources, and is based on five main guiding principles: reliability, affordability, innovation, competition and environmental stewardship. The U.S. Department of Energy estimates the deployment of an SMR could create over \$100 million in new local tax revenue over an 18-year-period. The lifespan of this nuclear technology is 40-years. A 300-megawatt SMR can power 150,000 homes.

Virginia Enacts Legislation to Support Nuclear Energy Development

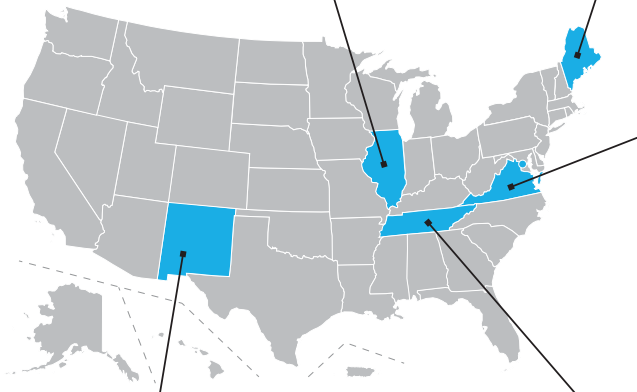
March 23, 2023 - Virginia Governor Glenn Youngkin, a Republican, signed into law a suite of bills aimed to boost a range of energy technologies including nuclear power. [HB 2386](#) creates the Virginia Power Innovation Fund to support research and development of innovative energy technologies, including nuclear, hydrogen, carbon capture and utilization, and energy storage, including the creation of the Virginia nuclear innovation hub. [HB 1779](#) establishes the Nuclear Education Grant Fund and Program to award grants on a competitive basis to any public institution of higher education or private institution of higher education that seeks to establish or expand a nuclear education program.

NM New Mexico Law Bans Spent Nuclear Fuel Storage

March 17, 2023 - New Mexico enacted legislation ([SB 53](#)) banning a spent nuclear fuel facility in the state. The bill prohibits the state, a political subdivision of the state or an entity or authority created by a joint powers agreement shall not issue, approve or certify a permit, contract, lease or license necessary for the construction or operation of a disposal facility for spent fuel or high-level waste until the state has consented to or concurred in the creation of the disposal facility or a repository is in operation.

TN Tennessee Governor Issues Order to Create Nuclear Advisory Council

May 16, 2023 - Tennessee Governor Bill Lee signed an executive order creating the Tennessee Nuclear Energy Advisory Council, which will provide recommendations to facilitate a nuclear energy ecosystem for the future. The council will recommend actions in four key areas: legislative, policy and budgetary changes to address regulatory, workforce or education barriers to support nuclear energy facilities; funding opportunities for state government, local governments and the private sector; storage and waste practices that conserve natural resources; and federal actions that the state should pursue with federal partners and agencies.



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Recent Actions: Federal



NRC NRC Examines Rule Changes to Reflect Advanced Reactor Export Licensing

May 16, 2023 – NRC is **considering** initiating a rulemaking to more clearly incorporate advanced reactor concepts into its regulations that govern the export of nuclear material and equipment. In March, commission staff requested a rulemaking plan for the implementation of changes to reflect advanced reactor export licensing considerations. Staff said that such a move would reduce regulatory uncertainties associated with the deployment of equipment and substances associated with advanced reactors and ensure predictability and efficiency in the licensing reviews of export applications.

NRC Grants License for Holtec's Spent Fuel Storage Facility

May 9, 2023 – NRC **issued** a license authorizing Holtec International to construct and operate a consolidated interim storage facility for spent nuclear fuel in Lea County, New Mexico. The license authorizes the company to store 500 canisters holding approximately 8,680 metric tons of commercial spent fuel for 40 years. The company plans to eventually store up to 10,000 canisters in 19 subsequent phases with each expansion phase requiring a license amendment with additional NRC safety and environmental reviews. The commission has previously issued similar licenses for away-from-reactor storage installations. Private Fuel Storage received a license in 2006, but was never constructed. The NRC issued a license in September 2021 to Interim Storage Partners LLC for a proposed storage site in Andrews, Texas, but the company has not yet initiated construction.

New Mexico Governor Michelle Lujan Grisham and Attorney General Raúl Torrez issued a joint statement following the decision by the U.S. Nuclear Regulatory Commission to grant a license to Holtec International for an interim storage facility for spent nuclear fuel.

"This decision by the NRC – which has been made despite the grave concerns of the state and the legislature over the project's potential impacts to health, safety and the economy – is incredibly disappointing. It also undermines the NRC's alleged commitment to meaningful engagement with stakeholders, as it appears our concerns were wholly ignored and went unaddressed by Holtec and the NRC.

NRC Looks at Updates to Environmental Reviews for Nuclear License Renewals

April 20, 2023 – NRC is **weighing** (NRC-2018-0296) comments on proposed rules to amend regulations that govern its environmental reviews of operating license renewal applications for nuclear power plants under the National Environmental Policy Act. The proposal would update the commission's 2013 findings on the environmental effect of renewing operating licenses.

NRC to Regulate Fusion Systems Based on Byproduct Material Facilities

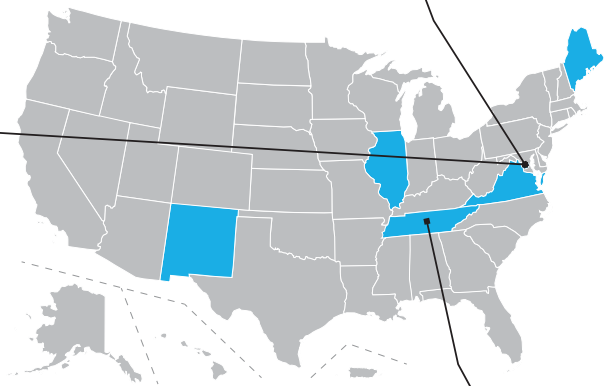
April 14, 2023 – The Nuclear Regulatory Commission **directed** its staff to create a regulatory framework for fusion energy systems, building on the existing process for licensing the use of byproduct materials. In January, the staff suggested three options for the regulation of fusion energy systems: a utilization facility approach, a byproduct material approach, and a hybrid approach, which would introduce decision criteria under either of the first two approaches based on an assessment of potential hazards. The action is intended to provide regulatory certainty for the technology given the growth in pilot-scale commercial fusion designs. Under the limited-scope rulemaking approved under Option 2, the staff should take into account the existence of fusion systems that have already been licensed and are being regulated by the Agreement States, as well as those that may be licensed prior to the completion of the rulemaking. The move follows commission staff's determination that fusion systems fall outside of the requirements to be regulated as nuclear reactors. Fusion systems would generate electricity from the energy released when hydrogen atoms are combined to form helium. Current nuclear reactors use the splitting, or fission, of uranium atoms.

DOE DOE Releases Reports on Pathways to Accelerate Decarbonization

March 21, 2023 – DOE **released** the first three of a set of reports, called Pathways to Commercial Liftoff reports, assessing how the U.S. can decarbonize by 2050 through massive deployment of hydrogen, advanced nuclear and energy storage. By 2030, the reports concluded that cumulative investments must increase to about \$300 billion across the hydrogen, nuclear, and long duration energy storage sectors, with continued acceleration until 2050 to remain on track to realize long-term decarbonization targets. The report on advanced nuclear indicates that the U.S. domestic nuclear capacity has the potential to scale from ~100 GW in 2023 to ~300 GW by 2050 – driven by deployment of advanced nuclear technologies. However, the nuclear industry is currently "at a commercial stalemate between potential customers and investments in the nuclear industrial base needed for deployment," which puts decarbonization goals at risk. Waiting until the mid-2030s to deploy at scale could lead to missing decarbonization targets and/or significant supply chain overbuild. Further, the report finds that advanced nuclear technology has the potential to deliver new economic opportunities for traditional energy producing communities that already have pre-existing power generation infrastructure, such as coal communities.

DOE Seeks Applications for Second Cycle of \$6 Billion Nuclear Credit Program

March 2, 2023 - DOE **issued** application guidance for the second award cycle of the \$6 billion CNC program established by the IIJA to prevent the premature retirement of nuclear reactors due to economic factors. The second round of funding is available to reactors that are at risk of closure by the end of the four-year award period, including plants that stopped operations after Nov. 15, 2021. The first award cycle limited eligibility to power reactors that had announced intentions to close within the four-year award period. Last November, DOE conditionally selected the Diablo Canyon Power Plant in California to receive the first round of funding from the CNC Program. The guidance describes the timelines, deliverables, and information required to apply for certification and submit bids to receive allocated credits. Congress appropriated \$1.2 billion in each of fiscal years 2022 through 2026 for the CNC Program. These appropriations will be available for allocations of credits until spent or Sept. 30, 2031, whichever occurs first.



TVA TVA Announces Multi-Party Agreement to Accelerate SMR Deployment

March 23, 2023 – The Tennessee Valley Authority (TVA) **announced** a technical collaboration agreement with Ontario Power Generation (OPG), Synthos Green Energy (SGE), and GE Hitachi Nuclear Energy (GEH) to invest in the development of the GEH BWRX-300 SMR design. GEH anticipates a total investment of around \$400 million associated with the development. Under the agreement each will fund a part of the cost and collectively form a Design Center Working Group to ensure the standard design is deployable in multiple jurisdictions. The long-term goal is for the design to be licensed and deployed in Canada, the U.S., Poland and beyond. TVA is preparing a construction permit application for a BWRX-300 at the Clinch River Site near Oak Ridge, Tennessee and exploring additional sites in the TVA service area for potential SMR deployments. The reactor design is focused on lowering construction and operating costs below other nuclear power generation technologies.

Industry Voices

NRC Decision to Create a Regulatory Framework for Fusion Energy

The Fusion Industry Association commended the decision saying that it “will give fusion developers the regulatory certainty they need to innovate while they grow fusion energy into a viable new energy source, while also most effectively protecting the safety, security, and health of the public.” Fusion energy would be regulated under the same regulatory regime as particle accelerators. “Such an approach listed under the byproduct materials regulatory regime (10 CFR Part 30), would separate the regulatory oversight of fusion from the utilization facilities regime (10 CFR Parts 50 & 52) that regulate nuclear fission energy,” the group noted.

NRC License Issuance for Holtec’s Spent Nuclear Fuel Storage Facility in New Mexico

New Mexico Governor Michelle Lujan Grisham and Attorney General Raúl Torrez, in a joint statement, expressed disappointment over the decision saying that it “undermines the NRC’s alleged commitment to meaningful engagement with stakeholders, as it appears our concerns were wholly ignored and went unaddressed by Holtec and the NRC.”

Upcoming Events

May 31,
2023

DOE Civil Nuclear Credit Program

The U.S. Energy Department is due to receive applications for the second award cycle of the \$6 billion Civil Nuclear Credit program. The second round of funding is available to reactors that are at risk of closure by the end of the four-year award period, including plants that stopped operations after Nov. 15, 2021. The first award cycle limited eligibility to power reactors that had announced intentions to close within the four-year award period.

July 10,
2023

NRC Advanced Power-Reactor Applications

NRC is due to receive comments on a draft interim staff guidance to help determine whether an application for a non-light water reactor design that uses the Licensing Modernization Project process meets the minimum requirements for construction permits, licenses, and other certifications.

Policy Monitors



DOE

Civil Nuclear Credit Program Related Documents



NRC

News Releases



IRS

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