

Nuclear energy in

By Matt Crozat

President Biden signed the Infrastructure Investment and Jobs Act (IIJA) into law in November 2021. Commonly known as the “bipartisan infrastructure bill,” this legislation included significant investments in civilian nuclear energy in the U.S. along with a range of other spending initiatives. The law directs funding to preserve the operation of nuclear plants facing the prospect of early closure, demonstrate new advanced reactors, and explore the ability of nuclear energy to produce hydrogen for other energy applications. Additional incentives to retain and expand the use of nuclear energy are still being considered in Congress, but the IIJA is law, and the Department of Energy is beginning the process of implementing its key provisions.

Civil Nuclear Credit Program

The IIJA created a new program within the DOE aimed at countering the pressures leading to the early closure of nuclear plants in the U.S. As of this writing, 12 reactors have permanently ceased operation over the past decade, mostly due to economic pressures. An additional 20 reactors were facing closure before state governments took action to ensure they were being valued more appropriately. The IIJA includes \$6 billion for the DOE to establish a Civil Nuclear Credit Program to provide funding for plants that might be forced to close without such support.

The legislation requires a nuclear reactor owner to submit an application to the DOE that documents the expected revenues from electricity sales and other services as well as the forecasted costs to operate the reactor. The DOE must review the information in the application to certify that the reactor is at risk of closing. Owners of certified reactors submit bids to the DOE that include how much electricity the reactor will produce over a four-year period (the span of the award) and the financial shortfall that the credit will need to cover for the plant to remain in operation. The program will receive applications in 2022 and again in subsequent years.

This past April, the DOE issued guidance to explain the specifics of how the first round of applications will work. The initial tranche of funding will be available to reactors that had announced their plans to close prior to the legislation being signed into law and that have not rescinded their closure

plans. This definition would at least include Entergy’s Palisades plant in Michigan, which was set to close in May, and Pacific Gas & Electric’s two units at Diablo Canyon in California, which are slated for closure in 2024 and 2025. Both Gov. Gretchen Whitmer of Michigan and Gov. Gavin Newsom of California have expressed openness to using the Civil Nuclear Credit Program as a means of keeping these reactors in operation. As of this writing, it is unclear if the closure plans for these reactors will be reversed.

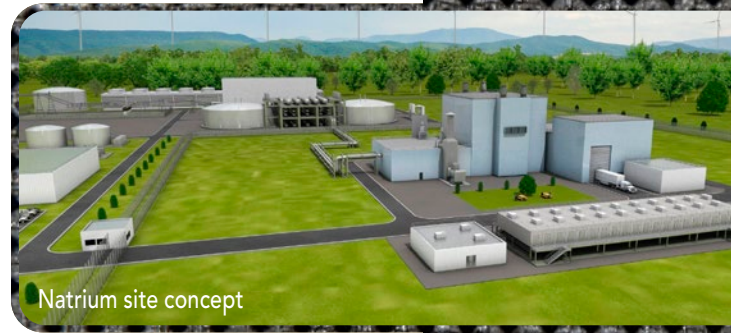
The DOE has announced that a second round of applications will be accepted in the first quarter of fiscal year 2023, which begins on October 1. This set of applications will likely be less restrictive regarding which reactors can be eligible for certification. Reactors that have participated in state programs to preserve nuclear operation will have the opportunity to apply for funding from the Civil Nuclear Credit Program that can offset funds provided by their states.



infrastructure law

Support for advanced reactors

The IIJA includes \$2.4 billion to fund the demonstration of advanced reactor technologies. The DOE's Advanced Reactor Demonstration Program had selected two projects for funding in October 2020. TerraPower's Natrium sodium-cooled fast reactor is going to be deployed at the site of a retiring Wyoming coal plant, while X-energy will build a four-pack of its XE-100 high-temperature, gas-cooled reactor in Washington state. Both projects are proceeding in cost-sharing agreements between the DOE and the project developers. The \$2.4 billion in the IIJA represents assured funding for the DOE's share of the construction costs. This is a notable change from most other DOE cost-sharing arrangements in which the department will make selections, but funds must subsequently be provided through Congressional appropriations each year. The prepaying of the DOE's share removes a key uncertainty in project development.



Hydrogen production

The IIJA provides \$8 billion to establish at least four regional clean hydrogen hubs. These hubs will be expected to combine low-carbon hydrogen production with industrial and other consumers that will use that hydrogen in place of fossil fuels. The law explicitly requires that at least one of these hubs must demonstrate the use of nuclear energy to produce clean hydrogen. The DOE is in the process of implementing this program and is likely to provide additional information about the criteria for projects to receive awards.

These investments are very good news indeed for the nuclear community. The IIJA opens the way for the continued production of clean electricity—via the current generation of reactors as well as the next—and for reduction of carbon output thanks to a nuclear-assisted boost to the hydrogen economy. ☒

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