



TVA is investing in the exploration of new nuclear technology

TVA is pursuing advanced nuclear technology as a significant component of TVA's and the nation's clean energy efforts.

Benefits of New Nuclear

SAFETY

New nuclear technologies offer advanced, passive safety systems for improved safety and security.

100% CARBON-FREE, 24/7 RELIABLE POWER

Nuclear energy is carbon-free and can run all day, every day. For this reason, it pairs well with intermittent renewable energy sources. In fact, advanced nuclear technology has the versatility to serve as baseload power or as a complement to renewables.

TVA's New Nuclear Program

In August 2024, TVA's Board of Directors authorized an additional \$150 million for TVA's New Nuclear Program to advance reactor development and licensing. This is an investment of \$350 million total since the launch of the New Nuclear Program in February 2022.

- The New Nuclear Program provides a disciplined, systematic roadmap for TVA's exploration of advanced nuclear technology, both in terms of various reactor designs being proposed and potential locations where such facilities may be needed in the region to support future energy needs—as outlined in [TVA's Strategic Intent and Guiding Principles](#).
- TVA is uniquely positioned to support carbon-free energy goals at the national level and provide energy security to the federal facilities it serves across the Tennessee Valley, without adversely affecting generation reliability or unreasonably raising energy costs for our customers.
- TVA can leverage recent and ongoing experience in constructing and operating large-scale energy projects, including completing Watts Bar Nuclear Unit 2 in 2016.

JOB CREATION

Construction of new nuclear technologies, like a small modular reactor, will create thousands of highly-skilled jobs and bring capital investment to the region. TVA is looking at the possibility of multiple SMR deployments beyond the Clinch River Nuclear Site.

RESILIENCE

Resilient energy sources are critical to the businesses and services that rely on them. Having a resilient power source during energy disruptions can save billions in costs, maintain critical services, and save lives.

Clinch River Nuclear Site

- TVA has the nation's first early site permit for small modular reactors from the Nuclear Regulatory Commission (NRC) for the Clinch River Nuclear Site.
- Advanced reactor designs under evaluation for the Clinch River Site Advanced Nuclear Technology Park include both light-water and non-light-water cooled reactors, with more than a dozen vendors providing TVA detailed information to support the Programmatic Environmental Impact Statement.
- Light-water reactor technology is considered most ready for deployment near-term. TVA's New Nuclear Program is preparing an NRC construction permit application for a BWRX-300, small modular reactor at the Clinch River Nuclear Site, subject to required environmental reviews and Board approval.
- TVA's efforts are supporting a path from first-of-kind technology deployment to cost effective commercial deployment at scale, but additional support and collaboration will be needed.

Advanced Nuclear Technologies

TVA's New Nuclear Program is looking at a variety of advanced nuclear technology options that might help meet both our near- and long-term generation needs including small modular reactors (SMRs). Some SMR designs, such as the BWRX-300, use elements of proven technology and new innovations that simplify construction, maintenance, and operations to achieve a cost efficient and reliable design. These designs can also leverage the existing nuclear supply chain, including fuel supply, to increase cost effectiveness and reduce risk.

Small modular reactors (SMRs) are advanced reactors, such as the BWRX-300, with an electric generating capacity of up to 300 MW, in contrast to an average of about 1,000 megawatts for existing commercial reactors.

Government and Policy Support

Government and policy support is needed to realize the benefits of new nuclear. First-of-a-kind nuclear technology, like any innovative technology, carries financial and technical risks better shared by multiple partners. Key national, regional and industry leaders have partnered with TVA and are supportive of its plans for advanced nuclear technology. Federal government support is also essential to the advancement of first-of-a-kind technology deployment, due to the risks and additional costs that are inherent to the technology deployment process. In order to reach its long-term net-zero carbon emissions aspirations, TVA will need to consider multiple clean energy technologies, including SMRs, and government support will be critical to timely deployment of SMR technologies in the United States.

Technology Collaboration

We cannot pursue new nuclear technology alone; this must be a national effort that we do in partnership with other utilities, research institutes, and state and federal governments.



HITACHI

Developer of the BWRX-300 design being evaluated for deployment. TVA also has a two-party agreement with GE Hitachi as an early step, not a design selection, to support planning and preliminary licensing for a potential deployment of a BWRX-300 small modular reactor at the Clinch River Nuclear Site. This agreement will help inform a future decision about deployment and enable the refinement of cost and schedule estimates to support a future decision on project authorization.

**ONTARIO POWER
GENERATION**

Participating in the BWRX-300 SMR design for deployment in Canada; two years ahead of TVA's proposed deployment timeframe. OPG and TVA have a collaboration agreement that facilitates sharing of experiences that could reduce the financial risks of innovating new technology while taking advantage of both companies' extensive nuclear energy experience.

synthos
green energy

Participating in the BWRX-300 SMR design being evaluated for deployment in Poland. Orlen Synthos Green Energy and TVA have a collaboration agreement that facilitates sharing of experiences that could reduce the financial risks of innovating new technology.



Participating in the BWRX-300 SMR design being evaluated for deployment at Clinch River Nuclear Site or potential future sites.





In [April 2022](#), TVA joined a consortium assembled by Kairos Power with other North American utilities (including Bruce Power, Constellation, and Southern Company) to help further develop the Kairos Power advanced fluoride salt cooled high temperature reactor (KP-FHR). TVA was already supporting Kairos Power through an agreement from [May 2021](#) to provide engineering, operations, and licensing support to help Kairos Power deploy its low-power demonstration reactor, named Hermes, at the East Tennessee Technology Park (ETTP) in Oak Ridge, Tennessee, only a few miles from TVA's Clinch River Nuclear Site.



In March 2022, TVA and ORNL [announced](#) a partnership to promote, pursue, evaluate, and demonstrate the feasibility, operability, and affordability of utility-scale carbon-free technologies. Under the agreement, the entities will explore light water SMRs and fourth-generation advanced nuclear reactors, building on the partners' 2020 advanced reactor technology MOU.



TVA and UT [announced an agreement](#) in April 2020 to explore new nuclear technologies with the support of UT's advanced modeling and simulation tools. This collaboration supports the evaluation and potential demonstration and operation of light-water or non-light-water fission reactors that build on the success of the current generation of reactors and will also leverage the expertise of UT's nuclear engineering department. This partnership also provides a unique opportunity to engage with students and prepare the nuclear workforce of the future.