

Duke Energy's nuclear strategy - spanning license renewals, uprates, advanced reactor development and industry partnerships - positions the Carolinas to meet rapidly growing demand with reliable, low-cost, baseload power, while maintaining flexibility for future technology decisions and safeguarding long-term energy security.

Five decades of operational experience

Duke Energy has operated nuclear plants for more than 50 years in the Carolinas, consistently setting industry benchmarks for safety and efficiency. With 11 reactors at six sites, Duke Energy operates the largest regulated nuclear fleet in the nation.

- Brunswick Nuclear Plant (Southport, NC) – 1,870 MW
- Harris Nuclear Plant (New Hill, NC) – 964 MW
- McGuire Nuclear Station (Huntersville, NC) – 2,316 MW
- Catawba Nuclear Station (York, SC) – 2,310 MW
- Oconee Nuclear Station (Seneca, SC) – 2,554 MW
- Robinson Nuclear Plant (Hartsville, SC) – 759 MW

Nuclear power keeps energy affordable. Nuclear plants are among the lowest cost generation resources to operate. In 2024, federal nuclear production tax credits generated more than \$500 million in customer savings.

License renewals protect long-term energy security

Extending the operating life of current units is the most cost-effective way to support future demand. The Nuclear Regulatory Commission (NRC) licenses a nuclear power plant for an initial 40 years. License renewals allow for an additional 20 years. A Subsequent license renewal (SLR) enables plants to extend operations from 60 to 80 years.

Near-term milestones

- Oconee Nuclear Station: Received Nuclear Regulatory Commission (NRC) approval for 80-year of operation in 2025.
- Robinson Nuclear Plant: Subsequent License Renewal (SLR) application submitted in 2025.
- Brunswick Nuclear Plant: Subsequent License Renewal (SLR); submission planned for late 2026.
- Harris Nuclear Plant: Current operating license is through 2046; an SLR will be sought for operation through 2066.

Upgrades add low-cost capacity quickly

Duke Energy is increasing nuclear generation output through targeted extended power upgrades to the tune of 300 additional megawatts. Upgrades are regulated, permanent increases in a nuclear power plant's NRC-licensed power output. By upgrading equipment, optimizing systems and using enhanced analyses, utilities increase generating capacity to meet higher electricity demand with existing infrastructure at a fraction of the cost of new generation.

Recent & planned power upgrades

- Oconee Nuclear Station added nearly 46 MW in 2024.
- Brunswick Nuclear Plant will add 26 MW by 2029.
- McGuire Nuclear Station and Catawba Nuclear Station will add a combined 225 MW by 2031.

New nuclear projects to meet future growth

Duke Energy continues to make progress on near-term activities to support potential advanced nuclear deployment, maintaining the option of bringing small modular reactors (SMRs) or large light-water reactors online to meet growing system needs and in line with scheduled coal unit retirements. To meet long-term demand, Duke Energy is exploring the deployment of new nuclear technologies.

Small Modular Reactors (SMRs)

SMRs are advanced, compact nuclear reactors with a power capacity of up to 300 MW per unit - roughly one-third of traditional reactors - designed for factory fabrication, transportability and scalable deployment.

After two years of development, Duke Energy submitted an Early Site Permit (ESP) application to the NRC for the Belews Creek site in December 2025, which they accepted. The ESP is technology-neutral, preserving flexibility to select a design later.

The ESP resolves environmental and safety issues up front and confirms the site suitability before committing to construction. While it doesn't commit Duke Energy to building new nuclear on the site, it is a strategic step to keep advanced nuclear options for customers and communities.

Large Light-Water Reactors (LLWRs)

The preferred sites for LLWRs are the W.S. Lee site, in Cherokee County, SC and the Harris site, in Wake County, NC. However, if a decision is made in the future to construct large light-water reactors at the Belews Creek site, the early site permit could be revised to include large light-water reactor designs.

In 2016, Duke Energy received NRC licenses to build two Westinghouse AP1000® units at the W.S. Lee site. The licenses are valid for 40 years, and the company continues to maintain the licenses and optionality for future construction and operation of two units at the site.

The other preferred site in the Carolinas for LLWRs, the Harris site, is currently home to a 964 MW, single-unit Westinghouse pressurized water reactor (PWR) that has safely and reliably operated since 1987. In 2008, Duke Energy applied to the NRC for two AP1000® units to be built at the site. In 2013, Duke Energy requested the NRC to suspend review of the application due to changing market factors.

The company continues to submit semiannual and annual reports to the NRC. These activities maintain the option to restart development of an updated application for the Harris site to obtain a combined operating license in the future using the existing application as a launch point.

Industry collaboration

Duke Energy is collaborating with others in the industry to integrate best practices from nuclear industry peers, lessons from major new-build projects and the latest research. These partnerships help Duke Energy evaluate and develop new nuclear power, helping to inform the Integrated Resource Planning (IRP) process.

Duke Energy is working with the Tennessee Valley Authority (TVA) and GE Hitachi to accelerate SMR deployment through a joint, public-private application for a Department of Energy (DOE) grant aimed at supporting Gen III+ SMR technology, which will allow them to share best practices with other utilities.

The company has also joined an advisory group for the Sodium reactor, a 345 MW advanced sodium-cooled fast reactor paired with a molten salt energy storage system being developed by TerraPower and GE Hitachi.