

TVA is Laying the Foundation for the Clean Energy Economy

At TVA, we are reducing emissions within our own operations and investing in new technologies to accelerate a clean energy economy and the electrification of many sectors. We've cut carbon emissions by 57% in 2021 from 2005 levels, and our residential power rates are lower than those paid by nearly 80% of the top 100 utilities. Looking ahead, we see a path to reduce carbon emissions an approximate 80% by 2035.

We're building infrastructure for electric vehicles, upgrading our system to enable distributed energy resources, reviewing our own assets and partnering to bring clean energy companies to our seven-state region.

We have a shared outcome many stakeholders are working to achieve: a cleaner energy future – one that continues to prioritize cost, reliability and resiliency as we transition to innovative solutions and create economic opportunity for all. And we're engaging and collaborating with stakeholders to identify and implement solutions that will advance us toward our shared goal. To reach net-zero carbon requires not only leveraging all the tools in our toolbox, but also new tools that may become available. We are working to go farther, faster, but this will be driven by the development of innovative energy solutions.

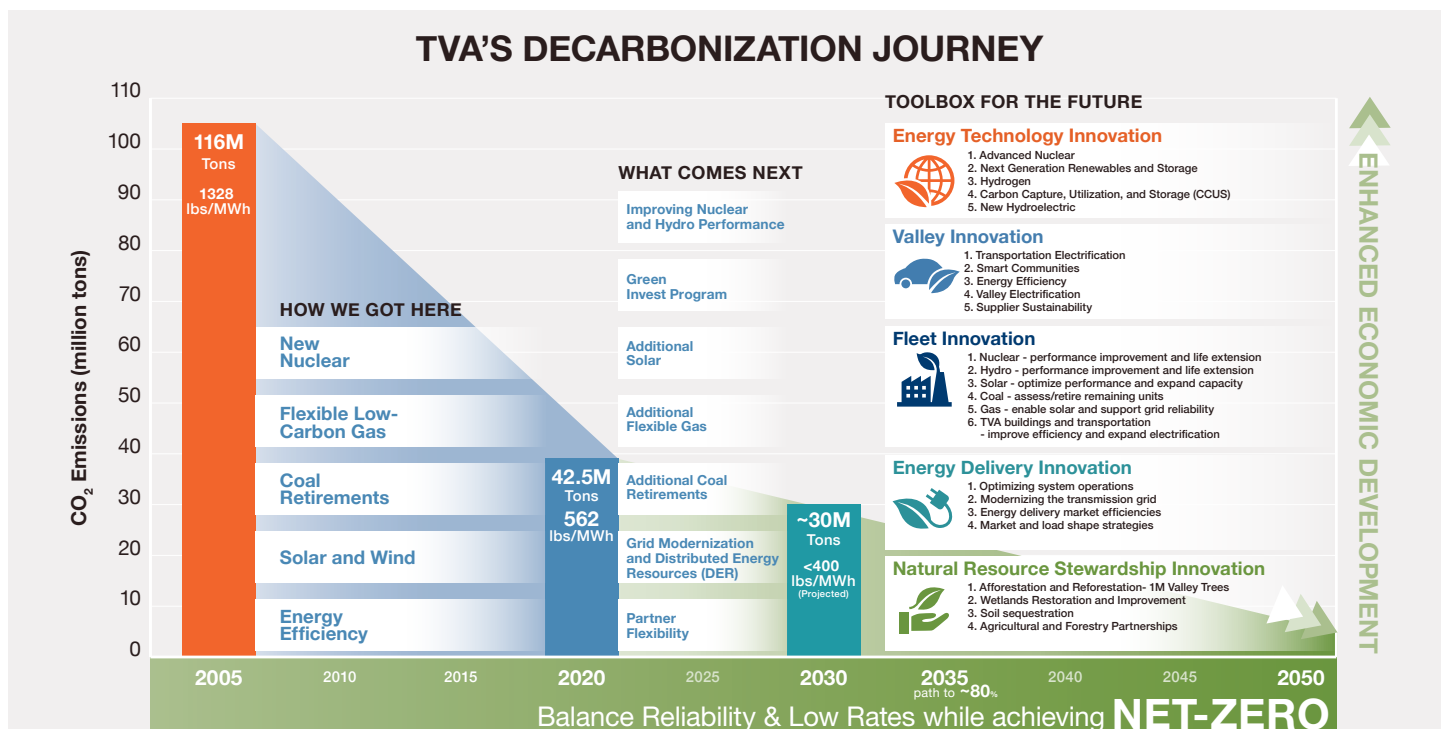
Our focus is having a diverse fleet of assets that will provide flexibility and ensure reliability as we accelerate our industry-leading transition. This is consistent with the TVA Act's least-cost planning requirement.

TVA has reduced carbon emissions by 57% in 2021 from 2005 levels, and is on a path to an approximate 80% reduction by 2035, while maintaining residential rates lower than 80% of other utilities.

The energy system of the future

We're taking a three-fold approach to planning and building the energy system of the future.

- **Investing:** We are continually investing in our current generating assets, such as nuclear and hydro upgrades, to make them run more efficiently.
- **Evaluating:** We are following the NEPA process on projects around the region, soliciting public comment and suggestions on options, like retirement and replacement generation.
- **Exploring:** We are exploring, testing and pursuing innovative technologies to further reduce carbon emissions while keeping rates low and the power reliable.



Transitioning our generation fleet: Cumberland Fossil Plant

As part of this approach, we are evaluating all of our assets to ensure we are well positioned for the future. We apply a rigorous, detailed and data-driven process aligned with the National Environmental Policy Act (NEPA) that provides opportunities for public input. We look at many important factors beyond the assets themselves, including reliability, resiliency, environmental justice, climate, location, flexibility, risk and cost which can create energy burden.

We're exploring a wide range of options for the Cumberland Fossil Plant in Cumberland City, Tenn. and as part of this process, we developed a draft Environmental Impact Statement (EIS) to outline various paths to consider as we move forward. The plant was built between 1968 and 1973 – has a summer net capability of 2,470 megawatts.

TVA is looking to replace approximately 1,450 megawatts of generation – enough to power 780,000 homes – at the Cumberland Fossil Plant, reducing reliance on coal.

The draft EIS assesses the impacts associated with the retirement of the Cumberland fossil plant and the potential construction and operation of alternative replacement generation. The document considers the continued operation of the current plant, as well as three alternatives that involve retiring both units at the plant and replacing the generation from one of the retired units. A summary and comparison of each scenario are included in the table.

Cumberland Draft EIS Alternatives

Summary	No Action Alternative Keep coal plant running	Alternative A Natural gas combined cycle plant <i>*Preferred alternative*</i>	Alternative B Two simple cycle combustion turbine natural gas plants	Alternative C ¹ Solar and storage
Timing for Retirement of First Coal Unit	Continue running the plant with upgrades to comply with new environmental regulations	Retirement of one unit as soon as 2026, but no later than 2030, and the second unit as soon as 2028, but no later than 2033		
Timing for Replacement Generation for Initial Coal Unit	N/A	Fastest alternative for replacement generation	+2-4 years for project timeline relative to Alternative A – extensive transmission upgrades required	+3 or more years for project timeline relative to Alternative A – extensive regional transmission upgrades and large number of projects
Cost Considerations	+\$42 million	Basis for comparison	+\$737 million	+\$2.3 billion
Carbon Reduction <i>(Improvement in 2030 from a 2005 baseline)</i>	7 percentage points worse <i>Requires carbon-emitting coal units to run</i>	Basis for comparison <i>Most efficient resource and allows optimization of full system dispatch</i>	1 percentage point worse <i>Requires less efficient units to run compared to combined cycle plant</i>	1 percentage point better <i>Requires less efficient, carbon-emitting resources to run to manage intermittency</i>
Reliability Considerations <i>(All alternatives must maintain system reliability)</i>	Challenged material condition; dependable year-round capacity	Dependable year-round capacity; regional transmission support	Dependable year-round capacity	Maintaining dependable year-round capacity requires storage and system upgrades
Land Impact	Maintains and uses existing site	Uses existing TVA-owned, brownfield site; requires 32-mile natural gas pipeline lateral; pipeline right-of-way to leverage existing TVA transmission right-of-way	Uses existing TVA-owned, brownfield site; leverages existing natural gas service with minor upgrades; requires new 40-mile right-of-way for transmission line	Requires significant land for solar and storage sites – ~22,500 acres in total; requires 35-mile right-of-way for transmission infrastructure

1. The solar proposed in Alternative C is above and beyond the 10,000 MWs of solar TVA is working to achieve by 2035.

Preferred Alternative: Alternative A – combined cycle

We will continue to evaluate all three viable alternatives during our environmental review. Based on the information TVA has evaluated to date and aligned with NEPA guidance, best practices and our commitment to be transparent with all interested stakeholders, we have identified the preferred alternative as the natural gas combined cycle alternative (Alternative A).

The current Cumberland site is the best candidate location for a combined cycle facility because it is an existing TVA brownfield site with existing transmission access and can be connected to natural gas supply via construction of an approximately 32-mile natural gas pipeline. Alternative A was also selected because a natural gas plant could be built and operating sooner than other replacement options, which reduces economic, reliability and environmental risks. TVA will consider incorporating solar generation or environmentally friendly features, such as a pollinator habitat at the Cumberland site in the future.

Natural gas enables renewables

For more than 85 years, TVA has produced clean, low-cost, energy, that has brought new investments and economic opportunities for the region. In addition to over 10% of energy from hydroelectric generation, TVA is leveraging increased market demand for renewable energy solutions to drive economic development while also providing energy system and environmental benefits for our region. We are investing in solar, with a goal of 10,000 MW by 2035, and developing business and residential solutions to increase the availability and reduce the cost of renewable energy.

Changes to our generation mix must address our obligations – balancing cost and reliability, and the drive to reduce carbon emissions for the region and our nation. Natural gas assets are the least-cost option to provide year-round dispatchable power to serve system reliability and solar integration needs, even with increased natural gas prices in the near-term.

Solar and wind resources need to be paired with gas and/or storage to provide equivalent, year-round dependability – a key consideration when comparing the costs of these resources. While solar and batteries are becoming more competitive, collectively they are still more expensive compared to natural gas alternatives, and supply chain challenges are introducing both cost and timeline risks for these resources.

\$1.4 billion in capital investment brought to the region through TVA's Solar Strategy

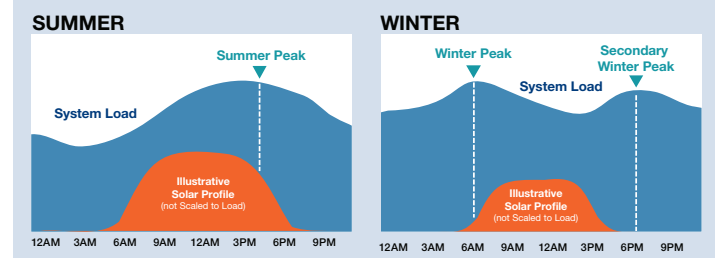
Facilitated more than **4,000 solar installations** with operational and contracted solar capacity totaling **more than 2,800 MW by 2024**, pending environmental review, working toward a goal of **10,000 MW of solar by 2035**.

Providing more than **1 million people access to community solar projects**

20 MW Vonore Battery Energy Storage System online by late 2022

TVA is a dual-peaking utility, meaning that it could experience the highest annual peak days in the summer or in the winter. During the winter, the peak typically occurs around 7:00 a.m., when solar resources are not generating. As such, battery storage and/or natural gas additions would be needed to provide year-round replacement capacity, especially during the winter.

Solar Contributes to Summer but not to Winter Peaks



Next steps

While all alternatives are potential options, Alternative A is identified as TVA's preferred alternative; however, the NEPA process will inform any final decision. TVA expects to publish a final EIS in fall 2022.