Leadership & Innovation on a Path to Net-Zero

TVA and the Energy System of the Future

TVA TENNESSEE VALLEY AUTHORITY

FORWARD-LOOKING STATEMENTS

This document contains forward-looking statements relating to future events and future performance. All statements other than those that are purely historical may be forward-looking statements. In certain cases, forward-looking statements can be identified by the use of words such as “may,” “will,” “should,” “expect,” “anticipate,” “believe,” “intend,” “project,” “plan,” “predict,” “assume,” “forecast,” “estimate,” “objective,” “possible,” “probably,” “likely,” “potential,” “speculate,” or other similar expressions. TVA believes that the assumptions underlying the forward-looking statements are reasonable. Numerous factors could cause actual results to differ materially from those in the forward-looking statements. For a discussion of these factors, please see the annual, quarterly, and periodic reports that TVA files with the Securities and Exchange Commission. New factors emerge from time to time, and it is not possible for management to predict all such factors or to assess the extent to which any factor or combination of factors may impact TVA’s business or cause results to differ materially from those contained in any forward-looking statement. TVA undertakes no obligation to update any forward-looking statement to reflect developments that occur after the statement is made. Reporting: All references to years in this Carbon Report refer to the calendar year ending December 31, unless specifically identified as fiscal year, which ends September 30. Unless stated otherwise, all carbon numbers in the carbon report are based on TVA’s system performance, which includes owned and purchased electricity. All financial data is reported in U.S. dollars. This report contains key measures of the progress being made and describes our strategies for the future. TVA is committed to continual improvement in reducing environmental impact and modernizing the electricity grid to support new technologies.

Publication Date: May 6, 2021
Reporting Period: January 1, 2020 - December 31, 2020
Contact: sustainability@tva.gov

Leadership & Innovation on a Path to Net-Zero

TVA and the Energy System of the Future

We plan to continue to achieve deep carbon reduction in the decades to come

as we build the energy system of the future, never compromising the low rates and high reliability that sustain the communities we serve.

Executive Summary

Since 1933, TVA has worked with many partners—communities, farmers, businesses, governments, local power companies and others—to serve the people of the region and make life better. We continue to execute on that mission today through our commitment to leadership and innovation in energy, the environment and economic development. TVA is an industry leader in carbon reduction, and we plan to continue to achieve deep carbon reduction in the decades to come—all the while, never compromising the low rates and high reliability that sustain the communities we serve. We are committed to working with our partners in the Tennessee Valley to accelerate the clean energy economy. As a federal agency, we also are committed to advancing federal goals set forth by the new administration.

TVA is the nation's largest public power provider. In partnership with 153 local power companies, TVA supplies energy across 80,000 square miles for 10 million people and 750,000 businesses. We also directly serve 56 large industrial customers, including military installations and U.S. Department of Energy facilities. TVA operates the nation's second-largest transmission system and the nation's third-largest nuclear fleet. In environmental stewardship, TVA manages the region's public lands and waters, including the Tennessee River system for flood control and other benefits.

TVA is the clean energy leader of the southeastern United States today. In FY 2020, nearly 60% of electric power in TVA's service territory came from carbon-free sources—the largest percentage of clean power produced by any southeastern utility. TVA has one of the largest, most diverse and cleanest energy-generating systems in the nation. We have maintained 99.999% reliability to customers since 2000 while keeping rates low, reducing carbon emissions and bringing online additional renewable energy.

TVA's commitment to carbon-free energy aligns with our mission of service. This commitment strengthens our ability to attract major businesses that create jobs and support economic growth in the Valley, and it enhances partnerships with businesses seeking to meet their own ambitious sustainability goals. It also protects the Valley's natural resources, the Tennessee River system and our public lands for future generations.

We are excited to continue our work reducing our carbon footprint. The largest contributor to TVA's carbon footprint is emissions from the creation of electricity, mostly by burning fossil fuels. Carbon intensity, or rate—the amount of carbon emitted per megawatt of energy created—is the primary metric we use to benchmark our performance year over year. In 2020, TVA achieved approximately 63% reduction in its mass carbon emissions compared to 2005 baseline standards. We have a plan to increase that number to 70% by 2030, and see a path to achieve approximately 80% reduction by 2035, through innovation and technologies that we believe will deliver meaningful, impactful progress. We aspire to achieve net-zero carbon emissions by 2050 and to support broader national efforts to decarbonize the economy.

As TVA electricity becomes increasingly clean, our local power company partners and the Tennessee Valley benefit from lower carbon emissions while still enjoying low rates and steady power reliability. As TVA reduces its carbon footprint, the carbon footprint of the Tennessee Valley goes down by virtue of TVA's cleaner portfolio. For example, if you were a purchaser of TVA power in 2005 and still are today, you have reduced your carbon footprint from electricity use by 63%.

TVA is a regional leader in carbon reduction today, and our progress is driven by investments in technology and projects that will decarbonize our operations over future years. This work has and will continue to move us toward a clean energy economy, one that provides good jobs for residents today and in the future.

In CY 2020, TVA's rate was 562 lbs/MWh; Mass was 42.5M tons; and Clean Energy Percentage was 59%

*Mass is in US Short Tons

3 Ways We Report on Carbon

Carbon is typically measured in three ways:

RATE (lbs/MWh)

which calculates the pounds of carbon emitted per megawatt hour of electricity delivered.

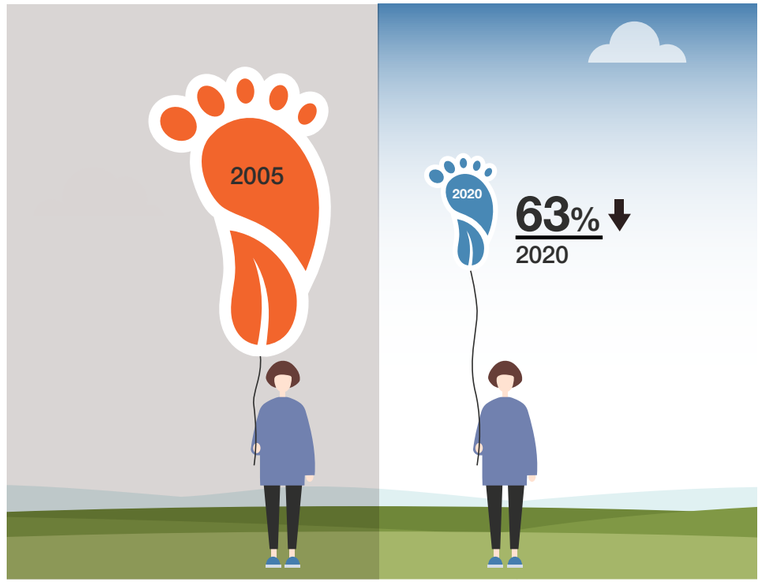
MASS (tons)

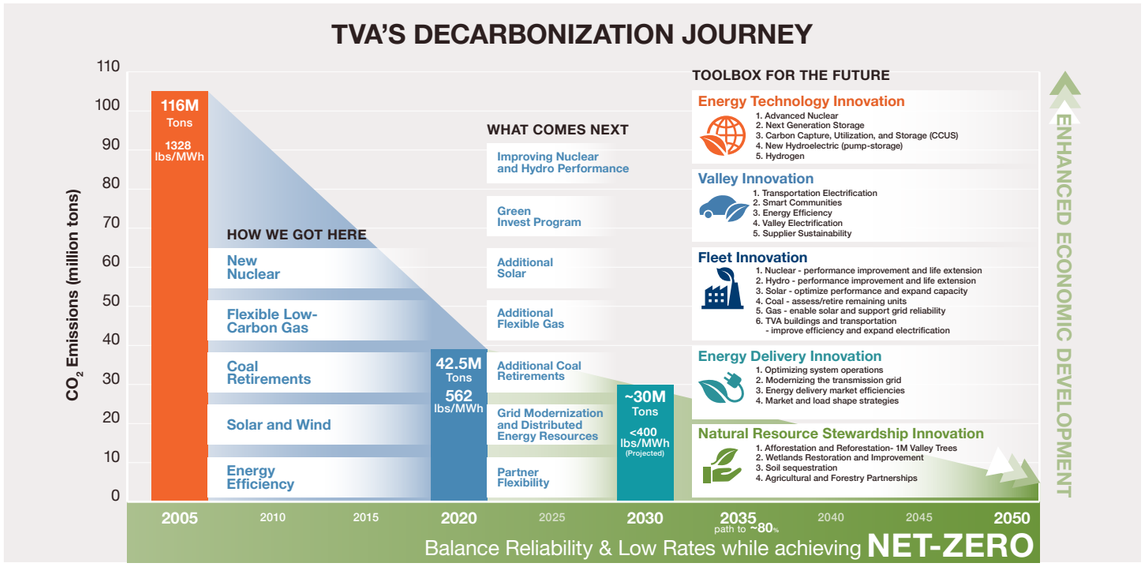
which refers to the total amount of carbon emitted.

CLEAN ENERGY

which reflects percentage of total energy from carbon-free sources: hydro, wind, solar and nuclear.

TVA'S REDUCTION IN MASS CARBON EMISSIONS SINCE 2005





Recent investments include renewable energy projects driven by Green Invest customers including Facebook and Google, that have helped attract companies to the Valley, our work that has brought online new nuclear generation at our Watts Bar facility, and our drive to continuously do things better. This report provides information on numerous areas of research and innovation as well as improvements we are evaluating to reduce carbon even further while igniting Valley investment in a clean energy economy.

We are committed to achieving deep carbon reductions without compromising the low rates and high reliability that sustain the communities we serve. Low rates and reliability are critical to achieving economy-wide deep decarbonization by enabling and encouraging the massive electrification required.

We recognize that the urgency of this work is growing. The Valley is increasing its use of electricity, and we want to be ready to meet the energy needs of the future while also reducing our carbon footprint even further. Both our carbon intensity and the Valley's absolute carbon footprint will drop as we work together to significantly reduce carbon emissions.

We are optimistic that by staying focused and working closely with partners in the Valley, we can make this transition together. We will seek to protect energy reliability and affordability while partnering with other stakeholders in the creation of a clean energy economy. We will need partnerships from the states, businesses, communities and individuals like you.

Low carbon, low rates, high reliability, and innovation—that's TVA.

CEO Message

TVA is the clean energy leader of the southeastern United States today. But we aren't satisfied. We are committed to continuing this leadership by innovating and collaborating with communities in the Tennessee Valley to create a clean energy economy that delivers deep carbon reductions without compromising the reliability and low rates that sustain the communities we serve.

The Tennessee Valley public power model delivers unmatched value with low and stable rates, 99.999% reliability, an award-winning economic development program and the stewardship of the Tennessee River and its public lands. We have a robust and diverse energy portfolio that includes the highest amount of renewable generation assets in the Southeast, with expectations of continued growth in our renewable portfolio.

This report outlines the ways that TVA is collaborating across the seven-state region to create a clean energy future. Today, TVA has reduced its mass carbon emissions by 63% from 2005 levels. We will build on TVA's leadership in carbon emissions reductions through targeted research to support development and deployment of carbon-free technologies. We will partner with communities to support the decarbonization of the Valley through electrification and efficiency, and we will do all of this without losing sight of reliability and affordability.

TVA's dedicated employees—engineers, scientists and experts—are working to meet the challenges and opportunities inherent in this energy transition. Our long-standing mission of service drives and inspires us daily to pursue new ideas and innovative solutions that improve our service to you. We are supporting cutting-edge research in new nuclear and hydrogen generation, energy storage options and grid modernization to support even more renewables and effectively operate with lower carbon emissions. We are also exploring connected communities, electric vehicles, and forest sequestration options and other partnering opportunities.

In addition to lowering overall carbon emissions from the electric system, we want to grow the region's clean energy economy and ensure that the transition benefits all of our communities and consumers. At the same time, we know we must stay aligned with our statutory mission and environmental policy, use the best available science, address growing customer demand for ever-cleaner energy, continue to attract and retain jobs and investment in the Valley, collaborate to find solutions, and measure and share progress with all of our stakeholders.

Our approach to climate change and managing our carbon footprint is based on TVA's long history of service and leadership. We are committed to meeting today's challenges by providing significant carbon reductions, driving and deploying innovation, and ensuring resiliency through proactive adaptation. We are a leader in providing reliable, affordable, and increasingly cleaner energy, and we are building the energy system of the future.

Jeff Lyash
President & CEO
TENNESSEE VALLEY AUTHORITY

We meet our carbon reduction goals while protecting high reliability and low rates.

TVA's focused efforts to build a robust, diverse power generation mix have led to a 63% reduction in our mass carbon emissions since 2005.

Leadership Today

TVA's shift toward a more diverse generation mix has helped keep rates flat and has significantly reduced TVA's carbon emissions. TVA's current generation mix emitted 63% less carbon in 2020 compared to 2005 levels (measured in tons emitted). Such performance, which places TVA in the top quartile for carbon reductions nationally, can be attributed to a strategically diversified generation portfolio that relies increasingly on clean nuclear, gas, hydro, solar and energy efficiency. This cleaner energy mix continues to deliver on TVA's obligation to provide power at rates as low as feasible.

Efforts that contributed to these carbon reductions include the addition of 1600 MW of new, zero emission nuclear generation between Watts Bar Unit 2 and extended power uprates at all three Browns Ferry units, and an investment of $436 million in energy efficiency programs since 2011. By 2023, TVA will have retired approximately 8600 MW of coal generation.

In addition, TVA offers the highest amount of renewable energy generation in the Southeast. We generate nearly 50 percent more renewable energy than our nearest competitor. We've contracted for 2,300 MW of utility-scale solar generation through the second quarter of FY21, and have announced almost $2.7 billion in solar investments to meet the needs of customers. As part of a long-term partner agreement, we are enabling local power companies (LPCs) to generate up to 5% of their energy through renewable and other energy sources to provide local solutions for their customers. This initiative could add up to 2,000 MW of solar if all LPCs were partners and utilized the maximum allowable capacity.

To manage resiliency and reliability with increased renewable energy on the system, TVA announced a battery-storage demonstration project at Vonore, Tennessee, that will be online in 2023. This project will help us understand how best to utilize batteries for balancing renewables and optimizing the transmission system. These learnings will help us to effectively plan for the future grid.

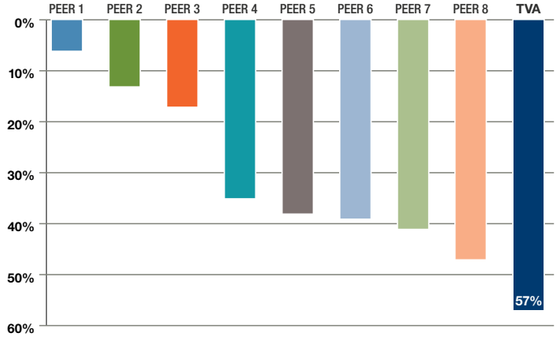
To increase availability and reduce the cost of renewable energy, TVA has developed TVA Green, a comprehensive portfolio of renewable solutions to meet the sustainability goals of business and residential customers. TVA offers these programs through local power companies.

To reduce its own energy usage and associated carbon emissions, TVA has an Internal Energy Management Program that identifies, funds, implements and tracks energy and water conservation projects at TVA's own buildings across the Valley. Since 2008, TVA has completed energy efficiency improvements, reducing cumulative energy usage by nearly 733 gigawatt hour (GWh), which is enough energy to power 50,000 average homes for a year. TVA's CO_2 emissions savings as a result of these improvements was 518,500 metric tons of CO_2e or equivalent to reducing emissions from 110,100 gasoline-fueled passenger vehicles driven for one year. This represents a lifetime energy and maintenance savings of $50 million. Typical projects might include replacing or retrofitting outdated light fixtures, upgrading to more efficient HVAC equipment and control systems, repairing water leaks and making architectural improvements that increase the efficiency of buildings.

These focused efforts, in addition to other generating fleet changes, have reduced TVA's carbon emissions from approximately 116 million (M) tons of carbon emitted each year in 2005 to 42.5 M tons emitted in 2020. We did this with an effective electric rate lower today than it was a decade ago, with fuel and purchased power costs about $1 billion lower and operating and maintenance costs reduced by a sustainable $800 million. In addition, TVA met its commitment to reduce debt to $21.8 billion by FY 2023 three years earlier than planned, with debt currently at its lowest level in 30 years. In addition, and most importantly, TVA continues to deliver power supply reliability of 99.999%.

PERCENT REDUCTION IN CO_2 EMISSIONS (TONS)

2005-2019



*Annual CO_2 emissions normalized by generation. Data captures emissions only from owned or controlled generation capacity and is reported on a calendar year basis. Data Sources: U.S. Energy Information Administration, U.S. Environmental Protection Agency.

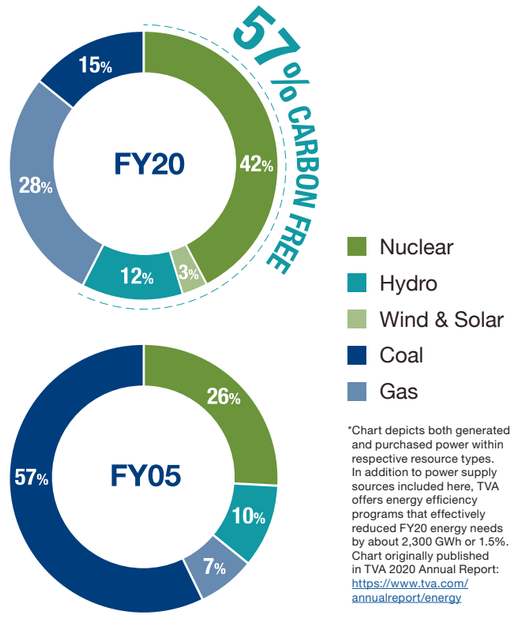


*Chart depicts both generated and purchased power within respective resource types. In addition to power supply sources included here, TVA offers energy efficiency programs that effectively reduced FY20 energy needs by about 2,300 GWh or 1.5%. Chart originally published in TVA 2020 Annual Report: https://www.tva.com/annualreport/energy

TVA / GREEN

GREEN CONNECT

helps residential customers who are ready to commit to a rooftop solar system (with or without battery storage) connect with quality installers. Customers have access to objective information and a network of quality installers, as well as receive installation verifications to ensure their systems are installed to TVA Green Connect standards.

BENEFITS: free program, unbiased information, access to quality solar installers, educational resources, and installation verified by independent third party.

GREEN FLEX

enables businesses with high energy consumption to quickly meet their sustainability goals at a lower cost through bulk purchase of out-of-Valley wind to reduce the impact of electricity consumption, support renewable energy and become a leader in sustainability.

BENEFITS: fast implementation, no sign-up fee, no infrastructure required, one-year commitment, low-cost bulk purchase (minimum of 2000 Renewable Energy Certificates), and Green-e™ certification.

GREEN INVEST

is a proven, award-winning model that offers business and industry an effective, timely and cost-competitive solution to aggressively meet their sustainability goals. The program matches customer-driven commitments for renewable energy with new-to-the world, in-Valley renewable projects by leveraging a competitive procurement process.

BENEFITS: new-to-the world utility-scale solution, lowest-cost renewables option, competitive procurement, site specific, project aggregation, in-Valley, and Green-e® certified.

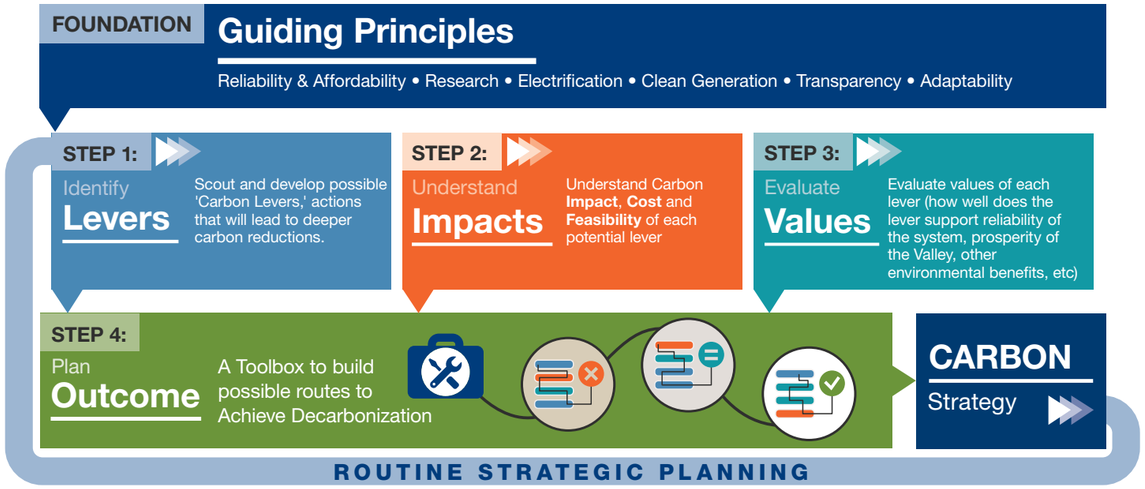
GREEN SWITCH

provides the easiest solution for customers to power their homes or businesses through 100% renewable energy. For as low as $2 per month, customers can match some or all of their current electricity use with a mix of solar, wind and biogas sources located here in the Valley.

BENEFITS: no long-term commitment, no upfront costs, no additional infrastructure, and Green-e® certified.

TVA has built a framework to evaluate clean energy options.

We are currently evaluating over 30 “levers,” or actions, that could lead to deeper carbon reductions. Our analysis helps us understand the potential impacts and benefits of each lever.

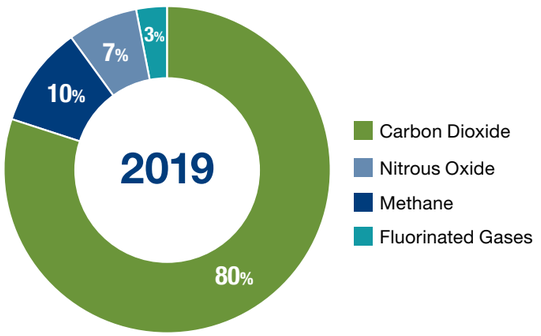


Framework to Evaluate Clean Energy Options

The clean energy future of the Valley requires both innovative and broad thinking. We need to understand Valley interests and needs, how we can address environmental and social justice concerns, and how TVA’s power mix supports economic development and carbon competitiveness.

Transportation and electricity generation are the two largest emitters of CO_2 in the United States and in the Tennessee Valley, followed by industry and agriculture. Developing alternatives to reducing emissions in all of these sectors, while creating a stronger economy, are keys to a broader decarbonization approach.

OVERVIEW OF GREENHOUSE GAS EMISSIONS



Source: *Overview of Greenhouse Gases | Greenhouse Gas (GHG) Emissions | US EPA*

TVA believes that moving toward a low-carbon future for itself and the region is in the best interest of the Tennessee Valley. We also recognize that low rates and strong reliability are critical to achieving economy-wide decarbonization by enabling and encouraging the large scale electrification required.

A clean energy economy is necessary for the Valley to remain competitive and thrive in the coming decades. Increasingly, industrial and commercial businesses are setting ambitious sustainability goals and measures to address climate change. The low and decreasing carbon content of TVA’s electricity is a significant advantage in attracting these companies that provide jobs and invest in the Valley. TVA and LPC offerings for renewable energy, electrification and energy management solutions take this advantage to the next level.

Achieving deep carbon reductions while maintaining a reliable supply of power to all consumers regardless of weather conditions is a very difficult goal, given the current system and economics involved. Achieving net-zero in the upcoming decades is only feasible by expediting technology development.

This is why we are engaging our best minds to develop a robust analysis of carbon reduction “levers,” or actions, that TVA could implement, either by itself or with partners, that would lead to deeper carbon reductions for the region. We are currently evaluating over 30 large and small actions to understand their impact on carbon, technical feasibility, cost, commercial readiness, and how well they support our greater mission and strategic priorities. Potential levers cover a broad spectrum and include such actions as increasing energy efficiency in the Valley; adding more battery storage; converting conventional combustion turbines to green hydrogen use; terrestrial carbon sequestration; electrification of transportation; and advanced nuclear energy. They are a mix of technologies that are available now, technologies that we are actively researching, and creative ideas for changing how we do business that could reduce carbon emissions. In addition, TVA also is exploring how best to encourage cost-effective carbon reductions through our project planning and management tools.

We are evaluating these carbon reduction options against a framework of multiple potential benefits to ensure that our stakeholders—whether they are residential customers, industrial customers, or local power companies and communities—get the best value for our investments and decisions. The first step of the framework process is identifying potential levers to lower or eliminate carbon emissions. We continue to seek new ideas and opportunities and partner with research labs and universities to make sure we are exploring new possibilities. The second step includes evaluating the impacts of each lever—the feasibility, cost and carbon reduction impact. As technologies change and develop, this analysis can change as well. The third step includes measuring each lever against a set of values and asking ourselves questions such as “How does this impact our other operations? Does this lever negatively impact certain socio-economic sectors? Does this lever drive economic development in the Valley? Are there other environmental benefits to this lever?” All of this leads to the creation of a toolbox of actions and preparation which moves us toward deeper carbon reduction. Our analysis is a continuing process and helps provide a holistic view of the options moving forward.

It’s a complex equation, but TVA is moving rapidly to holistically reduce or eliminate carbon emissions through a wide range of actions focused on evolving power generation in the Valley, enabling new technologies such as energy storage and carbon capture, and other actions to support TVA achieving net-zero emissions. We also will partner with Valley communities to help reduce other sources of carbon emissions in the Valley. We are exploring a myriad of carbon levers to influence TVA’s and the Tennessee Valley’s carbon footprint.

While there is not a single initiative, we have identified guiding principles that we know will be part of any carbon reduction plan. TVA will:

GUIDING PRINCIPLES

1. **Prioritize the needs of Valley stakeholders as we work to achieve our goals by maintaining low rates and high reliability, and attracting new jobs in the Valley.**
2. **Use best-available science and support research and policies that further carbon-free dispatchable technologies.**
3. **Partner with our long-term local power company customers and other customers and communities to support economy-wide decarbonization efforts and the strategic electrification of other sectors, such as transportation.**
4. **Maintain nuclear generation, hydro generation and a strong transmission grid as key enabling assets.**
5. **Be transparent with stakeholders in measuring and sharing our progress, and listen and work effectively with all our stakeholders to understand their priorities and needs.**
6. **Adapt to new technologies and changing policies, and be willing and open to change our plans and projects to achieve deep carbon reduction.**

What is Net-Zero?

Net-zero refers to a state where the amount of carbon emitted is balanced by carbon removed from or offset in the atmosphere.

Any emissions produced from TVA owned or controlled generating stations, other operational activities and from TVA's purchased energy are balanced by an equivalent amount of carbon removal, and, potentially, offsets.

TVA is analyzing the lever options to understand their possible carbon impacts, costs and feasibility (time and effort needed), in addition to other values the lever might offer. The charts below provide graphical depiction of this analysis. TVA and its partners look to a number of factors to prioritize our work.

CARBON REDUCTION OPTIONS- PILOT ANALYSIS OF VALUE

	Other Environmental Benefits	Power System Benefits	Partnerships Potential	Economic Development Benefits	Economic Prosperity	Supports Valley Customers	Technology Readiness	Scalability	Environmental Justice
Option 1	✓	=	✓	✓	✓	✓	✓	✓	✓
Option 2	=	=	✓		✓	✓	✓		✓
Option 3	=	✓	=	✓	✓		✓	✓	✓
Option 4		=	✓	=	=	✓	✓	✓	=
Option 5	=	=		=	=	=	✓	✓	=
Option 6	=		✓	✓	✓	✓		✓	✓
Option 7	=	✓	=	✓	✓	✓	✓	✓	

✓ = Meets / Yes = = Meets Some / It depends

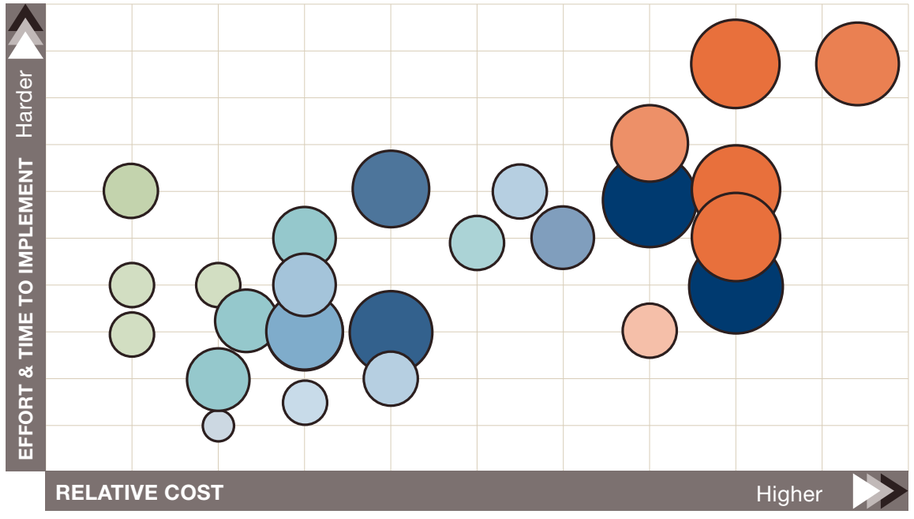
Energy Technology Innovation

Valley Innovation

Fleet Innovation

Energy Delivery Innovation

Natural Resource Stewardship Innovation



Larger size bubble represents larger carbon emission reductions; data is generalized based on preliminary analysis

Carbon Reduction Toolbox

Energy Technology Innovation

1. **Advanced Nuclear**
2. **Next Generation Storage**
3. **Carbon Capture, Utilization, and Storage (CCUS)**
4. **New Hydroelectric (pump-storage)**
5. **Hydrogen**

Valley Innovation

1. **Transportation Electrification**
2. **Smart Communities**
3. **Energy Efficiency**
4. **Valley Electrification**
5. **Supplier Sustainability**

Fleet Innovation

1. **Nuclear - performance improvement and life extension**
2. **Hydro - performance improvement and life extension**
3. **Solar - optimize performance and expand capacity**
4. **Coal - assess retirement of remaining units**
5. **Gas - enable solar and support grid reliability**
6. **TVA buildings and transportation - improve efficiency and expand electrification**

Energy Delivery Innovation

1. **Optimizing system operations**
2. **Modernizing the transmission grid**
3. **Energy delivery market efficiencies**
4. **Market and load shape strategies**

Natural Resource Stewardship Innovation

1. **Afforestation and Reforestation- 1M Valley Trees**
2. **Wetlands Restoration and Improvement**
3. **Soil sequestration**
4. **Agricultural and Forestry Partnerships**

After TVA identifies potential levers, or actions, to lower carbon emissions, evaluates the impacts of each lever and measures the values of each lever, the next step is to create a toolbox of actions that will move us toward deep carbon reduction. We have identified five key areas of innovation that will be part of the toolbox, each of which is described in its own section below: Energy Technology Innovation, Valley Innovation, Fleet Innovation, Energy Delivery Innovation and Natural Resource Stewardship Innovation.

TVA is evaluating carbon reduction options against a framework of multiple potential benefits to ensure that our stakeholders get the best value for our investments and decisions. These benefits may include projects that support energy justice, aid economic development, bring additional environmental benefit or align with community efforts. Each toolbox section below includes a preliminary view of cost, feasibility and potential carbon impact for each lever.

Energy Technology Innovation

TVA is investing heavily in research and development. Our brightest minds are working with partners to explore a wide range of no-carbon and low-carbon dispatchable technologies that are affordable, reliable and would lead to further decarbonization.

New cost-effective technologies have enhanced our company's progress in transitioning our region's generating fleet and reducing carbon emissions. For at least the next decade, solar, battery and natural gas technologies will continue to serve a growing portion of our energy needs while reducing carbon emissions and saving our customers money. However, renewable generation alone faces significant technical challenges if relied on exclusively to achieve carbon-free electricity.

We need a suite of new carbon-free or carbon-neutral resources that can be dispatched to complement our continued adoption of renewable energy, energy efficiency and demand response. These technologies may include carbon capture and storage, advanced nuclear or small modular reactors, seasonal energy storage and others not yet imagined. Each of these options holds promise, but they require considerable investment and further research and demonstration to become viable solutions at the cost and scale at which the electric sector will need them.

We are partnering with the federal government, the Electric Power Research Institute (EPRI), federal and private laboratories, peers, and others in exploring no-carbon and low-carbon dispatchable technologies. Below are some of the technologies we are exploring.

ADVANCED NUCLEAR

TVA continues to actively support the nuclear industry and the work of this nation to make small modular reactors (SMRs) and advanced reactor nuclear technologies commercially viable. TVA is evaluating future uses for the Clinch River Site, near Oak Ridge, Tennessee, which has the only NRC-approved Early Site Permit in the nation for potential deployment of small modular reactors. TVA is also monitoring potential new technologies that emerge from the U.S. Department of Energy funded advanced nuclear research, as well as other industry innovations.

NEXT GENERATION STORAGE

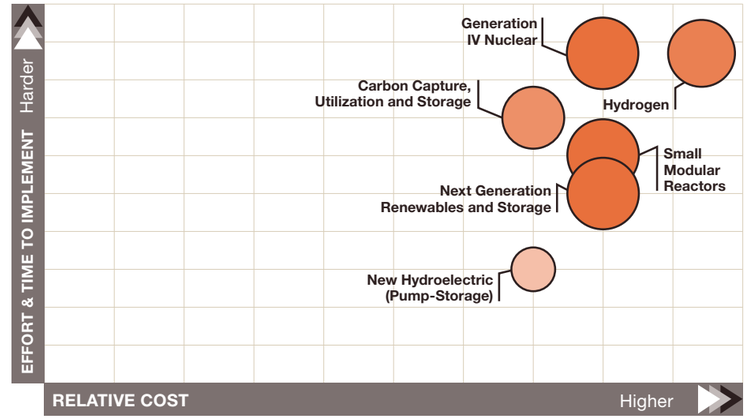
There are many different types of batteries that have large-scale energy storage potential, including sodium-sulfur, metal air, lithium ion and lead-acid batteries. Advancements in battery technologies continue to be made, especially driven by the expanding electric vehicle industry. As more developments are made with electric vehicles, battery technology will develop and costs should continue to decline. Electric vehicles could also have an impact on energy storage through vehicle-to-grid technologies, in which their batteries can be connected to the grid and discharge power for others to use.

Other storage options include thermal storage and mechanical storage. For thermal storage, excess energy produced during peak sunlight could be stored in thermal energy storage facilities – in the form of molten salt or other materials – and can be used into the evening to generate steam to drive a turbine to produce electricity. Mechanical energy storage systems take advantage of kinetic or gravitational forces to store energy. While the physics of mechanical systems are often quite simple (e.g. spin a flywheel or lift weights up a hill), the technologies that enable the efficient and effective use of these forces are particularly advanced. High-tech materials, cutting-edge computer control systems and innovative design could make these systems feasible in real-world applications in the future.

In the decades to come, renewable energy resources such as solar will play a vital role due to their availability, scalability and affordability. The renewable industry is growing and changing rapidly. The degree to which renewable resources can be successfully deployed to decarbonize the electric power system hinges on the future availability and cost of energy storage technologies.

Progress toward net-zero emissions will require continued investment in and development of new, cost-effective and scalable technologies, in addition to our existing nuclear, solar, wind, and hydro generating capacity.

CARBON REDUCTION OPTIONS- PILOT ANALYSIS OF IMPACT



Larger size bubble represents larger carbon emission reductions; data is generalized based on preliminary analysis

CARBON CAPTURE, UTILIZATION, AND STORAGE (CCUS)

CO_2 removal is likely key to achieving deep carbon reductions, because it can serve as a backstop for removing carbon that cannot be displaced by other means. TVA is engaged in technology development, understanding its capabilities and potential equipment deployment for post-combustion carbon capture at its existing coal, gas and new aero-derivative generating facilities. Additionally, TVA is investigating and monitoring the development of direct air capture.

NEW HYDROELECTRIC

TVA is working on maintaining and enhancing its existing hydroelectric facilities, including its Raccoon Mountain Pumped Storage Plant, and evaluating additional generating capacity, pumped storage, and pump-back potential at existing conventional hydro facilities. Pumped storage is a significant resource for balancing load and providing the flexibility to integrate more carbon-free generation on the system. TVA is exploring opportunities for "pump-back" at existing conventional facilities and for new pumped storage development.
Learn More in this Video.

HYDROGEN

Hydrogen is an attractive alternative fuel and energy carrier, especially if used to store energy for long periods. Hydrogen and similar low- to no-carbon fuels enable low-carbon and carbon-free dispatchable energy to ensure daily and seasonal reliability. Producing carbon-free or green hydrogen using nuclear and/or renewable power presents a significant opportunity for TVA. Producing blue hydrogen made by steam methane reforming with CCUS is also under evaluation as it may be cheaper than green hydrogen in the near to medium term. TVA is exploring equipment and opportunities within its gas fleet to retrofit existing assets and systems for hydrogen combustion as well as evaluating new assets that use hydrogen fuel to produce electricity in fuel cells, combustion turbines and reciprocating engines. Hydrogen also can be used in hard-to-electrify industrial processes and transportation.

Valley Innovation

Partnerships are key to creating a clean energy economy in the Tennessee Valley. We collaborate with local power companies, states, business and industry, communities and other federal agencies to develop programs and advance technologies that help reduce the region's carbon footprint.

Innovative solutions and partnerships are key elements to reducing TVA's and the Valley's carbon footprint. Working together to innovate the ways we utilize energy will be key to creating a clean energy economy.

TRANSPORTATION ELECTRIFICATION

One of the largest opportunities for such a partnership is the electrification of transportation. With abundant, reliable and increasingly clean TVA energy in the region, TVA and our local power company partners are in an excellent position to foster the broader adoption of electric vehicles. The transportation sector is a leading source of the nation's CO_2 air emissions, and transportation is also our largest electrification opportunity. TVA works with partners to enable the adoption of electric vehicles (EV) in the Tennessee Valley, and the results will bring significant environmental and cost advantages. TVA's active support for the electrification of transportation moves the entire region toward greater sustainability and economic opportunity in the future.

TVA's Electric Vehicle Initiative, built on partnerships with local power companies and other organizations, anticipates growing the number of EVs across its seven-state service area from approximately 14,000 today to over 200,000 by 2028. In addition to significantly reduced carbon emissions, the average EV driver can save up to $1,000 in fuel costs every year.

TVA has been working hard at minimizing or removing market barriers slowing down adoption of electric vehicles. We have established policies that look at the electric vehicle rate as a unique and separate class—creating a new, economic, stable rate for those building charging stations. This move opens the door to the development of more rapid charging stations across the TVA's service area.

Electric vehicles are already playing a large clean energy economy role in the Valley as well. We are home to three major automakers turning out electric cars in Tennessee: the Nissan Leaf and, soon the Aryia, a crossover SUV, in Smyrna; the Volkswagen ID-4, a crossover SUV, in Chattanooga; and the new Cadillac Lyriq, yet another crossover SUV, as part of General Motors recent $2 billion expansion in Spring Hill. As these EV manufacturers prosper, so will the people who work in and around these plants, or supply parts for them.

The Tennessee Valley is one of the fastest growing automotive production regions in the country and is emerging as a key player in the development of electric vehicles. The Valley carbon reduction opportunity is large, because a mile driven on TVA electricity emits approximately half as much carbon as a mile driven on gasoline.

Other Valley Innovation partnership opportunities are reflected below. TVA partners with communities, customers, suppliers and others throughout the Valley to reduce carbon emissions. We also partner with local power companies to offer a number of services to promote the wise use of energy, manage energy demand peaks and lower energy bills.

VALLEY SUSTAINABLE COMMUNITIES

The Valley Sustainable Communities Program assists communities in identifying and cataloging their sustainable assets and increasing their sustainability commitments. Valley Sustainable Communities are leaders in sustainable energy, water conservation, waste reduction, natural resource protection and overall quality of place. Through the program, designated communities meet strict environmental, economic and social goals. https://www.tvasites.com/media-center/how-green-is-our-valley/

HOME UPLIFT

This program helps those with the heaviest energy burden to lower their energy bills by providing free home energy upgrades that increase energy efficiency and comfort of homes. Funds are used for HVAC repair/replacement, insulation, air penetration reduction, windows and doors, as well as minor health and safety repairs that enable energy upgrades.

CONNECTED/SMART COMMUNITIES

Information is necessary for understanding effective carbon emissions reduction strategies across our Valley communities. Monitoring and measuring the "footprint" of the community for decision makers includes transportation and mobility; distributed energy resources; smarter buildings transparent about energy use and generation; and smart energy water and waste management. Armed with this information, communities can create strategic plans that reduce their carbon footprint and proactively manage projects and programs to effectively decarbonize and improve quality of life throughout the Valley. TVA's work in grid transformation will enable Connected Communities.

OTHER ELECTRIFICATION

As with vehicles, carbon emissions from buildings, industrial processes and homes can be reduced through electrification. TVA's EnergyRight for Business and Industry offers a suite of standard or custom smart energy solutions to electrify consumers end-use equipment and processes. Additionally, a Community Centered Growth program seeks to partner with local power companies and the communities they serve to revitalize businesses supporting electrification and economic development efforts in the region. TVA's EnergyRight for the Home provides a New Homes program to support the development of all-electric home construction in the Valley.

CARBON ACCOUNTING TOOLS

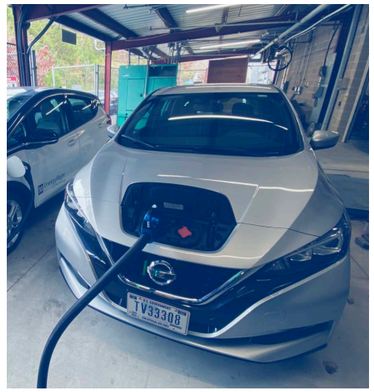
Carbon accounting is complicated, and its methodologies continue to improve. TVA is working to develop and support policies along with deploying a carbon accounting tool for customer accounting and for a Valley-wide inventory. Together with LPCs, we are working on protocols for managing community renewable projects and other distributed energy resources. TVA is also piloting community-wide inventories with ICLEI-Local Governments for Sustainability.

DEMAND RESPONSE

These programs offer cost-saving options to businesses to help meet the Valley's power needs during critical peak times without generating more costly, carbon intensive electricity from power plants or building new generation assets.

SUPPLIER SUSTAINABILITY

TVA's vendors and contractors reducing their carbon footprint supports reductions in TVA's indirect carbon emissions and supports decarbonization throughout the economy. Using local suppliers is often less carbon intensive. In addition, many of the utility industry's major suppliers are undertaking more aggressive sustainability programs to advance a circular economy and reduce greenhouse gas emissions.



RESIDENTIAL SERVICES

These programs provide a portfolio of tools such as virtual home energy evaluations, virtual energy workshops, financing options and a Quality Contractor Network of vetted, trained contractors that support homeowners' energy goals.

COMMERCIAL NAVIGATION

The movement of goods via the Tennessee River System presents opportunities for carbon emissions reductions through increased efficiency over truck transportation. Partnerships with port communities, industries using the waterways, the US Army Corps of Engineers who operate the locks at TVA dams, and commercial towing operators and their trade associations to leverage strategic investments in navigation and infrastructure are under review and assessment.

BUSINESS AND INDUSTRY

These programs help businesses, non-profits and the public sector optimize and manage energy usage through a Preferred Partners Network of vetted, trained contractors and educational resources that help them achieve their energy goals and boost their bottom line.

In February 2021, Tennessee Valley Authority (TVA) and the Tennessee Department of Environment and Conservation (TDEC) announced an unprecedented partnership to develop an electric vehicle fast charging network across the state of Tennessee. Access to fast charging stations spaced no more than 50 miles apart across major interstates and highways will significantly reduce barriers to widespread EV adoption.

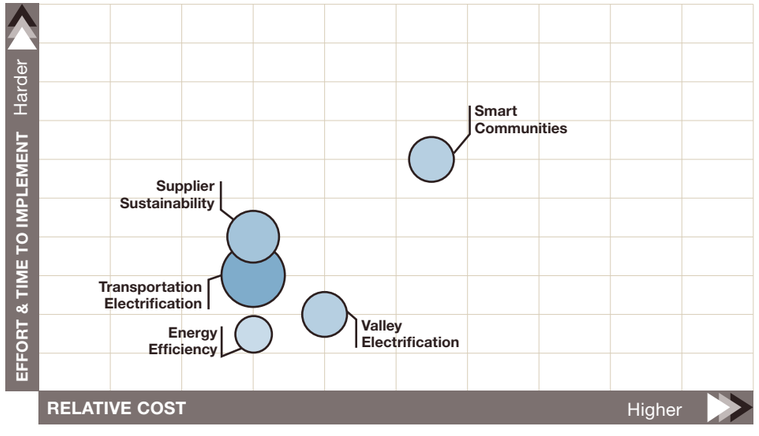
200,000
Electric Vehicles by 2028,
would result in the following benefits for our region:

~1 Million Metric Tons of CO_2 saved per year

$120 Million
in refueling reinvested in the local economy per year

$200 Million
in consumer fuel savings per year

CARBON REDUCTION OPTIONS- PILOT ANALYSIS OF IMPACT



Larger size bubble represents larger carbon emission reductions; data is generalized based on preliminary analysis

Fleet Innovation

TVA is implementing new technologies that ensure our diverse generation portfolio becomes cleaner each day. We are improving our nuclear and hydroelectric facilities and are adding more solar, battery storage and natural gas to our portfolio.

TVA's scientists and engineers are working on increasing effectiveness and efficiencies of our existing operations and at our existing facilities, such as heat rate improvements and other modifications to increase output, internal energy management, nuclear plant improvements and life extensions, and evaluating untapped hydroelectric resources. TVA's diverse generation mix has led to significant reductions in TVA's carbon emissions as well as improved reliability. Gas, renewables and storage are generally the most economic new additions in the near-term beyond nuclear improvements.

As a result of the work to date, TVA's effective electric rate is lower today than it was a decade ago with fuel and purchased power costs about $1 billion lower and operating and maintenance costs reduced by a sustainable $800 million. TVA met its commitment to reduce debt to $21.8 billion by FY 2023 three years earlier than planned, with debt currently at its lowest level in 30 years. Power supply reliability of 99.999% continues to be achieved.

Renewables and storage are offering increasingly cost-effective clean energy. TVA defines renewable energy as energy production that is sustainable and often naturally replenished, such as solar, wind, biomass, geothermal and hydroelectric. As some of these resources cannot be turned on and off when needed, controllable and dispatchable resources are key to maintaining a reliable electric grid. New storage options and improvements are discussed in the Power Generation Innovation section of this report.

IMPROVING AND EXTENDING NUCLEAR PERFORMANCE

TVA has been a national leader in expanding its nuclear fleet capacity, bringing online the first new U.S. commercial nuclear unit of this century with Watts Bar Unit 2, and completing successful extended power uprates at all three of its units at Browns Ferry.

Ongoing nuclear fleet performance improvements involve investing in capital projects to enhance future reliability of units and improving outage execution. Working collaboratively with peer utilities and suppliers, TVA is upgrading equipment and systems on its nuclear units, maintaining the material condition of reactors and other plant components, and streamlining plant processes. These innovations provide an opportunity to work collaboratively through license renewals, which will allow TVA nuclear units to operate through their full 80-year lifetimes to yield decades of additional megawatt hours (MWh) of carbon-free and low-cost energy.

IMPROVING AND EXTENDING HYDRO PERFORMANCE

Hydroelectric generation was TVA's original generating resource, powering the social and economic development of the Tennessee Valley out of the Great Depression. TVA's integrated river system includes 49 dams with 29 hydroelectric plants comprised of 109 generating units, some of which are well over 100 years old. These units continue to provide low-cost electricity from free fuel—the Tennessee River and its tributaries. TVA has made investments to modernize some of these hydro facilities, and ongoing investments to extend the life of these assets and improve performance over time would provide carbon-free generation to the system.

TVA's historic hydroelectric development has proven to be valuable investments providing for navigation, flood control and electric power for decades. Modernizing and upgrading this equipment and maximizing its potential continues to provide opportunities for cost-effective, reliable, and low-carbon generation.

ADDING SOLAR ENERGY GENERATION

TVA expects to add 10,000 MW of solar capacity by 2035, a large portion of which is driven by local power companies and customers participating in our award-winning Green Invest program. We are partnering with customers like Facebook, General Motors, Google and Vanderbilt University to power their in-Valley operations with solar farms located throughout our service area.

USING GAS TO SHIFT FLEXIBLE LOW-CARBON GAS CAPACITY

Gas generation is a key piece of our ongoing energy transformation. TVA is evaluating adding cleaner-burning natural gas units so that we remain responsive to the Valley's energy needs throughout the year. We see gas as a bridging strategy – a way to continue to add renewables, enable possible retirement of an aging coal fleet, and support the needs of the system while new technologies are developed. Also, given natural gas plants' relatively low carbon emission profile, improving technologies such as carbon capture and sequestration can further improve gas generation's carbon profile while maintaining reliable and affordable electricity.

Modern gas plants are highly efficient and flexible generation resources. They can be made even more so by continuous improvement in plant equipment and processes. Gas plant development is heavily dependent on modernizing natural gas infrastructure. Additionally, plants that burn natural gas have the potential to burn hydrogen, further reducing their carbon emissions profiles. Coupled with carbon capture, utilization and storage, natural gas could power the Valley far into a net-zero future.

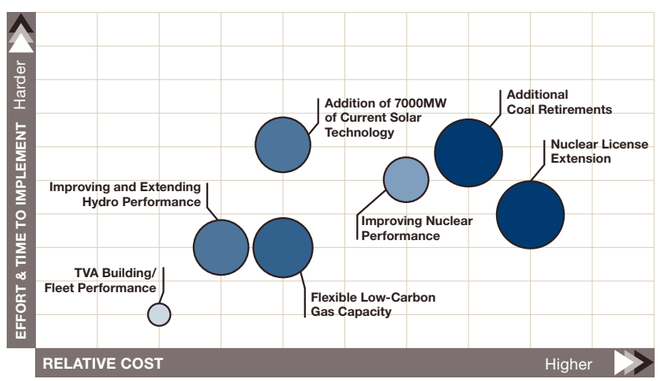
ASSESSING REMAINING COAL

Our strategic planning involves understanding our legacy. TVA's coal fleet has powered the Valley for many decades, providing stable jobs and supporting many communities. Our first coal plant was built in 1919, and subsequent plants have provided years of reliable, low-cost power to homes and businesses throughout the Valley. Many of these plants have or are coming to the end of life; the capital, operations and maintenance investments needed to keep them running would not provide the most affordable power to the Valley. To date, we have retired or announced the retirement of nearly 60% of our coal fleet units, and we are evaluating the impact of retiring the balance of the fleet by 2035. This evaluation includes environmental review, public input and Board approval. Coal burning generators have the greatest carbon-emitting intensity, and we have an opportunity to replace this generation with cost-effective lower-carbon options as TVA continues to evaluate its fleet and costs.

TVA is moving toward a generation plan with greater reliance on cleaner energy generation technologies. Since September 30, 2010, TVA has reduced its summer net capability of coal-fired units by over 7,700 MW. Bull Run is slated for closure by December, 2023, which means at that point we will have retired about 60% (8600 MW) of our original coal units.

Work is ongoing to evaluate TVA's remaining coal plants as TVA strives to generate clean, reliable and low-cost power for years to come. TVA periodically assesses material condition, performance and required investment of its other coal plants. Gallatin, Kingston, Shawnee (all built in the 1950s) and Cumberland (commissioned in 1968) have been utilized less in recent years. Addressing the reliability, performance (startup/ramping) and inefficiencies (heat rate, auxiliaries) of aging equipment can be extremely costly.

CARBON REDUCTION OPTIONS- PILOT ANALYSIS OF IMPACT



Larger size bubble represents larger carbon emission reductions; data is generalized based on preliminary analysis

Energy Delivery Innovation

We are reducing carbon emissions by transforming our grid to be even more interconnected, intelligent and reliable. We are also offering flexibility to customers through demand response programs, and upgrading technology used to move energy across the region.

Another set of opportunities for reducing carbon is through how we deliver power, including upgrading our system capabilities, improving the transmission grid, and providing customer flexibility and options through pricing and programs. In addition, as we deploy more renewable energy resources, we must ensure we have sufficient resources to meet swings in load and generation that naturally occur with increased use of renewable energy.

We are investing in a new System Operations Center (SOC), state-of-the-art energy management system, and the strategic fiber network, which will enable us to execute on more innovative, cleaner ways to deliver power, while maintaining our industry-leading 99.999% reliability.

OPTIMIZING SYSTEM OPERATIONS

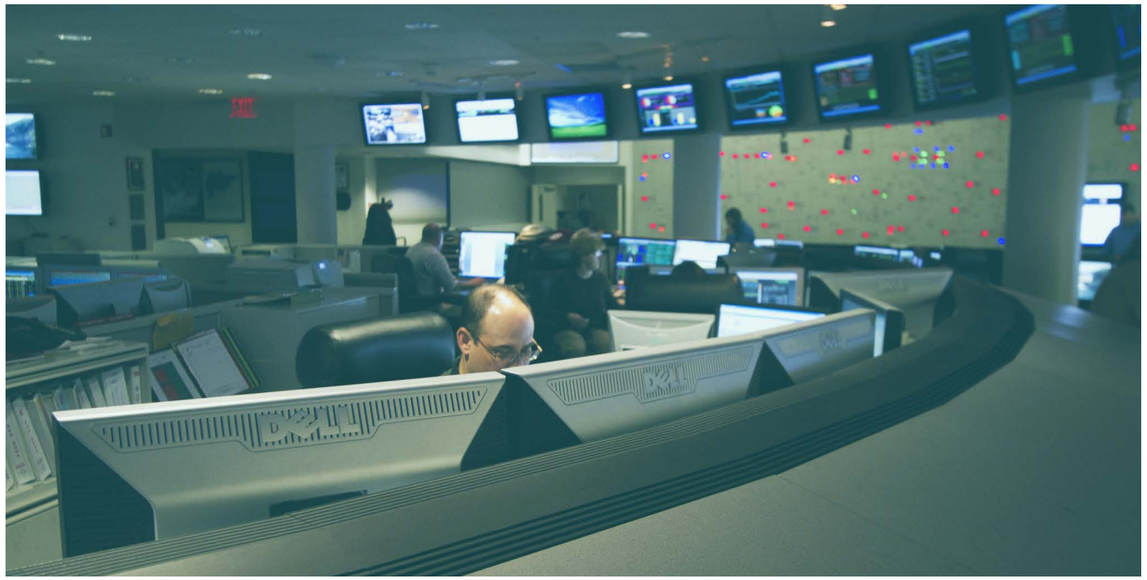
The new energy management system will enable efficiencies in how we dispatch generation, manage transmission and optimize the market. These efficiencies will allow us the flexibility to explore how we could model for more low- or no-carbon dispatch, and/ or leverage the market to procure lower carbon resources.

REGIONAL ENERGY EXCHANGE MARKET

TVA is partnering with other energy companies in the southeastern United States to explore an integrated, automated intra-hour energy exchange with goals of lowering costs to customers, optimizing renewable energy resources and helping maintain the reliable service we provide today. The regional exchange takes advantage of technology that is available today to make incremental progress in the short-term, as we continue to invest in longer-term solutions to reduce our carbon footprint through optimizing the ways that we deliver energy.

DISTRIBUTED ENERGY RESOURCE INTEGRATION

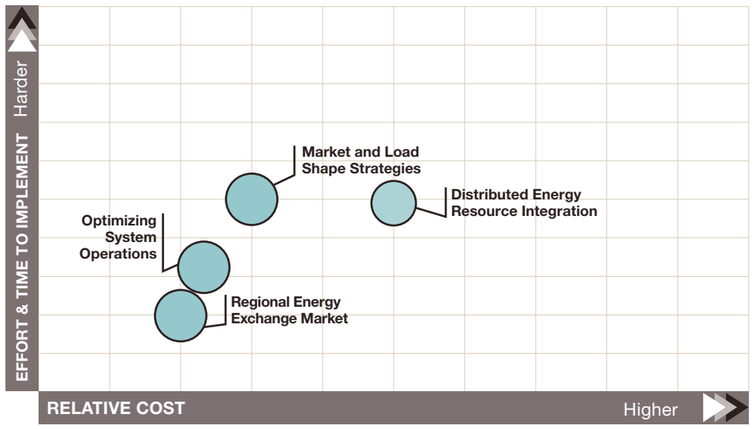
TVA manages its load to ensure the system is reliable and cost-efficient through resource planning/dispatch, power purchases and demand response programs. The investments that we are making to modernize our grid will allow us to explore how we can expand these existing programs to reduce our carbon footprint as well. Our modernization efforts will deliver a highly reliable and integrated grid where resources are planned and operated with a holistic, consistent and interconnected approach. In turn, this will enable new technologies, more efficient models and refined processes that are required to optimize the value of Distributed Energy Resources (DER) – including demand response, generation and storage. We are actively exploring a Distribution System Operator framework that will enable DER resource integration to provide value and more clean energy to the system. All of these efforts will position us to reduce our carbon footprint, all while maintaining reliability, respecting local control, and providing the opportunity for system value.



MARKET AND LOAD SHAPE STRATEGIES

In addition to energy efficiency and electrification, carbon emissions and carbon intensity are reduced by optimizing load and load shape through programs such as Demand Response and Conservation Voltage Regulation. Additionally, using carbon emissions and/or carbon price signals in electric usage and electric rates have the potential to drive consumer behaviors toward choices and use patterns that lower emissions. Education, communications, accounting and revenue use are issues to work through in exploring and expanding these innovations.

CARBON REDUCTION OPTIONS- PILOT ANALYSIS OF IMPACT



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Natural Resource Stewardship Innovation

TVA is working on natural resources management opportunities related to the nearly 300,000 acres of public land we manage as well as lands where we partner with others to protect resources. We are assessing the potential for carbon offsets and sequestration and for applying greenhouse gas protocols.

In keeping with TVA's long-standing stewardship and natural resources management of nearly 300,000 acres of public land, we have teams working on natural resources management opportunities in forest and vegetative carbon storage and soil sequestration. In addition to reigniting TVA's historic tree-planting efforts with lands that touch communities all along the Tennessee River, TVA is assessing the potential for carbon offsets and sequestration, appropriate management practices for terrestrial carbon, and applying greenhouse gas protocols to its forests, wetlands, prairie, pasture and agricultural lands. Moreover, partnering with adjacent and other Valley landowners, TVA will share its learnings and practices to support others in managing for terrestrial carbon.

Paired with our other carbon-reducing efforts, natural climate sequestration can serve as a carbon sink to reduce atmospheric CO_2 concentrations. These efforts—such as wetland development and shoreline stabilization—can also help mitigate impacts from climate change.

TVA is evaluating deploying natural carbon sequestration solutions including reforestation and afforestation, avoided deforestation and land management practices. We will continue to constructively engage in policy development to ensure appropriate protocols are in place for quantification of GHG removal and storage.

REFORESTATION AND AFFORESTATION

Reforestation is converting previously forested land back into forest. Afforestation, on the other hand, is planting forests on lands where they did not previously grow. Trees and other vegetation remove carbon dioxide from the atmosphere, sequestering nearly a third of global emissions.

TVA has the expertise, the land base and historical experience to help support tree planting efforts. The TVA Act directs TVA "to provide for reforestation and the proper use of marginal lands in the Tennessee Valley." Reforestation can have many benefits beyond carbon removal, including providing habitat, enhancing soil fertility, controlling floods, and improving air and water quality.

1 Million
Trees Program

WETLANDS RESTORATION

There are many types of wetland in the United States, ranging from mineral to organic soils and forested to non-forested systems, further differentiated by the type of biome in which they are found. All wetlands sequester carbon from the atmosphere through plant photosynthesis and by acting as sediment traps for runoff. Carbon is held in the living vegetation as well as in litter, peats, organic soils and sediments that have built up, in some instances, over thousands of years.

The U.S. Global Change Research Program estimates that terrestrial wetlands in the continental United States store a total of 13.5 billion metric tons of CO_2, much of which is within soils deeper than 30 cm. The magnitude of storage depends upon wetland type and size, vegetation, the depth of wetland soils, groundwater and nutrient levels, pH, and other factors. Wetland soils also store carbon that washes in from upland areas, through soil erosion or movement of leaves and tree debris.

SOIL SEQUESTRATION

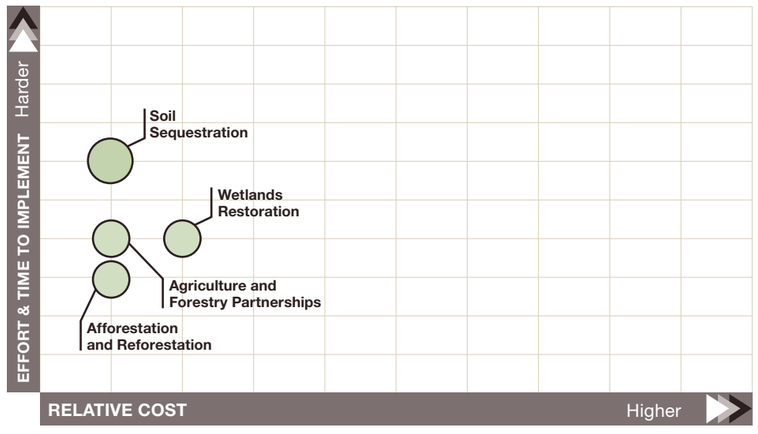
Ways to enhance soil's carbon uptake include using plant varieties that have deeper roots, agroforestry, adding organic materials, and changing crop rotations, among others. The potential for this strategy is location-specific, depending on the soil type, prior and current land management practices, environmental conditions and other factors. Enhancing soil carbon can yield significant co-benefits, including improved soil health and increased yields.

AGRICULTURE/FORESTRY PARTNERSHIPS

Agriculture activities serve as both sources and sinks for greenhouse gases. Today, agriculture is a net carbon emitter, contributing about 14% of all greenhouse gas emissions, but it can be turned into a net absorber, pulling carbon out of the atmosphere.

Agriculture sinks of greenhouse gases are reservoirs of carbon that have been removed from the atmosphere through the process of biological carbon sequestration. The primary sources of greenhouse gases in agriculture are the production of nitrogen-based fertilizers; the combustion of fossil fuels such as coal, gasoline, diesel fuel and natural gas; and waste management. Conservation tillage, organic production, cover cropping and crop rotations can drastically increase the amount of carbon stored in soils.

CARBON REDUCTION OPTIONS- PILOT ANALYSIS OF IMPACT



Larger size bubble represents larger carbon emission reductions; data is generalized based on preliminary analysis

TVA recognizes there are inherent risks in the initiatives to reduce carbon and in the ramifications of climate change in the Tennessee Valley.

We are mitigating these risks with an integrated risk management process as well as comprehensive resource planning. We also continue to evaluate and mitigate risks created by climate change through our adaptation and resiliency plans.

Addressing Risk and Preserving our Mission

TVA will meet our ambitious carbon goals while protecting reliability, low-cost pricing and economic development activities as mandated by the TVA Act of 1933. Cost is a critical success factor in consideration for clean energy strategy, as it enables a growing, robust, sustainable economy. So far, we have successfully reduced carbon emissions while keeping energy costs low for customers. In fact, about 70% of the people served by large utilities across the nation pay higher rates than do TVA customers, and TVA's industrial rates are among the very lowest in the nation—lower than 90% of those charged by the nation's top 100 utilities. Energy reliability is also a fundamental requirement, and we are proud that we have maintained 99.999% reliability to customers since 2000.

TVA's mission is to serve the people of the Tennessee Valley to make life better. This means environmental stewardship addressing climate change and decarbonization efforts must support the well-being of all, including those in lower socioeconomic levels. To accomplish this, TVA must recognize the risks inherent in many of these initiatives. There are uncertainties with any new technology and operational development and deployment. There are also financial, operational and environmental impacts to assess and consider, including siting and permitting, cost impacts to rates and reliability.

As we work toward deep carbon reductions over the next several decades, we will continue to monitor and take steps to mitigate any risks along the way. Changing weather patterns, extreme weather conditions and other events such as flooding, droughts, wildfires, and snow or ice storms can all impact our system in terms of system operability, customer demand and the health of regional economies.

INTEGRATED RISK MANAGEMENT

TVA's Enterprise Risk Management (ERM) conducts annual risk assessments to identify the significant risks facing the business. In partnership with resource and business planning activities, enterprise-level risks are documented in these assessments to develop a profile of TVA's significant risks. In addition, mitigation strategies and plans to manage risks are documented. The Enterprise Risk Scorecard summarizes the enterprise risk profile and takes into account, among other factors, the annual risk assessment, market profile, external factors and emerging trends. The Chief Risk Officer (CRO) is responsible for the design, implementation and maintenance of TVA's overall control system for risk management, advising organizations throughout TVA on risk management issues and ensuring business plans and annual budgets effectively integrate risk management activities and mitigation plans.

In conjunction with ERM, Risk & Performance Assurance (R&PA) conducts periodic assessments focused on the effectiveness of the risk mitigation actions. Priority of these reviews is based on emerging and evolving drivers of enterprise risks and review of risk mitigation plans coupled with the potential impact to the agency. R&PA partners with the business to track remediation of any gaps in risk mitigation plans and results are monitored and reported to TVA leadership on a monthly basis.

The Enterprise Risk Committee, made of TVA's Enterprise Leadership team and The Audit, Risk, and Regulation Board Committee receive regular updates on TVA's risk profile, emerging and evolving risks and effectiveness of the risk mitigation actions.

TVA Integrates ERM across strategy development, business objective formulation, and implementation and performance to enhance value.

TVA FOLLOWS THE COMMITTEE OF SPONSORING ORGANIZATIONS OF THE TREADWAY COMMISSION (COSO) ENTERPRISE RISK MANAGEMENT FRAMEWORK

RESOURCE PLANNING

Our resource planning process is designed to manage capital-intensive investments over decades-long time horizons. We evaluate a range of scenarios and stress test our energy portfolio against a variety of important variables, while adhering to our least-cost planning mandate as required by the TVA Act. We use load forecasts to account for changing weather patterns, a key variable in explaining actual loads and in forecasting future loads.

SUSTAINABILITY AND CLIMATE ADAPTATION AND RESILIENCY

The goal of TVA's adaptation and resiliency planning process is "to ensure the agency continues to achieve its mission and program goals and to operate in a secure, effective and efficient manner in a changing climate." Weather effects associated with climate change represent financial risk. Adaptation and resilience planning can reduce potential service interruptions, equipment damage and associate costs. While no individual weather event can be definitively linked to climate change, particular weather events can demonstrate the vulnerability of TVA facilities. TVA established its initial Climate Adaptation Statement in 2011. Enhancing climate resilience means being able to plan and prepare for, absorb, recover from, and more successfully adapt to climate-related impacts. Under Executive Order 14008, TVA is submitting our Climate Adaption Action Plan to the White House Council for Environmental Quality. TVA's climate plan addresses adaptation and resiliency actions per the EO. This plan provides TVA planners with the analytical framework, references, tools and other guidance to understand how to consider climate change in their plans and projects and build resilience in the short and long term—including guidance on how to use climate projections that involve multiple future scenarios and different time periods in planning and project designs.

We are committed to achieving even deeper carbon reductions in the decades to come.

To that end, we will continue the development and deployment of a diverse portfolio of energy resources to reliably and affordably serve Valley communities, and we will work with our partners in the Tennessee Valley to accelerate the clean-energy economy.

Path Forward

We are committed to achieving even deeper carbon reductions in the decades to come. To that end, we will continue the development and deployment of a diverse portfolio of energy resources to reliably and affordably serve Valley communities, and we will work with our partners in the Tennessee Valley to accelerate the clean-energy economy.

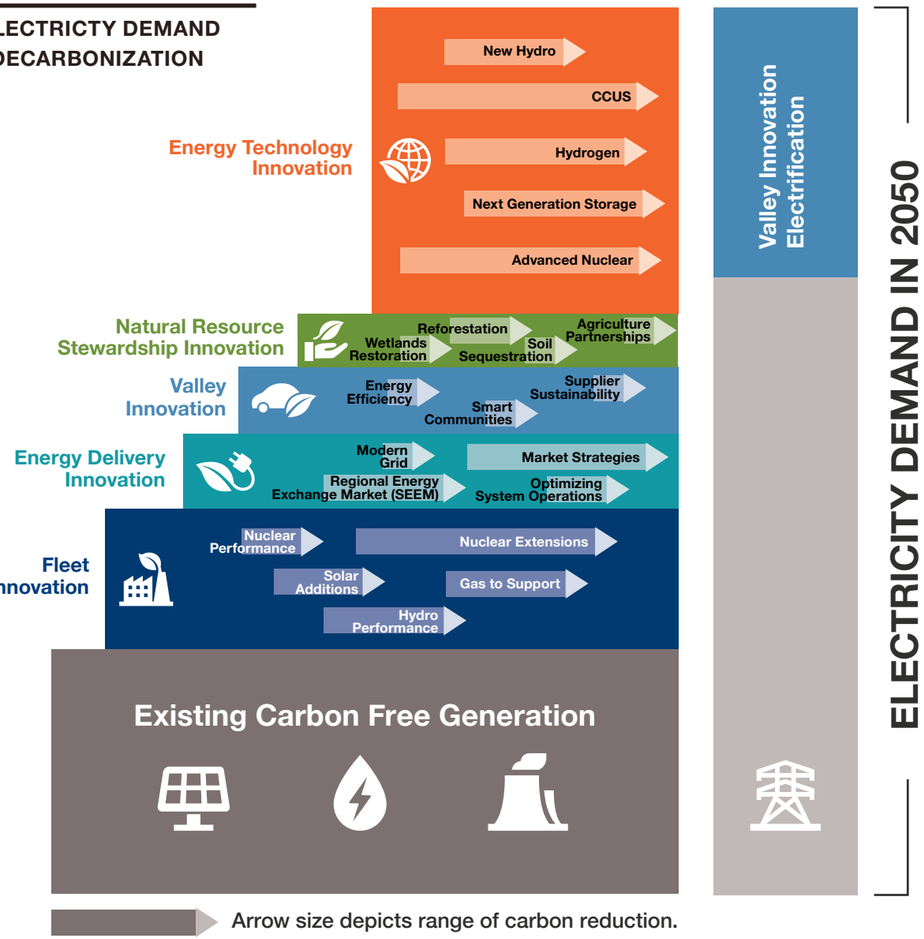
Current plans for TVA's power supply project a more diverse, flexible and cleaner resource mix, achieving a 70% reduction in carbon intensity by 2030, with a path to an approximate 80% reduction in carbon intensity by 2035, compared to a 2005 baseline. We believe these emission reductions can be achieved cost effectively with continued fleet transition and operational changes, and with the renewable, carbon-free generation and energy storage technologies available today. To accomplish this, we will build upon areas that are transforming our system and delivering clean, reliable, low-cost power to customers today.

- **Continue investments in solar and offering customers more renewable energy options under our TVA Green Programs**
- **Maintain our carbon-free hydroelectric and nuclear plants and improve their efficient operations**
- **Continue to transform our energy portfolio by assessing the retirement of additional coal plants and replacement with low-carbon natural gas, renewables and advanced technologies**
- **Continue to evaluate new technologies, carbon reducing levers, and utilize framework to develop 2030-2050 asset plans**
- **Utilize TVA Federal Advisory Groups to review environmental justice impacts**
- **Work with LPCs on customer-centric options, including helping customers manage their energy usage and bills through efficiency**
- **Conduct public stakeholder discussions focused on carbon reduction**
- **Support the Tennessee Valley toward a future with a robust clean energy economy**

Through this evaluation framework, TVA will increase research and development of generation technologies, storage options, and carbon offsets. We will need new carbon-free dispatchable technologies—technologies not yet commercially available at the cost and scale needed to achieve our aspirations. Because of this, there needs to be significant research and development to ensure we have these technologies to deploy in the coming decades.

As we advance these efforts, stakeholders are essential and will help to influence the outcomes. We will continue working collaboratively with customers, nongovernmental organizations, policy makers and others to identify and implement pragmatic solutions to make our goals possible.

MEETING ELECTRICTY DEMAND AND DEEP DECARBONIZATION



While there is not a single initiative, we have identified guiding principles that we know will be part of any carbon reduction plan. TVA will:

1. **Prioritize the needs of Valley stakeholders as we work to achieve our goals by maintaining low rates and high reliability, and attracting new jobs in the Valley.**
2. **Use best-available science and support research and policies that further carbon-free dispatchable technologies.**
3. **Partner with our long-term local power company customers and other customers and communities to support economy-wide decarbonization efforts and the strategic electrification of other sectors, such as transportation.**
4. **Maintain nuclear generation, hydro generation and a strong transmission grid as key enabling assets.**
5. **Be transparent with stakeholders in measuring and sharing our progress, and listen and work effectively with all our stakeholders to understand their priorities and needs.**
6. **Adapt to new technologies and changing policies, and be willing and open to change our plans and projects to achieve deep carbon reduction.**

OUR ACTION AND EXPLORATION PLAN

In the five areas set forth in this report—Energy Technology Innovation, Valley Innovation, Fleet Innovation, Energy Delivery Innovation, and Natural Resource Stewardship Innovation—there are immediate steps to take to reduce carbon today and to prepare for the future.

TVA's work toward deep carbon reduction plays an important role in our comprehensive plan to build a strong, sustainable future. TVA's full sustainability efforts are highlighted in our Sustainability Report.

	LEADERSHIP TODAY	SHORT TERM ACTION-NEXT FIVE YEARS	FUTURE OPTIONS TO REDUCE CARBON
ENERGY TECHNOLOGY INNOVATION *New technologies for a net-zero future* • **Advanced Nuclear** • **Next Generation Storage** • **Hydrogen** • **Carbon Capture, Utilization, and Storage (CCUS)** • **New Hydroelectric such as pumped storage**	• Early site permit for SMR at Clinch River site • Founding member of the Electric Power Research Institute Low-Carbon Resources Initiative • Contracted for 1,178 MW of utility-scale solar generation to the region by the end of FY20 • Early analysis of pump-back options at hydro facilities	• Lead the identification of technologies that advance net-zero electricity • Identify technology and partnership for Clinch River SMR • Battery-storage demonstration project at Vonore, Tennessee, that will be online in 2023 • Long duration storage pilot project	• Clinch River SMR developed through partnerships; other advanced nuclear exploration • Additional large-scale batteries or storage projects online • Test or demonstrations of carbon capture, renewable natural gas or hydrogen with subsequent development • Pumped Storage/New Technology Hydro Addition
VALLEY INNOVATION *Being a catalyst for economy-wide carbon reduction* • **Transportation Electrification** • **Smart Communities** • **Energy Efficiency** • **Valley Electrification** • **Supplier Sustainability**	• Electric rates that are priced below 70 percent of America's other Top 100 utilities • Developed Electric Vehicle Road Map with Partners • New power rates to help to support development of electric vehicles • TVA Green Programs offer customers renewable energy options • Working with our LPCs on programs that help customers manage their energy usage and bills through efficiency • Efficient electrification to support lower Valley carbon footprint	• TVA's Fast Charging Network for Electric Vehicles • Support TN Valley in emerging as one of the top regions in America for manufacturing electric vehicles • Enable local power companies to generate up to 5% of their energy load through renewable and other sources • Continued energy efficiency to support low income homes and efficient electrification in the Valley • Work with Valley suppliers to understand carbon levers in supply chain	• Well over 200,000 electric vehicles in the Tennessee Valley by 2028 • Mass transit support • Demonstration projects to aggregate electric vehicles and chargers into resource pool • Additional demand response • Evaluate use of coal combustion residuals materials to de-carbonize concrete production • Incorporate environmentally friendly policies and metrics into existing sourcing and procurement practices
FLEET INNOVATION *Creating more carbon reductions with our existing fleet* • **Improving nuclear performance** • **Nuclear License Extension** • **Improving and extending hydro performance** • **Addition of current solar technology (and more as storage technology advances)** • **Evaluate retirement of additional coal** • **Flexible low-carbon gas capacity** • **TVA Building/Fleet Performance**	• Diverse generation mix that provides reliable and affordable energy and positions TVA well for future • Maintaining our carbon-free nuclear plants and improving outage performance • Continue to invest in new solar through nationally recognized renewables program • TVA has an Internal Energy Management Program and has completed energy efficiency improvements saving enough energy to power 50,000 average homes for a year • Retired or announced the retirement of nearly 60% of our coal units	• Additional renewable energy (MW) • Continue to develop and match large-scale solar, with storage options, to large business and industrial customers through our award-winning Green Invest program • Increase investment in existing hydro assets to optimize performance and extend life • New flexible gas brought online to support renewables • Climate change considerations embedded into established business practices • Investing in the current nuclear fleet for 80-plus years of operation • Increase TVA fleet procurement of electric vehicles	• Additional renewable energy with storage • Ongoing nuclear performance improvements involving outage execution, capital projects and staffing alignment to ensure that existing nuclear units operate through their full 80-100 year lifetimes • Evaluating the impact of retiring the balance of the coal fleet by 2035 • New flexible gas brought online to support renewables; demonstrate carbon capture • TVA Corporate Fleet shifted to electric vehicles where feasible • Condition based maintenance • Increase investment in existing hydro assets to optimize performance and extend life

	LEADERSHIP TODAY	SHORT TERM ACTION-NEXT 5 YEARS	FUTURE OPTIONS TO REDUCE CARBON
ENERGY DELIVERY INNOVATION *Reducing carbon emissions by finding innovative ways to deliver power* • **Optimizing system operations** • **Modernizing the transmission grid** • **Energy Delivery Market Efficiencies to optimize renewables/** • **Regional Energy Exchange Market** • **Market and Load shape strategies**	• 99.999% reliable power today • Support the development of a regional energy exchange market • Technology enabled Right of Way management	• Complete construction of new system operations center • Market enabled centralized dispatch for DER Integrated system and distribution planning • Enhanced dispatch engine capable of co-optimizing reliability, least cost and environmental impacts • Participation in the regional energy exchange market	• Digitization, advanced sensors and fiber-optic communication will better connect TVA's operational assets and expand integration of distributed energy resources • Fully integrated planning which resolves load shape locally and offsets the need for system scale peaking resources • Operational infrastructure in place to fully support this integrated planning model.
NATURAL RESOURCE STEWARDSHIP INNOVATION *Assess the potential for carbon reduction and sequestration and for applying greenhouse gas protocols* • **Reforestation and afforestation (1 Million Trees)** • **Wetlands Restoration** • **Soil Sequestration** • **Agriculture and Forestry Partnerships**	• Protects vegetation and wetlands on public lands today • Public lands and waters provide significant economic value today • "Shade Your Stream" program for water quality	• Develop million trees program • Conduct climate change adaptation research • Establish partnerships with agricultural community	• Be a leader in nature-based climate solutions to mitigate climate change and build resilience • 500,000 trees planted and 15 acres of wetlands restored/improved by 2035; 1M trees by 2050 • carbon sink and flooding protection (adaptation) projects

Glossary

CARBON, OR CARBON DIOXIDE (CO_2): a colorless, odorless, non-poisonous gas that is a normal part of Earth's atmosphere. Carbon dioxide is a product of fossil-fuel combustion as well as other processes. It is considered a greenhouse gas as it traps heat (infrared energy) radiated by the Earth into the atmosphere and thereby contributes to the potential for global warming.

CARBON FREE: electricity that is generated in a manner that does not directly emit carbon dioxide when produced.

CO_2 INTENSITY: amount of carbon dioxide per unit of product produced, typically reflected for electricity as units of CO_2 mass (kilograms or pounds) per million British thermal units (kg or lbs CO_2/MMBtu) or units of CO_2 mass (kilograms or pounds) per megawatt-hour. Can also be referred to as CO_2 Rate.

CO_2 RATE: the amount of carbon in pounds per megawatt hour of electricity generated (lbs./MWh). Can also be referred to as CO_2 Intensity.

MASS CO_2 EMISSIONS: the total weight of CO_2 emissions, typically expressed in metric or short tons, of carbon dioxide electricity generated, generated and purchased, or as delivered, in a given year.

NET-ZERO: A state where the amount of carbon emitted is balanced by carbon removed from or offset in the atmosphere.

RENEWABLE ENERGY: energy production that is sustainable and often naturally replenished, such as solar, wind, biomass, geothermal and hydroelectric.

SCOPE 1, 2, 3, EMISSIONS:

Scope 1 - direct emissions include all emissions that come from an organization's owned and controlled assets.

Scope 2 - covers indirect emissions from the end use of electricity, steam, heating and cooling, such as in TVA's buildings.

Scope 3 - covers all other indirect emissions that arise from sources up and down an organization's value chain, except from purchased electricity for end use consumption of electricity, steam, heating and cooling, which is Scope 2.

TVA emissions: carbon emissions from TVA's owned, operated and purchased power

Valley emissions: carbon emissions from all sectors and all carbon accounting scopes in the Valley geographic region (such as transportation, buildings, agriculture, etc)

Appendices

CARBON ACCOUNTING AND DISCLOSURES

As a federal agency, TVA is required to submit several Federal Energy and Sustainability reports annually in order to achieve goals set forth in the Energy and Policy Act of 2005, National Energy Conservation Policy Act of 1978, and Energy Independence and Security Act of 2007. TVA engages in industry, federal, and customer-oriented disclosure initiatives that support the GRI framework. As a service, TVA provides as-delivered CO_2 emission rates to its customers and stakeholders in a manner consistent with generally accepted carbon accounting standards, such as the Climate Registry's Electric Power Sector Protocol for the Voluntary Reporting Program and the new World Resources Institute and World Business Council for Sustainable Development's Greenhouse Gas Protocol's Scope 2 Guidance. Please also refer to TVA's Sustainability website for additional information www.tva.gov/sustainability.

GOVERNANCE

TVA is governed by the bylaws of the Tennessee Valley Authority, Board Practices and Committee Charters. These form the framework for the governance of TVA laid forth in the TVA Act. TVA is transparent in its actions, including public disclosure through the Regional Resource Stewardship Council and the Regional Energy Resource Council, TVA Board meetings, and Securities and Exchange Commission (SEC) filings. Meeting agendas and information for council and Board meetings, along with TVA's SEC filing, are available on TVA's website. TVA is a government-owned corporation, and our mission of service is fundamentally different from that of publicly traded companies. TVA has oversight similar to other utilities, such as a Board of Directors, SEC requirements, credit rating agencies, and Sarbanes-Oxley Act requirements. In addition, TVA has oversight from Congress, the Government Accountability Office (GAO), Office of Management and Budget (OMB), the U.S. Treasury, and an independent Office of the Inspector General (OIG).

Periodic audit plans are developed using information from assurance programs and processes supporting performance incentive plans, regulatory obligations, relevant Sarbanes-Oxley (SOX) deficiencies, and business plan results. TVA also submits financial information to Congress, OMB, SEC, Nuclear Regulatory Commission (NRC), U.S. Treasury, Energy Information

Administration, and others, in accordance with applicable regulatory and statutory requirements. As required by the TVA Act, TVA maintains our accounting records in accordance with the Federal Energy Regulatory Commission (FERC) Uniform System of Accounts for Public Utilities. In addition, TVA presents our financial statements and related disclosures in conformity with Generally Accepted Accounting Principles (GAAP) promulgated by the Financial Accounting Standards Board. These financial statements are annually audited by an independent registered public accounting firm. Read more here: www.tva.com/investors.

The TVA Board established two separate Public Advisory Councils, the Regional Resource Stewardship Council and the Regional Energy Resource Council, which were formed under the Federal Advisory Committee Act to advise TVA on our stewardship activities and energy resource decisions in the Tennessee Valley region. Both of these councils focus on sustainable decisions and performance to foster a record of responsible stewardship in the Tennessee Valley. Gaining routine input from stakeholders helps TVA manage our priorities in a responsible way to meet the diverse needs of people across the Valley and sustain the vitality of the region. Read more here: www.tva.com/about-tva/our-public-advisory-councils.

Appendix C

TVA RENEWABLES HIGHLIGHTS:

Fiscal Year 2020

2020 HIGHLIGHTS

- 7,044 MW Operating and Contracted Renewables Capacity in 2020
- Community solar available to over 1 million customers

2020 RFP FOR RENEWABLES:

- 6,800 MW of renewables and storage submitted
- More than 1,000 MW of projects are expected to be announced in early 2021

GREEN INVEST PROGRAM

- 1,110 MW utility-scale, new-to-the-world solar agreements
- Contracted 50 MW battery storage
- Met sustainability needs for Facebook, General Motors, Google, Knoxville Utilities Board and Vanderbilt University
- Generated ~$1.4 Billion total in solar investments in TVA's service area

GREEN SWITCH AND GREEN FLEX PROGRAMS

- ~9,000 total participants
- 311,777 MWh Green Power Sales

PARTNER FLEXIBILITY OPTION

Launched program that enables our long-term LPC partners to self-generate up to 5% of their energy needs, giving them more flexibility to meet their customers' unique needs or clean energy goals.

- 62 LPCs signed Flexibility Agreements
- 6 LPCs are actively engaged in planning 10 projects
- 2 Initiated solar projects

DISPERSED POWER PRODUCTION

- 111 operating projects
- 268 MW of power

BATTERY TECHNOLOGY

- TVA's first owned and operated grid-scale battery energy-storage system, a 40 megawatt-hour demonstration system, will help ensure continued electrical reliability for up to 14 gigawatts of solar energy planned through 2038. The Vonore Battery Energy Storage System is due to be operational in late 2023.

TVA-DIRECTED SOLAR PROJECT

The land associated with the first potential TVA-directed utility-scale solar project is currently undergoing pre-decisional environmental and cultural due diligence investigations prior to land acquisition.

2020 AWARDS

- Top 100 Green Utilities in the world by Energy Intelligence
- Top 10 ranking for Green Power Sales by NREL for 7th year
- Green Power Market Development Award (Center for Resource Solutions)
- TenneSEIA's 2020 Solar Champion Award- Chris Hansen, vice president of O&R

TESTIMONIALS:

Metropolitan Government of Nashville and Davidson County

"This public-private partnership will serve as a model for NES's other large customers to replicate. I challenge Nashville's corporate sector and major institutions to consider TVA Green Invest as a smart way to prepare for what must be a greener future."

-Nashville Mayor **John Cooper**- Green Invest Customer, FY21

Knoxville Utilities Board

"KUB is proud to be the first TVA distributor to demonstrate our commitment to clean energy through the purchase of 502 megawatts of solar power. Our Green Invest partnership is an important part of our work to support Knoxville's emissions reduction goals and build on KUB's legacy of environmental stewardship."

-**Gabe Bolas**, KUB President and CEO- Green Invest, FY21

TVA is the nation's largest public power provider. Through our partnership with 153 local power companies, TVA supplies energy across 80,000 square miles for 10 million people and 750,000 businesses. We also directly serve 56 large industrial customers, including military installations and U.S. Department of Energy facilities. TVA operates the nation's second-largest transmission system and the nation's third-largest nuclear fleet. In environmental stewardship, TVA manages the region's public lands and waters, including the Tennessee River system for flood control and other benefits.

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