

**Written Testimony of  
Jeffrey J. Lyash  
President and Chief Executive Officer  
Tennessee Valley Authority  
As submitted to the U.S. House Subcommittee on Water Resources and Environment  
U.S. House Committee on Transportation and Infrastructure  
June 24, 2021**

## **INTRODUCTION**

Chairman Napolitano, Ranking Member Rouzer, and members of the committee, thank you for the opportunity to appear today to represent one of the nation's largest utilities and a corporate agency of the federal government, the Tennessee Valley Authority (TVA).

I marked my second anniversary as president and chief executive officer (CEO) of TVA in April. I am privileged and honored to lead the 10,000 women and men of TVA as we serve the communities and people of the Tennessee Valley region and the nation.

My career in the energy industry spans more than 40 years. Before joining TVA, I was president & CEO of Ontario Power Generation, one of Canada's largest electric utilities with a diverse generating portfolio.

Before that, I was president of CB&I Power, with responsibilities that included providing operating plant services for nuclear and other forms of generation. Formerly, I served in executive vice president capacities at Duke Energy and Progress Energy, and as president and CEO of Progress Energy Florida. I spent a significant portion of my career building, maintaining and operating nuclear facilities.

I have held a Senior Reactor Operator's License issued by the U.S. Nuclear Regulatory Commission (NRC) and worked in a wide range of leadership roles at nuclear facilities including as operations manager, engineering manager, plant manager, and director of site operations.

Earlier in my career I served at the Nuclear Regulatory Commission in both technical and leadership positions.

From my perspective as a leader in the energy industry and in nuclear energy specifically, I firmly believe that reliable and affordable electricity is foundational to our national security and our economy. I also believe that low carbon electricity is critical to decarbonizing the broader economy.

To accomplish and sustain this, a diverse portfolio of generating assets will be needed, and nuclear energy must continue to play a vital role in our nation's energy supply. I appreciate the Committee's interest in our energy resources and the infrastructure needs of the nation.

TVA's mission is to serve the people of the Tennessee Valley region and the nation to make life better, and our national charter is engraved in stone at many of our facilities: "Built for the People of the United States."

TVA was created in a time of great challenges for our nation – a time when new ideas and fresh approaches were essential to economic recovery during the Great Depression. TVA and its broad mission of service represented a break with the past, a determination to bring new thinking to the problems at hand, and an investment in building the infrastructure necessary to an improved quality of life and economic opportunity.

That investment, which has since been repaid with interest, helped lift the region out of the Great Depression and supplied energy for crucial defense industries to help win World War II.

Today, TVA is applying the same spirit of service, innovation, and forward-thinking that revolutionized life in the Valley to the emerging challenges of our time. In my testimony, I will discuss how we are continuing TVA's mission as we adapt to new challenges, technologies, and opportunities.

## **TVA MISSION**

In 1933, personal income in the TVA region averaged \$3,500 a year in today's dollars – and just 45% of the national average at that time. Nearly two-thirds of Valley residents were farmers, and only 3% of them had electricity. Even fewer had running water. Valley lands were ravaged by erosion, overuse and wildfires. In some parts of North Alabama, three people in five had malaria. The Tennessee River was unmanaged, subjecting the region to devastating floods year after year while at the same time impeding transportation in areas of shallow water and treacherous shoals.

TVA was tasked with addressing a wide range of challenges. It focused on the innovative concept of managing the vast resources of the Tennessee Valley as an integrated system, across jurisdictional boundaries, to benefit the region as a whole. TVA engineers built a network of hydroelectric dams to achieve multiple purposes – providing the infrastructure not only for low-cost power but also flood control, transportation, water quality, and more.

TVA scientists and educators developed groundbreaking fertilizer technology that helped revive the Valley's exhausted farmland and became the basis for 75% of the fertilizers used around the world. TVA engineers developed the nation's first 512-kV transmission systems to reliably link TVA to a regional family of local power companies across 80,000 square-miles. And TVA economic development specialists pursued collaborative approaches to recruiting and retaining investments that would create and sustain quality jobs.

TVA's commitment to developing and delivering new ideas transformed the seven-state Tennessee Valley region, leveraging the value of low-cost public power and going far beyond it, helping to lift the people of the Valley out of poverty and bringing the benefits of low-cost power to every community in the Valley.

In 2018, the region's per capita income had risen to 82% of the national level. The Valley's dependence on agriculture has shifted to an emphasis on industry, with only 0.5% of workers still employed in agriculture. TVA's early efforts to reforest the region with 570 million seedlings restored large tracts of land to beneficial use. TVA's integrated network of multi-

purpose dams has averted more than \$9.5 billion in potential flood damage since 1936. The TVA's managed system also provides extensive recreation opportunities for hunting, fishing, and other valued outdoor leisure.

## **TVA'S OPERATIONS**

Today, TVA is the nation's largest public power supplier, providing energy that 10 million people across seven southeastern states rely on every day. We are also the nation's third-largest electricity generator. Our transmission system is the nation's second-largest, with 16,300 miles of high-voltage lines; and we have delivered low-cost energy to our customers with 99.999% reliability – every year since 2000.

TVA has one of the nation's largest, most diverse, and cleanest generating portfolios, including hydroelectric, natural gas, coal, wind, and solar generation, as well as significant energy storage resources. In addition, and a focus of our discussion today, our portfolio includes the nation's third-largest nuclear fleet. In Fiscal Year 2020, our nuclear fleet generated 42% of the electricity delivered to our customers, energy that is carbon-free.

TVA's nuclear fleet has a generating capacity of approximately 8,000 megawatts and is the backbone of our clean generation portfolio. TVA is an industry leader in expanding nuclear generation. In 2016, TVA brought online the first new nuclear generation of the 21st Century, achieving commercial operation of the second unit at the Watts Bar Nuclear Plant, adding about 1,164 megawatts of carbon-free energy for our system.

We have upgraded our existing Browns Ferry Nuclear Plant units to generate additional low-cost, reliable and carbon-free energy; and we are investing in maintaining and upgrading our plants to extend their operations by decades.

In our fossil-fueled generation, TVA's coal-burning units are among the nation's oldest. They have served our power system well for decades. In FY 2005, coal supplied about 60% of our total power supply, compared with less than 15% in FY 2020. TVA has retired or announced

retirements for 8,600 megawatts of coal generation. We will continue to evaluate the impact of retiring the balance of the coal fleet by 2035; our evaluation includes environmental review, public input and Board approval. As plants are retired, we work closely with each plant community and its public officials, business leaders, the public, and plant employees to support the transition.

As we reduce coal generation, we are modernizing our gas generation fleet as a bridging technology. This, and our continued and increased reliance on nuclear generation, will to help reduce emissions and support high levels of reliability, given the intermittency of renewables. And in partnership with multiple other utilities in the Southeast, we are working to establish the Southeast Energy Exchange Market. This market could potentially help all participants in the Southeast realize a higher penetration of renewables by creating a bilateral market to exchange energy efficiently.

## **ENERGY AND THE ECONOMY**

The impact of a reliable, low-cost energy supply can be seen in the region's economic development successes. Over the past five years, TVA has helped attract or retain about 341,000 jobs and more than \$45 billion in capital investment for the region. In FY 2020, despite pandemic conditions, we helped the region attract or retain 67,000 jobs and more than \$8.6 billion in capital investment.

For a growing number of businesses and industries, having a supply of carbon-free energy has joined cost and reliability as a key factor in determining where they locate or expand their operations. TVA's ability to provide low-cost, increasingly clean, highly reliable energy is essential for powering the ambitious strategies and climate goals of these businesses. This ability creates a competitive advantage for our region in attracting innovative industries, jobs and investments and continuing to power the Valley's economic development.

The priorities on which TVA has focused during the past several years include investing and modernizing the power system to drive down costs, maintaining financial and organizational

discipline, and significantly strengthening our partnerships with customers, labor unions, and stakeholders. Our success in executing this strategy has positioned us well for the future.

Over the past decade, TVA has kept its effective rate flat while at the same time investing over \$15 billion to balance and modernize our generation portfolio, and we continue to make investments to further modernize and diversify our generation system.

TVA is investing more than \$2 billion in transmission system improvements over five years to ensure that we continue to provide increasingly clean, low-cost, reliable energy. We are working to find ways to ensure reliability as local power companies bring their own solar and other renewable resources onto the system.

The heart of the energy system of the future will be TVA's new System Operations Center and Energy Management System, a \$300 million investment employing smart technologies to manage power grid operations more reliably, efficiently and securely. The center's Energy Management System will increase system flexibility by integrating and monitoring distributed energy resources and demand response, helping to keep costs low and reliability high as energy sources and customers' energy use continue to evolve.

TVA's responsibilities for energy, environmental stewardship, and economic development also make us an important contributor to ongoing efforts to improve air quality in the region and the nation. Our system is one of the nation's cleanest with almost 60% of our energy supply coming from carbon-free sources.

Our efforts to build a resilient, diverse power generation mix have led to a 63% reduction in mass carbon emissions since 2005 in the total energy we supply to the region. In addition to our expanding use of nuclear energy, from 1970 to 2020, TVA invested \$6.8 billion in environmental controls to reduce emissions from fossil-fueled plants. These environmental control investments have reduced our sulfur dioxide emissions 99% below 1977 levels. Nitrogen oxide emissions have been reduced 97% below 1995 levels. We have reduced carbon dioxide

emissions by about 60% compared with the 2005 benchmark, one of the largest decreases in the power industry.

To continue diversifying our power system, we are adding significant renewable energy. As of the second quarter FY 2021, TVA has commitments of over 2,300 megawatts of solar capacity expected to come online by the end of 2023. Including these projects, we expect to add 10,000 megawatts of solar by 2035, which is primarily based on customer demand in the near term and represents a 24-fold increase from today.

In renewable energy, our utility-scale solar program, Green Invest, is setting a standard for the industry. The program is based on a unique public/private partnership structure and competitive bid process that enable the growth of affordable solar without shifting costs to non-participants. Additionally, Green Invest leverages the demand for utility-scale solar from business and industry for economic development in our communities.

Since 2018, Green Invest has attracted nearly \$2.7 billion in solar investment and procured more than 2,000 megawatts of solar on behalf of its customers – maintaining TVA’s green energy leadership as the energy provider with the greatest amount of renewable generation in the Southeast.

TVA’s environmental responsibilities include managing the 652-mile Tennessee River system, an important part of the nation’s commercially navigable inland waterway system. Nearly 50 million tons of commercial goods move through the TVA system of locks and dams each year. Other benefits of the river system include flood control that prevented \$1 billion in flood damage in FY2020 as the region experienced 150% of normal rainfall.

The river system’s hydro-electric dams are TVA original energy source; and the system’s 40,000 miles of rivers, streams and tributaries also support water supply and water quality, as well as other needs. The river system also supports a thriving recreation industry that produces almost \$12 billion a year in economic activity, supporting more than 130,000 jobs and generating almost \$917 million in tax revenues to the region’s state and local governments.

## **THE PUBLIC POWER MODEL**

TVA carries out all aspects of its mission of service with no federal appropriations of tax dollars. While TVA is a corporation of the federal government, TVA funds its power system and virtually all other operations entirely with revenues from energy sales and proceeds from debt issuances.

TVA's unique business model is structured so that TVA serves the people of the Valley with public power, in partnership with local power companies. In supplying public power, TVA is statutorily obligated to supply energy at the lowest feasible rate, with an obligation to serve the people and their communities, not shareholders. And we serve people throughout the region, from the largest cities to the most remote farms.

Because TVA is self-financing and must fulfill its broad mission, revenues from energy sales cover TVA services that investor-owned utilities generally do not offer, such as river management, extensive economic development programs, innovative demonstration projects, and a wide range of environmental stewardship programs.

Even so, TVA maintains some of the nation's lowest energy prices. 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 lowest in the nation – lower than 90% of the nation's top 100 utilities. TVA's effective rates have remained flat and low for the past seven years even as we have reduced debt to its lowest level in more than 30 years and invested in the power system. Our long-term financial plan projects flat, effective wholesale rates for the next decade, and we continue to have solid confidence in those plans.

TVA's commitment to putting the people and communities we serve first was evident this winter as extreme weather overwhelmed other power providers outside the TVA region. Unfortunately, the people living in those areas were hit hard by the blackouts and price surges. While only a portion of our service territory experienced similar extreme weather, TVA's commitment to



service, our ongoing investments in the power system, and the dedication of our employees kept our plants operating, supplying energy at stable prices, and with high reliability. This event has demonstrated the resiliency of our system.

Built into TVA's business model is our relationship with the 153 local power companies across the region. We supply wholesale energy to the local power companies, which then distribute the energy to the homes and businesses they serve.

In the past two years, we have strengthened the partnership between TVA and local power companies, by introducing the long-term partnership agreement. As a result, we now have new and stronger partnerships in place with 142 of the 153 local power companies that we serve, representing 93% of the region's local power companies. We are aligned around 20-year commitments to plan and work together to keep rates low and stable, across the seven-state region.

Long-term partners benefit from a 3.1% credit on their monthly wholesale bills, and 71 of our partners also are taking advantage of TVA's Generation Flexibility program to help meet local generation needs for their customers, including the deployment of distributed solar resources. In addition, TVA directly supplies energy to 57 large corporations and federal installations in the region, including Oak Ridge National Laboratory and other Department of Energy facilities at Oak Ridge, Tennessee.

Last winter, the TVA Board commissioned the internationally recognized Lazard firm to assess TVA's business performance through 2020 and determine if this business model is a reasonable approach to fulfilling TVA's mission in the future. The Lazard report builds on an earlier strategic review by the firm, one done in 2014, and notes that TVA's financial performance has been notably strong against both our own financial plan and the performance of other utilities. The report concludes that TVA's business structure and the public power model continue to be a reasonable approach to support TVA's mission for providing the greatest value to the 10 million people in TVA's seven-state service area.

Public power means having financial stability without tax dollars; and it puts service, community, and people over profits. During pandemic conditions, TVA has been uniquely situated to demonstrate its commitment to our customers and communities by helping to mitigate the impact of unprecedented challenges.

For all customers, for FY 2021, we have reduced our already low energy prices by 2.5% through a Pandemic Relief Credit on monthly bills during the year. This credit will put a projected \$200 million back into Valley communities in FY 2021 in the form of rate reductions, bill assistance for those in need, upgraded system infrastructure to maintain reliability, and more.

For large industrial and commercial customers, we began offering Back-to-Business incentives to help businesses return to full operations and to help the economy recover. As of the second quarter FY 2021, we have invested \$12 million in credits to help everyone get “back to business.”

Early in the pandemic, as household bills began to stack up, TVA provided the local power companies we serve with regulatory flexibility and \$1 billion in credit support to help them and the people they serve. Also, early on, we established a Community Care Fund to help charitable organizations meet local needs through matching funds from local power companies and others. The value of the Community Care Fund now exceeds \$7 million. The Community Care Fund has made more than 460 grants to organizations across the region, addressing local needs through food banks, boxed-lunch programs for students, United Way, Boys and Girls Clubs, and other programs.

Together, TVA and local power companies ensure a reliable, increasingly clean and low-cost energy supply; a local presence and local voice; and the reinvestment of revenues into the energy, economic development, and environmental services that benefit the region.

## GOVERNANCE AND FINANCES

TVA is governed by our Board of Directors, which is responsible for providing strategic oversight. The nine part-time Board members are appointed by the President with the advice and consent of the U.S. Senate. Board responsibilities include formulating broad strategies, goals, long-range plans, and policies for TVA; reviewing and approving annual budgets; and setting and overseeing electric rates.

For FY 2021, the TVA Board approved a budget of \$10.0 billion, which includes \$2.2 billion in continuing capital improvements to our generating, transmission and infrastructure assets. TVA's financial position continues to be strong and stable.

In FY 2020, the TVA team delivered exceptionally strong financial results, providing TVA the flexibility to take a number of special steps, such as the \$200 million Pandemic Relief Credit and the Community Care Fund I mentioned previously. These initiatives helped address the ongoing impacts of COVID-19 in our communities.

In FY 2020, TVA's total operating revenues of \$10.2 billion were down about 5% from projections due to a combination of weather factors and the impacts of the pandemic. That shortfall was offset by improved operational performance that lowered operating and maintenance costs, reduced fuel costs and exceeded TVA's debt reduction target by nearly \$400 million, reducing debt to its lowest level in 30 years.

TVA's fuel, purchased power, operating and maintenance, tax equivalents, and interest expense were all lower in FY 2020 than in FY 2019. TVA's fuel and purchased power expense was 15% lower year-over-year, primarily driven by lower effective fuel rates and lower energy sales due to impacts of milder weather and COVID-19, as well as the increased generation of nuclear power.

TVA paid nearly \$552 million in tax equivalent payments in FY 2020 to state and local governments served by its energy generation or in areas supporting TVA properties. The

payments compensate state and local governments that cannot levy property or sales taxes on TVA as a federal entity. We return 5% of power sales revenues from the previous year in the form of tax equivalent payments to the eight states where we sell electricity or own generating plants, transmission lines, substations and other assets, and directly to 147 local governments where TVA owns power property.

TVA's strong financial position helped us absorb the impacts of the pandemic in 2020, provide extra support for our customers, and reduce effective power rates for customers for 2021, when our communities need relief the most. This would not have been possible without the ongoing financial discipline of our employees.

## **THE WOMEN AND MEN OF TVA**

The strength of TVA truly is its people – a diverse and skilled workforce of 10,000 employees and almost 14,000 contractor partners. Almost 20% of TVA employees are veterans, and we will continue our focus on employing those American heroes as we face the future. Our employees and contractors are represented by 17 unions, and we value and appreciate all our union partners.

In 2020, we entered into two historic agreements with our union partners – a 10-year extension of the recognition of the TVA Trades and Labor Council for Annual Employees as representing TVA craft employees, and a 10-year extension of TVA's project labor agreements with the North American Building Trades Union.

The TVA Retirement System administers retirement benefits for approximately 9,700 employees and 23,000 retirees and beneficiaries. Pension assets total about \$8 billion; liabilities are approximately \$13.6 billion; annual pension benefit payments total about \$720 million; with a plan to be fully funded for TVA's pension liability by 2036. TVA implemented a plan in 2016 focused on fully funding the pension over a 20-year period. The plan includes assumptions around system demographics, contributions, asset returns, and discount rates. The funding plan is ahead of schedule, and we consistently update the details of the funding plan. Separately, 401(k) plan assets total \$3.3 billion.

## **CYBERSECURITY**

As we supply reliable energy, the efficiency and security of our transmission system are critical. TVA works around the clock to monitor and protect its critical cyber assets, partnering with other government agencies, as well as with industry groups and peers such as the Edison Electric Institute and neighboring utilities.

TVA has a comprehensive cybersecurity program aligned to industry and federal best practices that operates to identify, detect, protect, and respond to threats. We focus on being proactive and using risk-based assessments to protect TVA. In addition to having multi-layered threat analysis capabilities, we perform continuous monitoring, penetration testing and vulnerability assessments.

TVA's critical systems are housed within a specialized, isolated network that is separated from corporate networks and inaccessible from the internet. This network segmentation provides a significant added level of security.

TVA trains its employees to recognize and resist cyber threats. TVA also adheres to an array of industry and government standards, including National American Electric Reliability Corporation (NERC) Critical Infrastructure Protection (CIP) standards, Nuclear Regulatory Commission (NRC) security requirements and the Federal Information Security Management Act (FISMA).

## **CARBON REDUCTION**

TVA is a national leader in carbon reduction and is the largest clean-energy producing utility in the Southeast, including our nuclear energy and hydro generation, and home to a nationally recognized solar energy program.

We have nearly 50% more clean generation than our closest regional peer, and currently have one of the lowest greenhouse gas intensities per unit of electricity produced in the U.S. But we are not satisfied. We are committed to continuing to reduce greenhouse gas emissions while maintaining our focus on delivering low-cost, reliable energy that our customers expect and deserve for the long-term.

In May, we announced TVA's decarbonization plan to increase our carbon reduction from the current 63% to 70% by 2030 and a path for reaching approximately 80% by 2035, using existing technology and without impacting TVA's reliability or costs. While we are encouraged by more ambitious goals, under the current technology and expected costs, our aspirational goal is to achieve net-zero carbon emissions by 2050.

We recognize that reaching net-zero by closing the last 20% gap in carbon emissions, or accelerating our reduction, depends on the development of emerging technologies at a commercial scale and at a cost that will enable their deployment. These include advanced nuclear, carbon capture and sequestration, long-duration energy storage, and alternative fuels such as hydrogen. Importantly, our challenge is not only to lower CO<sub>2</sub> emissions from the existing generation system, but also to provide the additional zero-carbon resources needed to satisfy what may very well be increasing demand as clean electricity is used to decarbonize other sectors of the economy, such as transportation.

In 1950, electricity was just 2% of end-use energy. Today, it is 22%; and by 2050, there are projections that say it could be over 40%. We must work together to develop and demonstrate new technologies to meet this critical demand for electricity to further evolve existing technologies, such as energy storage systems and carbon capture, and develop new capabilities, such as advanced nuclear technologies

TVA stands ready to help lead in these innovation efforts.

## **THE NEED FOR NEW NUCLEAR**

I believe our goal for the energy industry and the nation should be to decarbonize the generation of electricity and then use our clean energy supply to reduce emissions, drive innovation and grow the economy. I believe that goal can be achieved through the development and use of carbon-free nuclear energy.

Carbon-free nuclear is one key aspect of our energy supply as we work to electrify the economy, drive down customer costs, and eliminate emissions. TVA is engaged today in developing new nuclear technology because we believe it is essential to TVA's and the nation's decarbonization efforts. We are applying TVA's experience as a leader in technology innovation and deployment in the industry to the new challenge of identifying the best options for the next generation of advanced nuclear.

TVA believes light water small modular reactors are the specific advanced nuclear technology that could be most ready for deployment near-term – with the first commercial operation by 2030s. This would enable advanced nuclear to make a meaningful contribution to carbon reduction within the next two decades.

In December 2019, TVA received the nation's first Early Site Permit for a small modular reactor from the U.S. Nuclear Regulatory Commission for two or more small modular reactors at our Clinch River Site in Oak Ridge, Tennessee. This is the only site in the nation with an NRC-approved early site permit for small modular reactors.

In the second quarter of 2021, TVA initiated a programmatic Environmental Impact Statement to address potential environmental effects associated with the construction, operation, and decommissioning of an advanced nuclear reactor. We already have a partnership to explore the economic feasibility of small modular reactor technology with the University of Tennessee and the Department of Energy's Oak Ridge National Laboratory, among others.

Successful partnerships, such as our recent agreement to collaborate with Kairos Power on deploying a low-power demonstration reactor, are particularly important in the development of advanced nuclear designs. In the Tennessee Valley and elsewhere, nuclear technology plays a critical role in meeting electricity generation needs and carbon reduction goals in a manner that maintains reliability and keeps rates affordable. As one of the nation's largest electricity providers, TVA is committed to being part of the solution and to working with others to meet this important challenge.

TVA is working with Department of Energy's Oak Ridge National Laboratory, the largest multi-program science and energy research lab in the United States, to explore options and opportunities for fostering innovations in nuclear and other technologies.

The national lab is a customer of TVA and a key part of the Department of Energy's efforts to reduce its carbon footprint. TVA and ORNL have a number of exciting opportunities to work together to develop advanced nuclear technologies. In the Tennessee Valley and elsewhere, nuclear technology is one way to meet electricity generation needs and carbon reduction goals. As one of the nation's largest electricity providers, TVA is committed to being part of the solution and to working with others to meet this important challenge.

TVA is poised with a site, expertise, nuclear construction know-how, and mission to lead in this technology to achieve the nation's carbon-free goals. As TVA strives to explore new technologies, we must remain cognizant of our unique business model: TVA is a federal entity with no appropriated funding, with a mandate to set power rates as low as feasible, and with no eligibility for tax credits or other incentives available to investor-own utilities.



## CONCLUSION

TVA delivers on its mission of service through work in three key areas: energy that is low-cost and reliable; economic development that brings jobs and capital investment to the region; and environmental stewardship of the region's public lands, water and air. TVA was created with, and has continued to build on, its clear mission to benefit the public good.

This was our initial mission during the Great Depression as we began building the infrastructure to support a better quality of life. This was our mission while powering the nation to win World War II. This continued to be our mission during the subsequent decades of American growth and prosperity, and it is still our mission.

We are investing in the future today as we set our plans and aspirations for years to come.

The challenges are certainly different today than in 1933, but they are no less critical to the lives of those we are privileged to serve – delivering vital services and support across the region for almost 90 years, including during this unprecedented pandemic that has impacted families, communities, businesses and industries.

TVA's mission has stood the test of time, but TVA has never stood still. We are always striving to live up to the words prominently visible at many TVA facilities: Built for the People of the United States.

# # #