Climate Adaptation Plan

As Submitted May 31, 2024

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 using words such as: may, will, should, expect, anticipate, believe, intend, project, plan, predict, assume, forecast, estimate, objective, possible, probably, likely, potential, speculate, aim, aspiration, goal, seek, strategy, target 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 any 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.

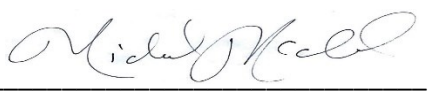
Final Submission Signature
The agency CSO has reviewed the 2024 Climate Adaptation Plan and provided approval for submission, as indicated by signing below.
 _____ Vice President, Environment & Sustainability; Chief Sustainability Officer

Table of Contents

Section 1: Agency Profile 4

Section 2: Risk Assessment 7

2A. Climate Hazard Exposures and Impacts Affecting Federal Buildings 8

2B. Climate Hazard Exposures and Impacts Affecting Federal Employees 9

2C. Climate Hazard Impacts on and Exposure to Federal Lands, Waters and Cultural Resources 10

2D. Climate Hazard Exposures and Impacts Affecting Mission, Operations and Services 12

Section 3: Implementation Plan 15

3A. Addressing Climate Hazard Impacts and Exposure 15

1. Addressing Climate Hazard Exposures and Impacts Affecting Federal Buildings 15
2. Addressing Climate Hazard Exposures and Impacts Affecting Federal Employees 16
3. Addressing Climate Hazard Exposures and Impacts Affecting Federal Lands, Waters and Associated Cultural Resources 17

3B. Climate-Resilient Operations 19

1. Accounting for Climate Risk in Planning and Decision Making 19
2. Incorporating Climate Risk Assessment into Budget Planning 20
3. Incorporating Climate Risk into Policy and Programs 21
4. Climate-Smart Supply Chains and Procurement 23
5. Climate Informed Funding to External Parties 24

3C. Climate Training and Capacity Building for a Climate Informed Workforce 24

3D. Summary of Major Milestones 25

Section 4: Demonstrating Progress 26

4A. Measuring Progress 26

4B. Adaptation in Action 29

Appendix: Risk Assessment Data 31

Tennessee Valley Authority

2024-2027 Climate Adaptation Plan

Section 1: Agency Profile

AGENCY PROFILE	
Agency Mission	TVA was built for the people, created by federal legislation, and charged with a unique mission - to improve the quality of life in a seven-state region through the integrated management of the region's resources. TVA's mission focuses on three key areas: ▪ Energy—Delivering reliable, low cost, clean energy. ▪ Environment—Caring for the region's natural resources; and ▪ Economic Development—Creating sustainable economic growth.
Agency Climate Adaptation Official	Michael McCall - Vice President, Environment and Sustainability; Chief Sustainability Officer
Agency Risk Officer	Thomas C. Rice - Vice President, Treasurer and Chief Risk Officer
Point of Public Contact for Environmental Justice	tvainfo@tva.gov
Owned Buildings	2319 owned buildings of 26,345,397 Gross Square Feet *(FRPP public dataset, FY 2022)*
Leased Buildings	13 leased buildings of 82,532 GSF *(FRPP public dataset, FY 2022)*
Employees	10,901 employees Approximately 15,600 contractors *(10-K; September 30 2023)*
Federal Lands and Waters	TVA owns and manages 293,000 acres of public land to protect the integrated operation of the TVA reservoir and power systems, to provide for the appropriate public use and enjoyment of the reservoir system and to promote the continuing economic development of its region. *(tva.com 2024)*
Budget	TVA does not receive funding from Congress. Revenues come almost exclusively from sales of electricity. Operating Revenues ($ Millions): FY 2022: $12,540 FY 2023: $12,054 *(10-K; September 30 2023)*
Key Areas of Climate Adaptation Effort	Environment & Sustainability Enterprise Risk Management Cultural Compliance

	Power Operations Supply Chain Transmission

TVA's unique, long-standing mission of service is just as relevant today as it was when TVA began in 1933: To serve the people of the Tennessee Valley to make life better. As times have changed, TVA has changed with them by updating and refining its work to accomplish its mission of providing affordable energy, economic development, and environmental stewardship through integrated river system management, partnerships, and technological innovation. To deliver on the commitment to the 10 million people TVA serves, it builds climate resilience and sustainability into everything it does.

TVA maintains its Climate Adaptation Plan (CAP) as a cohesive part of its major planning processes, including integrated resource management and planning, natural resource, and National Environmental Policy Act (NEPA) planning. This plan was prepared in accordance with guidance for Federal climate adaptation planning from the White House Council on Environmental Quality (CEQ). The information presented here aligns with adaptation and resilience requirements in section 211 of Executive Order (E.O.) 14008 Tackling the Climate Crisis at Home and Abroad, section 5(d) of E.O. 14030 Climate-Related Financial Risk, and section 503 of E.O. 14057 Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability.[1] Consistent with the TVA Act and Board authority, TVA reviews applicable Executive Orders (EO) as well as all guiding principles for applicability to TVA programs and policies, as mentioned below. TVA's purpose in enhancing preparedness for and resilience to the climate crisis includes areas that have co-benefits for mitigation and environmental justice.

In December 2022, TVA received a report from the Government Accountability Office (GAO) assessing TVA's ability to anticipate, prepare for, or adapt to changing conditions and withstand, respond to, or recover rapidly from disruption attributed to climate conditions. The report specifically examined climate related risks to operations and the steps TVA has taken to manage these risks.

TVA formed an internal review team to evaluate existing processes in response to the GAO's findings. To strengthen climate resiliency, TVA established priority actions, to ensure that: 1) TVA planning processes identify assets and operations vulnerable to climate change and analyze likelihood and degree of consequences, 2) measures to address climate change vulnerabilities are identified and prioritized, and 3) processes are in place to reassess plans and incorporate updated climate change information. The priority actions and responsible Business Units are:

1. Implement and maintain seasonal readiness programs that incorporates climate threats (Agency Leads – Chief Operating Office, TVA Nuclear)

[1] 86 FR 7619 (Feb 1, 2021), 86 FR 27967 (May 25, 2021), 86 FR 70935 (Dec. 13, 2021.)

2. Evaluate climate threats in enterprise risk management (Agency Lead – Enterprise Risk Management)
3. Research methods for improved climate resilience and adaptation planning (Agency Lead – Enterprise Planning)
4. Include relevant climate change information in updated Integrated Resource Plan (Agency Lead – Enterprise Planning)
5. Evaluate systems and components with low operating and design margin for potential resiliency hardening (TVA Lead – TVA Nuclear Design Engineering)
6. Integrate climate resiliency in transmission grid resiliency matrix (Agency Lead – Transmission Compliance & Resilience)
7. Complete asset analysis and incorporate climate resiliency into business processes (Agency Lead – Power Operations)

Actions taken and planned related to these will be outlined through this report, as well as additional actions in progress related to the priorities identified in TVA's 2021 CAP.

Through its Climate Adaptation Plan, TVA is also able to advance environmental justice considerations consistent with TVA's statutory mission of service, where aligned with Executive Order 14008 and EO 14096 on *Revitalizing Our Nation's Commitment to Environmental Justice for All* as appropriate. As TVA implements its Climate Adaptation Plan to increase the resilience of facilities and operations, it continues to support making the region the best place in the country to live, work and play. TVA manages the Tennessee River system to provide multiple benefits to the people it serves including flood control, recreation, and power production, to ensure that its region will be a safe, healthy, and beautiful place to live and play for years to come. TVA uses best efforts to address disproportionate and adverse environmental and health effects, risks, and hazards, including those related to climate change and cumulative impacts of environmental and other burdens on communities with environmental justice concerns and provide opportunities for the meaningful engagement of persons and communities with environmental justice concerns, in alignment with TVA's statutory mission responsibilities.

Section 2: Risk Assessment

TVA used the Federal Climate Mapping for Resilience and Adaptation Application (Federal Mapping App)— which was developed for federal agencies by the White House Council on Environmental Quality (CEQ) and the National Oceanic and Atmospheric Administration (NOAA) to conduct a high-level screening of climate hazard exposure for federal facilities.

TVA assessed the exposure of its buildings; employees; and lands, waters, and cultural and natural resources to five climate hazards: extreme heat, extreme precipitation, sea level rise, flooding, and wildfire risk.

Climate Data Used in Agency Risk Assessment

Hazard	Description	Scenario	Geographic Coverage
Extreme Heat	Measured as whether an asset is projected to be exposed to an increased number of days with temperatures exceeding the 99th percentile of daily maximum temperatures (calculated annually), calculated with reference to 1976-2005. Data are from high-resolution, downscaled climate model projections based on the Localized Constructed Analogs (LOCA) dataset prepared for the 4th National Climate Assessment.	RCP 4.5 RCP 8.5	CONUS CONUS
Extreme Precipitation	Measured as whether an asset is projected to be exposed to an increased number of days with precipitation amounts exceeding the 99th percentile of daily maximum precipitation amounts (calculated annually), with reference to 1976-2005. Data are from high-resolution, downscaled climate model projections based on the LOCA dataset prepared for the 4th National Climate Assessment.	RCP 4.5 RCP 8.5	CONUS CONUS and AK
Sea Level Rise	Measured as whether an asset is within the inundation extents from NOAA Coastal Digital Elevation Models and the 2022 Interagency Sea Level Rise Technical Report. Intermediate and Intermediate-High sea level rise scenarios used as proxies for RCP 4.5 and 8.5, respectively.	RCP 4.5 RCP 8.5	CONUS and PR CONUS and PR
Wildfire Risk	Measured as whether an asset is in a location is rated as high, very high, or extreme risk based on the U.S. Forest Service Wildfire Risk to Potential Structures (a data product of Wildfire Risk to Communities), which estimates the likelihood of structures being lost to wildfire based on the probability of a fire occurring in a location and likely fire intensity. Data reflects wildfires and other major disturbances as of 2014.	Historical	All 50 States
Flooding	Measured as whether an asset is located within a 100-year floodplain (1% annual chance of flooding) or 500-year floodplain (0.2% annual chance of flooding), as mapped by the Federal Emergency Management Agency National Flood Hazard Layer.	Historical	All 50 States and PR

Exposure to extreme heat, extreme precipitation, and sea level rise were evaluated at mid- (2050) and late-century (2080) under two emissions scenarios, Representative Concentration Pathway (RCP) 4.5 and RCP 8.5. Exposure to flooding and wildfire risk were only evaluated for the present day due to data constraints.

Climate Scenarios Considered in Agency Risk Assessment

Scenario Descriptor		Summary Description from 5th National Climate Assessment
RCP 8.5	Very High Scenario	Among the scenarios described in NCA5, RCP 8.5 reflects the highest range of carbon dioxide (CO_2) emissions and no mitigation. Total annual global CO_2 emissions in 2100 are quadruple emissions in 2000. Population growth in 2100 doubles from 2000. This scenario includes fossil fuel development.
RCP 4.5	Intermediate Scenario	This scenario reflects reductions in CO_2 emissions from current levels. Total annual CO_2 emissions in 2100 are 46% less than the year 2000. Mitigation efforts include expanded renewable energy compared to 2000.

Additional details about the data used in this assessment are provided in the Appendix.

2A. Climate Hazard Exposures and Impacts Affecting Federal Buildings

Indicators of Exposure of Buildings to Climate Hazards	RCP 4.5 2050	RCP 4.5 2080	RCP 8.5 2050	RCP 8.5 2080
Extreme Heat: Percent of buildings projected to be exposed to more days with temperatures exceeding the 99th percentile of daily maximum temperatures (calculated annually) from 1976-2005	100%	100%	100%	100%
Extreme Precipitation: Percent of buildings projected to be exposed to more days with precipitation amounts exceeding the 99th percentile of daily maximum precipitation amount (calculated annually) from 1976-2005	99%	99%	99%	100%
Sea Level Rise: Percent of buildings projected to be inundated by sea level rise	0%	0%	0%	0%
	High Risk	**Very High Risk**		**Extreme Risk**
Wildfire: Percent of buildings at highest risk to wildfire	0%	0%		0%
	100- or 500- year floodplain			
Flooding: Percent of buildings located within floodplains	10%			

TVA operates and maintains about 2,300 buildings in parts of seven states in the southeastern region of the United States. These buildings range from full scale offices in metropolitan cities to storage sheds on plant sites in more rural areas. As confirmed through the Federal Mapping App, all buildings are projected to be exposed to more hot and more wet days (an increase in the number of days with a maximum temperature greater than the 99th percentile of daily

maximum temperatures and an increase in number of days with precipitation exceeding the 99th percentile of daily precipitation amounts). No buildings are at risk of sea-level rise, and approximately 10% are located within the 100-year or 500-year floodplains.

Increasing temperatures may create greater demand for electricity and affect TVA's power plant operations, ability to generate power, the efficiency of TVA's transmission and other critical infrastructure. Increased risk of flooding associated with heavy precipitation events can damage or otherwise negatively affect TVA's generation and transmission infrastructure, which can lead to outages and costly repairs. Heavy precipitation events pose inland flooding risks for electricity assets and supporting building infrastructure along riverbanks or in floodplains.

TVA uses a seasonal readiness process to manage assets and operations that may be vulnerable to extreme climate threats in the short term of 6-12 months and is working to implement and maintain this process as Priority Action 1, *"Implement and maintain seasonal readiness programs that incorporate climate threats"*. As a result of the Winter Storm Elliot event in December 2022, TVA has completed an assessment to identify specific actions to ensure the reliability and resilience of the power grid and assets and enhance communications with local power companies and stakeholders during severe weather events.

In addition, TVA is in the process of completing an updated Integrated Resource Plan (IRP), which serves as a compass for how to reliably meet forecasted energy demand in the coming decades. The comprehensive study contains resource needs, policy goals, physical and operational constraints, risks, and proposed resource choices. Long-term climate related vulnerabilities will be assessed in this plan to address Priority Action 4, *"Include relevant climate change information in updated IRP"*.

2B. Climate Hazard Exposures and Impacts Affecting Federal Employees

The majority of TVA's workforce lives in the Tennessee Valley region in the southeastern United States which includes parts of Tennessee, Alabama, Mississippi, Kentucky, Virginia, Georgia, and North Carolina, and a small percentage of employees are based in Washington, D.C. As the workforce generally resides near office complexes and generation facilities, TVA's workforce climate hazard risk is assumed to be similar to the building risks discussed in Section 2A. Increasing temperature and other climate-related hazards pose a particular risk to staff that work outside, including risks like heat stress or ability to reach the job sites. Climate impacts to TVA's workforce are included in risk management planning and will continue to be evaluated as part of Priority Actions 2, 3, and 4.

2C. Climate Hazard Impacts on and Exposure to Federal Lands, Waters and Cultural Resources

Federal Asset	Current Climate Hazard Impact or Exposure	Future Climate Hazard Impact or Exposure
Natural Resources • 293,000 acres of public land and 11,000 miles of shoreline • Wildlife living on this land	Extreme temperatures, Heavy precipitation	Extreme Temperatures: • Contributes to lower species survival rates due to changes that lead to less food, less successful reproduction, environmental changes for native wildlife and potential for invasive species to thrive. Heavy Precipitation: • Contributes to erosion and extreme events affecting wildlife and unique natural areas by destroying habitats and key pieces of ecosystems.
Cultural Resources • Estimated 627 Historic architectural resources (Federal Buildings and other structures); 496 of these are historic properties—listed in or eligible for listing in the National Register of Historic Places (NRHP)	Extreme temperatures; Heavy Precipitation and Flooding; Drought; Increased Storms with High Winds; and More Frequent Wildfires	Extreme temperatures (both high and low), heavy precipitation and flooding, drought, increased storms with high winds, and more frequent wildfires all can have a direct effect upon historic buildings. The highest concentration of TVA's historic architectural resources is located at TVA's dam facilities. Deterioration of the components of these historic buildings, districts, and sites accelerate with all these changes within the climate. Specific anticipated effects of each of these changes are discussed in detail within TVA's 2023 Section 3 Report, available on achp.gov.
Cultural Resources • Estimated 12,500 archaeological resources significant to Tribes and SHPOs	Heavy Precipitation, Flooding, Drought, More Frequent Wildfires	Heavy Precipitation: • Contributes to erosion and damage to archaeological sites and above ground archaeological features. Flooding • Contributes to erosion and exposure of sensitive archaeological features which also makes them more vulnerable to looting and vandalism. Droughts • Lowered reservoir levels expose sensitive archaeological features – increasing access and making them more vulnerable to looting and vandalism. More frequent wildfires • Fires can cause damage to above ground archaeological features and artifacts that are exposed on the surface

TVA manages approximately 293,000 acres of land Valley-wide (TVA public lands) as part of its mission of service. The lands that TVA stewards have provided the foundation for the dams and reservoirs that protect the region from flooding and secure for its residents the benefits of a navigable waterway and low-cost hydroelectricity. In addition, TVA maintains and protects an estimated 627 historic architectural resources including Federal buildings and other structures, as well as an estimated 12,500 archaeological resources significant to Tribes and State Historic Preservation Officers (SHPOs). All these resources are exposed to many climate hazards including temperature changes, heavy precipitation and flooding, drought, extreme weather events, and frequent wildfires.

Extreme heat can accelerate deterioration of building components, while extreme cold and increasing freeze thaw cycles have negative effects on masonry buildings, which are featured on many of TVA's historic properties. Extreme heat also lowers many species' survival rates due to changes that lead to less food, less successful reproduction, and interfering with the environment for native wildlife. Rising temperatures risk destabilizing the balance between wildlife and their ecosystem. As plants adapt to changing warming patterns, usually by blooming earlier or shifting to cooler locations, the wildlife that has adapted to them will be forced to face new environments. Some species will struggle to find nutritious enough food. Pollinators must feed from flowers that are blooming earlier in the year and other animals may find their habitats are no longer able to support their biology. In addition, as native species lose their natural advantages, invasive species have potential to multiply in the changing environment, such as Emerald Ash Borers and Spongy (Gypsy) Moths.

Heavy precipitation events pose inland flooding risks for infrastructure along riverbanks or in floodplains, as well as recreation facilities at TVA dams, particularly restrooms and campgrounds. Flooding also has detrimental effects on wildlife and unique natural areas as it can destroy key pieces of the ecosystems and habitats that support native plants.

Drought can increase erosion and encourage settling of buildings at TVA's historic resources, leading to cracks in foundations. Lower reservoir levels can also expose sensitive archaeological features, which increases access and makes them more vulnerable to looting and vandalism.

Fires also can cause damage to above ground archaeological features and artifacts exposed on the surface and can affect the structural integrity of historic properties. Changes in climate factors may be leading to an increased wildfire season length, wildfire frequency, and amount of burned area as well as excessive fuel loading from stressed or dying vegetation.

Biodiversity in the region is particularly threatened by flooding, drought, and precipitation changes, as this can displace wildlife. TVA has been involved in projects including the establishment of riparian buffers, the removal of stream barriers, and the propagation and reintroduction of at-risk fish and mussel species to help maintain and sustain the aquatic biodiversity of the region. Data collected by stream monitoring under these programs are shared with partner agencies and organizations to advance scientific understanding of the Tennessee River's rich aquatic biodiversity and to support aquatic conservation programming and understand how species are affected by climate hazards.

2D. Climate Hazard Exposures and Impacts Affecting Mission, Operations and Services

SUMMARY OF KEY CURRENT AND PROJECTED CLIMATE HAZARD IMPACTS AND EXPOSURES		
Area of Impact or Exposure	Identified Climate Hazard	Description
Ability to produce and deliver reliable, low-cost energy	Extreme Temperatures (both hot and cold); Heavy Precipitation and Flooding, Drought, Increased Storms with High Winds, and More Frequent Wildfires	TVA works to produce and provide power to roughly 10 million people in the southeastern U.S. TVA's plant assets and transmission system are constantly exposed and are at risk of many climate hazards.
Caring for the region's natural resources	Extreme Temperatures (both hot and cold); Heavy Precipitation and Flooding, Drought, Increased Storms with High Winds, and More Frequent Wildfires	TVA's mission includes caring for the region's natural resources.
TVA operates more than 50 power plants across 7 states including. • 5 fossil (25 active units) • 3 nuclear (7 units) • 29 hydro (109 units) • 1 pumped storage hydroelectric (4 units) • 9 natural gas combustion turbine gas (87 units) • 8 natural gas combined cycle gas (14 power blocks, 35 units [21 gas turbines, 14 steam turbines]) • 1 diesel generator site (5 units) • 13 solar energy sites	Increasing Temperature	Increasing temperatures may create greater demand for electricity and affect TVA's power plant operations, ability to generate power, the efficiency of TVA's transmission and other critical infrastructure, and the health of TVA's outdoor workers.
TVA operates more than 50 power plants and maintains 16,400 miles of transmission lines across 7 states.	Heavy Precipitation and Flooding	Increased risk of flooding associated with heavy precipitation events can damage or otherwise negatively affect TVA's generation and transmission infrastructure, which can lead to outages and costly repairs. Heavy precipitation events pose inland flooding risks for electricity assets and supporting infrastructure along riverbanks or in floodplains.
Many TVA assets rely on water availability including hydropower, coal-fired, natural gas, and nuclear plants.	Drought	Drought could reduce the water available for TVA's power plants that rely on water for their power generation operations. In TVA's region, an inadequate supply of water could reduce generation at TVA's hydropower

		plants and at its coal-fired, natural gas, and nuclear plants, which depend on water from nearby river systems for cooling. This could require TVA to purchase power from other producers or to rely on more costly power generation options.
TVA's power plants and 16,400 miles of transmission lines are at risk from extreme weather events.	Extreme Weather Events	Extreme weather events, such as high winds, thunderstorms, heat waves, intense cold periods or ice storms, and extreme rainfall, could threaten TVA's operations and damage infrastructure, which could have negative financial implications. According to the Fourth National Climate Assessment, extreme weather events, such as tornadoes, hail, and thunderstorms are exhibiting changes that may be related to climate change, and modeling studies consistently suggest that the frequency and intensity of severe thunderstorms in the United States could increase with climate change.
TVA's 16,400 miles of transmission lines are at risk from the threat of more frequent wildfires.	More Frequent Wildfires	More frequent wildfires threaten critical transmission infrastructure, including transmission towers. According to the Fourth National Climate Assessment, rising temperatures and increases in the duration and intensity of drought are expected to increase the occurrence of wildfires and reduce the effectiveness of prescribed burns in the Southeast. According to a report by Oak Ridge National Laboratory, large fires can cause a range of physical impacts on transmission and distribution systems, including damage to towers and poles leading to potential collapse of power lines. Additionally, the transmission capacity of a line can be affected by the heat, smoke, and particulate matter from a fire, even if there is no actual damage to the physical structure.

TVA's mission is to improve the quality of life in the Tennessee Valley Region through the integrated management of the region's resources. TVA achieves its mission by focusing on delivering reliable, low-cost energy, caring for the region's natural resources, and creating sustainable economic growth.

TVA operates more than 50 power plants and maintains 16,400 miles of transmission lines across 7 states. TVA's ability to produce and deliver reliable low-cost energy is particularly threatened by climate hazards. TVA's operations, ability to generate power, and efficiency of critical infrastructure are at risk of damage from extreme temperatures, flooding, drought, and heavy precipitation. Extreme temperatures, both cold and hot, may create greater power demand and affect the efficiency and safety of operating equipment. Increased risk of flooding associated with heavy precipitation events can damage or otherwise negatively affect TVA's generation and transmission infrastructure, which can lead to outages and costly repairs. Flooding and heavy precipitation could damage generation infrastructure and pose inland flooding risk to assets. Many of TVA's generation assets are heavily reliant on nearby river systems, therefore drought could reduce the water available for TVA's power plants that rely on water for its power generation operations, including hydropower plants and at its coal-fired, natural gas, and nuclear plants, which depend on water from nearby river systems for cooling. This could require TVA to purchase power from other producers or to rely on more costly power generation options.

TVA's transmission lines are at specific risk of more frequent wildfires, including transmission towers. The transmission capacity of a line can be affected by the heat, smoke, and particulate matter from a fire, even if there is no damage to the physical structure.

Several Priority Actions are working to address climate hazard impacts to TVA's assets, specifically Priority Action 5, *"Maintain climate resiliency as part of Transmission Grid Resiliency Matrix"*, an action led by Transmission Compliance & Resilience to address climate impacts to the transmission system and Priority Action 7, *"Complete asset analysis and incorporate climate resiliency into business processes",* led by Power Operations. These actions ensure that climate risks are included in the long-term risk scenarios related to TVA's transmission assets.

Caring for the region's natural resources is a significant part of TVA's mission. All the major climate hazards also affect TVA's ability to do so, as the natural resources are exposed to the same things as the generating assets.

Section 3: Implementation Plan

3A. Addressing Climate Hazard Impacts and Exposure

1. Addressing Climate Hazard Exposures and Impacts Affecting Federal Buildings

Prioritized Actions to Address Climate Hazard Exposures and Impacts Affecting Federal Buildings		
Climate Hazard Impact on nd/or Exposure to uildings	Priority Action	Timeline for implementation (2024-2027)
Extreme Temperatures (both hot and cold)	TVA buildings are designed to not only meet standards, but also to include room for growth. Design includes space for extra capacity related to higher demand from extreme temperature scenarios.	Continue to include extreme weather scenario buffers as part of building design.
Flooding	TVA utilizes a state-of-the-art stochastic flood event model to create thousands of realistic extreme floods. This information will help inform TVA of any changes related to flooding to critical areas.	Continue to update models based on new information to ensure risks associated with flooding are addressed.

TVA's Facilities Management (FM) Architectural and Engineering (A&E) Group has developed a design standard titled, "TVA FM Architectural and Engineering Design Standards – For TVA Corporate and FM Managed Facilities". For design and construction that FM performs on federal buildings, or those functions under FM's authority, FM has adopted technical requirements of current codes, standards, laws, regulations, ordinances, and requirements. The technical requirements of these codes and standards are supplemented by mandates of federal laws and Executive Orders, as well as TVA and other federal agency criteria. Many climate hazards to buildings are being addressed by following requirements and best practices in building design.

TVA has an in-house staff of environmental, safety, and security professionals, professional engineers and architects who are experts in local codes, federal mandates, and pertinent regulations. These professionals keep abreast of changes in their areas of expertise and ensure changes are appropriately incorporated into TVA design and construction processes. As new information is made available through codes, standards and/or regulations to improve the climate resiliency of Federal real property, TVA will be in a good position to quickly evaluate these and incorporate any which support its mission into TVA processes.

TVA Facilities Management has subject matter experts with in-depth knowledge of the design and operations of responsible TVA critical facilities and areas. They help ensure these areas

continue to operate as designed and commissioned through daily interactions with operations personnel, periodic preventive, and operational testing, monitoring through installed building automation systems (BAS) and troubleshooting issues when they arise.

TVA designs for critical systems always include room for future growth. In the event of extreme heat and/or cold, the extra capacity built into the design is available to meet extreme condition loads. Additionally, because many critical areas have extra components built in, there is also extra capacity (i.e., a backup chiller, pump, boiler, uninterrupted power supply, etc.) available to handle extra loading. TVA is utilizing a state-of-the-art stochastic flood event model to create thousands of realistic extreme floods. This information will help inform TVA of any changes related to flooding to critical areas under FM responsibility.

TVA's current Continuity of Operations Plan takes into consideration FM responsible critical areas and how these areas will be managed in extreme circumstances. Additionally, TVA is transitioning to a hybrid workforce which will allow many functions to be handled remotely in the event of extreme circumstances. This will help to eliminate the need for travel during extreme weather events while still fulfilling operational obligations for a large portion of TVA's workforce.

TVA has a long-term Strategic Real Estate Plan (SREP) that is a comprehensive blueprint designed to reduce costs and align corporate and generation real estate assets to TVA core business needs. TVA is reviewing all real estate property to ensure it has adequate space to support its people and assets. It is expected that if climate sensitive assets critical to TVA are identified by TVA, these assets would either be considered for repurpose, elimination or improvement (so they are no longer climate sensitive) through appropriate TVA processes.

2. Addressing Climate Hazard Exposures and Impacts Affecting Federal Employees

Prioritized Actions to Address Climate Hazard Exposures and Impacts Affecting Federal Employees		
Climate Hazard Impact on and/or Exposure to Employees	Priority Actions	Timeline for implementation (2024-2027)
Extreme Temperatures	Each plant evaluates the climate risks to their operations and has developed a safety plan specific to its location.	Plants review and maintain their safety plans as needed.

TVA's workforce is made up of a mixture of hybrid and remote office-based staff, staff based at power plant locations, and other staff in field positions, all primarily based in the Tennessee Valley region. Although TVA does not have data specific to climate hazards to employees, TVA has several standard procedures related to hazard recognition that include climate. These processes are accomplished through worksite analysis, execution of safe work requirements, reporting of good catches and safety suggestions, observations, intervention, and use of human

performance tools. TVA's Safe Work Requirements Manual addresses appropriate responses to weather (including cold temperatures and lightning) and heat stress.

Separate from the Safety organization, TVA's Emergency Management programs and plans, including the Agency Emergency Coordination Plan, also address how TVA may respond to climate hazards that have the potential to cause interruption, disruption, loss, emergency, disaster, or catastrophe and can escalate into a crisis. Each plant site has developed and maintains its own emergency plan specific to its potential locational hazards in addition to the overarching plans.

Climate risks related to TVA's workforce will be assessed through several Priority Actions, including Priority Action 2, *"Evaluating Climate Threats in Enterprise Risk Management"* and Priority Action 4, *"Include climate change planning in updated Integrated Resource Plan".* Conditions for the workforce are included in long-term planning and will continue to be evaluated as climate hazards change and occur. As TVA continues to research methods for climate resilience planning to support Priority Action 3, TVA will look for opportunities to address the safety and well-being of its employees related to climate hazards.

3. Addressing Climate Hazard Exposures and Impacts Affecting Federal Lands, Waters and Associated Cultural Resources

Prioritized Actions to Address Climate Hazard Exposures and Impacts Affecting Federal Lands, Waters and Associated Cultural Resources		
Type of Land or Water Asset	Climate Hazard Impact on and/or Exposure to the Asset	Priority Action
Tennessee River and Shoreline	Extreme Temperatures (both hot and cold); Heavy Precipitation and Flooding, Drought, Increased Storms with High Winds	TVA is in the 3rd year of Climate Impact Assessment assessing impacts of certain climate scenarios to six key river management areas (water supply, flood prevention, navigation, recreation, water quality, and power production) within the Tennessee Valley. TVA is involved in an ongoing partnership with DOE Water Power Technologies Office (WPTO) / Oak Ridge National Laboratory (ORNL) to downscale their national data to TVA's region.
Lands under easement with Federally recognized Tribes	Extreme Temperatures (both hot and cold); Heavy Precipitation and Flooding, Drought, Increased Storms with High Winds	TVA's Archaeological Site Monitoring & Protection Program is focused on the identification of significant archaeological sites that are being impacted by erosion and other related impacts that may be connected to climate adaptation. TVA has prioritized Native American Sacred Sites as

		a high priority for protection efforts. TVA's primary protective measure involves the stabilization of eroding shoreline adjacent to these sites that have been impacted by heavy rains and extreme flood events.
Tribal Treaty and Reserved Rights	Extreme Temperatures (both hot and cold); Heavy Precipitation and Flooding, Drought, Increased Storms with High Winds	TVA's Archaeological Site Monitoring & Protection Program is focused on the identification of significant archaeological sites that are being impacted by erosion and other related impacts that may be connected to climate adaptation. TVA has prioritized Native American Sacred Sites as a high priority for protection efforts. TVA's primary protective measure involves the stabilization of eroding shoreline adjacent to these sites that have been impacted by heavy rains and extreme flood events.

The most significant climate threats to TVA include extreme temperatures, heavy precipitation, flooding, drought, and extreme weather events. To combat this, TVA has implemented and maintained a seasonal readiness process that identifies and prioritizes measures to address potential seasonal risks of climate change for winter and summer outlook and is working to ensure that its planning processes prioritize proactive measures to address climate change vulnerabilities and reassess plans with updated information. TVA also conducts comprehensive Land Conditions Assessments for reservoir lands. The on-the-ground process determines the land conditions and identifies stewardship "needs" for maintaining or improving the conditions of a land parcel.

TVA's river management and water assets are at particular risk of temperature changes, precipitation, and flooding. To address Priority Action 3, *"Research methods for improved climate resilience and adaptation planning"*, TVA is working on several collaborative efforts. TVA is in the 3rd year of a Climate Impact Assessment assessing impacts of certain climate scenarios to six key river management areas (water supply, flood prevention, navigation, recreation, water quality, and power production) within the Tennessee Valley.

TVA has worked with partners to implement over $4 million dollars in stream and aquatic habitat improvement projects in the Tennessee River watershed since 2014. These projects include the establishment of riparian buffers, the removal of stream barriers, and the propagation and reintroduction of at-risk fish and mussel species. Data collected by stream monitoring under these programs are shared with partner agencies and organizations to advance scientific understanding of the Tennessee River's rich aquatic biodiversity and to support aquatic conservation programming to help maintain and support the ecosystems affected by climate hazards.

In addition to these things, TVA's Natural Resources team also uses prescribed fire to cost-effectively maintain and enhance the overall health of fire dependent and early successional plant communities, maintains forest roads and trails to provide resource management and public use access, carries out native plant communities' restorations and reforestation tree plantings with appropriate species to address site specific and environmental conditions, and conducts long range planning to possibly increase overall capacities and capabilities by having contractual resources in place.

TVA's Archaeological Site Monitoring & Protection Program is focused on the identification of significant archaeological sites that are being impacted by erosion and other related impacts that may be connected to climate adaptation. TVA has prioritized Native American Sacred Sites as a high priority for protection efforts. TVA's primary protective measure involves the stabilization of eroding shoreline adjacent to these sites that have been impacted by heavy rains and extreme flood events.

3B. Climate-Resilient Operations

1. Accounting for Climate Risk in Planning and Decision Making

As part of TVA's overall resilience plan, the Enterprise Risk Management (ERM) Group is the risk conscience of the organization. ERM is responsible for providing a holistic risk profile through a systematic approach to identify, assess, prioritize, report, and monitor enterprise level risks and opportunities impacting the achievement of TVA's objectives and is the lead group on Priority Action 2 identified in TVA's GAO report response, *"Evaluate climate threats in enterprise risk management"*. ERM aligns with the Committee of Sponsoring Organizations (COSO) Framework which provides a 360-degree process focusing on risk identification, documentation, and risk mitigation measures to ensure improved reliability and resiliency. TVA's Enterprise Risk team practices a resilient risk assessment approach which assesses the probability and impacts (financial, reputational, and safety) of various types of risks, including climate-related risks, considering the mitigation efforts taken by TVA.

ERM actively monitors currently documented climate risks and their impact on TVA's core operations to ensure the proper resources and mitigation plans are in place for TVA to be resilient if the risks occur. These risks are regularly reviewed with leadership to ensure they are considered in planning and strategic decision-making. On an annual basis, the ERM team facilitates risk workshops to review all risk portfolios, including those with climate related risks, with leadership in each group. The purpose is to ensure leadership is aware of the assessment (probability and impact) of each risk and comfortable with the portfolio. This allows leaders to factor risk into their business plans and decision-making. In addition, ERM works with individuals and teams at all levels of the business, including senior leadership and the Board of Directors, to ensure the risk management approach is aligned with business practices to meet safety, strategic, financial, and operational objectives.

The following climate-related risks are identified and factored into planning and strategic decision-making at TVA:

- Degrading asset material condition (Power Operations)
- Nuclear resiliency in extreme weather conditions (Nuclear)
- Power Operations Resiliency in Extreme Environmental Conditions (Power Operations)
- Inadequate Transmission Capacity to meet Economic Development and Generation Needs (Transmission & Power Supply)
- Seismic event (Transmission & Power Supply)
- Wildfire event (Transmission & Power Supply)
- Unexpectedly extreme weather (Transmission & Power Supply)
- Geo-magnetic Disturbance (GMD) (Transmission & Power Supply)
- Natural gas commodity risk (Power Operations)
- Coal Supply Resilience (Power Operations)
- Bridge Failure due to Seismic Event (Generation Projects & Fleet Services)
- Catastrophic Event with Environmental Impacts (Environmental & Stewardship)
- Failure to Maintain Essential Reservoir Levels and/or Flows (River & Resources Stewardship)

2. Incorporating Climate Risk Assessment into Budget Planning

The Enterprise Risk Management (ERM) process incorporates climate risk into planning and budget decisions. Annually, the ERM team facilitates risk workshops to review all risk portfolios, including those with climate related risks, with leadership in each group to ensure leadership is aware of the assessment (probability and impact) of each risk and comfortable with the portfolio. Once each risk portfolio has been approved by leadership, ERM coordinates and collaborates with the Business Planning team to share all risk information which is factored into planning and budget decisions. Additionally, TVA's Enterprise Level Risk Portfolio is shared with the Board and Executive Leadership team quarterly to ensure that risk is factored into strategy which drives planning and budgeting.

The ERM group works with leadership groups across several layers of the business from Directors with the Risk Management Working Group to Vice Presidents with the Risk Management Steering Committee, to Executive Leadership with the Enterprise Risk Council, and finally to Board Members with the Audit, Finance, Risk, and Cybersecurity Committee. During these meetings, there are deep dives into certain risk areas, including climate risk, to ensure that there is consensus around TVA's exposure to the risk as well as planning, budgeting, and mitigation efforts.

As result of the GAO report, the Enterprise Risk Management process was reviewed to ensure that the process includes routine assessments and resiliency plans associated with each risk

portfolio, which was confirmed. ERM also considers the resilience actions and technologies and looks at peer benchmarking data during the annual reassessments.

3. Incorporating Climate Risk into Policy and Programs

To address Priority Action 3, "Research methods for improved climate resiliency and adaptation planning", led by Enterprise Planning, many things are being evaluated including reports, policies, and assessments. Many groups around the agency are involved in these processes and spend time reviewing reports and policies. They are leading the charge to address Priority Action 3, as well as several other priority actions, and will provide input into incorporating climate resilience and adaptation into the upcoming Integrated Resource Plan.

TVA is preparing to meet the requirements of the Securities and Exchange Commission rule to enhance climate-related disclosures. TVA has completed an initial readiness engagement with an external auditor and is currently evaluating gaps from this engagement to prepare for reporting requirements. TVA is also involved in EPRI Climate READi, a 3-year initiative to create a common Resilience and Adaptation framework across the utility sector.

Nature-based solutions are being incorporated in adherence to EOs 11988 and 13609, which consider nature and nature-based solutions to reduce flood risk and flood losses. TVA is working to finalize internal guidance incorporating EO 13690 in 2024. Currently, TVA is working to incorporate nature-based solutions by designing parking lots using pervious pavement, using vegetated drainage swales, vegetated drainage islands in parking lots to store runoff, and roots wads to stabilize reservoir shoreline.

TVA works to incorporate the co-benefits of environmental justice and mitigation by enhancing preparedness for and resilience to the climate crisis. TVA has established a dedicated office leading efforts in developing and maturing its Environmental Justice Program, with specific goals to increase strategic and focused outreach, enhance internal education, and aligning and coordinating how TVA supports and engages with people in disadvantaged communities. Efforts of the agency’s environmental justice teams include developing a framework for how TVA will identify disadvantaged communities and their needs, in line with evolving Federal policy and guidance; improving communication and services to disadvantaged communities; planning strategically to ensure TVA holistically considers its impact on communities, including climate related impacts, when making operational decisions; and communicating emerging environmental justice policy issues and strategies and sharing progress on development of agency policy positions.

TVA has an obligation to manage and protect cultural resources that are on its land pursuant to federal preservation laws, including but not limited to the National Historic Preservation Act, the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act. TVA periodically monitors significant cultural resources to identify impacts and prioritizes protection needs. These efforts include protection from impacts from climate

events or other environmental effects. Protection projects are implemented in consultation with State Historic Preservation Officers and Federally recognized Indian Tribes.

TVA has established a Government-to-Government relationship with over 20 Tribes that have a religious or cultural interest in TVA's power service area. Since 2015, TVA has increased efforts to partner with Tribes and strengthened Government-to-Government relationships with Tribes. TVA has prepared an updated action plan to implement the policies of EO 13175, which was developed in consultation with Tribes. TVA committed to Tribes to make land available for the reinterment of Native American Ancestors and executed a Memorandum of Agreement to outline this commitment. TVA also became a signatory to the Memorandum of Understanding Regarding Interagency Coordination and Collaboration for the Protection of Indigenous Sacred Sites. TVA has developed multiple mutually beneficial partnerships and projects that promote Tribal Sovereignty and the importance of Indigenous Knowledge as well as increase Native American cultural awareness including Archaeological Survey Partnerships, Native Plant Partnership, Tribal Cultural History Project, Sacred Site Management Plans and Tribal Engagement events.

TVA's Archaeological Site Monitoring & Protection Program is focused on the identification of significant archaeological sites that are being impacted by erosion and other related impacts that may be connected to climate adaptation. TVA has prioritized Native American Sacred Sites as a high priority for protection efforts. TVA's primary protective measure involves the stabilization of eroding shoreline adjacent to these sites that have been impacted by heavy rains and extreme flood events.

4. Climate-Smart Supply Chains and Procurement

TVA has assessed climate hazard risk to critical supplies and services. An environmental resiliency survey of vendors was modeled based on supply chain disruptions experienced during Covid-19. This assessment was provided by Wood-Mackenzie based on various supply chain risk factors. The highest risk was in the Tennessee valley since this is the origin of most supplies and services. It also revealed that TVA's most acute impact of risk was the mobility of personnel and services from any specifically affected local area.

At risk supplies/services	Outline Actions to Address Hazard(s)	Identify Progress Towards Addressing Hazard(s)
TVA's most acute impact of risk is the mobility of personnel and services from any specifically affected local area.	TVA has greatly expanded its remote work capabilities via Teams, telecom solutions, and cyber authentication tools.	TVA staff support now has a wide array of methods to address mobility constraints.
Maintenance Services Corporate Services Engineering & Technical Services Information Technology Services	Same as above	Same as above

Following winter storm Elliot, Supply Chain participated in an Agency-wide resiliency review of generation assets and augmented the spares and inventory program. TVA has determined that the steps to address supplies/services disruption from climate hazards are the same as any supply chain disruption. Steps implemented include adding a new risk function, emergency coordination plan, risk profiles, and Teams communication link; a bi-weekly macro risk meeting; participating in business unit emergency response programs.

As a Federal Agency, TVA Supply Chain implemented a system coded Green Product Acquisition in 2013. More recently, in FY21 TVA Supply Chain established a carbon scope 3 baseline and then refreshed it in FY23. This is one of the first scope 3 baselines in the electric utility industry. It reports scope 3 categories 1 and 2 and covers major spend categories, along with the top emitting suppliers. TVA reports scope 3 categories 3,5,6,7 to FEMP currently.

TVA utilizes steel vendors with products with lower carbon emissions density by incorporating electric arc furnace technology and recycled scrap materials. For other aspects of scope 3, a plan for the plan has been developed, but not funded. Levers and actions have been identified, and, most importantly, measurement and target formulations and objectives. In addition, TVA has established goals for its Fleet vehicles to have 100% light duty acquisitions by 2027 and medium duty by 2035.

5. Climate Informed Funding to External Parties

TVA does not receive Federal funding. TVA does offer rebates through residential and school programs for energy efficiency improvements that produce ancillary carbon reductions and other non-energy related benefits, however no rebates are specifically related to climate adaptation or resilience currently.

3C. Climate Training and Capacity Building for a Climate Informed Workforce

Training and Capacity Building		
Agency Climate Training Efforts	*Percent of the agency's Federal staff that have taken a 60+ minute introductory climate training course (e.g., Climate 101).*	*0*
	Percent of the agency's senior leadership (e.g., Sec, Dep Sec, SES, Directors, Branch Chiefs, etc.) that have completed climate adaptation training.	*0*
	Percent of budget officials that have received climate adaptation related training.	*0*
	Percent of acquisition officials that have received climate adaptation related training.	*0*
Agency Capacity	*Number of full time Federal staff (FTE) across the agency that have tasks relevant to climate adaptation in their job description.*	We are unable to determine exactly how many FTE have climate adaptation tasks in their job description, but we estimate roughly 10, which includes TVA's Sustainability & Climate team, as well as leaders directly responsible for the team.

TVA is conducting broad climate training initiatives to improve executive and staff understanding and implementation of guiding policies and disclosures including the Environmental Policy, Environmental Management System Road Map Implementation, Sustainability Report, and Climate Action Implementation Plan. In addition, a Climate Resiliency and Adaptation training application is in development, which will include training on overarching climate change, vulnerabilities, and indicators, as well as how climate events can impact TVA and how to be better prepared for them. This application will be promoted TVA-wide, and all employees will be encouraged to complete the training.

TVA's Biodiversity Policy, adopted in 2021, guides employees across TVA to consider biodiversity risks and opportunities and to integrate biodiversity considerations into project planning. An interdepartmental Biodiversity Action Team is responsible for driving policy education and implementation. TVA continues to review alignment of this policy and other guiding documents, assess workforce understanding and familiarity, and update approaches as

needed. TVA is in the process of retooling its disclosure documents and stakeholder engagement strategy in preparation for compliance with the newly proposed SEC Climate Disclosure rules and in alignment with this plan.

TVA is fostering a culture of knowledge and practice for climate adaptation through ongoing discussion, education, and interdepartmental collaboration. This includes monthly climate policy interdepartmental meetings of key staff, a TVA-wide Adaptation and Resiliency SharePoint collaboration site, and an executive level Sustainability Steering Committee, who work to evaluate key focus areas, goals, metrics, and reporting frameworks. TVA employees are encouraged to incorporate climate considerations into their planning and projects, including consideration of both long- and short-term vulnerabilities, and to seek to balance trade-offs. Significant climate change risks are identified in each TVA major planning process and inform agency-wide and regional planning.

3D. Summary of Major Milestones

Section of the Implementation Plan	Description of Milestone	Climate Risk Addressed	Indicators for success
3A – Climate Hazards to Assets, Workforce, and Operations	Complete updated Integrated Resource Plan	Extreme temperatures and precipitation, flooding, drought, wildfire, etc.	Finalized plan published and implementation started
3B4 – Supply Chain/Agency Fleet	Fleet vehicles acquisitions to be 100% light duty by 2027	GHG emissions	Determining what % of fleet vehicle acquisitions are light and medium duty
3C - Climate Training Application	Complete building of internal Climate Adaptation and Resiliency Training	Climate literacy of workforce	Tracking how many employees participate in the training course
3C – Climate Literacy of Workforce	Update and maintain interdepartmental teams and policies	Climate literacy of workforce	Engagement in group meetings and implementation of policies

Section 4: Demonstrating Progress

4A. Measuring Progress

Key Performance Indicator: Climate adaptation and resilience objectives and performance measures are incorporated in planning and budgeting of agency programs by 2027.		
Section of the CAP	**Process Metric**	**Agency Response**
3A –Addressing Climate Hazard Impacts and Exposure	Step 1: Agency has an implementation plan for 2024 that connects climate hazard impacts and exposures to discrete actions that must be taken. (Y/N/Partially) Step 2: Agency has a list of discrete actions that will be taken through 2027 as part of their implementation plan. (Y/N/Partially)	**Yes.** TVA has identified risks and established priority actions that will be addressed related to climate hazards and resiliency, outlined in Section 3. **Yes.** TVA is developing a cultural resource specific climate adaptation plan to address issues related to potential impact, which will be incorporated into larger cultural resource plans.
3B1 – Accounting for Climate Risk in Decision-making	Agency has an established method of including results of climate hazard risk exposure assessments into planning and decision-making processes. (Y/N/Partially)	**Yes.** On an annual basis, the Enterprise Risk (ERM) team facilitates risk workshops to review all risk portfolios, including those with climate related risks, with leadership in each group. See 3B1 for details.
3B2 –Incorporating Climate Risk Assessment into Budget Planning	Agency has an agency-wide process and/or tools that incorporate climate risk into planning and budget decisions. (Y/N/Partially)	**Yes.** The Enterprise Risk Management (ERM) process incorporates climate risk into planning and budget decisions. See 3B2 for details.
3B5 – Climate Informed Funding to External Parties	Step 1: By July 2025, agency will identify grants that can include considerate and/or evaluation of climate risk. Step 2: Agency modernizes all applicable funding announcements/grants to include a requirement for the grantee to consider climate hazard exposures. (Y/N/Partially)	**N/A.** TVA does not receive Federal funding.
Key Performance Indicator: Data management systems and analytical tools are updated to incorporate relevant climate change information by 2027.		

Section of the CAP	Process Metric	Agency Response
3B3 – Incorporating Climate Risk into Policy and Programs	Agency has identified the information systems that need to incorporate climate change data and information and will incorporate climate change information into those systems by 2027. (Y/N/Partially)	**Yes.** To address several priority actions, TVA has conducted an asset analysis, which includes current data management tools. Enterprise Risk Management and other responsible groups are working to ensure climate hazards are addressed in analytical tools. TVA's Cultural Resource Management System already includes information on site conditions for archaeological sites that includes effects from climate adaptation and other related impacts.
Key Performance Indicator: Agency CAPs address multiple climate hazard impacts and other stressors, and demonstrate nature-based solutions, equitable approaches, and mitigation co-benefits to adaptation and resilience objectives.		
Section of the CAP	**Process Metric**	**Agency Response**
3B3 – Incorporating Climate Risk into Policy and Programs	By July 2025, 100% of climate adaptation and resilience policies have been reviewed and revised to (as relevant) incorporate nature-based solutions, mitigation co-benefits, and equity principles. (Y/N/Partially)	**Yes.** All relevant policies are regularly reviewed and assessed with a climate adaptation viewpoint, specifically with emphasis on environmental justice and cultural resource management.

Key Performance Indicator: Federal assets and supply chains are evaluated for risk to climate hazards and other stressors through existing protocols and/or the development of new protocols; response protocols for extreme events are updated by 2027.		
Section of the CAP	**Process Metric**	**Agency Response**
3B4 – Climate-Smart Supply Chains and Procurement	Step 1: Agency has assessed climate exposure to its top 5 most mission-critical supply chains. (Y/N/Partially) Step 2: By July 2026, agency has assessed services and established a plan for addressing/overcoming disruption from climate hazards. (Y/N/Partially)	**Yes.** Supply Chain has participated in several Emergency exercises and through those exercises, updates have been made to processes – Emergency Coordination Plan and in the process of updating COOP. **Yes.** Supply Chain will continue to make updates to its Risk Plan, COOP, and Emergency Coordination Plans as needed.
	Agency has identified priorities, developed strategies, and established goals based on the assessment of climate hazard risks to critical supplies and services. (Y/N/Partially)	**Yes.** Following the winter storm Elliot, Supply Chain participated in an Agency-wide resiliency review of generation assets and augmented the spares and inventory program. The TVA resiliency team is still underway and is formalizing measures and processes. Supply Chain has an internal risk team that works closely with Enterprise Risk Management and provides strategies, and risk profiles on several topics including climate hazards, along with an Emergency Coordination Plan for Supply Chain. Additionally, a task force was established with the Transmission Operations group to identify plans for critical materials for these risks.

Key Performance Indicator: By 2027, agency staff are trained in climate adaptation and resilience and related agency protocols and procedures.		
Section of the CAP	**Process Metric**	**Agency Response**
3C – Climate Training and Capacity Building for a Climate Informed Workforce	Step 1: By December 2024 100% of agency leadership have been briefed on current agency climate adaptation efforts and actions outlined in their 2024 CAP. (Y/N/Partially) Step 2: Does the agency have Climate 101 training for your workforce? (Y/N/Partially) If yes, what percent of staff have completed the training? Step 3: By July 2025, 100 % employees have completed climate 101 training. (Y/N/Partially)	**Yes.** Agency leadership and board members will be briefed on this plan after publication. **Partially.** A Climate 101 training application is in development and has not yet been publicized within the agency, therefore no staff have completed the training. **Partially.** By July 2025, the Climate 101 training will be available internally, but will not be required, so there will likely be some participation, but not 100% of the agency's employees.

4B. Adaptation in Action

TVA has had many successes because of the 5 priority actions identified in the 2021 CAP. Work to achieve these priorities continues and adapts, and the ongoing priorities have been incorporated into the new priorities.

TVA is continuing to make progress on 2021 Priority Action 1, *"Climate Resiliency for Aquatic Species".* Through the Sentinel Monitoring and Aquatic Ecology Management programs addressed by this action, TVA has worked with partners to implement over $4 million dollars in stream and aquatic habitat improvement projects in the Tennessee River watershed since 2014. These projects include the establishment of riparian buffers, the removal of stream barriers, and the propagation and reintroduction of at-risk fish and mussel species. Data collected by stream monitoring under these programs are shared with partner agencies and organizations to advance scientific understanding of the Tennessee River's rich aquatic biodiversity and to support aquatic conservation programming. As a result of TVA's conservation efforts, the Snail Darter was removed from the Endangered Species list in October 2022, indicating the success of these efforts.

2021 Priority Action 2, *"Improve Climate Adaptation and Resiliency Literacy at TVA",* continues to be addressed. As discussed in Section 3C, recent strategic planning and disclosure initiatives reflect progress on this action. TVA updated its Environmental Policy in 2020 and adopted its Biodiversity Policy in 2021; initiated and completed multiple roadmap teams to support and

expand its integrated Environmental Management System; publishes annual corporate Sustainability Reports; and released a supplemental Carbon Report in 2021. The board-level support of these policies and disclosures-- as well as other collaboration strategies such as monthly interdepartmental climate policy meetings-- enable staff-level engagement and familiarity with climate adaptation and resilience planning.

TVA is currently in the third year of a multi-year project in support of 2021 Priority Action 3, *"River Management Climate Change Impact Assessment"*, which will assess the impacts of certain climate scenarios to six key river management areas (water supply, flood prevention, navigation, recreation, water quality, and power production) within the Tennessee valley. TVA is working with DOE Water Power Technologies Office (WPTO) / Oak Ridge National Laboratory (ORNL) to obtain projected temperature and precipitation data from various global climate models and downscale them to the Tennessee Valley region. TVA's goal will be to use this research to better plan for the future of its river operations, whereas ORNL will use this opportunity to provide further guidance to other national hydropower stakeholders in evaluating climate impacts and adaption strategies and to add to the scientific literature. Furthermore, ORNL may also assess other climate change interest areas (i.e., hydrothermal projections) from a research perspective within the Valley through this project.

A large milestone was completing 2021 Priority Action 4, *"Flood Hazards and Water Reliability"*, by completing a water reliability study in a joint project with the University of Tennessee. This study is used to improve planning and performance by testing the resiliency of TVA's management policies and intake equipment. State-of-the-art stochastic flood event models were used to evaluate the magnitude and likelihood of realistic extreme floods and assess their impact on TVA infrastructure, and a 600-year reconstruction of rainfall within the Valley was used to assess the impact of extreme drought events. These models are incorporated into planning processes to ensure TVA is equipped to respond to the extreme weather events associated with climate change.

TVA continues to make progress on 2021 Priority Action 5, *"Investing in the Future while Keeping Energy Costs as Low as Possible"*. The 2020-2030 Financial Plan has enabled TVA to deliver energy at some of the lowest rates in the nation while remaining on track toward its decarbonization goals. In 2023, TVA announced and began work on the Valley Pathways Study, a partnership with the University of Tennessee Baker School of Public Policy and Public Affairs to develop a roadmap for a Net Zero greenhouse gas emission economy by 2050. This study provides a holistic view of the entire economy and will enhance TVA's position as a leader in decarbonization and develop an actionable plan to accelerate the transition to a clean energy economy throughout the Valley. A preliminary findings report was published in February 2024.

Appendix: Risk Assessment Data

The Federal Mapping App uses the following data:

Buildings

Buildings data comes from the publicly available Federal Real Property Profile (FRPP). The General Services Administration (GSA) maintains FRPP data and federal agencies are responsible for submitting detailed asset-level data to GSA on an annual basis. Although FRPP data is limited—for example, not all agencies submit complete asset-level data to GSA, building locations are denoted by a single point and do not represent the entirety of a structure or could represent multiple structures, and properties may be excluded on the basis of national security determinations— it is the best available public dataset for federal real property. Despite these limitations, this data is sufficient for screening-level exposure assessments to provide a sense of potential exposure of federal buildings to climate hazards.

Personnel

Personnel data comes from the Office of Personnel Management's (OPM) non-public dataset of all personnel employed by the federal government that was provided in 2023. The data contains a number of adjustments, including exclusion of military or intelligence agency personnel, aggregation of personnel data to the county level, and suppression of personnel data for duty stations of less than 5 personnel. Despite these adjustments, this data is still useful for screening-level exposure assessments to provide a sense of key areas of climate hazard exposure for agency personnel. TVA's data was not included in this dataset and is therefore not present in this plan.

Climate Hazards

The climate data used in the risk assessment comes from the data in Climate Mapping for Resilience and Adaptation (CMRA) Assessment Tool. When agency climate adaptation plans were initiated in 2023, CMRA data included climate data prepared for NCA4. Additional details on this data can be found on the CMRA Assessment Tool Data Sources page. Due to limited data availability, exposure analyses using the Federal Mapping App are largely limited to the contiguous United States (CONUS). Additional information regarding Alaska, Hawai'i, U.S. Territories, and marine environments has been included as available.