Tennessee Valley Authority

Sustainability Report and Implementation Plan 2021

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Executive Summary

1. VISION

Overview

TVA submitted its first Federal Sustainability Report and Implementation Plan (SRIP) to the White House in June 2010. TVA's efforts align with several Executive Orders (EO) that include 13990, 14030 and 14008 on Tackling the Climate Crisis at Home and Abroad. The objective of TVA's Federal Sustainability Program is to reduce the non-power block component of the TVA environmental footprint as a federal agency. This report is focused on TVA's federal infrastructure including buildings, fleet, and procurement and follows the specific requirements of federal sustainability reporting. TVA also issues a broader Sustainability Report each year that encompasses our power generation activities which you can find at the below link.

https://www.tva.com/environment/environmental-stewardship/sustainability/sustainability-report

Mission and Scope

The TVA mission includes serving the Tennessee Valley through providing low-cost, resilient and reliable energy, environmental stewardship and economic development. Achieving the EO 14008, EPAct05 and EISA 2007 goals directly supports the broader TVA Mission.

Sustainability focuses on environmental, economic and social criteria aspects that are integral to TVA and its mission:

- The TVA Environmental Policy and commitment to cleaner energy correlates with the environmental aspect of sustainability. TVA efforts to manage natural resources responsibly, reduce emissions from power consumption, increase use of clean energy, all while providing low-carbon, low-cost and reliable power, are central to this commitment.
- TVA's economic development commitment mirrors the economic aspect of sustainability through goals of increasing capital investment and attracting and retaining quality jobs for the people and businesses served by TVA.
- The TVA mission is supported by its values, all of which reflect sustainability's social aspect: safety, integrity, inclusion and service.

TVA established strategic priorities to provide a framework for our mission of service. Our three-year business plan, 10-year financial plan and 20-year integrated resource plan are each aligned to our mission, strategic priorities and objectives. Combined, these tools help TVA achieve sustainability goals.

- People Advantage - The strength of TVA is its people. All that TVA accomplishes comes through the dedication and commitment of its 10,000 employees and our over 10,000 contract partners, who are represented by 17 labor unions.
- Operational Excellence - Building on TVA's best-in-class reputation and performance in supplying reliable, low-cost, and increasingly clean energy for the people of the Tennessee Valley.
- Financial Strength- Ensuring TVA's ability to continue to carry out our mission of service as we invest in the future
- Powerful Partnerships - TVA's opportunity to serve the people of the Tennessee Valley and the nation comes to life through our Powerful Partnerships with customers, the communities we serve, and other stakeholders.

- Igniting Innovation - Innovation is in TVA's DNA, and innovation is critical as we build the energy system of the future and address climate challenges.

As the nation's largest public power provider, TVA safely delivers cleaner, reliable, low-cost energy to 153 local power companies and 56 directly served customers. TVA employs about 10,000 people in the Tennessee Valley. TVA's service area, the area in which it sells power, is defined by the TVA Act. TVA supplies power in most of Tennessee, northern Alabama, northeastern Mississippi, and southwestern Kentucky and in portions of northern Georgia, western North Carolina, and southwestern Virginia, covering 80,000 square miles and serving nearly 10 million people.

TVA's transmission system interconnects with systems of surrounding utilities. The transmission system is approximately 2,500 circuit miles of 500 kilovolt, 11,800 circuit miles of 161 kilovolt, 2,000 circuit miles of other voltage transmission lines, and 3,900 miles of fiber. TVA has 517 transmission substations, power switchyards, and switching stations and 1,322 customer connection points (customer, generation, and interconnection).

TVA's power portfolio is dynamic and adaptable in the face of changing demands and regulations. Today, the power we deliver is nearly 60 percent carbon-free. TVA efficiently delivered more than 151 billion kilowatt hours of electricity to customers from a power supply that was 42 percent nuclear, 22 percent natural gas, 13 percent coal-fired, 10 percent hydroelectric, 8 percent purchased power (non-renewable), and 5 percent purchased power (renewable). TVA's non-hydro renewable resources from TVA facilities are less than one percent. Purchased power (renewable) contains the majority of non-hydro renewable energy supply.

TVA owns and operates approximately 2,222 energy consuming buildings totaling over 24.5 million square feet across the seven state region. TVA's owns approximately 2,469 fleet vehicles that are determined by the operational needs of the individual business units. TVA has programs in place to monitor and optimize our buildings and vehicle fleets.

Performance Highlights

- In FY 2020, TVA invested $3.31M on improvements resulting in $321,634 in annual savings and 3,520 MWh in energy consumption savings. Since 2008, TVA has reduced its own energy usage by nearly 836 GWhs, enough energy to power 57,000 average homes for a year. TVA's CO2 emissions savings from these improvements was 591,500 metric tons of CO2e, equivalent to reducing emissions from 127,800 passenger vehicles driven for one year.
- TVA carbon emissions are on track to be reduced 63% from 2005 levels by the end of 2021 and reduced 70% by 2030.
- TVA continues to recycle coal combustion residuals into building products to reduce landfill storage and protect the environment.
- TVA returns 99.2% of the water it withdraws for thermoelectric power production back into the Tennessee River. TVA is in the 2nd quartile industry ranking for freshwater consumption.
- TVA's operations finished FY 2020 with a 51.0% reduction in Scope 1 & 2 GHG emissions over the FY 2008 baseline inventory primarily due to continued implementation of energy efficiency projects, lower eGRID emissions factor for our region and lower vehicle fleet usage due to COVID-19.
- TVA finished FY 2020 with a 67.6% reduction in energy intensity from a FY 2003 baseline.

2. LEADERSHIP

TVA's implementation of the Sustainability Plan will be directed by the following key staff:

- Rebecca C. Tolene – TVA Vice President of Environment and TVA Chief Sustainability Officer
- Monte L. Matthews – TVA Senior Manager, Sustainability & Climate and TVA Deputy Chief Sustainability Officer
- Chris A. Azar – TVA Senior Program Manager, Internal Energy Management Program, Energy Services and Programs

TVA's Environment & Energy Policy group is the point of contact with the Office of Management and Budget, and the Council on Environmental Quality for sustainability reporting. TVA's Environment & Energy Policy group also leads TVA's Sustainability Program and governance structure, which includes subject matter experts (SMEs) and representatives from multiple business units working together and with TVA's Sustainability Program to provide leadership and focus for TVA's efforts. These staff comprise the TVA Sustainability Working Group. TVA leadership is further engaged in sustainability efforts through membership on the Sustainability Steering Committee, formed in FY 2020 to enhance integration of sustainability goals into TVA-wide business planning.

3. REVITALIZING SUSTAINABILITY WITHIN TVA

The objective of TVA's Federal Sustainability Program is to reduce the non-power generating component of TVA's environmental footprint. The program achieves this objective by issuing and maintaining both the TVA Sustainability Report and SRIP, increasing awareness and engaging employees on sustainability, and implementing actions to reduce TVA's internal environmental footprint through cross-organizational collaboration.

Agency Priorities

- **EISA 2007 Energy and Water Surveys/Projects**
  TVA plans to continue to evaluate facilities to identify potential energy and water conservation measures. In addition, TVA plans to continue implementation of cost-effective energy and water saving projects in both goal subject and excluded buildings based on funding availability.

- **Electric and Zero Emission Vehicles**
  TVA continues to follow progress in EV technology and has established a cross-functional team to develop a best-case recommendation for the deployment of ZEV/PHEV vehicles and the associated charging infrastructure. Recommendations have been presented to TVA management for guidance and funding. In February 2021, TVA and the Tennessee Department of Environment and Conservation announced plans to develop an electric vehicle fast charging network across the state of Tennessee. Access to fast charging stations spaced no more than 50 miles apart across major interstates and highways will significantly reduce barriers to widespread EV adoption.

- **Resilience and Preparedness**
  TVA will continue to update its Statement on Climate Change, Adaptation Plan and High-Level Vulnerability Assessment consistent with the Fourth National Climate Assessment and EO 13653 and 14008 related guidance.

Overview of Operations

	FY 2019	FY 2020
Total Number of Employees (FTEs) as Reported in the President's Budget	10,009	9,989
Total Acres of Land Managed	293,000	293,000
Total Number of Buildings Owned	2,221	2,222
Total Number of Buildings Leased (GSA and Non-GSA Lease)	17	18
Total Building Gross Square Feet (GSF)	24,932,675	24,550,009
Number of Facilities in the U.S.	2,221	2,222
Number of Facilities Outside of the Continental U.S.	0	0
Total Number of Fleet Vehicles Owned	2,460	2,469
Total Number of Fleet Vehicles Leased	0	0
Total Number of Exempted-Fleet Vehicles (Tactical, Law Enforcement, Emergency, Etc.)	1,353	1,359
Total Amount Contracts Awarded ($ Millions)*	$12.6	$14.2

* as reported in FPDS

Sustainability Strategies and Planned Actions

1. GREENHOUSE GAS REDUCTIONS

FY 2020 Scope 1&2 Greenhouse Gas (GHG) Emissions:

51.0% reduction from FY 2008
16.1% reduction from FY 2019

TVA's strategy and approach for reducing GHG emissions includes continuing to show progress in other goal areas that translates into GHG emissions reductions. For Scope 1 & 2 GHG emissions, TVA expects to continue to show progress through continued implementation of energy efficiency projects, the start of the electric vehicle initiative, and through procuring power from cleaner sources. For Scope 3 GHG emissions, TVA expects to continue to show progress through reducing transmission and distribution losses, reduced employee business travel and employee commuting.

Implementation Status

TVA's operations finished FY 2020 with a 51.0% reduction in Scope 1 & 2 GHG emissions over the FY 2008 baseline inventory. TVA scope 1 & 2 emissions showed a reduction primarily due to continued implementation of energy efficiency projects, a lower eGRID emissions factor for our region and lower vehicle fleet usage due to COVID-19. TVA also saw energy usage decline at buildings that were not occupied as a result of COVID-19. In addition, TVA has been reviewing its building inventory and has improved the accuracy of the inventory. These efforts resulted in a 16.1% reduction in Scope 1 and 2 GHG emissions from FY 2019.

TVA continues to track its Scope 3 GHG emissions. TVA finished FY 2019 with a 54.8% reduction over the 2008 baseline inventory. In FY 2020, TVA showed a reduction in Scope 3 emissions through a few ways, which include a reduction in employee commuter and business travel due to COVID-19 and a reduction in municipal solid waste generated. These efforts resulted in a 33.6% reduction in Scope 3 emissions from FY 2019.

Priority Strategies & Planned Actions

In FY 2021 and FY 2022, TVA plans to focus on the following. For Scope 1 and 2 GHG emissions related to buildings, TVA plans to continue EISA 2007 and goal-subject energy/water surveys and project upgrades to reduce GHG emissions. For Scope 1 GHG emissions related to vehicles, TVA will continue to reduce petroleum use in fleet vehicles by reducing the miles traveled, increasing utilization of alternative fuel and electric vehicles, and optimizing its vehicle fleet size. For Scope 3 GHG emissions, TVA plans to continue voluntarily tracking Scope 3 GHG emissions data. In addition, TVA is looking to determine what reintegration and returning to normal might look like. This could impact who returns to a physical office and could significantly reduce the need for office space and reduce employee commuting emissions. The impact of COVID-19 will also likely reduce employee business travel through the early half of FY 2022.

Top Priorities
Continue implementation of energy efficiency projects that are identified and life-cycle cost effective.
Start implementation of our new electric vehicle (EV) initiative.
Continue to procure power from cleaner sources.

Specific actions that will be taken in FY 2022 to achieve priorities			
Specific Actions	**Timelines**	**Measures of Success**	**Expected Outcomes**
Use the Federal Energy Management Program (FEMP) GHG emission report to identify/target high emission categories and implement specific actions to address high emission areas identified.	Annual / Ongoing	Annual Review of GHG emissions report	Identify items to target for reductions.
Continue EISA 2007 and goal-subject energy/water surveys and project upgrades.	Annual / Ongoing	Annual completion of all EISA surveys	Completed surveys will identify opportunities for improvement that can be implemented, which will result in GHG emissions reductions.
Employ operations and management (O&M) best practices for emission generating and energy consuming equipment.	Annual / Ongoing	Higher employee engagement/ training	Employees that impact operations will be more educated about operations and management best practices.

2. MANAGEMENT OF REAL PROPERTY

CLEAN ENERGY

FY 2020 Renewable Electricity Use:

18.7% of total electricity in FY20

FY 2021 Plan:

18.5 - 19.0% of total electricity in FY21

TVA's strategy and approach to maintaining its current renewable energy progress is to continue to utilize hydroelectric modifications (HMODs) at its hydroelectric plants. In addition, TVA plans to continue purchasing renewable energy certificates (RECs) at its two large office buildings.

Implementation Status

TVA finished FY 2020 with its renewable energy usage as a percentage of total electricity at 18.7%. TVA utilized HMODs at its hydroelectric plants to meet the renewable energy goal. HMODs accounted for 65,075 MWh or 86% of the total renewable energy use. HMODs increase the amount of energy generated by the turbine, by increasing the turbine's efficiency. For this goal, the additional energy is considered to be renewable energy that is generated and used onsite by TVA buildings. TVA also purchased RECs totaling 10,388 MWh or 14% of the total renewable energy use for its two large office buildings through local power companies, which participate in TVA's Green Power Switch and Southeastern RECs program.

Priority Strategies & Planned Actions

In FY 2021 and FY 2022, TVA plans to maintain its current progress by continuing to utilize HMODs at its hydroelectric plants. TVA also plans to maintain the purchase of RECs at its two large office buildings.

Top Priorities
Utilize hydroelectric modifications (HMODs) at its hydroelectric plants.
Continue purchasing renewable energy certificates (RECs) at its two large office buildings.
Review if adding onsite renewables is life-cycle cost (LCC) effective as part of EISA Surveys.

Specific actions that will be taken in FY 2022 to achieve priorities			
Specific Actions	**Timelines**	**Measures of Success**	**Expected Outcomes**
Continue to implement HMODs at hydroelectric plants where LCC effective	Annual / Ongoing	Additional capacity is created by completion of HMOD projects.	More HMODs become available for internal use and TVA's overall generation of GHG emissions are reduced.
Purchase RECs to supplement installations and purchases of renewable energy, when needed to achieve renewable goals.	Annual / Ongoing	RECs purchased annually	TVA will continue to work towards increasing the amount of renewable energy as percentage of total electricity usage.
Include LCC of onsite renewables as part of EISA Surveys	Annual / Ongoing	Reports documenting if onsite renewables are LCC effective.	More onsite renewables could be installed resulting reduced GHG emissions.

ENERGY REDUCTION

FY 2020 Energy Intensity Progress (Btu/GSF):

67.6% reduction from FY03
9.1% reduction from FY19

FY 2021 Plan:

2.7 - 4.7% reduction in FY21 from FY20

TVA's strategy and approach to reduce energy consumption and increase energy efficiency is to continue to evaluate facilities to identify potential energy conservation measures as required by EPAct05 and EISA 2007. TVA plans to implement energy savings projects that consist of bundled cost-effective energy conservation measures.

Implementation Status

TVA finished FY 2020 with a 67.6% reduction in energy intensity from a FY 2003 baseline. In FY 2020, TVA had a large reduction in its energy intensity due to taking credit for measured energy savings at goal excluded facilities. At TVA a goal excluded facility is any facility that is used to generate, transmit and control power or connected to one that does. Goal excluded facilities are exempt from the energy intensity goal, but agencies are given a credit when verified energy efficiency improvements are implemented. In these goal excluded facilities the primary energy conservation measure (ECM) implemented is lighting. If this credit were not taken, TVA would have had a 37.6% reduction in energy intensity from a FY 2003 baseline.

TVA's Internal Energy Management Program (IEMP) role is to identify, fund, implement, and track energy and water conservation projects at TVA's facilities. To accomplish reducing energy and water at TVA buildings, IEMP staff conducts EISA 2007 energy and water surveys. During FY 2020, TVA surveyed 12 covered facilities accounting for ~2.6 million square feet. Cost-effective ECMs identified during the surveys are bundled into projects. After the projects are implemented, IEMP documents the savings. In FY 2019, TVA invested $3.31M on improvements resulting in $321,634 in annual savings and 3,520 MWh in energy consumption savings. In addition to IEMP efforts, other groups at TVA will fund improvements at its buildings. IEMP will provide recommendations and capture any savings that result due to the improvements.

Priority Strategies & Planned Actions

In FY 2021 and FY 2022, TVA plans to continue to evaluate facilities to identify potential energy and water conservation measures as required by EPAct05 and EISA 2007. To meet the energy intensity reduction, TVA plans to continue implementation of cost-effective energy saving projects in both goal subject and excluded buildings based on funding availability. These projects, which primarily include lighting, controls and HVAC improvements, are estimated to result in $222,800 in annual savings and 2,600 MWh in energy consumption savings at its facilities each fiscal year. TVA plans to continue to install and monitor energy meters per latest metering plan. Lastly, TVA plans to continue to track and monitor building energy usage to identify buildings that may have high-energy usage as compared to year over year and month over month analysis. Measures to reduce the high-energy usage would then be taken.

Top Priorities
Continue implementation of energy efficiency projects that are identified and life-cycle cost effective.
Continue to install and monitor energy meters per latest metering plan.
Review latest legislation and executive orders and incorporate into our internal processes.

Specific actions that will be taken in FY 2022 to achieve priorities			
Specific Actions	**Timelines**	**Measures of Success**	**Expected Outcomes**
Make energy efficiency investments in agency buildings.	09/30/2022	FY 2022 Total Investment ($)	Implement the most cost-effective projects totaling $2.5M that have been identified by the EISA energy and water surveys.
Install and monitor energy meters.	09/30/2022	# of meters installed	10 meters installed allowing for better analysis and identification of savings opportunities.
Collect and utilize building and facility energy use data to improve building energy management and performance.	09/30/2022	Annual Review of utility data completed	TVA will investigate building energy usage at buildings that have large increases and make corrections to prevent high energy usage in the future on an annual basis.
Identify opportunities to transition test-bed technologies to achieve energy reduction goals.	Annual / Ongoing	Knowledge transfer completed	Completion/participation in EPRI pilot project showcasing the potential savings of a new technology that can be applied to other facilities by the end of FY 2022.
Ensure that monthly performance data is entered into the EPA ENERGY STAR Portfolio Manager.	Annual / Ongoing	# of buildings benchmarked	All covered facilities and sustainable guiding principle buildings are benchmarked allowing the ability to identify any increases that are not based on weather.
Review latest legislation and executive orders and incorporate into our internal processes.	Annual / Ongoing	Updated TVA Processes	Consistent and updated guidance is provided to decision makers to ensure any improvements meet federal requirements.

WATER EFFICIENCY

FY 2020 Water Intensity Progress (Gal/GSF):

48.0% reduction from FY07
17.6% reduction from FY19

FY 2021 Plan:

0.5 - 0.75% reduction in FY21 from FY20

TVA's strategy and approach to improve water efficiency and reduce potable water consumption includes continuing to identify and implement cost-effective water conservation measures as part of the EISA surveys. To reduce non-potable water consumption, TVA plans continue to convert wet storage of coal fly ash storage to dry storage at its coal-fired plants and to retire coal-fired plants. Storm water management requirements continue to be included as part of any new construction projects.

Implementation Status

TVA finished FY 2020 with a 48.0% potable water reduction in Gal/GSF compared to its FY 2007 baseline. The reduction in FY 2020 was driven by decreased water usage associated with plant closures, the detection and repair of water leaks and lower building occupancy due to COVID-19. TVA has implemented the following strategies to improve water efficiency, reduce potable and non-potable water consumption, and manage storm water.

To improve water efficiency and reduce potable water consumption TVA has continued to conduct water surveys at multiple TVA sites covering ~2.6 million square feet to help identify opportunities to reduce water consumption. Additionally, we have a Strategic Real Estate & Governance Team at TVA that identifies opportunities to right-size the company's real estate portfolio and divest of unused property to better serve local communities. As part of the planning process, all TVA real estate is being reviewed with a primary focus on buildings with low occupancy, underutilization and poor asset condition. As we reduce our total building square footage, it may affect our future Gal/GSF results. As a result, TVA is looking at projects that will further reduce its water usage. In addition, TVA's potable water use could fluctuate due to its aging water infrastructure that is prone to leaking.

To reduce non-potable water consumption, TVA has continued to convert wet storage of coal fly ash storage to dry storage at its coal-fired plants and to retire coal-fired plants. Historically, TVA utilized non-potable water to sluice ash to settling ponds. With the ongoing projects to convert to dry ash handling the practice of sluicing of fly ash has been eliminated and the ash is transported by air, vacuum or mechanically, which eliminates the need for non-potable water. The movement away from wet storage coal fly ash systems will significantly reduce the overall use of non-potable water in TVA power generation facilities.

Lastly, stormwater management requirements are included as part of any new construction projects.

Priority Strategies & Planned Actions

In FY 2021 and FY 2022, TVA plans to continue to identify and repair water leaks through visual identification and through water bill analysis; conduct EISA surveys to identify and implement cost effective building improvements that will reduce facility water consumption; and reduce non-potable water consumption through conversion of wet fly ash storage to dry storage and plant retirements. Lastly, areas where potable water use can be converted to non-potable water sources will continue to be identified.

Top Priorities
Continue to identify and repair water leaks through visual identification and through water bill analysis.
Conduct EISA surveys to identify and implement cost effective building improvements that will reduce facility water consumption.
Reduce non-potable water consumption through conversion of wet fly ash storage to dry storage and plant retirements.

Specific actions that will be taken in FY 2022 to achieve priorities			
Specific Actions	**Timelines**	**Measures of Success**	**Expected Outcomes**
Install and monitor water meters and utilize data to advance water conservation and management.	09/30/2022	# of meters installed	5 meters installed allowing for better analysis and identification of savings opportunities.
Install high efficiency technologies, e.g. WaterSense fixtures.	Annual / Ongoing	Standards updated	Complete water efficiency projects as part of normal business planning if cost-effective.
Ensure that planned energy efficiency improvements consider associated opportunities for water conservation.	Annual / Ongoing	# cost effective measures identified	Continue to identify energy savings associated with reduced water consumption.
Reduce non-potable water use through conversion of wet fly ash storage to dry storage and plant retirements.	Annual / Ongoing	Reduction in non-potable water usage (Gal)	Continue to show reduction in non-potable usage.

PERFORMANCE CONTRACTING

FY 2020 Performance Contracting – Investment value and number of new projects awarded:

$3.31M / 25 projects in FY20 (self-funded projects)

FY 2021 Plan:

$2.5M / 20-40 projects in FY21 (self-funded projects)

TVA's strategy and approach is to self-fund its improvements. TVA, as an energy provider, has its own Federal Energy Services Program that provides Utility Energy Service Contracts (UESC) to Federal direct serve and Federal non-direct serve customers in its region at special request by the local power distributor. TVA can most cost effectively implement these services by acting as its own UESC provider. However, TVA is currently reviewing the Energy Act 2020 that requires that each Federal agency shall use performance contracting to address at least 50 percent of the energy- or water-saving measures that are identified. This could change TVA's approach in the future.

Implementation Status

TVA had self-funded projects totaling $3.31M in FY 2020, which exceeded the commitment of $2.5M. These projects included replacing/retrofitting inefficient lighting with more efficient LED lighting, replacing old/inefficient HVAC with more efficient HVAC, and adding/upgrading lighting and HVAC controls. These projects resulted in $321,634 in annual savings and 3,520 MWh in energy consumption savings at its facilities. TVA met its commitment through the implementation of projects identified by its energy, water and sustainability surveys.

Priority Strategies & Planned Actions

TVA is setting a target to implement projects totaling $2.5M for FY 2021. TVA as a provider of utility based ESPCs will continue to self-fund its own energy, water and sustainability projects. These projects are estimated to result in $222,800 in annual savings and 2,600 MWh in energy consumption savings.

Top Priorities
Continue to self-fund its own energy, water and sustainability projects.
Review Energy Act 2020 that requires that each Federal agency shall use performance contracting to address at least 50 percent of the measures that are identified.

Specific actions that will be taken in FY 2022 to achieve priorities			
Specific Actions	**Timelines**	**Measures of Success**	**Expected Outcomes**
Evaluate the top 25% of agency's most energy intensive buildings for opportunities to implement cost-effective projects.	Annual / Ongoing	Total Investment Opportunity Identified ($)	Complete all surveys that are due annually to identify cost-effective opportunities to be implemented.
Prioritize top ten portfolio-wide projects which will provide greatest savings potential.	Annual / Ongoing	Annual Review Completed	Maintain an updated list of potential conservation measures identified through ongoing surveys and prioritization completed.
Review Energy Act 2020 requirements regarding performance contracting	03/30/22	Completed plan	TVA has an execution plan and buy-in from management to use an ESPC or UESC to fund implementation of cost-effective opportunities.

WASTE REDUCTION

FY 2020 Non-hazardous Waste Management and Diversion:

8,574 metric tons of non-hazardous solid waste generated*
3.9% diverted and 96.1% sent to treatment and disposal facilities

FY 2021 Plan:

1.0% - 3.0% reduction in non-hazardous solid waste generated in FY21 from FY20
4.0% - 4.2% diverted and 95.8% - 96.0% sent to treatment and disposal facilities in FY21

*not including construction and demolition waste

A core TVA strategy is stewardship which manifests in this context as waste prevention, materials reuse, and recycling measures, including reducing hazardous and non-hazardous waste generation. A primary goal is avoiding waste generation through sustainable procurement practices that preclude waste generation. Increasing waste diversion includes reducing our waste footprint at all TVA facilities, reusing materials and improving recycling. At TVA, we are dedicated to ensuring safe, long-term storage and sustainable management of produced waste.

Implementation Status

In FY 2020, TVA reported 8,574 metric tons of non-hazardous Municipal Solid Waste (MSW) of which 332 metric tons were recycled for a 3.9% diversion rate. There was a reduction in total MSW generated during FY 2020 due to 40% of TVA's employees working remotely from mid-March through the end of the FY 2020. This sharply displaced generation of MSW from our corporate facilities and most generating sites. This step-change in waste generation will continue in FY 2021. For this reason, after Mandatory Remote Work Status ends, FY 2019 MSW totals should be analyzed to determine a revised baseline year for the calculation of solid waste goals. TVA has continued to maintain its recycling at its facilities through working with its contracted waste management company. Historically TVA has simply purchased waste disposal services. This entailed merely selecting a vendor to provide containers to remove trash, construction debris, recyclables and/or special waste. Under this approach, TVA has not been able to divert as much waste from landfills, increase recycling and/or reuse of goods, nor cut spending on waste disposal services.

Priority Strategies & Planned Actions

TVA plans to reduce spending, increase recycling and annually divert solid waste from landfills by working with the site generators and waste contractors. TVA also expects to continue to see a source reduction in waste through its plans to retire coal plants, which typically generate large amounts of non-hazardous waste. TVA will continue to implement HFC management training as part of its Technical Training Programs. Measures will be taken to ensure recycling equipment/contracted services are available at appropriate locations. TVA plans to accomplish this by doing the following:

- Being informed – Tracking waste and supporting recycling is fundamental to waste reduction. TVA employees will have more knowledge and understanding about the kinds of waste produced at the various sites. This will help employees to better manage TVA's disposal costs and determine the appropriate ways to recycle.
- Becoming more sustainable – The way we manage our waste will directly affect our environmental sustainability. For TVA, improving sustainability means complying with Executive Order (EO) 14008 on Tackling the Climate Crisis at Home and Abroad and the remaining sections of EO 13834 on Efficient Federal Operations. Moreover, TVA's mission includes serving the valley by providing environmental stewardship.

- Reducing costs and preserving resources – Informing our employees about the specific waste streams will enable TVA to save money on disposal costs and preserve resources by recycling and reusing natural resources such as lumber and metal. Additionally, by better managing our waste and actively recycling we will conserve the environment by not emitting large quantities of greenhouse gases.

TVA is engaged and partnering up. This means that we are building teams who will manage the designs, plans and implementation of waste management activities. Partners will come from various areas throughout our organization. This partnership will be broad enough to represent our entire organization, provide myriad of ideas, innovative solutions and continuous improvement. Specifically in conjunction with our waste disposal vendors, the partnership will:

- Identify organizational goals/needs that will enable the partnership to establish short and long term goals;
- Research and review information pertinent to designing, planning and implementation;
- Communicate the importance of managing waste, reducing waste and increasing recycling;
- Encourage, engage and incentivize employee participation through education, surveys, and award programs;
- Provide reports to management and the organization at large;
- Monitor progress.

Top Priorities
Expand continuous improvement programs promoting waste avoidance and minimization, research and eliminate or reduce existing waste streams, identify reuse and recycling opportunities, and perform cost benefit analysis.
Perform and expand internal waste minimization/recycling reviews.

Specific actions that will be taken in FY 2022 to achieve priorities			
Specific Actions	**Timelines**	**Measures of Success**	**Expected Outcomes**
Ensure acquisition programs and processes support waste reduction and waste elimination	On-going	Fewer instances disposing of spoiled or unusable products	Lower quantities of solid waste generation; O&M cost savings
Expand continuous improvements actions in waste minimization	On-going	Reducing waste generation and disposal	Lower quantities of solid waste generation; O&M cost savings
Ensure availability of recycling resources	On-going	Increasing recycling	Increased diversion of solid waste to approved recycling partners

SUSTAINABLE BUILDINGS

FY 2020 Sustainable Buildings Progress:

28 sustainable Federal buildings
14.1% of buildings / 22.3% of gross square footage (GSF)

FY 2021 Plan:

22.3% - 22.4% of gross square footage (GSF) in FY21

TVA's strategy and approach to make Guiding Principles for Sustainable Federal Buildings (GP) improvements to its existing buildings include continuing to complete GP improvements that were previously underway. TVA plans to continue to review all new building designs and major renovations for incorporation of the new GPs. In addition, TVA plans to complete the reassessment criteria for buildings that previously met the GPs.

Implementation Status

TVA finished FY 2020 at 22.3% (based on gross square feet) for buildings meeting the Guiding Principles for Sustainable Federal Buildings (GP). TVA continues to apply the GPs to its Knoxville Office Complex. To date, 85% of the GPs have been completed at the Knoxville Office Complex. TVA is currently anticipating parts of the Knoxville Office Complex to undergo renovation, which will be a multi-year effort. TVA has continued to incorporate sustainable design criteria into major renovation and new construction efforts. As part of TVA's Strategic Real Estate Plan, TVA reviews its building inventory in an effort to reduce inefficient, high cost and underutilized space. This consolidation effort provides an opportunity to further practice sustainable efforts such as:

- Renovate space using removable, reusable wall systems;
- Recycle and recondition office furniture and panel systems;
- Install recyclable carpet tiles, low VOC finishes and bio-based materials;
- Upgrade lighting systems using LED lighting including occupancy sensors; and
- Install personal workstation occupancy sensors to control plug load.

Priority Strategies & Planned Actions

In FY 2021 and FY 2022, TVA plans to continue completing GP projects that were previously underway and achieving compliance on 1-2 buildings per year or 10,000 to 20,000 GSF in building space. TVA plans to continue using the Energy Star Portfolio Manager Sustainable Checklist, the FEMP Excel based checklist to track GPs progress for existing buildings and its own internal database (Tririga) to track building energy/water use. TVA will continue to review all new building designs and major renovations for incorporation of the new GPs if the building is greater than or equal to 10,000 square feet. TVA plans to budget for implementing GPs at new and existing buildings through its annual business planning process.

Top Priorities
Continue completing GP projects that were previously underway and achieving compliance.
Continue to review all new building designs and major renovations for incorporation of the new GPs if the building is greater than or equal to 10,000 square feet.
Complete the reassessment criteria for buildings that previously met the GPs.

Specific actions that will be taken in FY 2022 to achieve priorities			
Specific Actions	**Timelines**	**Measures of Success**	**Expected Outcomes**
Continue completing GP projects	09/30/22	# of buildings meeting GPs / GSF meeting GPs	Completed GP improvements at 1-2 buildings per year or 10,000 to 20,000 GSF in building space.
Incorporate green building specifications into all new construction, modernization, and major renovation projects.	09/30/22	Completed update of TVA process and procedures	TVA-SPP-05.20 - Internal Environmental and Energy Sustainability Process and TVA-SPP-05.21 - Resources Efficient Building Design Process to guide TVA project managers, architects, and interior designers in incorporating sustainability into all new construction and major renovation projects.
Complete Reassessment on buildings that previously met the GPs.	Annual / Ongoing	# of GP buildings reassessed	Completed reassessment of all required/due GP buildings, which ensure that buildings are showing persistent savings.

3. FLEET AND MOBILITY

FY 2020 Petroleum Reduction Progress (Gal):

40.3% reduction in petroleum fuel since 2005
16.5% reduction in petroleum fuel since FY19

FY 2021 Plan:

2.5% reduction in FY21 from FY20

FY 2020 Alternative Fuel Use Progress (Gal):

10,033.8% increase in alt fuel since 2005
63.1% decrease in alt fuel since FY19

FY 2021 Plan:

2.0% increase in FY21 from FY20

TVA's strategy and approach to improve fleet efficiency include continuing to focus on removing underutilized vehicles and continuing to grow the "Valley-Ride" program, which promotes vehicle sharing. In addition, TVA is planning to implement its new multi-tiered EV initiative starting in FY 2022.

Implementation Status

TVA's fleet is comprised of roughly 2,469 vehicles. The quantity and vehicle type is determined by the operational needs of the individual business units. This is done through a joint effort between Fleet Management, the operational user and business unit upper management. TVA's Fleet Management team utilizes a diverse inventory of light and medium-duty assets ranging from sedans to 1 1/2-ton trucks to support the company's mission. All of TVA's medium-duty assets are utilized for mission critical work, as well as some of the light-duty assets.

Finding vehicles that meet TVA's functional needs and are alternative fueled and or low-GHG emissions compliant can sometimes prove to be difficult. In past situations, cost was the overriding factor in determining which vehicle would be most beneficial to TVA. To address this issue, vehicles with a GVWR (Gross Vehicle Weight Rating) greater than 8,500 pounds carry an exemption from the DOE. This exemption allowed TVA to exclude medium and heavy-duty vehicles from the fleet goal since they are larger vehicles used for mission critical operation that support our nation's critical infrastructure. Currently there are no alternative fuel or low-GHG emission compliant vehicles that can perform the same mission. However, TVA still operates smaller trucks, vans, and SUV's that play a significant role in supporting mission-critical activities. TVA will initially seek to purchase low GHG-emitting vehicles before purchasing a noncompliant vehicle. While additional focus will also be placed on reductions in petroleum consumption and travel, these practices cannot be applied to all vehicles currently classified as non-exempt.

- TVA's Fleet Services has made an effort to focus on underutilized vehicles over the past few years, specifically sedans and SUV's (travel type vehicles). We have continued to monitor our utilization since our rightsizing event and have set internal metrics to help keep us on track.
- Another initiative that was implemented in FY 2019 was TVA's new automated rental pool system called "Valley Ride". This new standalone system was made possible by the Smart track system, which has provided an automated key box. This has given TVA the opportunity to provide vehicles for TVA's various business units without having someone there to hand out keys. What this system has also done is provided us with the opportunity to maximize our utilization on our owned assets. Before our temporary shut down due to the COVID-19 virus we had a 90% utilization rate between Monday – Thursday for these pooled vehicles. TVA plans to continue to roll this out in a larger scale when we resume business as usual.
- In alignment with EO 14008 TVA fleet department is targeting electric vehicles as well as the infrastructure to support our internal fleet. TVA is planning to accomplish 100% of all Light Duty replacements with EV/PHEV, or other zero carbon alternatives by 2025. Additionally, by 2030 75% of TVA's Light Duty, and 50% of TVA's

Medium Duty fleet will be EV/PHEV or other alternative power methods that best mitigate the agency's carbon footprint while improving the lives of the people of the Tennessee Valley.

- TVA's service territory requires employees to travel to urban and very rural areas on average 2,000 miles more annually than utility industry peers. The availability of GHG compliant vehicles to support TVA's mission and the geographic coverage area affects TVA's opportunity to improve performance in this area. Fueling options in rural areas are limited. Miscoded E85 fuel transactions by retail suppliers continue to influence the accuracy of reporting. TVA will continue to purchase alternative fuel vehicles that meet core mission requirements when available. The most cost-effective and fuel-efficient options will influence the vehicle types purchased. The fulfillment of the Fleet Alternative Fuel Consumption Goal is dependent upon the availability of product and funding.

Priority Strategies & Planned Actions

In FY 2021 and FY 2022, TVA plans to do the following:

- Beginning in FY 2022 TVA will be kicking off its EV initiative, which begins with our electrification effort at our nuclear sites.
- Implement plan to install appropriate charging or refueling infrastructure for zero emission or plug-in hybrid vehicles and opportunities for ancillary services to support vehicle-to-grid technology.
- Increase utilization of alternative fuel in dual-fuel vehicles.
- Use a FMIS to track real-time fuel consumption throughout the year for agency-owned vehicles.
- Minimize use of law enforcement exemptions by implementing GSA Bulletin FMR B-33, Motor Vehicle Management, and Alternative Fuel Vehicle Guidance for Law Enforcement and Emergency Vehicle Fleets.

Top Priorities
ValleyRide expansion to increase utilization.
Start implementation of our new EV initiative.

Specific actions that will be taken in FY 2022 to achieve priorities			
Specific Actions	**Timelines**	**Measures of Success**	**Expected Outcomes**
Opening new ValleyRide locations	Before the end of FY 2022	Cost savings/utilization	Adoption rate increase as we come out of this pandemic and adding vehicles and locations as demand increase, removing underutilized vehicle throughout our fleet.
Identifying locations for charging infrastructure and EV placement	Phase I 2021-2025 Phase II 2026-2030	Meeting the timelines outlined in our plan	75% of light duty fleet zero carbon alternative and 50% of our Medium duty converted to zero carbon alternative- all by 2030

4. SUSTAINABLE PROCUREMENT

FY 2020 Sustainable Acquisition Progress:

88.0% of contract actions of contract actions and 89.3% of obligations (in dollars), for a total of $12.7M in contract actions with statutory environmental requirements

FY 2021 Plan:

0.5% increase of contract actions and 0.5% increase of obligations (in dollars) in FY 2021

TVA Supply Chain sustainable purchases, and business in general, were challenged by the unprecedented COVID-19 pandemic. There were many unknowns, changes in priorities, and potential for supply chain disruptions to all purchases, including green products. TVA Supply Chain was still able to increase the percentage of sustainable contract actions and increase the overall dollar obligation.

TVA's sustainable acquisition strategy for FY 2021 continues to focus on review and update of TVA policies, programs and standard terms and conditions in our purchase request and contracting processes. Furthermore, TVA Supply Chain has launched a new Net-Zero Planning program in FY 2021.

Implementation Status

In FY 2020, there was an increase of 2% in the number of sustainable contract actions from FY 2019 as calculated by TVA's methodology. Although the spend did not meet the 1% increase target, the overall dollars of sustainable spend, as calculated by TVA's methodology, increased by $820,686 during the volatile COVID-19 market. TVA's methodology is based on green codes identified on purchase order lines issued in TVA's purchasing system of record. Green codes indicate that the product or service is eligible bio-based, energy efficient products, Energy Star, EPEAT-registered electronic products, recycled content, water efficient products, products containing alternatives to ozone depleting substances, products containing no or low toxic constituents, or another environmentally preferable products or services. The numbers reported indicate that of those in which a sustainable option is available, the sustainable option was purchased. Bio-based purchases for FY 2020 were 63% well above the 50% target. TVA continues to review Request for Proposal and Request for Quote processes to ensure inclusion of contract clauses, which provide for and promote bio-based and other designated green product purchases. Applicable purchases mean the item purchased is available in a bio-based option. TVA reviews applicable standard terms and conditions annually.

Priority Strategies & Planned Actions

TVA will continue to review and provide necessary updates to procurement policies, programs, and standard terms and conditions to ensure purchases provide for federally mandated sustainable products in all relevant contracts where appropriate and practical. Additionally, TVA Supply Chain has initiated a new effort to focus on identifying opportunities and improving the carbon situations by material and services categories (as determined to be in scope).

TVA projects the following for FY 2021:

- Projected Progress for FY 2021: 0.5% increase in contracts & contract dollars w/environmental clauses from prior year.[1]

[1] Dependent upon continued supply chain effects of COVID-19.

Top Priorities
Initiate the TVA Supply Chain Net-Zero Planning program.
Begin implementing the recommendations of the TVA Supply Chain Net-Zero Planning program. This program incorporates a wide selection of resources outside and within TVA such as the Carbon Team, Carbon Accountant, Benchmarking, and Coal Origination departments. Based on inquires to other utilities, and considering EPA reporting, TVA Supply Chain is leading in Net-Zero planning.
Continue review of sustainability contract language.

Specific actions that will be taken in FY 2022 to achieve priorities			
Specific Actions	**Timelines**	**Measures of Success**	**Expected Outcomes**
Begin work on first recommendation of the plan: contract for installing water chemical monitoring dispensers at Browns Ferry Nuclear Plant (BFN)	In Progress	Contract Implemented	The contract to install the net-carbon reducing equipment at BFN is implemented.
Issue communication to all Contracting Officers detailing the Green Procurement Goals	12/31/2021	Communication Issued	Contracting Officers will understand the FY22 Green Procurement Goals
Terms & Conditions Team to review sustainability related clauses	September 30, 2022	Clauses Reviewed - Updated as Needed	The T-CAT team, including the Office of General Counsel, will review sustainability clauses as part of annual review and make changes as needed.
Begin implementing the recommendations of the Supply Chain Net-Zero Planning program	September 30, 2022	Teams Identified	Includes setting up various hit team and/or cross functional teams to review identified commodities

5. ELECTRONICS STEWARDSHIP AND DATA CENTER

FY 2020 Electronics Stewardship Progress:

Where applicable and available all newly purchased or leased equipment, meets energy efficiency requirements

Where applicable and available all electronic equipment is disposed using environmentally sound methods*

*Reuse, donation, recycling, transfer, sale, or demanufacturing.

TVA continues to procure electronic equipment which promotes energy efficiency and environmental stewardship. TVA is constantly evaluating the cost-benefit of procuring more efficient sustainable technologies that align with the statutory requirements on a more frequent basis. In addition, TVA maintains the disposal of surplus electronics with certified recyclers. TVA continues to make iterative steps towards continuous improvement of the overall energy efficiency of our technology fleet.

Implementation Status

TVA continues to ensure that technology procurement is focused on devices with optimized levels of energy efficiency. TVA focuses on procuring devices configured with the most power-conscious components that meet TVA's business requirements. TVA also continues to ensure that electronic equipment is re-marketed or recycled in environmentally sound methods.

TVA's current status is detailed below:

- TVA purchases Energy Star registered electronics when they are available.
- TVA purchases EPEAT certified devices when they are available and meet TVA's business requirements.
- TVA continues to procure Solid State storage in all laptops and desktops, which are more power-efficient than traditional spinning hard drives.
- All TVA networked Printers and Multifunction Devices are configured with a centrally managed power management policy.

Priority Strategies & Planned Actions

TVA plans to do the following:

- TVA plans to only utilize solid-state storage in laptop and desktop PCs. This shift continues to result in increased energy efficiency as legacy technology is cycled out.
- TVA will continue to explore the right balance of power efficiency and performance in end-user hardware.
- TVA will continue to utilize Intel's "U" series of mobile processors where operationally viable to reduce power consumption further. Further opportunities for power-saving hardware are continuing to be evaluated.
- TVA has transitioned to a 36-month PC Lifecycle which ensures old technology is refreshed with more sustainable technology on a more frequent basis.
- TVA continues to lifecycle printers on a four-year basis to ensure old technology is refreshed with more sustainable technology on a scheduled basis.
- TVA will continue to manage the disposal of surplus electronics with certified recyclers.
- TVA plans to continue to ensure statutory energy-efficient product procurement requirements are met when acquiring new electronics.

Top Priorities
Evaluate the cost-benefit of procuring more efficient sustainable technologies that align with the statutory requirements on a more frequent basis.
Ensure that electronic equipment is re-marketed or recycled in environmentally sound methods.

Specific actions that will be taken in FY 2022 to achieve priorities			
Specific Actions* **	**Timelines**	**Measures of Success**	**Expected Outcomes**
Utilize solid-state storage in laptop and desktop PCs	Ongoing	All computers only include solid-state storage.	Will result in increased energy efficiency as legacy technology is cycled out.
Explore the right balance of power efficiency and performance in end-user hardware	Ongoing	Complete review of user needs vs. hardware needed.	Will result in lower equipment spend and more energy efficient hardware.
Utilize Intel's "U" series of mobile processors	Ongoing	Complete review of when Intel's U series can be used.	Reduced energy consumption
Transition to a 36-month PC Lifecycle	Ongoing	Complete annual review.	Reduced energy consumption and reduced cost in maintaining aging computers.
Lifecycle printers on a four-year basis	Ongoing	Complete annual review.	Reduced energy consumption
Manage the disposal of surplus electronics with certified recyclers	Ongoing	Complete annual review.	Reduced waste footprint
Ensure statutory energy-efficient product procurement requirements are met	Ongoing	Complete annual review.	Statutory Compliance and reduced energy consumption