

Tennessee Valley Authority

2020 EEI ESG/Sustainability Reporting Template



August 2021

Introduction and Purpose

The Tennessee Valley Authority (TVA) provides the people of the Tennessee Valley with low-cost and reliable energy while maintaining a healthy environment and prosperous economy – without compromising the ability of future generations to do the same. The three Es — energy, environmental stewardship, and economic development — continue to drive everything TVA does to sustain the Tennessee Valley region. TVA’s mission to “serve the people to make life better” is as relevant today as it was when established in 1933.

This report provides key sustainability metrics for voluntary use, and is consistent with the sustainability reporting template developed by the Edison Electric Institute.

ESG / Sustainability Governance at TVA

TVA’s nine-member Board of Directors (the Board) serves as the governing body for TVA. As provided by the TVA Act and the TVA Bylaws, the principal responsibilities of the Board are to establish broad strategies, goals and objectives; set long range plans and policies; and ensure their implementation by the TVA staff under the leadership of the Chief Executive Officer (CEO). Board members are nominated by the President of the United States and confirmed by the Senate, and board terms are for five years.

The Board has established two separate councils — the Regional Resource Stewardship Council and the Regional Energy Resource Council — under the Federal Advisory Committee Act to advise TVA on its stewardship activities and energy resource activities in the Tennessee Valley. Both of these councils focus on decisions and performance to foster a sustainable environment in the Tennessee Valley.

TVA has an enterprise leadership team led by a Chief Executive Officer. The strength of TVA is its people, and its leadership team is no exception. They are an experienced, talented and diverse group of leaders committed to TVA’s mission of service through low-cost, reliable energy, economic development and environmental stewardship. As the nation’s largest public power supplier and one of the top producers of electricity, TVA’s leadership team sets the strategy, vision and operational direction for the enterprise.

TVA has appointed a Chief Sustainability Officer (CSO) that provides sustainability governance and oversight across TVA’s business units. TVA’s CSO and Deputy CSO oversee a TVA-wide Environmental Executive Council, in addition to a Sustainability Steering Committee, and a

Sustainability Working Group, which are collectively responsible for the governance of sustainability at TVA. TVA has also appointed an executive leader as Chief Risk Officer. Both the sustainability officer and risk officer are members of the Risk Management Steering Committee and report to an Enterprise Risk Council. The council is responsible for the highest level of risk oversight at TVA and for communicating enterprise-wide risks with policy implications to the TVA Board or a designated Board committee.

Adapting to the Changing Business Environment

TVA is an industry leader in carbon reduction. TVA's overall carbon emissions have been reduced by 63 percent since 2005. This was accomplished primarily by incorporating renewable energy assets, replacing aging plants and expanding the nuclear energy program.

TVA's power system portfolio has evolved significantly over the past decade and a half, and we have seen a substantial reduction in TVA's carbon footprint. In 2020, nearly 60 percent of the electric power in TVA's service area came from carbon-free sources.

In calendar year 2020, TVA delivered electricity with a system average carbon rate of 561.92 lbs/MWh (approximately 24 percent improvement from 2019). This allows TVA to offer clean and affordable electricity, which helps the region attract and retain business and employment for people.

TVA has a firm plan to achieve 70 percent reduction in carbon emission by 2030, and has a path to achieve approximately 80 percent reduction by 2035. TVA believes these goals can be achieved by leveraging existing technologies, and utilizing innovations and partnership support for early steps into small modular reactors and longer duration storage to allow TVA to maintain low cost and reliable power.

As TVA seeks to go beyond 80 percent carbon reduction, progress toward net-zero emissions will require continued investment in new, cost-effective technologies in addition to nuclear, solar, wind and hydro. Ultimately, TVA aspires to achieve net-zero carbon emissions by 2050 and to support broader national efforts to decarbonize the economy. The principles below will be followed to further reduce emissions:

- Prioritizing the needs of Valley stakeholders
- Using best-available science and supporting research and policies that further carbon-free dispatchable technologies
- Partnering with customers and others to support economy-wide decarbonization through electrification and efficiency efforts
- Maintaining nuclear generation, hydro generation and a strong transmission grid as key enabling assets
- Being transparent with stakeholders in measuring and sharing our progress
- Adapting new technologies and changing policies to achieve deeper carbon reduction

As progress is made toward achieving these goals, it's important that TVA continues to balance high reliability and low energy costs. As one of the nation's largest electricity providers, TVA is committed to being part of the solution and to working with others to solve this important challenge.

To further adapt to future business dynamics, TVA is also identifying strategic possibilities, such as partnering with Tennessee Department of Environment and Conservation to develop a statewide electric vehicle fast charging network to power the growth of electric vehicles across Tennessee, and regional partnerships, to help reduce barriers to transportation electrification.

Managing and Adapting to Future ESG/Sustainability Risks and Opportunities

TVA is actively engaged in several business and industry groups to manage ESG/sustainability risks and opportunities arising from regulation, customer trends, and research and development. In addition to the Edison Electric Institute, TVA is a member of the Electric Power Research Institute, the North American Energy Standards Board, and the Business Council on Sustainable Electricity, among others.

TVA has a Chief Risk Officer who oversees TVA's enterprise risk management function and ensures all significant internal and external risks are identified and fully integrated into strategic and business planning.

As a federal agency, TVA complies with the National Environmental Policy Act, and is guided by Executive Orders (EO), such as EO 14008 on Tackling the Climate Crisis at Home and Abroad and the remaining sections of EO 13834 on Efficient Federal Operations. TVA has developed a Federal Sustainability Report and Implementation Plan that follows EO 14008 guidance for TVA buildings and its vehicle fleet. As part of this Federal Sustainability Report and Implementation Plan, TVA has established annual sustainability objectives in accordance with the Office of Management and Budget federal scorecard targets. TVA works to integrate its federal goals for implementing EO 14008 and the remaining sections of 13834 into existing business operations.

TVA has several key programs and initiatives that support its sustainability strategy, such as "The Climate Action Adaptation and Resiliency Plan" which guides TVA's planning process to include a long-range view of climate impacts on TVA's system. TVA also manages the Tennessee River system and associated public lands to reduce flood damage, maintain navigation, support power production and recreational uses, improve water and air quality, and protect shoreline resources. TVA will continue to manage the natural resources of the Tennessee Valley using the Natural Resources Plan, which is currently being updated.

TVA's Sustainability Report aligns with the Federal Sustainability Report and Implementation Plan and together address key aspects of TVA's energy, environmental, economic, and social resources and responsibilities. TVA's Sustainability Report explains TVA's history of sustainable performance, tells TVA's mission of service story, and discloses sustainability results.

Topic Areas	Links
ESG Page for Investors	TVA - Environmental, Social, & Governance Reports https://tva.q4ir.com/esg/
Carbon Emission Goals	Sustainability Report https://www.tva.com/environment/environmental-stewardship/sustainability/sustainability-report
TVA's Decarbonization Journey	Carbon Report https://www.tva.com/environment/environmental-stewardship/sustainability/carbon-report
Integrated Resource Plan (IRP)	IRP https://www.tva.com/environment/environmental-stewardship/integrated-resource-plan
Natural Resource Plan (NRP)	Natural Resource Plan https://www.tva.com/environment/environmental-stewardship/environmental-reviews/natural-resource-plan
Climate Action Adaptation and Resiliency Plan	Climate Action Adaptation and Resiliency Plan https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/about-tva/guidelines-reports/climate-statements-plans/2020-climate-adaptation-plan.pdf?sfvrsn=c3506352_2



Electric Company ESG/Sustainability Quantitative Information

Parent Company: Tennessee Valley Authority
Operating Company(s): Tennessee Valley Authority
Business Type(s): Generation & Transmission
State(s) of Operation: Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee, Virginia
State(s) with RPS Programs: North Carolina
Report Date: 8/23/2021

Ref. No.	Refer to the 'EEI Definitions' tab for more information on each metric	Baseline	Last Year	Current Year	Comments, Links, Additional Information, and Notes
		2005	2019	2020	
<i>Data is reported on a fiscal year basis, unless otherwise noted as Calendar Year (CY).</i>					
Portfolio					
1	Owned Nameplate Generation Capacity at end of year (MW)	30,644	33,727	32,750	<i>Caledonia Combined Cycle Plant is currently a leased facility operated by TVA; Includes natural gas facilities operated by TVA, subject to leaseback and long-term lease agreements.</i>
1.1	Coal	15,075	7,886	6,915	
1.2	Natural Gas	4,662	12,509	12,509	
1.3	Nuclear	5,790	7,922	7,922	
1.4	Petroleum	13	9	9	
1.5	Total Renewable Energy Resources	5,104	5,401	5,395	
1.5.1	Biomass/Biogas	0	0	0	
1.5.2	Geothermal	0	0	0	
1.5.3	Hydroelectric	5,104	5,400	5,394	
1.5.4	Solar	0	1	1	
1.5.5	Wind	0	0	0	
1.6	Other	0	0	0	
2.i	Owned Net Generation for the data year (MWh)	159,896,000	139,129,000	134,295,000	
2.1.i	Coal	98,404,000	27,934,000	19,825,000	
2.2.i	Natural Gas	595,000	31,704,000	33,635,000	
2.3.i	Nuclear	45,156,000	63,433,000	64,832,000	
2.4.i	Petroleum	0	0	0	
2.5.i	Total Renewable Energy Resources	15,723,000	16,058,000	16,003,000	
2.5.1.i	Biomass/Biogas	0	0	0	
2.5.2.i	Geothermal	0	0	0	
2.5.3.i	Hydroelectric	15,723,000	16,058,000	16,003,000	
2.5.4.i	Solar	0	0	0	
2.5.5.i	Wind	0	0	0	
2.6.i	Other	18,000	0	0	
2.ii	Purchased Net Generation for the data year (MWh)		21,945,000	19,526,000	
2.1.ii	Coal				
2.2.ii	Natural Gas				
2.3.ii	Nuclear				
2.4.ii	Petroleum				
2.5.ii	Total Renewable Energy Resources		7,840,000	7,934,000	
2.5.1.ii	Biomass/Biogas				
2.5.2.ii	Geothermal				
2.5.3.ii	Hydroelectric				
2.5.4.ii	Solar				
2.5.5.ii	Wind				
2.6.ii	Other				
3	Capital Expenditures and Energy Efficiency (EE)				<i>Construction Expenditures based on Statement of Cash Flows.</i>
3.1	Total Annual Capital Expenditures (nominal dollars)		\$ 1,700,000,000	\$ 1,643,000,000	
3.2	Incremental Annual Electricity Savings from EE Measures (MWh) (CY)		32,377	101,138	
3.3	Incremental Annual Investment in Electric EE Programs (nominal dollars) (CY)		\$ 21,406,000	\$ 15,660,000	
4	Retail Electric Customer Count (at end of CY)				
4.1	Commercial		17	17	
4.2	Industrial		43	43	
4.3	Residential		0	0	



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Emissions (CY)					
5	GHG Emissions: Carbon Dioxide (CO2) and Carbon Dioxide Equivalent (CO2e) Note: The alternatives available below are intended to provide flexibility in reporting GHG emissions, and should be used to the extent appropriate for each company.				
5.1	Owned Generation				
5.1.1	Carbon Dioxide (CO2)				
5.1.1.1	Total Owned Generation CO2 Emissions (MT)	95,787,664	43,090,822	34,237,908	Amount reported in SEC financial statements for 2020 and 2019 CO2 emissions was 43 million and 47 million, respectively, and is based on rounded short tons. The conversion factor used for this template was 1 MT = 1.1023 short tons.
5.1.1.2	Total Owned Generation CO2 Emissions Intensity (MT/Net MWh)	0.599	0.310	0.255	
5.1.2	Carbon Dioxide Equivalent (CO2e)				
5.1.2.1	Total Owned Generation CO2e Emissions (MT)		43,094,983	34,455,726	For power block only. TVA's Sustainability Report provides Total Owned Generation CO2e Emissions for power block and non-power block together (scope one).
5.1.2.2	Total Owned Generation CO2e Emissions Intensity (MT/Net MWh)		0.310	0.257	
5.2	Purchased Power				
5.2.1	Carbon Dioxide (CO2)				
5.2.1.1	Total Purchased Generation CO2 Emissions (MT)		13,543,114	6,521,407	
5.2.1.2	Total Purchased Generation CO2 Emissions Intensity (MT/Net MWh)		0.617	0.334	
5.2.2	Carbon Dioxide Equivalent (CO2e)				
5.2.2.1	Total Purchased Generation CO2e Emissions (MT)				
5.2.2.2	Total Purchased Generation CO2e Emissions Intensity (MT/Net MWh)				
5.3	Owned Generation + Purchased Power				
5.3.1	Carbon Dioxide (CO2)				
5.3.1.1	Total Owned + Purchased Generation CO2 Emissions (MT)		56,633,937	40,759,315	
5.3.1.2	Total Owned + Purchased Generation CO2 Emissions Intensity (MT/Net MWh)		0.352	0.265	
5.3.2	Carbon Dioxide Equivalent (CO2e)				
5.3.2.1	Total Owned + Purchased Generation CO2e Emissions (MT)				
5.3.2.2	Total Owned + Purchased Generation CO2e Emissions Intensity (MT/Net MWh)				
5.4	Non-Generation CO2e Emissions of Sulfur Hexafluoride (SF6)				
5.4.1	Total CO2e emissions of SF6 (MT)		324,988	35,541	2019 value includes historical emissions that were not previously captured.
5.4.2	Leak rate of CO2e emissions of SF6 (MT/Net MWh)		N/A		
6	Nitrogen Oxide (NOx), Sulfur Dioxide (SO2), Mercury (Hg)				
6.1	Generation basis for calculation				
6.2	Nitrogen Oxide (NOx)				
6.2.1	Total NOx Emissions (MT)	173,538	19,430	12,577	
6.2.2	Total NOx Emissions Intensity (MT/Net MWh)	0.001085	0.000140	0.000094	
6.3	Sulfur Dioxide (SO2)				
6.3.1	Total SO2 Emissions (MT)	417,339	26,972	17,082	
6.3.2	Total SO2 Emissions Intensity (MT/Net MWh)	0.002610	0.000194	0.000127	
6.4	Mercury (Hg)				
6.4.1	Total Hg Emissions (kg)		50.1	17.5	
6.4.2	Total Hg Emissions Intensity (kg/Net MWh)		0.0000004	0.0000001	

Note: Emissions intensity calculations are estimated by dividing calendar year emissions data by applicable fiscal year net generation data in the Portfolio section.



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Resources					
7	Human Resources				
7.1	Total Number of Employees (end of fiscal year)	12,703	10,009	9,989	
7.2	Percentage of Women in Total Workforce		20.1%	20.1%	
7.3	Percentage of Minorities in Total Workforce		11.8%	11.0%	
7.4	Total Number on Board of Directors/Trustees	3	9	5	
7.5	Percentage of Women on Board of Directors/Trustees	33%	11%	0%	
7.6	Percentage of Minorities on Board of Directors/Trustees	0%	11%	0%	
7.7	Employee Safety Metrics				
7.7.1	Recordable Incident Rate		0.46	0.34	<i>Revised due to reclassifications.</i>
7.7.2	Lost-time Case Rate		0.07	0.10	
7.7.3	Days Away, Restricted, and Transfer (DART) Rate		0.22	0.17	
7.7.4	Work-related Fatalities		0.00	0.00	
8	Fresh Water Resources used in Thermal Power Generation Activities				
8.1	Water Withdrawals - Consumptive (Millions of Gallons) (CY)		22,030	28,372	
8.2	Water Withdrawals - Non-Consumptive (Millions of Gallons) (CY)		4,101,799.5	2,919,893.7	
8.3	Water Withdrawals - Consumptive Rate (Millions of Gallons/Net MWh) (CY)		0.00015834	0.00021127	
8.4	Water Withdrawals - Non-Consumptive Rate (Millions of Gallons/Net MWh) (CY)		0.02948199	0.02174239	
9	Waste Products				
9.1	Amount of Hazardous Waste Manifested for Disposal (MT) (CY)		93.67	93.13	
9.2	Percent of Coal Combustion Products Beneficially Used (CY)		45%	87%	

Goal Applicability	Baseline Year	Target Year	Reduction Goal Description (Short)	Source (URL)
Tennessee Valley Authority	2005	2030	TVA's plan to achieve 70% reduction in carbon emissions by 2030	TVA's Carbon Report
Tennessee Valley Authority	2005	2035	Path to ~80% carbon emission reduction by 2035	TVA's Carbon Report
Tennessee Valley Authority	2005	2050	Aspiration to achieve net-zero carbon by 2050	TVA's Carbon Report

Notes

1. Additional information on the emissions goals listed above, including how they will be achieved, can be found in the Qualitative section.
2. Information on the type of emissions (e.g., carbon, methane, CO₂e, etc.) and which scope(s) of emissions apply — based on the WRI GHG Reporting Protocol, TCR Reporting Protocol(s), or other acceptable reporting procedures — should be included in the goal description. Emissions reported in the Quantitative section are not based on a Scope 1, 2 or 3 methodology.
3. Goal Applicability refers to the entity to which the goal applies (e.g., parent company, operating company, electric or gas utility, etc.).