

Tennessee Valley Authority

2019 EEI ESG/Sustainability Reporting Template



September 2020

Introduction and Purpose

The Tennessee Valley Authority (TVA) provides the people of the Tennessee Valley with low-cost and reliable electricity 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 President Franklin Delano Roosevelt signed the TVA Act in 1933.

Today, decision-making is forcing a new paradigm within the utility industry. Utilities are challenged to think differently to foster a sustainable environment going forward, or risk the potential loss of future business. The EEI ESG/Sustainability reporting template is a summary of key sustainability metrics for voluntary use. TVA participated in the template development process and is continuing participation because sustainable performance is paramount to its customers and other stakeholders.

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 each board member serves a term of 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 also has an Enterprise Leadership Team (ELT), led by the CEO, which drives business strategy and deployment, including decisions relating to sustainable performance. TVA considers sustainability in overall planning and business decisions. TVA’s goals align with

customer needs – to provide low cost and clean power that helps the Tennessee Valley and its businesses prosper.

TVA has appointed an executive leader as Chief Sustainability Officer (CSO), per Executive Order 13834 (Efficient Federal Operations). Sustainability governance and oversight is provided through the CSO's office but is applied across TVA business units. TVA's CSO and Deputy CSO oversee a TVA-wide Sustainability Working Group, which is responsible for the governance of sustainability at TVA.

Central to TVA's sustainability efforts are the [Corporate Sustainability Report](#), Environmental Policy, Environmental Management System, [Integrated Resource Plan \(IRP\)](#), and [Natural Resource Plan \(NRP\)](#), all of which align with TVA's mission. More detailed information about TVA's programs can be found at www.tva.gov, as well as annual reports (10-Ks), quarterly reports (10-Qs), and current reports (8-Ks) TVA files with the Securities and Exchange Commission.

Adapting to the Changing Business Environment

TVA recognizes that the energy industry is evolving based on customer preferences, regulatory drivers, and international pressures and expectations. TVA's energy mix has shifted from a largely fossil fuel-based portfolio to a more diversified mix, which utilizes a balance of coal, gas, nuclear, hydroelectric, and renewables. In the Tennessee Valley, TVA is projected to experience relatively flat load growth. TVA is actively adjusting and expanding its business model to incorporate distributed energy resources and partnerships with the local power companies (LPCs) on renewable projects. To further adapt to future business dynamics, TVA is also identifying strategic possibilities, such as a broadband fiber network along TVA's transmission lines, to further optimize its generation and transmission system.

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 (EPRI), the North American Energy Standards Board, and the Business Council on Sustainable Electricity (BCSE), 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.

TVA is well-positioned to meet the increasing pressure for a low-carbon generating fleet. In calendar year 2019, TVA delivered electricity with a system average carbon rate of 741.66 lbs/MWh (approximately 12 percent improvement from 2018). TVA is on track to further improve our carbon rate to below 600 lbs/MWh by the end of 2020. This allows TVA to offer clean and affordable electricity, which helps the region attract and retain business and employment for people in the Tennessee Valley.

TVA has developed a grid resiliency impact analysis system relating to transmission flow and operational decisions. The system will help TVA better manage and identify risks from the transmission system. Enhanced resiliency will be based on three critical elements: damage prevention, system recovery, and survivability.

TVA builds partnerships with stakeholders that help bring jobs to the Tennessee Valley and make the economy stronger to benefit the people of the region. TVA is charged with developing and implementing strategic programs to attract capital investment within its service area and to create and retain jobs.

Sustainability Plans and Progress

As a federal agency, TVA must comply with the National Environmental Policy Act (NEPA), and is guided by Executive Orders, such as EO 13834. TVA has developed a Federal Sustainability Performance Plan that follows EO 13834 guidance for TVA buildings and its vehicle fleet. As part of this Federal Sustainability Performance Plan, TVA has established annual sustainability objectives to meet in accordance with the Office of Management and Budget federal scorecard targets. TVA works to integrate its federal goals for implementing EO 13834 into its existing business operations.

TVA has several key programs and initiatives that support its sustainability strategy, such as “The Climate Change Adaptation 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 continues to expand its groundbreaking methodology on customer carbon calculations. TVA currently calculates CO₂ rates for certain customers based on actual hourly electric consumption profiles. TVA is expanding this program to include additional customers. TVA currently calculates over 600 specialized carbon rates. In an effort to encourage energy behavior changes, TVA has established annual carbon awards for the top performing and most improved companies.

TVA has published its first company-wide Sustainability Report. TVA’s Sustainability Report aligns with the Federal Sustainability Performance 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.

TVA continues to serve the people of the Tennessee Valley with low-cost and reliable electricity and helps maintain a healthy environment and prosperous economy without compromising the ability of future generations to do the same.

ESG/Sustainability Template – Section 2: Quantitative Information

Disclaimer: All information below is being provided on a voluntarily basis, and as such, companies may elect to include or exclude any of the topics outlined below and customize the template to their specific needs. The decision to include data for historical and future years is at the discretion of each company and the specific years (e.g., historical baseline) should be chosen as appropriate for each company.

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

Ref. No.	Refer to the EEI website for more information on definitions related to each metric	Baseline	Prior Year	Current Year	Comments, Links, Additional Information, and Notes
		2005	2018	2019	
<i>Data is reported on a fiscal year basis, unless otherwise noted as Calendar Year (CY).</i>					
Portfolio					
1	Owned Summer Net Capability at end of year (MW)	30,644	33,526	33,727	
1.1	Coal	15,075	7,886	7,886	
1.2	Natural Gas	4,662	12,509	12,509	
1.3	Nuclear	5,790	7,723	7,922	
1.4	Petroleum	13	9	9	
1.5	Total Renewable Energy Resources	5,104	5,399	5,401	
1.5.1	Biomass/Biogas	0	0	0	
1.5.2	Geothermal	0	0	0	
1.5.3	Hydroelectric	5,104	5,398	5,400	
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	141,505,000	139,129,000	
2.1.i	Coal	98,404,000	31,471,000	27,934,000	
2.2.i	Natural Gas	595,000	32,104,000	31,704,000	
2.3.i	Nuclear	45,156,000	64,194,000	63,433,000	
2.4.i	Petroleum	0	0	0	
2.5.i	Total Renewable Energy Resources	15,723,000	13,736,000	16,058,000	
2.5.1.i	Biomass/Biogas		0	0	
2.5.2.i	Geothermal		0	0	
2.5.3.i	Hydroelectric	15,723,000	13,736,000	16,058,000	
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)		21,428,000	21,945,000	
3	Investing in the Future: Capital Expenditures, Energy Efficiency (EE), and Smart Meters				
3.1	Total Annual Capital Expenditures (nominal dollars)		\$ 1,759,000,000	\$ 1,700,000,000	
3.2	Incremental Annual Electricity Savings from EE Measures (MWh) (CY)		228,202	32,377	
3.3	Incremental Annual Investment in Electric EE Programs (nominal dollars) (CY)		\$ 36,213,000	\$ 21,406,000	
3.4	Percent of Total Electric Customers with Smart Meters (at end of year) (CY)		100%	100%	
4	Retail Electric Customer Count (at end of CY)				
4.1	Commercial		18	17	<i>In addition, TVA had wholesale power contracts with 154 local power company customers. Customer count is based on meters in accordance with the definition on Form EIA-861 Annual Electric Power Industry Report.</i>
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)				
5.1	Owned Generation				
5.1.1	Carbon Dioxide (CO ₂)				Amount reported in SEC financial statements for 2019 and 2018 CO ₂ emissions was 47 million and 52 million, respectively, and is based on rounded short tons. The conversion factor used for this template was 1 MT = 1.1023 short tons.
5.1.1.1	Total Owned Generation CO ₂ Emissions (MT)	95,787,664	47,521,550	43,090,822	
5.1.1.2	Total Owned Generation CO ₂ Emissions Intensity (MT/Net MWh)	0.599	0.336	0.310	
5.1.2	Carbon Dioxide Equivalent (CO ₂ e)				For power block only. TVA's Sustainability Report provides Total Owned Generation CO ₂ e Emissions for power block and non-power block together (scope one).
5.1.2.1	Total Owned Generation CO ₂ e Emissions (MT)		47,796,287	43,094,983	
5.1.2.2	Total Owned Generation CO ₂ e Emissions Intensity (MT/Net MWh)		0.338	0.310	
5.2	Purchased Power				
5.2.1	Carbon Dioxide (CO ₂)				
5.2.1.1	Total Purchased Generation CO ₂ Emissions (MT)		13,049,225	13,543,114	
5.2.1.2	Total Purchased Generation CO ₂ Emissions Intensity (MT/Net MWh)		0.609	0.617	
5.3	Owned Generation + Purchased Power				
5.3.1	Carbon Dioxide (CO ₂)				
5.3.1.1	Total Owned + Purchased Generation CO ₂ Emissions (MT)		60,570,775	56,633,937	
5.3.1.2	Total Owned + Purchased Generation CO ₂ Emissions Intensity (MT/Net MWh)		0.372	0.352	
5.4	Non-Generation CO₂e Emissions				
5.4.1	Fugitive CO ₂ e emissions of sulfur hexafluoride (MT)		117,863	324,988	2019 value includes historical emissions that were not previously captured.
5.4.2	Fugitive CO ₂ e emissions from natural gas distribution (MT)		N/A	N/A	
6	Nitrogen Oxide (NO_x), Sulfur Dioxide (SO₂), Mercury (Hg)				
6.1	Generation basis for calculation	Total			
6.2	Nitrogen Oxide (NO_x)				
6.2.1	Total NO _x Emissions (MT)	173,538	21,451	19,430	
6.2.2	Total NO _x Emissions Intensity (MT/Net MWh)	0.001085	0.000152	0.000140	
6.3	Sulfur Dioxide (SO₂)				
6.3.1	Total SO ₂ Emissions (MT)	417,339	26,744	26,972	
6.3.2	Total SO ₂ Emissions Intensity (MT/Net MWh)	0.002610	0.000189	0.000194	
6.4	Mercury (Hg)				
6.4.1	Total Hg Emissions (kg)		67.7	50.1	
6.4.2	Total Hg Emissions Intensity (kg/Net MWh)		0.0000005	0.0000004	

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	10,023	10,009	
7.2	Total Number on Board of Directors/Trustees	3	8	9	
7.3	Total Women on Board of Directors/Trustees	1	1	1	
7.4	Total Minorities on Board of Directors/Trustees	0	1	1	
7.5	Employee Safety Metrics				
7.5.1	Recordable Incident Rate		0.34	0.44	
7.5.2	Lost-time Case Rate		0.12	0.00	
7.5.3	Days Away, Restricted, and Transfer (DART) Rate		0.25	0.00	
7.5.4	Work-related Fatalities		0.00	0.00	
8	Fresh Water Resources				
8.1	Water Withdrawals - Consumptive (Billions of Liters/Net MWh)		0.0000007	0.0000006	
8.2	Water Withdrawals - Non-Consumptive (Billions of Liters/Net MWh) (CY)		0.000098	0.000112	
9	Waste Products (CY)				
9.1	Amount of Hazardous Waste Manifested for Disposal (MT)		52.44	93.67	
9.2	Percent of Coal Combustion Products Beneficially Used		38%	45%	