



2020 Carbon Emissions Management Annual Report



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Our Commitment

As an integral member of the community, SWACO is committed to sustainability and environmental stewardship. In 2019, SWACO developed a Carbon Emissions Management Plan (“Plan”) that identified measures for reducing the carbon footprint of SWACO facilities and operations through an informed decision-making process.

The Plan serves as a guiding framework to reduce SWACO’s carbon footprint through a stepwise approach. The Plan established a baseline and created a process for routinely monitoring SWACO’s carbon footprint. It also identified industry best practices for carbon emission reductions through benchmarking. Ultimately, the purpose of the Plan was to set a realistic, measurable goal for addressing carbon emissions and outline a way to achieve the goal.

Achieve an emission rate of
0.05
tCO₂e
 per ton of material processed by
2032

SWACO’s vision is “a community that is environmentally safe and resourceful.” In recognition that climate plays an important role in the quality of life, economic well-being and long-term sustainability of the District, SWACO is committed to lessening the impact of its contribution to climate change and has set a goal to reduce emissions by 64% (per ton processed) by Year 2032.

To establish that goal, SWACO developed its inventory of carbon emissions using 2017 as a baseline year. The baseline year provides a reference point that all progress can be tracked against. In 2017, SWACO emitted 156,946 MTCO₂e (“metric tons of CO₂ equivalents”). This equates to 0.14 tons of CO₂e per ton of material processed by SWACO. The largest source of emissions was landfill gas, followed by vehicles and equipment fuel, then building electricity, building fuel, waste material, and recycled material. To reduce emissions 64% by 2032, SWACO’s net emissions limit is 0.05 tons of CO₂e per ton of material processed.

2017 Baseline Emissions Summary			
Emission Source	2017 MTCO ₂ e Emissions	% of Total Emissions	% of Total Emissions Excluding Landfill Gas)
Landfill Gas	149,963	95.83%	-
Vehicle/Equipment Fuel	5,622	3.59%	80.51%
Building Electricity	1,647	1.05%	23.58%
Building Fuel	77	0.05%	1.10%
Waste Material	33	0.02%	0.48%
Recycled Material	-396	-0.25%	-5.67%
Total	156,496		
Total (Excluding Landfill Gas)	6,983		

Measuring Carbon Emissions

SWACO calculated this goal using a science-based tool and organized SWACO's carbon emission sources according to industry standards which categorizes emissions as direct or indirect and are referred to as Scope 1, 2, and 3. When SWACO created its Carbon Emissions Management Plan the scope of the plan was limited to Scope 1 and 2, which encompasses the direct and indirect emissions from sources owned and operated by SWACO such as vehicles (Scope 1) and the energy purchased and used by SWACO in our buildings (Scope 2).

Within the first year of taking action to reduce and manage SWACO's carbon emissions, it became evident the importance of community waste reduction for SWACO to achieve its goal. The community's waste contributes to SWACO's largest source of carbon emissions, landfill gas, and even if all of SWACO's other operations were carbon neutral, SWACO would still be unable to meet any meaningful goal without the participation of the District and its residents. SWACO continually creates and supports programs such as Community Consortiums, Food Waste Champions, and Community Waste Reduction Grants to reduce SWACO's emissions by reducing and diverting waste from the landfill. The emissions produced with implementation of these programs are far fewer than if the material was disposed of in the landfill. The emissions that are produced or reduced by community programs, recycling, and composting are known as Scope 3 and are indirect emissions that are significantly influenced by SWACO's investments and programs, though not directly under SWACO's control. SWACO has now begun the process of measuring how our programs within the District impact our carbon emissions.

Global Warming Potential of Major Greenhouse Gases

The protocol that SWACO used to develop its Carbon Emissions Management Plan utilizes a methodology that calculates emissions using a standard unit known as carbon dioxide equivalent ("CO₂e"). Each source of SWACO's emissions emits greenhouse gases that have a different global warming potential (GWP), meaning that they trap different amounts of heat in the earth's atmosphere. Published emission factors account for the GWP of each greenhouse gas and through a series of calculations included in the protocol, express total emissions as CO₂e. This standard unit of measurement is used for comparison purposes.



Turning Vision into Reality: 2020 Actions to Reduce Emissions

After our goal was set, SWACO began to put the Plan into action. To strategically implement the Plan, SWACO categorized emissions-reducing initiatives into four (4) different areas: (1) Building Energy, (2) Landfill Gas, (3) Waste Management, and (4) Vehicle/Equipment Fuel and then assigned members of various departments to each area, forming working groups. Through our working groups, we continue to identify innovative ways to reduce our emissions and drive greater sustainability and efficiency across SWACO's operations.

Building Energy Management

2020 Building Energy Emissions Summary (MTCO ₂ e)				
	2020	2017	Change from 2017	Change in % from 2017
Emissions	1,733	1,724	+9	+0.5%
Emissions-Reducing Actions	1,717	N/A	N/A	N/A
Net Emissions	16	1,724	-1,708	-99.1%

Highlights: Building Energy Emissions-Reducing Actions

- ODSA-Funded Energy Audit
- Smart Meter Installation
- Continual Lighting Upgrades
- Optimizing Computer Energy Usage
- Utilizing Renewable Energy at SWACO Facilities

SWACO's building electric energy usage was 3,176,846 kWh and its natural gas usage was 19,125 ccf in 2020. Additionally, SWACO used 387 gallons of propane in 2020. Without taking into account any of the emissions-reducing measures undertaken in 2020, SWACO's building energy usage resulted in 1,733 metric tons of CO₂e emissions. In keeping with our principle to contribute to a safe and healthy community we seek to build sustainable practices and make decisions with long-term impacts in mind. To do so, we commissioned a facilities energy audit to guide our decision-making and to operate sustainably over the long term.

In 2020, SWACO obtained \$22,500 in funding from Ohio Development Services Agency (ODSA) to conduct an energy audit of SWACO facilities. The audit identified potential energy-saving measures that could result in a reduction of over 248 metric tons of CO₂e per year. In 2021, Staff will review the findings and determine the feasibility and priority for implementation.

In 2020, SWACO also gained the ability to further analyze energy usage through the installation of smart meters at all facilities. These smart meters will allow Staff to better understand and monitor changes in energy usage.

To reduce energy usage, SWACO continually replaces older lightbulbs with LEDs, which use up to 75% less energy than an incandescent bulb. Replacing lightbulbs with more efficient LEDs bulbs will result in energy

savings of over 159 metric tons of CO₂e per year at SWACO once all lighting has been transitioned. SWACO is also taking steps to research and optimize the products identified for other energy-saving measures, such as reflective window coating and motion sensor lighting. Additionally, automatic sleep mode was implemented on all computers, resulting in approximately 1.5 metric tons of CO₂e savings per year.

SWACO has significantly reduced its building energy emissions by switching energy suppliers. *By switching energy suppliers, SWACO facilities are now powered by 100% renewable energy: resulting in a reduction of approximately 1,636 metric tons of CO₂e per year.*

The building energy initiatives outlined above resulted in emissions savings of approximately 1,717 metric tons of CO₂e in 2020.

Landfill Gas Emissions Management

2020 Landfill Gas Emissions Summary (MTCO₂e)*				
	2020	2017	Change from 2017	Change in % from 2017
Emissions	318,670	239,329	+79,341	+33.2%
Emissions-Reducing Actions	108,603	89,366	+19,237	+21.5%
Net Emissions	210,067	149,963	+60,104	+40.1%

*The Landfill Gas Emissions Summary includes the calculated potential emissions if a gas collection control system was not installed early at the landfill.

Highlights: Landfill Emissions-Reducing Actions

- Early GCCS Installation
- Planting Trees

The landfills managed by SWACO, the Franklin County Sanitary Landfill (“the landfill”) and the Model Landfill, produced a combined 318,670 metric tons of CO₂e in 2020. Common to most solid waste management facilities, landfill gas emissions are the most significant source of our carbon emissions.

The baseline gas generated is calculated using the US EPA’s LandGEM tool, which is a standardized practice that uses various information, such as the waste quantity and composition, operating conditions and design, to theorize how much fugitive gas is emitted at the Landfill annually. SWACO utilizes innovative and best practices to maximize gas collection, which reduces our landfill gas emissions below the baseline.

SWACO begins capturing greenhouse gases earlier than many other landfills by installing its Gas Collection Control System prior to the standards set by the EPA and also converts the gas into energy through a public-private partnership. These innovative practices reduced approximately 108,602 metric tons of CO₂e at the landfill in 2020 and will save approximately 460,263 additional metric tons of CO₂e because of SWACO’s progressive approach to GCCS installation.

Additionally, on SWACO’s campus approximately fifty (50) trees were planted, which will be capable of absorbing approximately 1 metric ton of CO₂e per year.

The landfill initiatives outlined above resulted in emissions savings of approximately 108,603 metric tons of CO₂e in 2020.

Facilities Waste Management

2020 Facilities Waste Emissions Summary (MTCO₂e)				
	2020	2017	Change from 2017	Change in % from 2017
Emissions	15	33	-18	-54.5%
Emissions-Reducing Actions	110	396	-286	-72.2%
Net Emissions	-95	-363	+268	+73.8%

Highlights: Facilities Waste Emissions-Reducing Actions

- Purchasing Supplies with Recycled Content
- Reduced Delivery Trips
- Electronic Signature Adoption

While encouraging residents, communities, and businesses to divert materials from the Landfill, it is important that we do the same at our own facilities. In 2020, SWACO facilities diverted 19 tons of material from the Landfill. This is 29% of material produced at SWACO facilities.

At SWACO's Administrative Office Building, over 57% of supplies ordered contain recycled content. To continue our sustainability practices and reduce emissions produced by delivery vehicles, SWACO piloted a strategy for limiting deliveries to the Administrative Office Building. This strategy resulted in 57% fewer delivery trips and potential savings of 55.5 metric tons of CO₂e.

Furthermore, SWACO integrated electronic signatures to reduce paper waste. By routing contracts and other documentation electronically, SWACO was able to reduce paper use by 52%. Additionally, on SWACO's campus the practice of leaving grass clippings on the lawn when mowing ("grasscycling") puts nutrients back into the soil.

Various initiatives to study and assess how waste is generated and disposed of by employees at SWACO facilities was delayed in 2020 by COVID-19. Upon the return to normal operations, an audit of waste and packaging supplies has been planned for all of SWACO facilities in order to provide a detailed understanding of problems, identify opportunities, and produce an analysis of SWACO's waste composition. Upon completion of the audits, Staff will review the results to develop and begin implementing strategies for reducing waste.

Implementing various waste reduction strategies at SWACO facilities resulted in approximately 109.58 metric tons of CO₂e savings in 2020.

Vehicle and Equipment Fuel Management

2020 Vehicle and Equipment Emissions Summary (MTCO ₂ e)				
	2020	2017	Change from 2017	Change in % from 2017
Emissions	6,255	5,622	+633	+11.3%
Emissions-Reducing Actions	N/A	N/A	N/A	N/A
Net Emissions	6,255	5,622	+633	+11.3%

Highlights: Vehicle and Equipment Fuel Emissions-Reducing Actions

- Anti-Idling Policy
- Rebuilt Three Units
- Purchased Three Tier IV Units

In 2020, SWACO vehicles and equipment produced 6255 metric tons of CO₂e. SWACO’s fleet is the largest source of emissions outside of landfill emissions. Reducing fuel consumption can lead to a significant reduction in emissions. In 2020, SWACO vehicles traveled over one million miles to haul recyclables, waste, and maintain operations within the landfill and consumed 598,483 gallons of diesel and 10,122 gallons of unleaded gasoline.

To reduce fuel usage and increase efficiencies, SWACO formalized and enforced an anti-idling policy in 2020. Additionally, by rebuilding three (3) units, SWACO extended their useful life and reduced the number of units produced and in operation. Even greater emissions-reducing action was taken in 2020 when SWACO added three (3) new Tier IV units to its fleet, which replaced older and less efficient units. “Tier IV” refers to the latest fleet emissions milestone established by the U.S. Environmental Protection Agency and the California Air Resources Board for new off-road engines. These three (3) new units can use approximately 5% less fuel and will significantly impact SWACO’s emissions moving forward.

Investing in the District

2020 Investing in the District Emissions Summary (MTCO ₂ e)*	
	2020
Emissions	N/A
Emissions-Reducing Actions	311,675
Net Emissions	-311,675

*Residential curbside recycling data was not available at the time this report was issued. For our purposes, a number was projected using data from the previous 3 years.

Highlights: District Emissions-Reducing Actions

- Save More Than Food Campaign
- Community Waste Reduction Grants
- Food Waste Champion Program
- Franklin Soil and Water Conservation District’s Community Backyards Program
- Residential Yard Waste Program
- Recycling Cart Grants

- Community Consortia
- Curbside Recycling Program
- Residential Dropbox Program
- Landfill Gas-to-Energy Project
- Solar Energy Field Development

As a steward of the landfill and guided by a principle of contributing to a safe and healthy community, SWACO supports efforts that reduce carbon emissions by investing in programs within the District that are environmentally conscientious and reduce waste. These programs, considered Scope 3, have a direct impact on the amount of material entering the landfill and the resulting emissions.

In 2020, SWACO continued to make significant investments in diversion programs for residents and businesses to reduce the amount of material being disposed of at the landfill. This includes food waste, which currently represents (by weight) the top source of material entering the landfill, with nearly 500 tons coming to the landfill every single day. The launch of the Save More Than Food Campaign in 2020 promoted ways to reduce food waste and leverage resources to the benefit of the District. It increased awareness and helped the public access information and tools that will encourage our communities to reduce food waste from entering the landfill, which in turn will lead to a reduction in CO₂e emissions.



SWACO also awarded over \$74,000 in Community Waste Reduction Grant funding to reduce organic material waste. Grantees included City of Dublin, City of Hilliard, City of Upper Arlington, City of Westerville, Columbus Public Health, Food Rescue US, and Local Matters. To date, these grant projects diverted over 128 tons of food waste from the Landfill and resulted in a reduction of approximately 79 metric tons of CO₂e. Another program, the Food Waste Champion program, was developed and launched in 2020 to reduce food waste from local restaurants. Participants included Local Cantina, OhioHealth's Dublin Methodist Hospital, the Barn by Cameron Mitchell's, Harvest Pizzeria, and Wendy's. At the time that this report was developed, the Food Waste Champion program diverted 2.25 tons of food from the landfill which resulted in reducing approximately 1.2 metric tons of CO₂e. SWACO is also a sponsor of the Franklin Soil and Water Conservation District's Community Backyards Program provides residents with education and rebates for creating at-home composting.

In addition to the programs and projects that target organic waste, SWACO has funded 7 additional Community Waste Reduction Grants that resulted in over 4,687 tons of material being diverted from the landfill, which equates to a reduction of approximately 1,326 metric tons of CO₂e. SWACO also encourages and supports municipal recycling and diversion programs throughout the District.

SWACO's contributions to such programs include funding the collection and management of residential yard waste that is processed at specialized facilities. Facilities such as this reduce emissions by approximately 16,270.79 metric tons of CO₂e per year.

In 2020, Whitehall and Pleasant Township received grants to purchase recycling carts which expanded the recycling capabilities of 7,200 homes. Additionally, SWACO's Community Consortium leverages resources to provide twenty-five communities (approximately 95,482 households) with realizing greater value from their waste hauling contracts through a competitive, collaborative bidding process for curbside trash,

recycling, and yard waste hauling services. The collaboration of communities results in optimized hauling services and fuel usage by waste haulers. In 2020, it is estimated that 68,000 tons of recyclable material were collected curbside, which equates to about 210,380 metric tons of CO₂e diverted from the landfill.

SWACO directly collected 6,009 tons of material at Residential Dropbox locations to be recycled at Rumpke's Material Recovery Facility. The SWACO Residential Dropbox program reduces approximately 15,237 metric tons of CO₂e from entering the landfill. Furthermore, SWACO funds the District's Household Hazardous Waste program, which diverted 324 tons of hazardous material from the landfill.

SWACO's impact in the community isn't limited to just waste diversion. SWACO is also creating renewable energy through a public-private partnership. In 2014 SWACO implemented an innovative public-private partnership with Aria Energy to capture the methane gas produced at the landfill, clean it, and turn it into a renewable source of energy. This partnership converts the gas captured into a renewable resource and provides over 13,000 homes with clean energy. This partnership, which is a Scope 3 emissions source, captured enough gas to reduce emissions by approximately 14,045 metric tons of CO₂e in 2020.



In addition to SWACO's partnership with Aria, the Model Landfill will be put back into productive re-use as a solar energy facility. SWACO has partnered with BQ Energy Development, LLC and their intent is to develop, build, and operate a solar energy facility at the Model Landfill. The renewable energy produced will power 5,000 homes and reduce emissions by approximately 54,337 metric tons of CO₂e per year.

Waste reduction activities and increased diversion of materials away from the landfill are vital to reducing landfill emissions. The actions residents, businesses, and community partners take to minimize and divert waste will be vital to the reduction of future landfill emissions and play a significant role in contributing to an environmentally safe and healthy community. Common to most solid waste management facilities, landfill gas emissions are the most significant source of carbon emissions. By encouraging and supporting innovative diversion programs and sustainability projects, we reduce Scope 3 emissions to keep our community healthy and safe.

2020 Carbon Emissions Summary*

	2020	2017**	Change from 2017	Change in % from 2017
Tons Landfilled (tons)				
	1,199,860	1,137,349	+62,511	+5.5%
Building Energy Management (MTCO₂e)				
Emissions	1,733	1,724	+9	+0.5%
Emissions-Reducing Actions	1,717	N/A	N/A	N/A
Net Emissions	16	1,724	-1,708	-99.1%
Landfill Gas Management (MTCO₂e)				
Emissions	318,670	239,329	+79,341	+33.2%
Emissions-Reducing Actions	108,603	89,366	+19,237	+21.5%
Net Emissions	210,067	149,963	+60,104	+40.1%
Vehicle and Equipment Fuel Management (MTCO₂e)				
Emissions	6,255	5,622	+633	+11.3%
Emissions-Reducing Actions	N/A	N/A	N/A	N/A
Net Emissions	6,255	5,622	+633	+11.3%
Facilities Waste Management (MTCO₂e)				
Emissions	15	33	-18	-54.5%
Emissions-Reducing Actions	110	396	-286	-72.2%
Net Emissions	-95	-363	+268	+73.8%
Investing in the District (MTCO₂e)				
Emissions	N/A	N/A	N/A	N/A
Emissions-Reducing Actions	311,675	N/A	N/A	N/A
Net Emissions	-311,675	N/A	N/A	N/A
Total Emissions (MTCO₂e)				
	326,673	246,708	+79,965	+32.4%
Total Emissions-Reducing Actions (MTCO₂e)				
	422,105	89,762	+332,343	+370.3%
Total Net Emissions (MTCO₂e)				
	-95,432	156,946	-252,378	-160.8%
tCO₂e/Ton of Material Processed (Scope 1 & 2)				
	.20	.14	N/A	+42.9%
tCO₂e/Ton of Material Processed – Including “Investing in the District” (Scope 1,2, & 3)				
	-.09	.14	N/A	-164.3%

* The numbers associated with emissions-reducing actions are projections and estimates using available information and tools, such as the EPA's Waste Reduction Model.

**Baseline Year

Summary of SWACO's 2020 Carbon Emissions

- 1,199,860 tons of material were processed by SWACO at the Landfill
 - This is 62,511 additional tons compared to 2017
- SWACO's assets and operations emissions were 326,673 MTCO₂e in 2020
- Through programs at SWACO's campus and throughout the District, emission reductions were 422,105 MTCO₂e
- SWACO's 2020 total net emissions were less than zero (-90,432 MTCO₂e)
- SWACO's 2020 total net emissions were -0.09 tCO₂e per ton of material processed by SWACO

Looking Forward

SWACO identified within the Carbon Emissions Management Plan several priority initiatives to systematically manage carbon emissions. In 2020, an aggressive start was made in implementing the Plan. Looking forward, some key emissions-reducing areas of focus include:

- Investing in electric pickup trucks and on-site charging stations. Transitioning to an electric pickup truck can reduce emissions by as much as 4.55 metric tons of CO₂e per year.
- Conducting waste audits of all SWACO facilities to determine the types and quantities of waste that SWACO generates, where it is generated, and areas for improvement.
- Planning the landfill campus buildout with emissions-reducing measures in mind. This includes exploring the feasibility of incorporating on-site CNG fueling as well as generating solar energy on-site. Additionally, planning will include energy efficiency measures for new buildings and investigating options to retrofit existing buildings.
- Further development of the Organics Management Planning Project to foster a beneficial public-private partnership to design, build, and operate an organics composting facility capable of processing food waste and yard waste.
- Creating the Green Economy Business Park which will bring together the supply chain of sustainable materials management, including research, design, technology, and advanced manufacturing.
- Upgrading lighting at Morse Road and Jackson Pike Transfer Stations with LED lights, which will divert approximately 150 metric tons of CO₂e per year.
- Through a partnership with Rev1 Ventures, SWACO will advance new technologies in food waste management while propelling local startups.
- Reducing the miles traveled by SWACO's fleet by adding a compactor at SWACO's Morse Road Transfer Station, which will provide more tons of material per load.
- The Central Ohio Food Waste Initiative identified 20 solutions for food waste in a shared roadmap to cut Central Ohio's food waste in half by 2030. The 20 solutions take a systems-approach to solving food waste with solutions addressing food waste prevention, rescue, and recycling.

In 2021 and the years following, SWACO will continue to build upon the actions outlined in the Carbon Emissions Management Plan and its commitment to reduce its carbon footprint for the betterment of the District.