

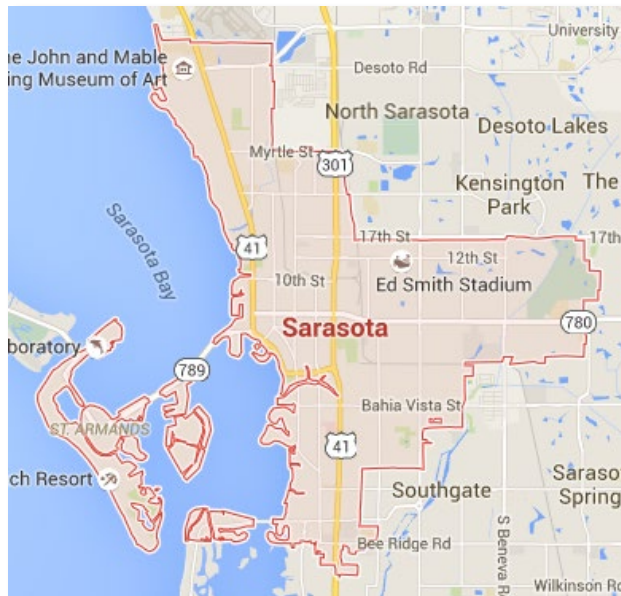


CITY OF SARASOTA GREENHOUSE GAS EMISSIONS REPORT 2003-2018

OVERVIEW

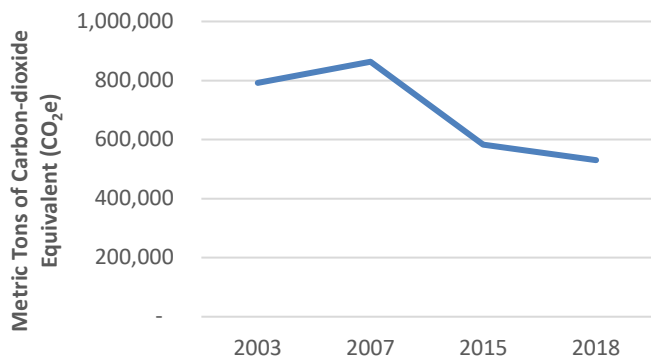
The City of Sarasota is a diverse community located on Florida’s Suncoast with 57,738 year round residents, several internationally recognized cultural arts venues, stunning sunsets along Lido Beach, a historic municipal golf course, and Major League spring training baseball with the Baltimore Orioles.

In 2018, the City of Sarasota emitted 530,256¹ metric tons of greenhouse gases (GHGs) community wide. Emissions came from energy use in commercial and residential buildings, municipal operations, the waste sector and from transportation. **This is a 7.1% decrease from 2015, when the City of Sarasota emitted 580,870 metric tons of CO₂e. Sarasota’s emissions declined 33% since 2003.** This reduction has occurred while the population and the number of jobs in Sarasota have increased. The decrease is in large part due to a cleaner electric grid, more efficient vehicles, and a methane capture system at the landfill.

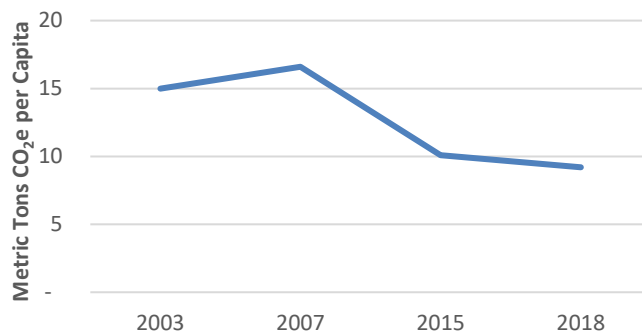


In 2017 the Sarasota City Commission unanimously approved a community-wide target of 100% renewable, zero emission energy sources by 2045 and 100% renewable zero emissions energy for municipal operations by 2030 (and a short-term target of 50% of for municipal operations by 2024). Measuring GHG emissions is an essential task to understand whether the City is on track to meet its emissions goals and to support policy to decrease emissions and increase efficiency citywide.

SARASOTA COMMUNITY GHG EMISSIONS



SARASOTA PER CAPITA EMISSIONS



¹ Specific numbers in this report reflect calculated data based on industry standard protocol, and the reporting of data to unit specificity should not be taken as an absolute number, but instead related to other years’ outputs.



ECONOMIC & POPULATION GROWTH

Since 2003, the Sarasota community has grown from 52,928 to 57,738 residents, an increase of 8.7%. The average personal salary increased from \$42,149 to \$61,523². In 2003 emissions per Sarasota resident over the same period decreased 47.9%, from 15.0 metric tons per year, to 9.3 metric tons³.

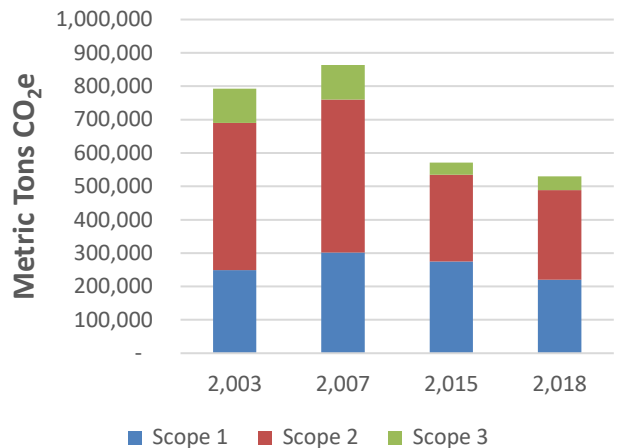
WHAT'S INCLUDED?		Energy used by buildings and other stationary sources; emissions produced from trash disposed of by the City.		On-road transportation, by vehicle miles traveled within City limits.		Wastewater treatment within city limits.
WHAT'S NOT?	Emissions generated outside the City boundary to produce goods or services used by residents (for example, emissions from food produced elsewhere but consumed in Sarasota). Air, boat, and train emissions are also not included in the totals. Trash generated within City boundaries that is not disposed of at the County landfill is also not included.					

BACKGROUND

The Sarasota community has a longstanding interest in climate change, with many local groups working on issues related to climate impacts. In 2007, the City signed the US Mayor’s Climate Protection Agreement. It conducted its first greenhouse gas inventory for both City operations and community-wide emissions in 2009 for data going back to 2003. In 2017 it passed a resolution in support of the Paris Agreement and participates in the US Climate Mayors network. The City has climate goals embedded in its comprehensive plan and has also completed a detailed Climate Change Vulnerability Assessment and Adaptation Plan. The Climate Adaptation Plan reviewed over 200 City-owned assets and prioritized those that are most at-risk and vulnerable to future conditions to inform strategic upgrades over time.

The City of Sarasota has conducted Greenhouse Gas Inventory Reports for calendar years 2003, 2007, 2015 and 2018. These reports are based on a combination of direct data and estimates for data that were derived from best practices and local government GHG inventory protocols. Data sources include City records, utility company reports, and information from state and federal agencies. Because these inventories have been completed using different protocols and by different

SARASOTA EMISSIONS BY SCOPE



² Income Data B.E.A., Department of Commerce, Labor Data: US Dept. of Labor, BLS

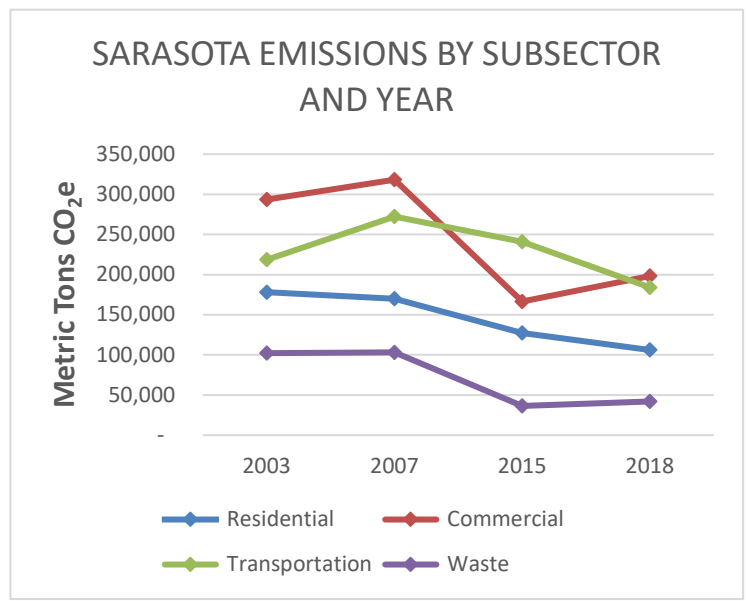
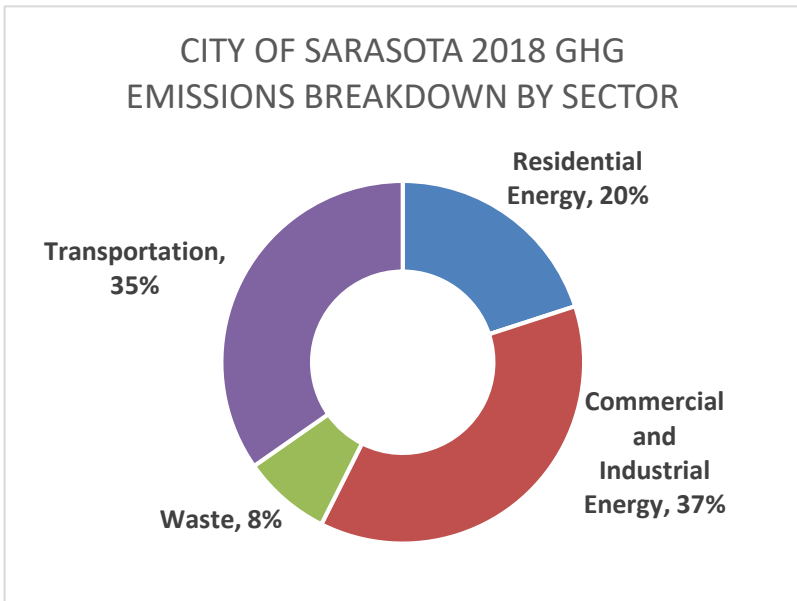
³ Because this inventory does not include every emission source, the per capita emission is better understood as relative to other years instead of an absolute number.



people, longer term trends are likely more reliable than absolute numbers or year-to-year changes.

EMISSIONS BY SCOPE AND SECTOR

This report summarizes GHG emissions from 2003 to 2018 and reflects both the quantity of energy used and the source of that energy. Because the official Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) requires the City to report emissions by Scope, they are included here. However, for ease of understanding, emissions are also broken down by more easily identifiable sectors and graphed by year below. More detailed information explaining the subsectors of each scope are found in the Appendix at the end of this report.



STATIONARY SECTOR - 2018

The stationary sector includes community-wide emissions from:

- Electricity consumption in commercial, industrial, and residential buildings,
- Natural Gas use in commercial, industrial, and residential buildings

In Sarasota, energy use in stationary sources dominates, accounting for 57% of total emissions (304,411 MTCO_{2e}). Within the stationary sector, commercial, industrial, and large residential buildings generated 65% of emissions (198,359 MTCO_{2e}), while small residential buildings accounted for 35% of emissions (106,052 MTCO_{2e}). Overall, stationary sector energy is down 35% since 2003 and down 3.7% since 2015.



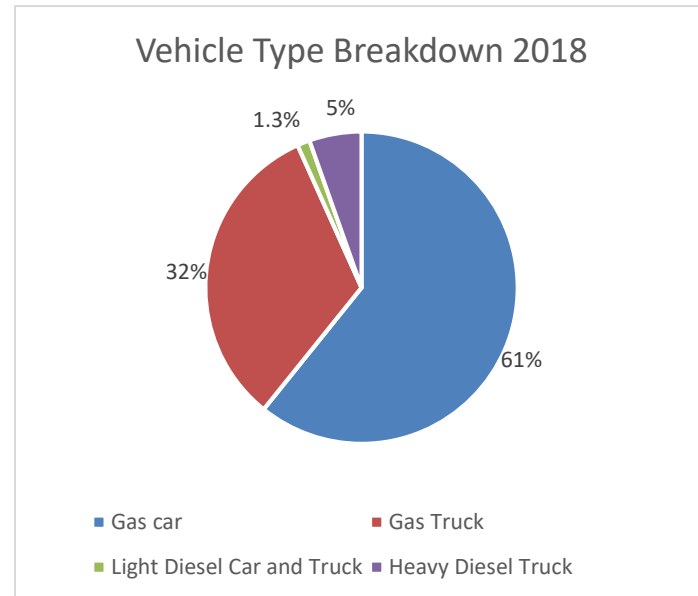
Emissions from commercial energy increased by 19% between 2015 and 2018 but are down 32% since 2003. Residential energy in the stationary sector is down 16.5% since 2015 down 40% since 2003. Much of these overall decreases is because of a cleaner FPL energy profile. An increase in the commercial energy sector may be due to the new construction and increased business activity seen in the City as it started to pick up again after the economic downturn in 2008.

TRANSPORTATION SECTOR -2018

The inventory captures the emissions from the estimated Vehicle Miles Traveled (VMT) inside the City. Emissions from transportation comprise 35% of the 2018 inventory (183,990 MTCO₂e) and are down 16% from the 2003 inventory and down 23% from the 2015 inventory.

To derive this data, the VMT in the city of Sarasota was provided by Florida Department of Transportation (FDOT) for 2018 and calculations were done in the GHG inventory tool based on the breakdown of vehicle types and fuel used.

Primary sources of energy in transportation include gasoline (93%) and diesel (7%). Electric vehicles, natural gas vehicles, and other types of transport are not yet captured in FDOT data and are not included in this report, however any electricity used at charging stations would be included in Scope 2 emissions.



WASTE SECTOR 2018

The community inventory tracks waste sector emissions from:

- Wastewater treatment emissions,
- Landfill municipal solid waste emissions

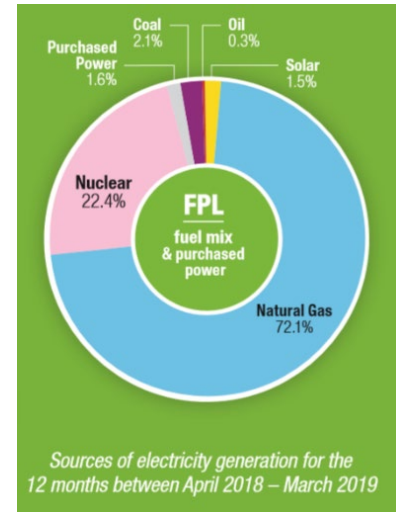
Waste sector emissions is the smallest sector of emissions within the City of Sarasota. GHGs reported in this sector account for less than 8% of total emissions (41,850 MTCO₂e). Almost all of Sarasota's solid waste is sent to the Sarasota County Landfill which captures the methane produced from the decomposition of the waste. The GHGs from city of Sarasota generated waste have decreased from 12% of overall community emissions in 2003 to 8% in 2018. This represents a 59% decrease since Sarasota County invested in a methane capture system at the landfill. Less than 1% of the City's emissions are because of the wastewater treatment center located within the City.

FACTORS DRIVING THE CHANGES

Short-term changes

In 2018, the community's GHG emissions decreased 7.1% (\downarrow 40,615 MTCO₂e) from 2015. This decrease reflects that:

- Regional emissions per unit of electricity decreased. Electricity supplied by the regional grid operator, FPL, is decreasing the amount of oil and coal that are being used to generate electricity and using natural gas instead⁴. This is reflected in lower emission factors.
 - A 5.8% increase in natural gas use, and a 2% decrease in coal was the main reason for lower emissions factors since 2015. As of March 2020, FPL has initiated large capital investments in solar energy and therefore, it is expected for the emission factors to continue to decrease over time.
- A 34% reduction in VMT was seen between 2015 and 2018, possibly due to a large impact of a Red Tide event, but not fully explained by that. This reduction is responsible for a large part of the total emissions reduction that the City saw between 2015 and 2018. Transportation emissions data calculation is based on industry best practices. However, this data relies on Florida Department of Transportation's estimation of VMT, which is then input into a model of vehicle breakdown. Because each of these steps increases the chance for error, relying on this data as an absolute number is not advised. Instead understanding the overall trends is more useful.



Long-term changes

Sarasota's GHG emissions from 2003 to 2018 have declined by more than 33%. The Sarasota City Plan's Environmental Protection and Coastal Islands Chapter⁵ was officially adopted by the Commission in May 2017. This important guiding document established a target to reduce greenhouse gas emissions 35% by 2025 from 2003 levels. It is important to note that the City is only 2% away from achieving its adopted reduction goal. As was discussed in

⁴ The City acknowledges the negative environmental impacts that can be associated with the extraction, transportation, and storage of natural gas. The protocol used in this analysis is the most widely used and accepted global accounting of GHG emissions available to cities and calculates emissions from natural gas as cleaner than emissions from coal or oil. Fugitive emissions are not included in this calculation at this time.

⁵ Sarasota City Plan Environmental Protection and Coastal Islands Chapter Retrieved May 2020 from <https://www.sarasotafl.gov/home/showdocument?id=4837>



the short-term section, lower emission factors and a reduction in oil and coal consumption can account for much of the difference. Other reductions are harder to determine - having yearly reports would show more granularity. A large decrease is seen between the 2007 and 2015 inventories due to the new installation of a methane capture system at the local landfill. Improvements in vehicle fuel economy have also made a large contribution to overall reductions. Efforts to increase energy efficiency have also been undertaken, although it is difficult to parse this out in this report relying on utility and other granular data.

UNCERTAINTY

The inventory employs measured data, projections, models, and, where data is scarce, best estimates. All these sources have some level of uncertainty, most of which have not been quantified. Furthermore, greenhouse gas inventory methodology is frequently revised as new and better data and models become available, and international standards evolve. For these reasons, longer term trends are likely more reliable than absolute numbers or year-to-year changes.

The purpose of this GHG inventory report is to relay the results of emissions due to activity within the City of Sarasota and not to outline or prioritize GHG reduction activities. The City of Sarasota's Ready for 100 initiative, its commitment to 100% renewable energy, has a Roadmap to 100 report with annual community outreach where the City's GHG reduction efforts are located. More information on the Ready for 100 effort can be found at sarasotafl.gov/sustainability



APPENDIX - INVENTORY METHODOLOGY

COMMUNITY INVENTORY PROTOCOL

The method followed in this report allocates carbon emissions among the residential, commercial, industrial, transportation and wastewater treatment sectors according to energy use and the carbon intensity of that energy. It also calculates emissions from solid waste based on the tonnage of materials collected and deposited in the county landfill that can be attributed to the City of Sarasota.

The 2018 GHGI was prepared in accordance with Global Protocol for Community-scale Greenhouse Gas Emission Inventories (Referred to as GPC), the world's most widely-endorsed accounting and reporting standard for cities and businesses to understand, quantify, and manage greenhouse gas emissions. This report used a calculator tool called the City Inventory Reporting and Information System (CIRIS) which uses the GPC standard.

The previous City of Sarasota GHGIs for 2003, 2007 and 2015 were originally completed using ICLEI's online tool, ClearPath. Clearpath is also based on the GPC standard for GHGI's, which made running this older data in the new, CIRIS platform feasible and made any resulting data accurate and comparable. Like ClearPath, CIRIS facilitates a transparent calculation and represents a sector-based approach to measuring Sarasota's emissions.

Sarasota's GHG inventories are reported in CO₂ equivalents (or CO₂e) which is a universal unit of measurement that accounts for the global warming potential (GWP) of different greenhouse gases. Sarasota's GHG inventory includes carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), and uses Global Warming Potentials (GWPs) from the latest version of the International Panel on Climate Change (IPCC) Guidelines (currently 5AR). The formula used to determine the CO₂e from a given energy use is Activity Data x Emissions Factor = GHG Emissions from the activity.





EMISSIONS SCOPE, SECTORS AND SOURCES

Scope 1: GHG emissions from sources located within the city boundary
Scope 2: GHG emissions occurring because of the use of grid-supplied electricity, heat, steam, and cooling within the city boundary
Scope 3: All other emissions that occur outside the city boundary because of activities taking place within the city boundary

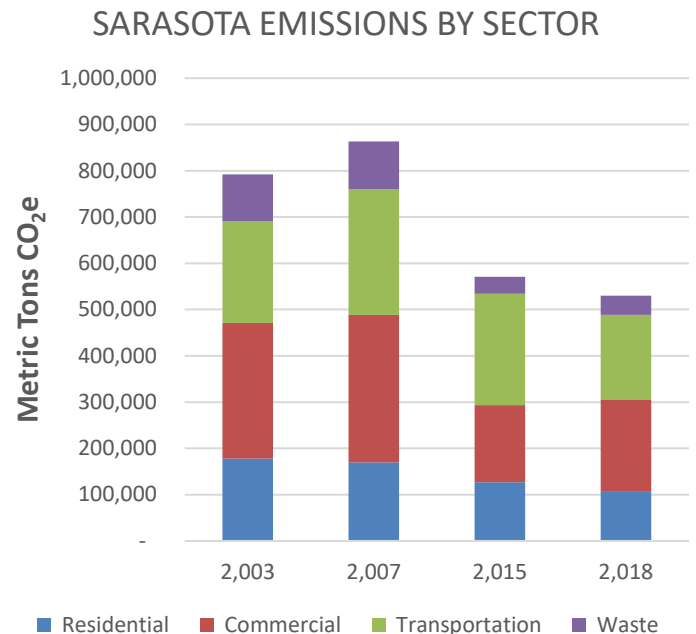
The goal of the community inventory is to include GHG emissions associated with all activities—residential, commercial/industrial, and transportation-related—within the administrative boundary of the City of Sarasota. The Sarasota community-wide inventory accounts for Scope 1 and 2 emissions from the following sources:

- Stationary energy use from residents, businesses, and other activities, including municipal buildings.
- On-road transportation.
- Solid waste and wastewater disposal and treatment.

Within Scope 2 emissions, the inventory does not currently include emissions from airplane travel to or from the region, or other regional transportation that occurs outside of the City boundary.

Regarding Scope 3 emissions, the City has not included emissions from the complete life cycle of consumer products used within the City of Sarasota, industrial processes that are not grid tied or use Natural Gas, or land use, or relating to agricultural practices or forestry management.

Sarasota currently is choosing to report at the GCP BASIC level, which covers scope 1 and scope 2 emissions from stationary sources, scope 1 emissions from transportation sources, and scope 1 and scope 3 emissions from waste.





The table below summarizes the sectors, emission sources, and energy types included in the community wide GHG inventory.

SCOPE	SECTOR	SUB-SECTOR	EMISSIONS SOURCES	ENERGY TYPES
SCOPE 1	Stationary Energy	Residential	Natural gas used in residential buildings	Natural gas
		Industrial, Commercial	Natural gas used in commercial and industrial buildings	
	Transportation	Transportation	All on-road vehicles (aviation excluded)	Gasoline; Diesel;
SCOPE 2	Stationary Energy	Residential	Electricity use in residential buildings	Electricity
		Industrial, Commercial	Electricity use in commercial, government and institutional buildings	
SCOPE 3	Waste	Wastewater	Process and fugitive emissions from treating wastewater	Anaerobic digester gas (methane, nitrous oxide)
		Municipal Solid Waste	Direct release of landfill gas due to landfilling of solid waste generated in the City	Methane





ACKNOWLEDGEMENTS

Jeff Vredenburg and Devin Beede conducted the 2018 update inventory for the City of Sarasota. The 2003, 2007 and 2015 data was recompiled by Jeff Vredenburg and rerun in CIRIS to compare with 2018. The 2003 and 2007 inventories were originally completed by a consultant, Cloe Waterfield of Twentyfifty in 2009, who worked closely with the City of Sarasota to gather the data from those years.

This report and the City of Sarasota's GHG inventories are overseen by Stevie Freeman Montes, Sustainability Manager in the City Manager's Office. The City of Sarasota would like to thank all the following for their contribution and assistance in the production of the City of Sarasota's GHG Inventory and this report:

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Kale Roberts and Eli Yewdall from ICLEI and Ashley Jankowski from the Climate Disclosure Project provided data and insight. Additionally, Annette Dann and Sandra Gonzales from FPL, Lance Horton from TECO Energy, Eric Brickner from FDOT, Wendi Crisp, Jason Timmons and Lois Rose from the Sarasota County Landfill and Lee Hayes Byron from Sarasota County all provided valuable information and advice during the process.

DESIGN CREDITS

All graphics produced using Excel
Design and some text used from Boston's Greenhouse Gas Inventory Report

Please direct comments or questions about the inventories to:
City of Sarasota Sustainability, Sustainability@SarasotaFL.gov



ADDITIONAL DATA

(Original data files available upon request to sustainability@sarasotafl.gov)

SARASOTA EMISSIONS BY SCOPE AND YEAR				
	2003	2007	2015	2018
Scope 1	249,081	301,814	274,613	220,114
Scope 2	441,017	458,631	259,843	268,792
Scope 3	102,235	103,134	36,415	41,350
Total	792,333	863,579	570,871	530,256

SARASOTA EMISSIONS BY SUBSECTOR AND YEAR				
	2003	2007	2015	2018
Residential	178,078	170,033	127,083	106,052
Commercial	293,343	318,201	166,493	198,359
Transportation	218,676	272,210	240,880	183,990
Waste	102,235	103,134	36,415	41,855
Total	792,332	863,578	570,871	530,256