

City of Sarasota

Greenhouse Gas Inventory: 2015 Government Operations



Greenhouse Gas Inventory Report February | 2017 Sarasota, Florida

About The City of Sarasota:

The City of Sarasota is a diverse community located on Florida's Suncoast with 53,000 year round residents, several internationally recognized cultural arts venues, stunning sunsets along Lido Beach, a 45-hole municipal golf course at the historic Bobby Jones Golf Club, and Major League spring training baseball with the Baltimore Orioles.

The City of Sarasota has taken a leading role in addressing climate change. In 2007, the city signed the US Mayor's Climate Protection Agreement and in 2009 conducted greenhouse gas inventories for both city operations and community-wide emissions. The city has both climate mitigation and adaptation goals in its comprehensive plan. Additionally, the sustainability program is working on a climate adaptation strategy that will improve the City's ability to integrate climate data into decision-making and public investments into the future. The City Commission approved a strategic plan for 2017 – 2019 which includes a specific key action to use climate data to inform long-range planning, zoning and administrative decisions. The Sarasota community has a longstanding and passionate interest in climate change, with many local groups working on issues related to climate impacts.

In 2015, the city re-organized its sustainability program to be within the City Manager's Department and to focus on public education, community and internal metrics, and climate change programs. To learn more about sustainability at the City of Sarasota, please visit the Sarasota Green City website: www.SarasotaGreenCity.com

City of Sarasota Commissioners

Mayor Willie Charles Shaw Vice-Mayor Shelli Freeland Eddie Commissioner Liz Alpert Commissioner Susan Chapman Commissioner Suzanne Atwell

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Acknowledgements

Project Team:

Mary Bishop conducted the 2015 update inventory under the supervision of Stevie Freeman-Montes for the City of Sarasota. The 2003 and 2007 inventories were 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. Archived files from the previous report provided all of the data for the 2003 and 2007 inventories. The 2003 and 2007 data were input into Clearpath and rerun by Mary Bishop so that a direct comparison could be made between previous years and 2015.

Many city staff contributed time and resources into gathering and organizing data for this report. Stevie Freeman-Montes, Jeffrey Vredenburg, Gerald Boyce, Michael Keim, Laz Vadaz, Todd Kucharski and Stacie Mason provided information or helped streamline the process with advice and suggestions.

Additional Contributors

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Glossary and Acronyms

ClearPath A could-based online software platform for quantifying greenhouse gases. Created by ICLEI Local Governments for Sustainability

Climate Change A change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods

CH₄ Methane, a greenhouse gas with a global warming potential (GWP) of 28

 CO_2 Carbon dioxide, a greenhouse gas to which other greenhouse gasses are standardized. One molecule of CO_2 is equivalent to one CO_2 e

CO₂e Carbon dioxide equivalents. The common unit used to measure the six greenhouse gases regulated under the Kyoto Protocol (CO₂, CH₄, N₂O, SF₆, HFCs and PFCs). Expresses the impact of each different greenhouse gas in terms of the amount of CO₂ that would create the same amount of warming¹

CY Calendar year

Emissions Factor A representative value that relates the quantity of a pollutant released into the atmosphere with an activity associated with the release of that pollutant. Emissions factors are usually expressed as the weight of pollutant divided by a unit weight, volume, distance, or duration of the activity emitting the pollutant (e.g., pounds CO₂ emitted per gallon of fuel burned)

FPL Florida Power and Light, Sarasota's electric utility provider

GHG Greenhouse Gas, a gas that absorbs radiation at specific wavelengths within the spectrum of radiation (infrared radiation) emitted by the earth's surface and by clouds. The gas in turn emits infrared radiation from a level where the temperature is colder than the surface. The net effect is a local trapping of part of the absorbed energy and warming on the planetary surface

GWP Global Warming Potential, a relative measure of how much heat a greenhouse gas traps in the atmosphere. It compares the amount of heat trapped by a certain mass of gas in question to the amount of heat trapped by a similar mass of carbon dioxide

GHGI Greenhouse Gas Inventory

kWh Kilowatt hours

MT Metric tons

Scope 1 Emission Source Direct sources of GHG emissions that originate from equipment and facilities owned or operated by the City of Sarasota. Examples include emissions from fleet vehicle fuel use

Scope 2 Emission Source Indirect sources of GHG emissions from purchased electricity

Scope 3 Emissions Source All other indirect sources of GHG emissions that may results from activities of the City of Sarasota but occur from sources owned or controlled by another company or entity. Examples include emissions from landfilled solid waste and commuting habits of City employees

TECO Tampa-based natural gas provider to the City of Sarasota

VMT Vehicle Miles Traveled

 $^{^1\,}http://www.theguardian.com/environment/2011/apr/27/co2e-global-warming-potential$

Executive Summary

2015 Overview

In order to inform efforts to better understand its climate impact, the City of Sarasota first conducted a greenhouse gas inventory (GHGI) report for calendar years (CY) 2003 and 2007. This established a baseline level of mission-related GHG emissions, to which future reports would be compared. This report, showing data from CY 2015, provides an update to the CY 2003 baseline. The US Local Government Operations Protocol, a national standardized methodology, was used for this report, with data sources and procedure explained in detail. This report, made possible by updating the original data with the new protocol methodology,

provides an overview comparison of GHG emissions from 2003, 2007 and 2015. GHG emissions are reported in metric tons of carbon dioxide equivalent (MT CO2e).

In 2015, the government operations of Sarasota generated a total of 23,991 metric tons CO2e. This is the equivalent to the greenhouse gas emissions from 5,068 passenger vehicles driven for one year and is 3.6% of the overall community-wide emissions. The Government Operations GHGI includes emissions from electricity use from all government operated facilities, street lights and traffic signals, solid waste and wastewater treatment facilities, vehicle fleet, and commuter vehicles for the City of Sarasota's 887 employees that worked for the City throughout 2015.

Comparison of Result: Baseline (2003) to 2015

There was an **overall 23% decrease in CO₂e emissions** from the City of Sarasota operations between 2003 and 2015. This reduction of emissions is similar to removing 773 houses from the electric grid or 1,547 cars from the road for one year.

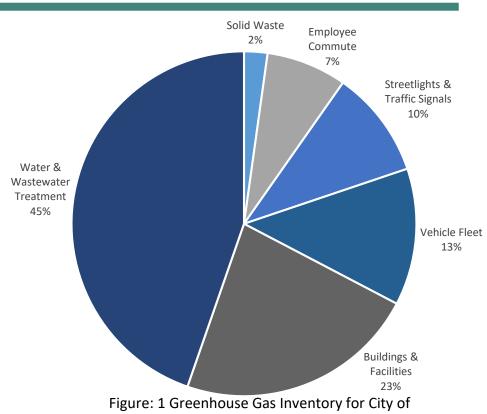


Figure: 1 Greenhouse Gas Inventory for City of Sarasota Operations by Source (CY 2015)

Emission sources that have increased since 2003:

Vehicle Fleet: There has been a **47% increase** in CO₂e from city fleet vehicles from 2003 to 2015 levels. City fleet includes police patrol, public works, utilities-related and other government-owned vehicles. The reasoning for this increase is expanded upon in the Inventory Results section of the full report.

Emission sources that have decreased since 2003:

Likely due to a cleaner energy mix and significant efficiency investments, all emissions associated with electricity use decreased between 2003 and 2015. The regional electric grid emission factor rates decreased 26% between 2003 and 2015, illustrating a cleaner fuel supply mix.

Buildings & Facilities kWh has decreased 17% and corresponding CO2e emission decreased 26%.

Streetlights and Traffic Signals kWh has decreased 12%, while corresponding CO2e emissions have decreased 26%.

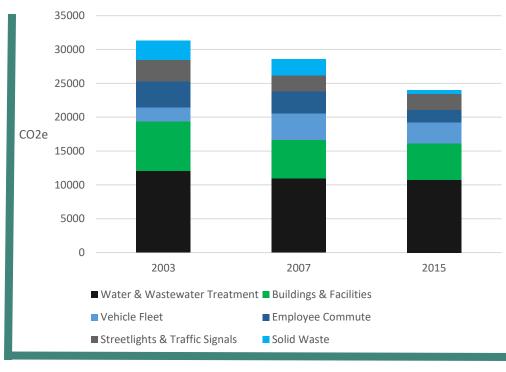


Figure 2: Metric Tons CO2e: Comparison 2003, 2007, 2015

Water and Wastewater Treatment kWh has increased 3% while corresponding CO2e emissions have decreased 11%.

Emissions have also decreased from the following two sources, based on estimations using best available data.

Solid Waste: The City's smallest emissions source (2%) has seen the most dramatic reduction since baseline year 2003, with an **81% decrease in CO₂e.** This significant change is due to positive methane management investments by Sarasota County at the landfill.

Employee Commute: Based on an internal survey which had 111 responses, averages for employees were computed and an estimated 1,809 metric CO2e was associated with commuting to and from work. This is a surprising 50% reduction when compared to baseline year 2003. *More examination is needed into this reduction and how this exact methodology compares to 2003, but the 2015 results came with a 92% confidence interval.*

Introduction

In order to provide data to inform the City of Sarasota's operations, the Sustainability program conducted a greenhouse gas inventory for the 2015 calendar year. This analysis is an update to a greenhouse gas inventory previously conducted for years 2003 and 2007. By measuring emissions from the City of Sarasota's operations, this inventory is a step toward managing and prioritizing mitigation actions and leading the way forward to a more sustainable city.

The City of Sarasota is striving to reach a greenhouse gas reduction goal of 35% by 2025, compared to a 2003 baseline. The City of Sarasota also has a strong climate adaptation program which analyzes the vulnerabilities of city assets to climate projections from sea level rise, increased extreme heat days, altered precipitation patterns, and storm surge. The climate adaptation planning process, coupled with this report, illustrate the City's strong commitment to addressing both the causes and impacts associated with climate change.

When a municipality decides to conduct a greenhouse gas inventory, there are two different types of inventories to consider: a local government operations inventory or a community inventory.

A *local government operations inventory* draws its boundaries around activities necessary for the city government to fulfill its mission, even though all those activities are on behalf of the citizens and businesses that live and work in the community.

A community inventory draws its boundaries around a geographic location and includes all the activities and emissions sources needed to serve that area including government, citizen and

business activities. Therefore, a local government operations inventory would be one component of a greater community-wide inventory. An updated 2015 community-wide greenhouse gas inventory was performed for City of Sarasota and illustrated a 22% decrease in GHG emissions from a 2003 baseline.

"THE CITY OF SARASOTA IS STRIVING TO REACH A GREENHOUSE GAS REDUCTION GOAL OF 35% BY 2025, COMPARED TO A 2003 BASELINE."

This inventory was prepared in

accordance with the Local Government Operations Protocol (LGO) For the Quantification and Reporting of Greenhouse Gas Emissions Inventories Version 1.1 – May 2010, the most widely-endorsed standard for cities to conduct internal GHGI. This inventory also used ICLEI Clearpath, an online calculator tool which counts carbon emissions from fleet, purchased electricity, solid waste, and wastewater processes.

Boundaries

In GHG inventory protocols, emissions sources and activities are classified as either being direct or indirect sources of GHG emissions. Direct emissions are those that stem from sources owned or controlled by a particular organization. Indirect emissions occur because of the organization's actions, but the source of emissions is controlled by a separate entity.

To distinguish direct from indirect emissions sources, three "scopes" are defined for traditional GHG accounting and reporting purposes. ²

Scope 1

Direct sources of GHG emissions that originate from equipment and facilities owned or operated by the City of Sarasota. Examples includes emissions from fleet vehicle fuel use.

Scope 2

Indirect sources of GHG emissions from purchased electricity.

Scope 3

All other indirect sources of GHG emissions that may result from the activities of the City of Sarasota but occur from sources owned or controlled by another company or entity. Examples include emissions from landfilled solid waste and commuting habits of City employees.

Scope 1 (direct) and **Scope 2** (indirect) emissions must be reported for most protocols and registries. **Scope 3** (indirect) emissions are typically considered optional when reporting, but serve to clarify an organization's entire carbon footprint.

Inventory Results

In CY 2015 the City of Sarasota's operations generated 23,991 MT CO2e from all three scopes (see Figure 3). For sense of scale, this is equivalent to annual emissions from 5,068 passenger vehicles driven for one year and 3.6% of the overall community-wide emissions. Estimated indirect Scope 3 emissions total 2,336 MT CO2e. This is equivalent to annual emissions from 493 passenger vehicles driven for one year. While Sarasota has less direct control over Scope 3 sources, they come from mission-critical activities and the City can influence them over time.

² Local Government Operations Protocol Version 1.1

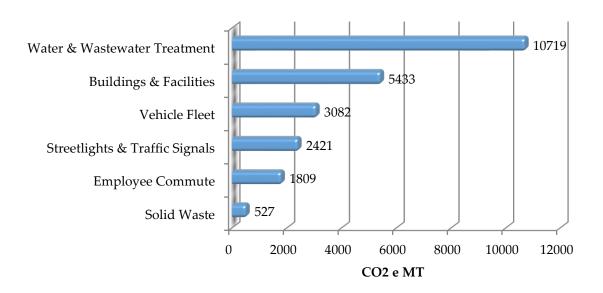


Figure 3: Government Operations GHG Emissions CY 2015

	2003	2007	2015
Buildings	23%	20%	23%
Vehicle Fleet	7%	14%	13%
Commute	12%	11%	7%
Streetlights	10%	8%	10%
Water/Sewage	39%	39%	45%
Waste	9%	8%	2%

Table 1: Percentage Comparison of Emission Sources per Year

Table one looks at the percentage breakdown each year of emission sources. For example, in 2003, 7% of the total greenhouse gas emissions from city operations was from fleet vehicles. In 2015, 13% of the total greenhouse gas emissions came from this same source.

Intensity factors are often used to compare performance over time, even if there is an increase in employee numbers or square footage. The number of employees for the city of Sarasota ranged from 936 (2003) to 1017 (2007) to 887 (2015). These numbers were provided by the finance department from annual W2s and include the total number of employees that have worked for the city throughout the year. This was the most accessible number to use when comparing back to 2003. Figure four gives metric tons carbon dioxide equivalent per employee per year for perspective and to serve as an intensity factor. **Per capita emissions decreased 19% from 2003 to 2015**, from 33.45 MT CO2e per employee to 27.05 MT CO2e.

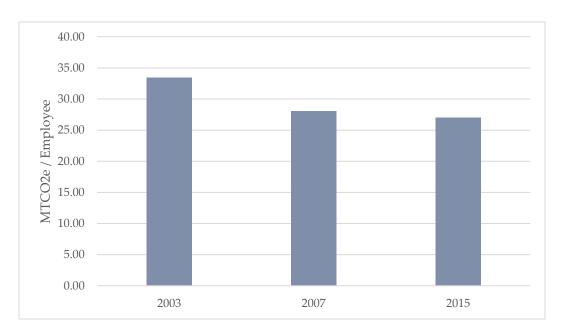


Figure 4: Greenhouse Gas Emission per Employee per Year

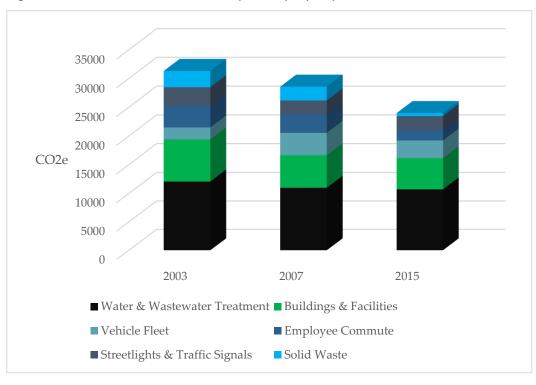


Figure 5: Metric Tons CO2e: Comparison 2003, 2007, 2015

Vehicle Fleet: The City of Sarasota's vehicle fleet includes police patrol vehicles, public works and utilities trucks, and all other government owned vehicles. Although there was a 47% increase in CO₂e between 2003 and 2015, a 21% reduction can be observed between 2007 and 2015. Additionally, there was a 38% increase in gallons of fuel used for city fleet from 2003 and

2007. There are many factors thought to be contribute to this issue, including a 20% increase in the number of vehicles using diesel in 2007 and because the city began temporarily supplying the fire station off Lemon and 5th with fuel while their building was being rebuilt. For unleaded fuel, there was an increase of vehicles between 2003 and 2007 and the police implemented a policy that switched from sharing vehicles to staff being allowed to take their units home. The numbers have decreased from

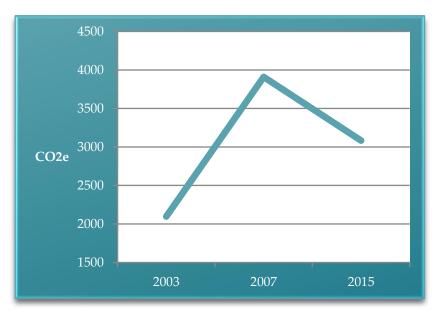


Figure 6: Metric Tons CO2e per year from Fleet Vehicles

2007 as the city is no longer fueling the fire station and vehicles overall have gotten more fuel efficient.

Emissions sources that have decreased since 2003 include:

Buildings & facilities: The grid electricity (kWh) and natural gas use of government operated buildings resulted in 5,433 metric tons CO₂e emitted in 2015. Also included in the calculation was the state of Florida's grid loss factor of 9.17%. Overall, building & facilities have seen a 26% reduction in CO₂e since baseline year 2003. One contributing factor to this decrease is that the Florida Reliability Coordinating Council (FRCC) regional electric grid emission factor rates decreased 26% from 2003 to 2015, therefore indicating electricity sources have become cleaner during that time. It was not possible to directly compare kWh of buildings energy use from 2003 and 2007 as the previous GHGI report and supplemental material only included CO₂e results from their analysis. For this emission source only, the CO₂e was compared across each year without the ability to cross-check kWh data. This issue is expected this to have minimal impact to the analysis.

Streetlights & Traffic signals: Grid electricity (kWh) data for all streetlight & traffic signals within city limits was used to calculate the 2,421 metric tons CO₂e that is attributed to this sector. Since 2003, a 25% reduction in CO₂e is observed. This is likely due to the cleaner regional grid rate but also the decrease in kWh devoted to streetlight and traffic signals from 2003 and 2015. During this time there was about 12% less energy used for this source. The City has implemented a significant LED streetlight replacement program during this time period.

Employee commute: Employee surveys were distributed to estimate the annual vehicle miles traveled (VMT) by the City of Sarasota's 621 Full Time Employees. Using the average commute of survey participants and 235 working days, it was estimated that City staff vehicles that run on gasoline traveled 3,683,276 miles, and City staff vehicles that run on diesel traveled 140,771

miles in 2015. The employee survey also included vehicle types, which for gasoline vehicles were 50% passenger cars, 44% light trucks, and 3% heavy trucks (97%). The remaining 3% were diesel vehicles, falling equally (1%) into the three weight categories. An estimated **1,809 metric tons CO₂e** can be contributed to employee commute for the City of Sarasota in 2015. This is a **50% reduction in CO₂e** since the baseline year 2003. More investigation is needed on why this decrease, perhaps methodology differences are in play. Details on how employee commutes for 2015 were calculated was catalogued for future inventories to ensure consistent methodology over time. It should be noted though that the 111 survey responses did equate to a 92% confidence interval and therefore data for 2015 employee commute is considered highly reliable.

Water & wastewater treatment: Water & wastewater treatment facilities remain the highest contributor among all sectors of this inventory, with 45% of total greenhouse gas emissions for the City of Sarasota attributed to this sector. Overall, there has been an 11% decrease in CO₂e emitted by water and wastewater facilities since 2003. This decrease is most likely solely due to the decrease in the regional electric grid emission sources being cleaner, as the kWh for the wastewater and water treatment actually increased 3% from 2003 to 2015.

Solid waste: The City's smallest emissions sector (2%) has seen the most dramatic reduction since baseline year 2003, with an **81% decrease in CO₂e.** This decrease is due to a new Sarasota County landfill gas-to-energy methane system, which dramatically reduced emissions from waste decomposition in addition to less material being sent to the landfill.

The cumulative reduction n of GHG emissions since 2003, across all sectors, can be observed in the graph below.

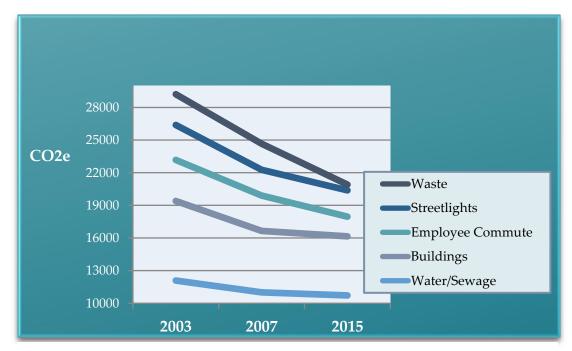


Figure 7: Emission sources that have decreased since baseline year 2003

Policy Context

The Intergovernmental Panel on Climate Change (IPCC), an international group of scientists assembled to study climate change, has identified human activity as "extremely likely to have been the dominant cause of observed warming since the mid-20th century" (IPCC 2013). Consensus statements from the IPCC suggest that human-caused emissions must be reduced significantly in order to avoid the worst potential climate impacts on human economies and social structures.³ Many corporations, government agencies, universities, non-profits and even individuals have proactively sought to take on this challenge. There has recently been an increased effort to increase regulatory action regarding GHG emissions, as well as energy and transportation legislation and climate action policy initiatives. Action is taking place at the international, national, state, regional and local levels and is summarized in Table 2 (below).

Table 2: Overview of Policy Activity Related to Greenhouse Gas Emissions Management

International	Parties to the United Nations Convention on Climate Change (UNFCC) reached an agreement on December 12, 2015 in Paris. The agreement commits all parties to report regularly on their emissions and implementation efforts and undergo international review. The agreement includes the goal of keeping average warming below 2 degrees Celsius, while also urging parties to "pursue efforts" to limit it to 1.5 degrees.
Federal	In 2007, the Supreme Court unanimously ruled that the US Environmental Protection Agency (EPA) had the authority to regulate greenhouse gas emissions under the Clean Air Act. The EPA had issued mandatory reporting guidelines for large emitters. Additionally, on June 2, 2014, the EPA under President Obama's Climate Action Plan proposed a mandate to cut carbon pollution from power plants by 32% from 2005 levels by 2030. The Clean Power plan allows states the flexibility to choose how they would reach their goal. The current US climate mitigation goal is to reduce GHGs 17% below 2005 levels by 2020 and 26-28% by 2025. January 2017 brought a new Federal administration which will likely alter many of the national level goals related to climate action.
State	In 2007, then Florida Governor Crist implemented a series of executive orders outlining significant steps to reduce state emissions. Those executive orders called on state agencies to take a leadership role in green buildings and fleets, called for a renewable electricity standard for utilities, and for net metering to facilitate localized renewable energy. Since then, present Governor Scott has been less active regarding policies related to greenhouse gas management. The state attorney general's office is participated in a group of states challenging the President Obama's Clean Power Plan. As of the publication of this report, there was no state-wide greenhouse gas reduction target FDEP was operating under and the agency is awaiting results of the Supreme Court decision on the Clean Power Plan challenge (via a conversation with EPA administrator on 05/31/2016).
Regional	Sarasota County has implemented a "2030 Challenge" via Resolution #2006-157 that directs new and renovated county buildings be designed to be carbon neutral, requiring no fossil

 $^{^3\} http://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf \\ http://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_summary-for-policymakers.pdf$

	fuel energy, by 2030. Additionally, the Community Energy Use and Greenhouse Gas
	Emissions Resolution #2010-243 commits Sarasota County to take a leadership role in
	reducing greenhouse gases from county operations and develop a Community Energy Action
	Plan for the reduction of energy use and associated emissions from the community. Sarasota
	County has completed a community and municipal-level greenhouse gas inventory as a part
	of this program and plans to update it in the near future.
Local	At the local level, over 1,000 cities across the country signed the US Mayors Climate
	Protection Agreement including the City of Sarasota in 2007. A comprehensive greenhouse
	gas inventory is the first step toward fulfilling a signatory's commitments. A GHGI was
	completed for 2003 and 2007 years, with this report serving as an update. Two goal were
	included in the city's recent comprehensive plan update of reducing community-wide and
	operations greenhouse gas emissions 25% by 2025 from 2003 levels.

Climate Action Priority Areas and Next Steps

In 2016, the City of Sarasota approved a greenhouse gas reduction goal of **25% by 2025 from a 2003 baseline**. It is estimated that the City look at the data presented in this report to prioritize areas for greatest impact. Sarasota's largest emission sources are:

- Water and Wastewater
- Buildings and Facility Energy Use
- Vehicle Fleet
- Street and Traffic Lighting

Based on the results of this analysis, it is recommended to:

- 1. Explore energy reduction and efficiency opportunities within the water and wastewater processes and building facilities.
- 2. Prioritize installing or purchasing of renewable energy.
- 3. Implement projects to reduce vehicle fossil fuel use for the city fleet.
- 4. Continue street and traffic lighting retrofits to LED technology.
- 5. Actively support and lobby for clean energy within the electric grid.
- 6. Sign the US Compact of Mayors

Recommended process improvements for next GHGI:

- 1. Include an analysis on supply chain emissions from city purchases and services. Although this type of analysis takes significant time and is based on life cycle estimates, it is an important component of an organizations carbon footprint.
- 2. Include emission sources from business travel. Work with finance to receive this in a useable format.
- 3. Improve solid waste data so that more precise volumes can be reported.

Appendix A: Methodology

The 2015 Inventory used ICLEI's—Local Governments for Sustainability's ClearPath emissions management platform to streamline calculations and store input and consumption data, emissions factors and methodology notes. The rationale for shifting the inventory approach to the ClearPath platform revolved around ensuring future comparability and replicability, employing best practices, and leveraging the latest guidance available for quantifying emissions in each sector.

This inventory follows the Local Government Operations Protocol, which provides the highest-consensus guidelines for minimum reporting scope and was developed by The Climate Registry and other organizations. The protocol only requires the reporting of emissions in Scopes 1 and 2 (as defined by the World Resources Institute).

The City of Sarasota has gone further to include several shared emissions categories from Scope 3, including solid waste and employee commute.

Employee numbers for the per capita analysis were provided by Michele Keeler. The number of total W2's for the entire year were used, relaying the total number of employees who worked for the city of Sarasota that year. In 2003 there was 936, 2007-1017 and in 2016 – 887 employees.

Appendix B: Electric Profile

The City of Sarasota signed a 30 year franchise agreement with the Florida Power & Light Company

(FPL) in 2010. This agreement allows FPL to serve as the sole utility provider of electric accounts within the City of Sarasota. FPL provided the electricity consumption data for the community inventory report. Emission factor data for this report was provided by the EPA's Emissions & Generation Resource Integrated Database (eGRID). This database provides annual total output emission rates for greenhouse gases for subregions, of which the majority of Florida belongs to the Florida Reliability Coordinating Council (FRCC) region seen in Figure 9. FPL is one of many utility providers in the FRCC region and provides electricity to 4.8 million customer accounts across nearly half of the state of Florida.4 The GHG Emissions for the of Sarasota's electricity City consumption may be calculated using any one of the following three emission factors:

- 1. The utility specific emissions factor of FPL
- 2. The regional eGRID emissions factor for the FRCC
- 3. The US national emission factor as reported by the EPA



Figure 8. Map of EGRID Subregions of the United States

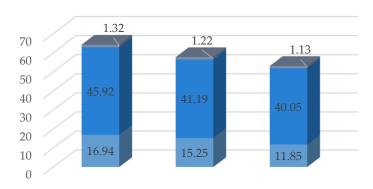


Figure 9: FRCC (Florida) Regional EGRID Emission Factor
Rate per year

⁴ https://www.fpl.com/about/company-profile.html

All three ways to calculate electricity emissions valid arguments on why they could be used. Since FPL is the utility directly serving the City Sarasota, it can be considered the most appropriate emission factor to However, utilities are connected (often at peaks and troughs of production) to many outside power sources. Therefore, it is possible to argue that the regional grid is a more accurate number. In fact, since electricity is often traded over long distances, the

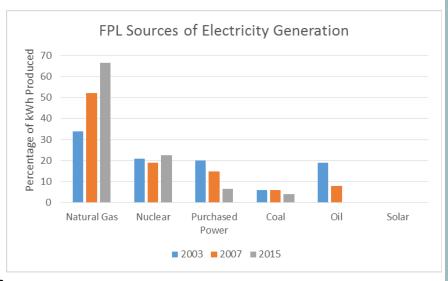
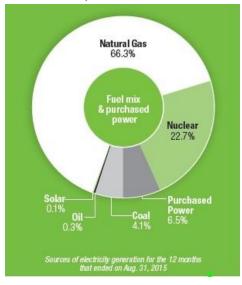


Figure 10: FPL Sources of Electricity Generation 2003, 2007 & 2015

national grid also has some meaning. For this report, eGRID subregion values for the FRCC were used to calculate emissions from all purchased electricity. This method is recommended in the Local

Figure 11: FPL Sources of Electricity Generation for 2015



Government Operations Protocol and also provides a third party validation of the emissions factors. Figure 8 shows the eGRID Subregions and Figure 9 shows the FRCC (Florida) regional EGRID emission factor rate per year. Both the regional FRCC

EGRID emission factor rate per year. Both the regional FRCC and FPL-specific emission factors have become "cleaner" since 2003. Although FPL's mixture of energy sources has improved, there is still room for improvement — only .1% of the energy comes from renewable sources (Figure 11). Figure 10 illustrates FPL sources of electricity generation over time, showing much more natural gas since 2003 and less oil and coal.

The natural gas utility to the City of Sarasota is TECO Peoples Gas. TECO is the sole provider of natural gas to the city, and as natural gas always has the same emissions factor, — the emissions generated per therm stays the same no matter when it is burned.

Appendix C: Data Sources

FPL Purchased Energy India Monahan Florida Power & Light Company 941-483-2034 239-595-8406 cell India.Monahan@FPL.com

Water and Wastewater – City of Sarasota Gerald Boyce General Manager, Utilities City of Sarasota 941-955-2325 Ext 6104 941-650-7117 cell Gerald.Boyce@sarasotagov.com

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