Yocelyn Galiano, ICMA-CM
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MEMORANDUM
Office of the Village Manager

DATE: July 11, 2023

TO: The Honorable Mayor and Members of the Village Council

FROM: Yocelyn Galiano, ICMA-CM, Village Manager

RE: Draft Sustainability Action Plan

I hereby respectfully submit a draft 2023 Sustainability Action Plan for your consideration and review. This proposed plan updates the Village's 2016 Climate Action Plan including carbon reduction goals for the organization and the community.

/yg

2023 Sustainability Action Plan

Pinecrest

Created by
Office of the Village Manager

6/1/23

Draft

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The term "sustainability" has been a buzzword such as the terms "eco-friendly" and "green." Sustainability has also been synonymous with environmental sustainability. However, sustainability is more than a buzzword, and since humans and the natural world are interconnected, sustainability focuses on more than just the environment. In essence, sustainability ensures that we respect people and living things while we utilize our environmental, social, and economic resources wisely with the purpose of sustaining and promoting the long-term well-being of the society, environment, and the organization.

Pinecrest's Sustainability Action Plan (SAP) provides a framework for the Village, its residents and commercial sector to curb climate emissions, prepare for climate impacts and become a more resilient community. The SAP is an evolving document. Action items and targets will become more quantitative and specific as the community continues to analyze baseline data, conducts future vulnerability assessments, conducts budget planning and engages the community for input. The Village's Sustainability Action Plan (SAP) emphasizes the commitment to its current and future residents, businesses, and staff. The SAP consists of objectives that enhance sustainability through a multi-dimensional approach that includes viewing sustainability through operational, financial, and environmental lenses. The SAP is a village-wide strategy to be implemented by local government, community partners, and residents. The objectives are focused on reducing local greenhouse gas emissions which cause climate change, managing resources wisely, enhancing operations, and promoting environmental awareness.

INTRODUCTION

The Greater Miami/Ft. Lauderdale area is one of the most populous metropolitan areas in the Southeastern region of the United States and its climate is influenced by many factors, including latitude, topography, and proximity to the Atlantic Ocean and the Gulf of Mexico. There have been increasing numbers of days above 95°F and nights above 75°F, and decreasing numbers of extremely cold days since 1970. Also, summers have been either increasingly dry or extremely wet. The number of Category 4 and 5 hurricanes in the Atlantic basin have increased substantially since the early 1980s compared to the historical record that dates back to the mid-1880s.

Large numbers of cities, roads, railways, ports, airports, oil and gas facilities, and water supplies are at low elevations and potentially vulnerable to the impacts of sea level rise. Miami, Tampa, Charleston, Virginia Beach and New Orleans (with roughly half of its population living below sea level) are among those most at risk. Sea level rise increases pressure on utilities – such as water and energy – by contaminating potential freshwater supplies with saltwater.

There is an imminent threat of increased inland flooding during heavy rain events in low-lying coastal areas such as southeast Florida, where just inches of sea level rise will impair the capacity of stormwater drainage systems to empty into the ocean. Drainage problems are already being experienced in many locations during seasonal high tides, heavy rains, and storm surge events.

Sea level rise and storm surge can have impacts far beyond the area directly affected. Homes and infrastructure in low areas are increasingly prone to flooding during tropical storms. Sea level rise reduces the efficiency of underground stormwater systems by partially submerging infrastructure and reducing their capacity for water retention during flood events. Septic systems are also negatively affected by higher ground water

levels also impacted by sea level rise.

Evidence for climate change abounds, from the top of the atmosphere to the depths of the oceans. Scientists and engineers from around the world have meticulously collected this evidence, using satellites and networks of weather balloons, thermometers, buoys, and other observation systems. Evidence of climate change is also visible in the observed and measured changes in location and behavior of species and functioning of ecosystems.

STRATEGIC PRIORITIES

The vision of the Village of Pinecrest is to be a highly livable community with an excellent government, stable finances, safe streets, outstanding recreation facilities and infrastructure, a high-quality residential character with lush streetscape, excellent schools, valuable cultural assets, and sustainable operations and living, with leadership which progressively enhances opportunities for citizen interaction and participation. In pursuing its vision, the village is committed to achieving it in a sustainable manner. A sustainable Pinecrest takes into consideration its people, the planet, and its prosperity through a multi-dimensional approach. Coupled with the Village's approach, the nearly 80 objectives captured within each of the six focus areas, the SAP complements the village's strategic and comprehensive plans, each with the goal of making strategic, long-lasting decisions that will benefit the village for years to come.

The SAP is a dynamic and adaptable plan that will continue to evolve as the village gains access to cutting-edge information, new data, and best practices. The evolution of the SAP is necessary to ensure that the village is flexible and maintains long-term processes that can be sustained over time. In addition, the SAP captures existing sustainability practices and policies through the Sustainability Inventory that will help to track their impact over time. At the center of the SAP is the Greenhouse Gas (GHG) Inventory that tracks the community's GHG emission sources and quantifies emissions to manage GHG risks and identifies reduction opportunities. The GHG Inventory plays a key role in understanding trends in emissions and removals, developing mitigation measures, and monitoring progress towards policy goals.

The SAP consists of two overarching goals that will be met through the six focus areas, each with goals and objectives for local government operations and the community.

Overarching Goals

- Net-zero greenhouse gas emissions by 2050 and a 50% reduction in greenhouse gas emissions from the 2018 baseline by 2030.
- Ensure sustainability of all programs, projects, and policies though the three lenses of sustainability.

THREE LENSES OF SUSTAINABILITY

Financial Sustainability

The village practices financial integrity and long term-sustainability by ensuring that village expenditures are strategically linked to the goals, objectives, core values, and existing obligations of Pinecrest. To maintain financial sustainability, the village utilizes a five-year forecast to reshape the financial trajectory. The forecast helps form a plan to fund upcoming costs and long-term liabilities. This is achieved by long term financial decisions, controlling the growth of expenditures, forecast modeling with various optimal and dismal scenarios, and adhering to the financial and investment policies for all village funds. The village prides itself in outstanding service levels and AAA bond ratings. Bond ratings signal to the market that the Village of Pinecrest is a low-risk investment; therefore, it grants the village lower interest rates on any borrowing and lower payments on general obligation bonds.

Operational Sustainability

The village practices operational sustainability through intentional, strategic, and proactive steps to strengthen operations and enhance efficiencies. The village addresses aging infrastructure, replacement plans, and seeks grant opportunities. The village focuses on the sustainability of the workforce by identifying labor trends, addressing employee engagement efforts, and by incorporating innovative incentives to reward the core values that support the vision of the community.

As the village evolves, the Capital Improvement Plan is updated annually to adjust for changing capital needs and changes in availability and cost of funds. Each project that is proposed is analyzed to determine its financial impact on operations, operating expenditures, and revenues. Each project that is confirmed undertakes a strict review to reduce subjectivity to ensure that projects are prioritized on a village-wide perspective. The village's performance is assessed through a performance management system to align department services and programs with the Village Council's strategic goals. The system enables departments to measure results against targets and make timely adjustments when results fall short of expected performance levels.

Environmental Sustainability

The village's commitment to environmental sustainability is highlighted by its ongoing efforts to document and improve carbon emission outputs. Additionally, the village's preservation of natural areas such as parks and pineland preserve areas signal the importance of preserving habitat for wildlife. Furthermore, the Village of Pinecrest is proud to be a Tree City USA and has held its position for the past 14 years. Reducing the energy consumption of buildings in the Village of Pinecrest is a priority, which is why all development coming into the village is encouraged to build green by practicing green building standards. Year-round water conservation measures to protect water resources are practiced through landscape irrigation restrictions.

INVENTORIES

Sustainability is embedded in various policies and is practiced across village departments. In addition to practicing sustainability the Village of Pinecrest prides itself in being transparent and publishes performance data in the Community Dashboard. Measuring the progress and success of programs, projects, and initiatives helps the Village stay on track and better manage assets. The SAP contains two inventories: the Sustainability Inventory (reported on the Community Dashboard) and the Greenhouse Gas (GHG) Inventory.

The Sustainability Inventory highlights programs, plans, projects, and processes from each department that practice sustainability through one or more of the lenses of sustainability (operational, financial, and environmental). The GHG Inventory measures greenhouse gas emissions produced from the community and includes a "drill-down" from local government operations from the usage of electricity, solid waste generation, water and wastewater treatment, and transportation. Identifying a baseline year for the GHG Inventory is essential in helping to measure the progress of programs and projects. The baseline year that was chosen for the SAP was 2019 because it was the most recent non-COVID-19 year.

Greenhouse gases (GHGs) are responsible for trapping heat in the atmosphere and keeping the Earth warm. The main GHGs are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and fluorinated gases. The primary GHG is CO2 and is primarily emitted from human activities. Human activities are responsible for GHG emissions and climate change, thus focusing on reducing our GHG emissions will help to mitigate climate change and reduce its associated risks.

Keeping track of the Village's GHG emissions though the GHG Inventory is essential in meeting our overarching goal of net-zero greenhouse gas emissions by 2050 and decreasing emissions by 7% by 2030. The GHG Inventory measures greenhouse gases produced from the community. The GHG emissions inventory also includes a local government operations inventory that is a "drill down" of the community inventory. The inventory calculates the various GHG emissions in a common unit, CO2e. It signifies the amount of CO2 which would have the equivalent global warming impact from activities and different types of emissions, known as scopes.

SUSTAINABILITY GOALS

The Village is committed to lead by demonstrating sustainable stewardship that will yield cost savings to taxpayers by reducing operating costs, providing a healthy work environment for staff and visitors, increasing public awareness of the environmental and economic problems associated with carbon emissions, and establishing community standards of sustainable living practices. The following six areas of focus detail the strategic objectives that enhance sustainability through a multi-dimensional approach to ultimately reduce Green House Gas and achieve the pillars of a "livable city".

LEADERSHIP
Innovation + Education

Pinecrest is a leader in sustainable living practices and is a model for other municipalities that would like to implement climate action initiatives. It has laid the groundwork for any municipality to piggyback off sustainable practices, ordinances and resolutions that include green regulations, green procurement and a sustainable building program. Pinecrest's innovation and leadership will impact future generations through the self-initiated sustainable practices it has put in place.

Past Innovation + Education Achievements

- Adopted 2009 Green Action Plan
- Created 2010 Strategic Action Plan Sustainability Element
- Hosted 2010 Going Green Conference
- Adopted 2016 Climate Action Plan
- Hosted an Annual Bike Ride Day (paused during COVID; returning 2024)
- Implemented organization-wide green procurement practices and recycling initiatives
- Completed a Greenhouse Gas Emission Inventory for years 2010, 2012, 2014 and 2018
- Adopted a green building ordinance
- Earth Day Festival. Recycling activation April 22nd.
- Collaborative relationship with CLEO Institute
- Hosted 2013 Climate Action Rally
- Entered into a Climate Action Compact with Miami-Dade County Public Schools
- Established the Sustainability Fund to facilitate physical improvements to Village-owned buildings that improve sustainability
- Established the PACE Districts
- Host Pinecrest Garden's Weekly Farmers Market
- Adopted code changes that prohibits plastic straws in the Village commercial properties and gas-powered leaf blowers throughout the Village.
- In the 2010 Strategic Plan, Council established a goal to reduce overall greenhouse emissions by 7% below December 2012 levels by 2030. The Village conducted a Local Government Operations (LGOP) and a community-wide Greenhouse Gas emissions inventory for the years 2010, 2012, 2014, and 2018. In base year 2010, the Pinecrest community as a whole emitted 232,616 metric tons of CO2e and by 2018, the Pinecrest community as a whole emitted 185,153 metric tons of CO2e – a reduction of 20%. Further, in 2010, Pinecrest's 2010 baseline LGOP Inventory found that local government operations (i.e. operations related to facilities, vehicles, and infrastructure directly owned and/or controlled by the Village) were responsible for emitting 2,351 metric tons of CO2e and in 2018 the Village organization was responsible for emitting 1,749 metric tons of CO2e – a 26% reduction.

2025 Objectives

- Develop volunteer program with emphasis on debris removal in environmentally sensitive areas such as mangroves (Pinecrest-by-the-Sea) and canal waterways that feed into Biscayne Bay.
- Expand the Comprehensive Environmental Education Program.
- Adopt the County's Extreme Heat Action Plan.
- Implement educational programs throughout the community to encourage the reduction of vehicle miles travelled through transit bicycle and pedestrian means.

2030 Objectives

- Foster a livable neighborhood that conserves land, and supports transit service and neighborhood-serving businesses.
- Provide a mix of housing, workplaces, and neighborhood-serving shops and services.
- Offer housing choices suited to all types of households and household incomes, provide a range of jobs, shops, and services, support diverse local businesses.
- Support the physical and mental health of residents by having a clean and safe neighborhood that promotes social inclusion and sociability.
- Create a livable neighborhood that is well served by parks, playgrounds, plazas, and greenways. Trees and plantings are integrated into street designs. Buildings are designed to provide compact gardens, courtyards, terraces, and green roofs.
- Use natural resources and energy sparingly and efficiently.

TRANSPORTATION
Infrastructure + Service

Pinecrest is enhancing mobility, access and safety through a range of transportation choices that are key to reducing auto dependence. The Village is currently looking at opportunities for transit and transportation improvements that guide planning and investment to expand transit, pedestrian and bicycle infrastructure and service.

Past Infrastructure + Service Achievements

- Installation of three electric vehicle fast-charging stations
- Completion of a Bike Lane and Route Plan
- Completion of US 1 Corridor Bicycle and Pedestrian Mobility Study
- Established green fleet practices and procedures
- Implemented Solar-powered pedestrian crossing flashers
- Collaborated with Miami-Dade County in the establishment of the SMART Plan, including a Bus Express Rapid Transit service along South Miami-Dade Busway
- Developed traffic circles with solar-powered lighting
- Operate Pinecrest People Mover to reduce car trips within Village
- Contract with Freebee to offer residents free, last-mile transit with much lower emissions

2025 Objectives

- Support car-free living by being well-connected to village-wide and regional destinations by sustainable transportation modes (walking, cycling, public transit, paratransit and taxi). Streets and public transit are designed for universal accessibility.
- Improve sidewalks and crossings on arterial streets that connect to parks and commercial corridor
- Decrease vehicle emissions by 6.5 percent from 2018 baseline.
- Expand Village's municipal electric vehicle fleet.
- Implement US 1 Safe Routes to School.
- Implement Bicycle and Mobility Pedestrian Plan.
- Develop Village-wide transit community strategy that integrates neighborhoods with high capacity transit along South Miami-Dade Busway corridor.

2030 Objectives

- Achieve a community with less dependence on gasoline-powered vehicles for transportation, measured by quantifying that 15% of cars owned by Village residents are electric or alternative fuel vehicles.
- Develop a Village-wide network of greenways and shared use paths that prioritize walking and bicycling on residential streets.
- Analyze need for expanded alternative fuel transit service (Pinecrest People Mover and Freebee) to high demand routes.
- Collaborate with Miami-Dade County transit to expand transit system to include more routes and more frequent service in areas identified in the Master Plan by funding service, building infrastructure, and coordinating planning.
- Pursue grant funding and partners to develop a network of fast-charging stations that will allow vehicles to charge in under 30 minutes increasing vehicle range, expanding opportunities for charging, and providing commercial opportunities to business owners.
- Expand Bike Lane and Route Plan.
- Diversify fuel options.
- Decrease vehicle miles travelled by 15 percent.
- Create and implement a Trip Reduction Program.
- Build more traffic circles to further decrease emission on residential streets.

BUILDING
Development + Land Use

Pinecrest strives to maintain the appearance of the Village and the quality of life for residential living by preserving the streetscape, minimizing impacts from commercial development, protecting the caliber of our educational institutions, and planning for the future needs of our community, while taking sustainability goals into account. It is the goal of the Village Council to minimize our community's impact on the environment with increased energy efficiency and growth management policies.

Past Development + Land Use Achievements

- Established 2010 Strategic Plan Climate Element
- Adopted ordinances to support a Sustainable Building Program that regulates building mass and introduces energy efficient design
- Adopted Green Land Development Regulations including expansion of the Pinecrest Business Alternative District that provides for mixed-use, transit-oriented development.
- Participate in Property Assessment Clean Energy (PACE) Program
- Developed and adopted a Master Plan Climate element
- US 1 Vision Plan Cross Access Easements
- Expedited permit program funds the Village's Sustainability Fund
- LEED Certified building is incentivized through permit fees discounted by as much as 50 percent and acknowledgement through proclamations to raise climate action awareness
- Improvement to the landscape ordinance provides protection of large trees and promotes increased canopy

2025 Objectives

- Implement Master Plan Climate Element.
- Continue to evaluate the impacts of climate change on the drainage system and identify strategies for enhancing resilience.
- Expand precipitation monitoring and evaluation capabilities to mitigate future flooding risk and to enhance understanding of neighborhood-scale climate impacts.
- Continue to implement the priority projects of the Stormwater Master Plan and update the plan every 7 years.
- Collaborate with neighboring municipalities and impacted residents and businesses to create a coordinated approach to land use management that enhances preparedness and increases the cost effectiveness of preparing for sea level rise. Prepare a worst-case scenario response strategy.

- Evaluate climate impacts to transportation infrastructure and operations, including critical needs for emergency response, goods and services movement, and community access. Identify and prioritize strategies for enhancing resilience
- Consider future climate conditions when designing buildings and identify current or future opportunities to include elements such as on-site stormwater management, distributed power generation, and passive solar.
- Pilot an advanced green building standard on a Village facility to assess its appropriateness for resilient design and to promote similar levels of green building in the private market.
- Review development codes and incentives, and identify barriers and potential opportunities, to encourage private development to become more resilient (e.g. increasing on-site stormwater retention).
- Retro-fit Municipal Center with solar panels.

2030 Objectives

- All buildings in the Village, regardless of age, have achieved a targeted basic level of energy performance.
- Energy codes have successfully transitioned to an outcome-based approach.
- Create a minimum energy performance standard to ensure widespread improvement of the Village's entire building stock. A standard should focus on the most cost-effective energy improvements, and can ramp up over time after tools and incentives are available to assist building owners.
- Require periodic retro-commissioning (building tune-ups) for the largest and least efficient commercial and multi-family buildings.
- Make the energy benchmarking scores of the Village's municipal buildings publicly available.
- Require building energy audits for the largest and least efficient commercial and multifamily buildings to help identify cost effective improvements.
- Adopt a Green Stormwater Infrastructure (GSI) policy and implementation strategy affirming GSI as the preferred stormwater management approach.
- Pilot a retro-commissioning incentive program to provide financial and technical assistance to tune up energy systems in existing commercial buildings.
- Require the energy performance of buildings undergoing major renovation to come close to the energy performance requirements for new buildings.

Environment
Stewardship, Conservation, Water + Recycling

The Village's Strategic Plan established environmental sustainability as one of six core goals to minimize the community's impact on the environment with increased energy efficiency and growth management policies. Pinecrest is dedicated to the conservation and hands-on management of all public green spaces. It also works to educate the public about the importance of trees through established programs, and is working on implementing incentive-based programs that will encourage homeowners and business owners to plant more trees and preserve private green spaces.

Past Stewardship + Conservation Achievements

- Adopted a Green Landscape Code
- Amendment adopted excluding artificial turf from definition of minimum required "green space"
- Amendment adopted allowing lakes to be counted as natural "green" or open space
- Improved commercial landscaping regulations to promote more canopy in commercial district
- Continue to implement Street Tree Planting Program
- Maintain Tree City USA status for 14 years and awarded Growth Award
- Conservation of Pineland Rock Preserve and Hidden Pines Park
- US 1 Vision Plan – Xeriscape and Florida Pines along commercial property and medians
- Bringing Pines Back to Pinecrest Program
- Florida Green Building Coalition – Florida Green City Silver Certification
- Active member of International Council for Local Environmental Initiatives (ICLEI), the Florida Gold Coast Clean Cities Coalition, the U.S. Green Building Council and the Florida Green Building Coalition
- Natural resource protection at Pinecrest Gardens, including to two endangered plant species
- Tracking Water Use and Recycling
- Lights upgraded to energy-efficient LED bulbs in Pinecrest Community Center, Coral Pine Park, Veterans Wayside Park, Red Road Linear Park, and Flagler Grove Park
- Required Florida Native Landscape for all Village projects and properties
- Completed the Open Space and Parks Acquisition Policy

2025 Objectives

- Maintain Tree City USA status.
- Maintain an accurate inventory of all trees in the Village.
- Identify areas where water can be reclaimed for use at municipal facilities.

- Develop strategy in coordination with Miami-Dade County Solid Waste to obtain baseline recycling data.
- Convert the athletic field and parking lot lights at Evelyn Greer Park to LED.
- Convert the remaining parking lot lights at the Community Center to LED.
- Add more LED lighting to Flagler Grove Park parking lot.

2030 Objectives

- Encourage or require more landscaping in commercial corridor.
- Increase the number of trees in the Village by 20 percent.
- Incentivize water reclaiming for grandfathered properties.
- Upgrade all lights at Village owned facilities to LED bulbs.
- Amend Land Development Regulations to include water reclaiming element.
- Continuously analyze opportunities to increase public open spaces in the Village.

Mitigation
Energy

Pinecrest has a long history of environmental sensitivity and activism, as a community and as a municipal government. This is why the Village is committed to reducing its carbon footprint by implementing programs that capture baseline numbers for recycling, and water and electricity usage. The Village also completed its first Community Greenhouse Gas Emission Report in December 2010 which established the baseline information in order to monitor effects of the Village's effects of sustainable efforts on future emissions.

Past Energy, Water + Recycling Achievements

- Tracking electricity use
- Community Greenhouse Gas Emissions Report 2010, 2012, 2014 and 2018
- Carbon Credit offset Program
- Community Center reached LEED Silver standards
- EV chargers placed in Village Hall and Pinecrest Gardens
- Village implemented fleet of hybrid/EV vehicles
- Completed the Potable Water Project

2025 Objectives

- Incorporate mitigation measures that will provide verifiable greenhouse gas savings.
- Develop fuel efficiency target goals for Village fleet.
- Retrofit all municipal buildings with sustainable energy solutions.
- Continue educational campaign to increase awareness about Property Assessed Clean Energy (PACE) program and focus on commercial sector.
- Create community outreach material that shows breakdown of cost and return of installation of solar panels on roof of median-sized homes.
- Reduce GHG emissions for business/commercial sector 7 percent from 2010 levels.

2030 Objectives

- Encourage or require all Village Households to recycle
- Implement credit system for shopping center owners who install electric vehicle chargers in parking areas
- Double solar panel installations for business and residential buildings
- Reduce GHG emissions for business/commercial sector 50 percent from 2010 levels

Adaptation and Resiliency
Stormwater, Sewer + Flood Plain Management

Past Stormwater, Sewer and Flood Plain Management Achievements

- Stormwater Master Plan completed using sea-level rise projections
- Identified and addressed flooding in top-ranked areas
- Prioritized stormwater projects for a 5-year capital improvement
- Vulnerable residents identified
- Definitions amended to comply with FEMA requirements of the "Class 8 Addendum" necessary to retain the Village's Class 8 membership in the Community Rating System, thereby allowing for a 10 percent reduction in standard flood insurance premiums
- Improved the Village's Community Rating Score from 8 to 7

2025 Objectives

- Complete a Village-wide vulnerability assessment.
- Provide residents with vulnerability assessment tools.
- Implement Emergency Buddy System program for most vulnerable residents.
- Complete all Stormwater Master Plan Priority Projects.
- Achieve improved Community Rating Score of 6 or better.
- Complete design of a Septic to Sewer Project.

2030 Objectives

- Reduce resident insurance rates by improving the Village's FEMA Community Rating Score
- Have infrastructure in place to fulfill future stormwater needs
- Implement Adaptive Management Plan for Climate Change and projected sea-level and groundwater rise.
- Commence construction of the Village Sewer Installation Project.

Exhibit A

Pinecrest

Created by
Office of the Village Manager

6/1/23

Draft

Pinecrest Village

2018 Inventory of Communitywide and Government Operations Greenhouse Gas Emissions

April 2020

Produced by the Pinecrest Office of the Village Manager
With Assistance from ICLEI - Local Governments for Sustainability USA

Credits and Acknowledgements

The authors would like to thank Angela Gasca, Assistant Village Manager, and all the Village of Pinecrest staff who provided insight and local data necessary for the completion of this report.

ICLEI-Local Governments for Sustainability USA

The 2018 Inventory of Communitywide and Government Operations Greenhouse Gas Emissions was completed by:

Jesse Carpentier, Program Officer

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Executive Summary

The Village of Pinecrest recognizes that greenhouse gas (GHG) emissions from human activity are catalyzing profound climate change, the consequences of which pose substantial risks to the future health, wellbeing, and prosperity of our community.

Pinecrest has a long history of commitment of sustainability, including the following activities:

- Development of three previous greenhouse gas inventories (2010, 2012, and 2014), 2016 Climate Action Plan, 2009 Green Action Plan, 2010 Strategic Action Plan Sustainability Element, 2010 Going Green Conference
- Establishment of the first free municipal electric vehicle fast charging station, a green procurement policy, green regulations and sustainable building ordinances, the Earth Day Festival, the Climate Action Rally, Sustainability Fund, and a PACE District
- Commitment to the Climate Action Compact with Miami-Dade County Public Schools and a collaborative relationship with CLEO Institute.

This report presents Pinecrest's fourth inventory of greenhouse gas emissions from the community as a whole, as well as from the Village's government operations in the year 2018.

Key Findings

Figure ES-1 shows communitywide emissions by sector. The largest contributor is transportation and mobile sources with 62% of emissions. The next largest contributors are residential energy (16%) and commercial energy (17%). Actions to reduce emissions in all of these sectors will be a key part of any future climate action efforts. Water & wastewater and solid waste were responsible for the remaining (less than 6%) of emissions.

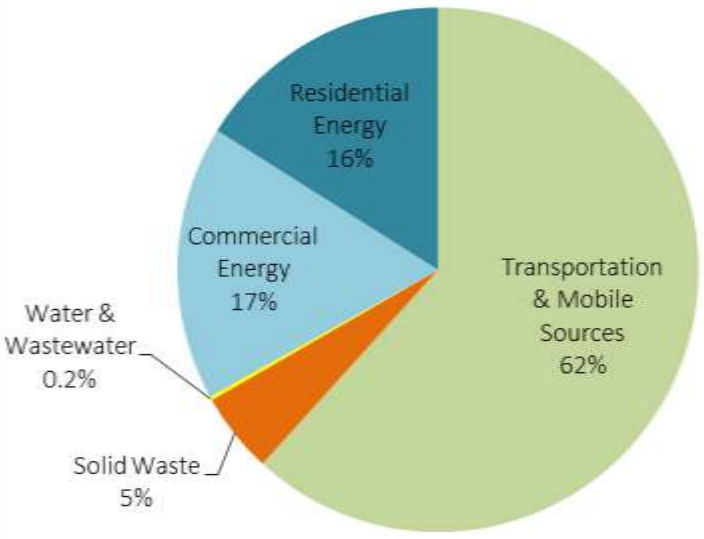

Figure ES- 1 Communitywide Emissions by Sector

Figure ES-2 shows local government operations emissions. The Buildings and Facilities sector accounts for a vast majority (42%) of these emissions. The next largest contributor is vehicle fleet (21%), followed by employee commute (23%). Solid Waste was responsible for the remainder (14%) of local government operations emissions.

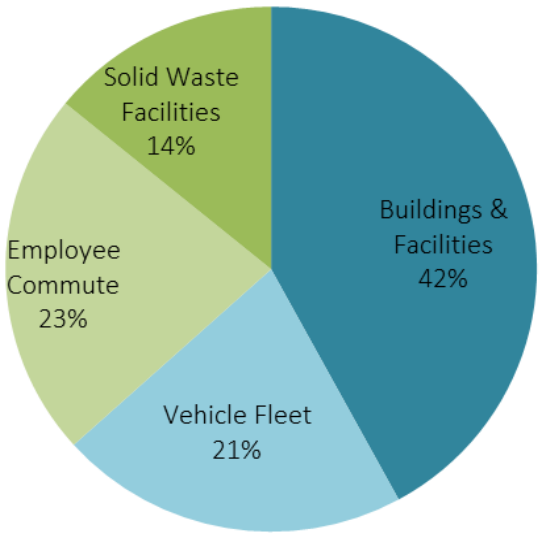

Figure ES- 2 Government Operations Emissions by Sector

The Inventory Results section of this report provides a detailed profile of emissions sources within Pinecrest; information that is key to guiding local greenhouse gas reduction efforts. These data will also provide a baseline against which the Village will be able to compare future performance and demonstrate progress in reducing emissions.

Climate Change Background

Naturally occurring gases dispersed in the atmosphere determine the Earth's climate by trapping solar radiation. This phenomenon is known as the greenhouse effect. Overwhelming evidence shows that human activities are increasing the concentration of greenhouse gases and changing the global climate. Over the last century and a half human activities, primarily the burning of fossil fuels for transportation and electricity, have increased these gasses concentrations in the atmosphere resulting in the trapping of more heat leading to changes in the global climate. Collectively, these gases intensify the natural greenhouse effect, causing global average surface and lower atmospheric temperatures to rise. Global climate change influences seasonal patterns and intensifies weather events, threatening the safety, quality of life, and economic prosperity of communities everywhere[1]. Many regions are already experiencing the consequences of global climate change, and Pinecrest is no exception.

According to the 2014 National Climate Assessment, the southeast U.S. will experience potentially devastating impacts from seasonal changes and hazards occurring at unprecedented magnitudes. Southeast Florida, including Pinecrest, is at particular risk for coastal hazards, such as flooding, erosion, and hurricanes that will continue to intensify with sea-level rise. So many people visit and move to this region to enjoy the beautiful coast, but its seaside location also puts it at extreme risk. In addition, climate change will continue to produce warmer seasons and extreme temperatures that threaten many sectors within Pinecrest and the greater region, most notably tourism, public health, and agriculture[2].

Many communities in the United States have started to take responsibility for addressing climate change at the local level. Reducing fossil fuel use in the community can have many benefits in addition to reducing greenhouse gas emissions. More efficient use of energy decreases utility and transportation costs for residents and businesses. Retrofitting homes and businesses to be more efficient creates local jobs. In addition, money not spent on energy is more likely to be spent a local businesses and add to the local economy. Reducing fossil fuel use improves air quality, and increasing opportunities for walking and bicycling improves residents' health.

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[1] International Panel on Climate Change. 2014. Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp. Retrieved from https://www.ipcc.ch/report/ar5/syr/

[2] U.S. Global Change Research Program. 2014. National Climate Assessment – Ch 19: Southeast. Retrieved from https://nca2018.globalchange.gov/chapter/19/

ICLEI Climate Mitigation Milestones

In response to the problem of climate change, many communities in the United States are taking responsibility for addressing emissions at the local level. Since many of the major sources of greenhouse gas emissions are directly or indirectly controlled through local policies, local governments have a strong role to play in reducing greenhouse gas emissions within their boundaries. Through proactive measures around land use patterns, transportation demand management, energy efficiency, green building, waste diversion, and more, local governments can dramatically reduce emissions in their communities. In addition, local governments are primarily responsible for the provision of emergency services and the mitigation of natural disaster impacts.

ICLEI provides a framework and methodology for local governments to identify and reduce greenhouse gas emissions, organized along Five Milestones, also shown in Figure 1:

1. Conduct an inventory and forecast of local greenhouse gas emissions;
2. Establish a greenhouse gas emissions reduction target;
3. Develop a climate action plan for achieving the emissions reduction target;
4. Implement the climate action plan; and,
5. Monitor and report on progress.

Figure 1 ICLEI Climate Mitigation Milestones

This report represents the completion of ICLEI's Climate Mitigation Milestone One, and provides a foundation for continued work to reduce greenhouse gas emissions in Pinecrest.

Inventory Methodology

Understanding a Greenhouse Gas Emissions Inventory

The first step toward achieving tangible greenhouse gas emission reductions requires identifying baseline emissions levels and sources and activities generating emissions in the community. This report presents emissions from both the Pinecrest community as a whole, and from operations of the Village of Pinecrest government. The government operations inventory is a subset of the community inventory, as shown in Figure 2. For example, data on commercial energy use by the community includes energy consumed by municipal buildings, and community vehicle-miles-traveled estimates include miles driven by municipal fleet vehicles.

Figure 2 Relationship of Community and Government Operations Inventories

As local governments have continued to join the climate protection movement, the need for a standardized approach to quantify GHG emissions has proven essential. This inventory uses the approach and methods provided by the U.S. Community Protocol for Accounting and Reporting Greenhouse Gas Emissions (Community Protocol) and the Local Government Operations Protocol for Accounting and Reporting Greenhouse Gas Emissions (LGO Protocol), both of which are described below.

Three greenhouse gases are included in this inventory: carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). Many of the charts in this report represent emissions in "carbon dioxide equivalent" (CO_2e) values, calculated using the Global Warming Potentials (GWP) for methane and nitrous oxide from the IPCC 5th Assessment Report:

Table 1 Global Warming Potential Values (IPCC, 2014)

Greenhouse Gas	Global Warming Potential
Carbon Dioxide (CO_2)	1
Methane (CH_4)	28
Nitrous Oxide (N_2O)	265

Community Emissions Protocol

Version 1.2 of the U.S. Community Protocol for Accounting and Reporting GHG Emissions[3] was released by ICLEI in 2019, and represents a national standard in guidance to help U.S. local governments develop effective community GHG emissions inventories. It establishes reporting requirements for all community GHG emissions inventories, provides detailed accounting guidance for quantifying GHG emissions associated with a range of emission sources and community activities, and provides a number of optional reporting frameworks to help local governments customize their community GHG emissions inventory reports based on their local goals and capacities.

The community inventory in this report includes emissions from the five Basic Emissions Generating Activities required by the Community Protocol. These activities are:

- Use of electricity by the community
- Use of natural gas by the community
- On-road passenger and freight motor vehicle travel
- Use of energy in potable water and wastewater treatment and distribution
- Generation and processing of solid waste by the community

The community inventory also includes the following activities:

- Other wastewater treatment activities

Local Government Operations Protocol

In 2010, ICLEI, the California Air Resources Board (CARB), and the California Climate Action Registry (CCAR) released Version 1.1 of the LGO Protocol.[4] The LGO Protocol serves as the national standard for quantifying and reporting greenhouse emissions from local government operations. The purpose of the LGO Protocol is to provide the principles, approach, methodology, and procedures needed to develop a local government operations greenhouse gas emissions inventory.

The following activities are included in the LGO inventory:

- Electricity consumption from buildings & facilities
- On-road transportation from employee commute and vehicle fleet
- Solid waste generated by government operations

[3] ICLEI. 2012. US Community Protocol for Accounting and Reporting Greenhouse Gas Emissions. Retrieved from http://www.icleiusa.org/tools/ghg-protocol/community-protocol

[4] ICLEI. 2008. Local Government Operations Protocol for Accounting and Reporting Greenhouse Gas Emissions. Retrieved from http://www.icleiusa.org/programs/climate/ghg-protocol/ghg-protocol

Quantifying Greenhouse Gas Emissions

Sources and Activities

Communities contribute to greenhouse gas emissions in many ways. Two central categorizations of emissions are used in the community inventory: 1) GHG emissions that are produced by "sources" located within the community boundary, and 2) GHG emissions produced as a consequence of community "activities".

Source	Activity
Any physical process inside the jurisdictional boundary that releases GHG emissions into the atmosphere	The use of energy, materials, and/or services by members of the community that result in the creation of GHG emissions.

By reporting on both GHG emissions sources and activities, local governments can develop and promote a deeper understanding of GHG emissions associated with their communities. A purely source-based emissions inventory could be summed to estimate total emissions released within the community's jurisdictional boundary. In contrast, a purely activity-based emissions inventory could provide perspective on the efficiency of the community, even when the associated emissions occur outside the jurisdictional boundary. The division of emissions into sources and activities replaces the scopes framework that is used in government operations inventories, but that does not have a clear definition for application to community inventories.

Base Year

The inventory process requires the selection of a base year with which to compare current emissions. Pinecrest's community greenhouse gas emissions inventory utilizes 2018 as its baseline year, because it is the most recent year for which the necessary data are available.

Quantification Methods

Greenhouse gas emissions can be quantified in two ways:

1. Measurement-based methodologies refer to the direct measurement of greenhouse gas emissions (from a monitoring system) emitted from a flue of a power plant, wastewater treatment plant, landfill, or industrial facility.
2. Calculation-based methodologies calculate emissions using activity data and emission factors. To calculate emissions accordingly, the basic equation below is used: Activity Data x Emission Factor = Emissions

Most emissions sources in this inventory are quantified using calculation-based methodologies. Activity data refer to the relevant measurement of energy use or other greenhouse gas-generating processes such as fuel consumption by fuel type, metered annual electricity consumption, and annual vehicle miles traveled. Please see appendices for a detailed listing of the activity data used in composing this inventory.

Known emission factors are used to convert energy usage or other activity data into associated quantities of emissions. Emissions factors are usually expressed in terms of emissions per unit of activity data (e.g. lbs CO_2/kWh of electricity). For this inventory, calculations were made using ICLEI's ClearPath tool.

Community Emissions Inventory Results

The total communitywide emissions for the 2018 inventory are shown in Table 2 and Figure 3.

Table 2 Communitywide Emissions Inventory

Sector	Fuel or source	2018 Usage	Usage unit	2018 Emissions ($MTCO_2e$)
Residential energy	Electricity (Florida Power & Light)	96,988.06	mWh	29,706
	Natural Gas (Florida City Gas)	18,692.16	therms	99
			Residential energy total	**29,805**
Commercial energy	Electricity	102386.9	mWh	31,359
			Commercial energy total	**31,359**
On-road transportation	Passenger Vehicles & Light Trucks (Gasoline)	131,393,162.66	vehicle miles	54,462
	Passenger Vehicles, Light Trucks, And Heavy Trucks (Diesel)	9,889,807.94	vehicle miles	13,774
Transit use	Tri-Rail (Diesel)	4,869.72	gallons	50
Air Transport	Passenger Travel (Jet Kerosene)	4,768,634.72	gallons	46,064
			Transportation total	**114,350**
Solid Waste	Landfilled	5,768.53	short tons	7,119
	Combusted	23,096.72	short tons	1,999
			Solid waste total	**9,118**
Water and wastewater	Digester Gas Combusted	7,754.38	standard cubic ft/day	0.84
	Digester Gas Flared	4,990.94	standard cubic ft/day	26
	Nitrogen Effluent Discharge	515.3	kg/day	397.2
	Nitrous Oxide Emissions	0.078	metric tons	20.62
			Water and wastewater total	**446**
			Total communitywide emissions	**185,153**

Figure 3 shows the distribution of communitywide emissions by sector. Transportation & mobile sources is the largest contributor, followed by residential and commercial energy.

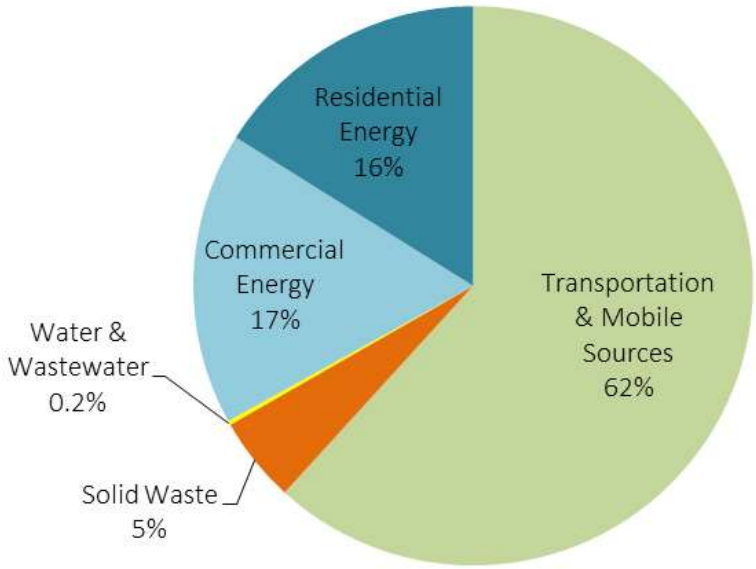

Figure 3 Communitywide Emissions by Sector

Next Steps

The inventory results should be used to focus and prioritize actions to reduce emissions. Based on the inventory results, the following areas have the greatest potential for emissions reduction:

- Install more bike lanes on arterial and collector roads to encourage cycling
- Create and host a carpool match system
- Advocate for increased frequency and efficiency of the transit system through participation in regional transportation planning efforts
- Encourage businesses to utilize virtual conferencing software for meetings to reduce unnecessary air travel
- Research the feasibility of Community Choice Aggregation to increase renewable energy usage
- Create and distribute educational materials to residents and businesses on how to increase energy efficiency, emphasizing the potential cost-savings

Completion of another GHG inventory in two to five years is recommended in order to assess progress resulting from any actions implemented. The detailed methodology section of this report, as well as the master data Excel file provided to the Village of Pinecrest, will be helpful to complete a future inventory consistent with this one.

Government Operations Emissions Inventory Results

Government operations emissions for 2018 are shown in Table 3 and Figure 4.

Table 3 Local Government Emissions Inventory

Sector	Fuel or source	2018 Usage	Usage unit	2018 Emissions ($MTCO_2e$)
Buildings & Facilities	Electricity	2,406,233	kWh	736
Vehicle Fleet	Gasoline (on-road)	42,294	gallons	373
Employee Commute	Gasoline	997,008	vehicle-miles	395
Solid Waste	Government-generated waste	795.6	short tons	245
			Total government emissions	**1,749**

Figure 4 shows the distribution of emissions among the four sectors included in the inventory. Buildings and facilities represents the vast majority of emissions, followed by vehicle fleet and employee commute. Public street lights/traffic signals and water & wastewater treatment facilities account for a very small portion of emissions.

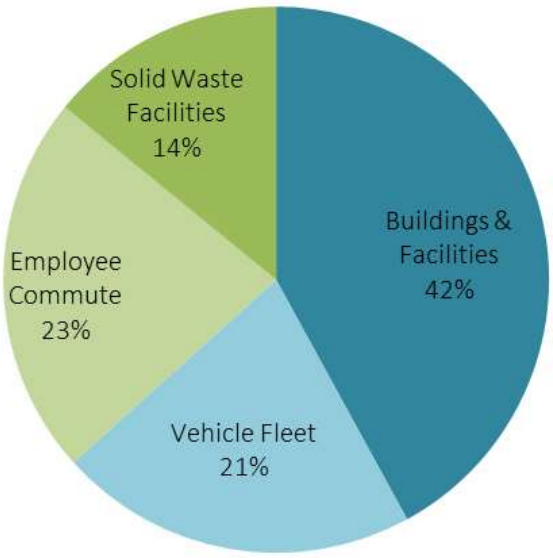

Figure 4 Local Government Operations Emissions by Sector

Next Steps

The local government operations emissions inventory points to a need for energy conservation and greater use of low-carbon transportation options, as energy use, employee commute, and vehicle fleet account for over 86% of emissions. The following are some steps that the Village of Pinecrest could take to reduce emissions from municipal activities:

- Identify opportunities to retrofit government buildings and facilities for energy efficiency
- Educate Village staff on how to conserve energy and water
- Certify as a SolSmart Community
- Create incentives and requirements for solar energy systems
- Adopt requirements for new construction of Village buildings that maximize energy efficiency (e.g. LEED criteria) and on-site energy production (e.g. solar)
- Identify opportunities for onsite energy production and energy retrofits on existing government buildings
- Install LEDs and auto shut-off lights in government buildings
- Develop requirements for "right-sizing" the fleet and purchasing electric/hybrid vehicles as much as possible
- Develop requirements for employee activities that involve using a vehicle, such as more efficient route design and efficient driving behavior. Utilize the GIS systems to identify behavior and policy modification options. Install systems that allow vehicles to use auxiliary systems without idling engines.
- Encourage staff to utilize virtual conferencing to replace in person off-site meetings as much as possible.
- Facilitate a carpooling program that matches employees with each other based on commute route and work schedule
- Offer a subsidy for commuters who choose to carpool, bike, or take transit. Many respondents said they would be more likely to carpool, bike, or take transit if there was a subsidy
- Start a Guaranteed Ride Home program that ensures employees will be able to get home if there is an emergency or an unexpected barrier to taking transit or carpooling home on any given day.
- Install more electric vehicle charging stations at all government buildings and develop a policy to allow for employees to charge personal vehicles.
- Allow flexibility in work schedules for employees, if appropriate for their position and responsibilities, such as an alternative work schedule (4/10 or 9/80) and/or to telework a certain number of days per year.

Conclusion

This inventory marks completion of Milestone One of the Five ICLEI Climate Mitigation Milestones. The next steps are to forecast emissions, set an emissions reduction target, and build upon the existing Climate Action Plan with more quantified strategies that can cumulatively meet that target. In addition, Pinecrest should continue to track key energy use and emissions indicators on an on-going basis. ICLEI recommends updating the inventory at least every five years to measure emissions reduction progress. Furthermore, ICLEI offers the Contribution Analysis tool, which will allow Pinecrest to more accurately determine what influences changes in emissions over time. As Pinecrest is an ICLEI member, the community will continue to have access to Clearpath and can utilize the forecasting, planning, and monitoring modules for next steps following this inventory.

This inventory shows that communitywide energy use and transportation patterns will be particularly important to focus on. Fortunately, Pinecrest is almost entirely powered by the grid (as opposed to natural gas), which means that any effort to make the grid cleaner will result in substantial emissions reductions. Pinecrest also has relatively flat terrain and comfortable weather for most of the year, which are conditions that the Village can leverage in efforts to encourage more walking and bicycling. Through these efforts and others, the Village of Pinecrest can achieve additional environmental, economic, and social benefits beyond reducing emissions.

Appendix: Methodology Details

Energy

The following table shows each activity related to energy consumption, data source, and notes on data gaps. The emissions factors used for electricity are provided in Table 5.

Table 4 Energy Data Sources

Activity	Data Source	Data Gaps/Assumptions
Communitywide		
Residential & commercial electricity consumption	Florida Power & Light	Florida Power & Light did not provide data for 2018. Consistent with previous inventories, Miami-Dade County electricity consumption data was scaled down to Pinecrest's population (Pinecrest accounts for 0.69% of Countywide Activity).
Residential & commercial natural gas consumption	Florida City & Gas	Florida City Gas did not provide data for 2018, so the number from the 2012 inventory was extrapolated to 2018 using a per-capita value.
Local Government Operations		
Electricity consumption in buildings & facilities	Florida Power & Light	It assumed that these numbers include electricity used for public street lights and traffic signals.

Table 5 Emissions Factors for Electricity Consumption

Year	CO_2 (lbs./MWh)	CH_4 (lbs./GWh)	N_2O (lbs./GWh)
2018	671	66	9
Note: Florida Power & Light reports a CO2 emission factor, but does not report emissions factors for CH4 and N2O, so the EPA's Emissions & Generation Resource Integrated Database (eGRID)[5] 2018 values were used for those gases.			

[5] EPA. Emissions & Generation Resource Integrated Database (eGRID). https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid

Transportation

Table 6 Transportation Data Sources

Activity	Data Source	Data Gaps/Assumptions
Communitywide		
Vehicle miles travelled	Miami-Dade County	Consistent with previous inventories, Miami-Dade County's VMT and transit ridership were scaled down to Pinecrest's population (Pinecrest accounts for 0.69% of Countywide Activity).
Transit ridership	Miami-Dade County	
Local Government Operations		
Government vehicle fleet	Office of the Village Manager	Fuel types were not provided, but vehicle types were provided and they were all vehicles that typically use gasoline. Thus, it is assumed that the vehicle fleet only uses gasoline.
Employee commute	Office of the Village Manager	Estimated annual vehicle miles traveled using employee zip codes, average number of working days a year, and the distance from those zip codes to the main government building.

For vehicle transportation, it is necessary to apply average miles per gallon and emissions factors for CO_2, CH_4 and N_2O to each vehicle type. The factors used are shown in Table 7.

Table 7 MPG[6] and Emissions Factors[7] by Vehicle Type

Fuel	Vehicle type	MPG	g CO_2/gal	g CH_4/mile	g N_2O/mile
Gasoline	Passenger car	24.21	8,310	0.0186	0.0093
Gasoline	Light truck	17.52	8,310	0.201	0.0167
Diesel	Passenger car	24.21	10,210	0.0005	0.001
Diesel	Light truck	17.52	10,210	0.001	0.0015
Diesel	Heavy truck	6.22	10,210	0.0051	0.0048

Water & Wastewater

Table 8 Water & Wastewater Data Sources

Activity	Data Source	Data Gaps/Assumptions
Communitywide & Local Government Operations		
Nitrogen Effluent Discharge	Miami-Dade County	Consistent with previous inventories, Miami-Dade County's wastewater and water treatment activity data was scaled down to Pinecrest's population (Pinecrest accounts for 0.69% of Countywide Activity).
Nitrous Oxide Process Emissions		
Digester Gas Combustion/Flaring		
Energy used for water and wastewater processes		

[6] Federal Highway Administration (2018). Highway Statistics. http://www.fhwa.dot.gov/policyinformation/statistics.cfm

[7] Derived from EPA (2018). Emissions Factors for Greenhouse Gas Inventories. https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf

Solid Waste

Table 9 Solid Waste Data Sources

Activity	Data Source	Data Gaps/Assumptions
Communitywide		
Combustion of solid waste	Miami-Dade County	Consistent with previous inventories, Miami-Dade County's solid waste activity data was scaled down to Pinecrest's population (Pinecrest accounts for 0.69% of Countywide Activity). Used Miami-Dade's 2017 waste characterization values to estimate emissions from landfilled solid waste (see table 10).
Landfilled solid waste		
Local Government Operations		
Solid waste generation	Office of Village Manager	Based on number of dumpster pick-ups, size of the dumpsters, and an average weight of dumpsters. Used Miami-Dade's 2017 waste characterization values (see table 10).

Table 10 Waste Characterization for Miami-Dade County (2017)

Waste Type	Percentage	CH4/wet short ton waste[8]
Mixed Municipal Solid Waste	22.23%	0.060
Newspaper	4.952%	0.043
Office Paper	4.313%	0.203
Corrugated Cardboard	9.536%	0.120
Magazines/Third Class Mail	9.716%	0.049
Food Scraps	3.664%	0.078
Grass	4.344%	0.038
Leaves	4.344%	0.030
Branches	4.344%	0.062

Inventory Calculations

The 2018 inventory was calculated following the US Community Protocol and ICLEI's ClearPath software. As discussed in Inventory Methodology, the IPCC 5th Assessment was used for global warming potential (GWP) values to convert methane and nitrous oxide to CO_2 equivalent units. ClearPath's inventory calculators allow for input of the sector activity (e.g. kWh or VMT) and emission factor to calculate the final CO_2e emissions.

[8] MSW factor: EPA (1998). U.S. EPA Emission Factor Database, Chapter 2.4 Municipal Solid Waste Landfills.

Other factors: EPA (2019)—Exhibit 6 of Documentation for Greenhouse Gas Emission and Energy Factors Used in the Waste Reduction Model (WARM). https://www.epa.gov/sites/production/files/2019-06/documents/warm_v15_management_practices.pdf

Exhibit B

Pinecrest

Created by
Office of the Village Manager

6/1/23

Draft

CHAPTER 10: CLIMATE CHANGE ELEMENT (Reference §163.3177(6)(g), F.S.)

§10-1: CLIMATE CHANGE GOALS, OBJECTIVES, AND IMPLEMENTING POLICIES. This section stipulates goals, objectives, and implementing policies for the Climate Change Element pursuant to ¶163.3177(6)(g)(10), F.S., and 163.3178, F.S.

Goal 10-1: SUSTAINABILITY, RESILIENCY, AND ENERGY EFFICIENCY. Achieve a sustainable, climate resilient community through the promotion of energy efficiency and greenhouse gas reduction strategies; by protecting and adapting public infrastructure, services, natural systems and resources from climate change impacts; and by continuing to coordinate and communicate locally and regionally to monitor and address the changing needs and conditions of the Village of Pinecrest.

Objective 10-1.1: GREENHOUSE GAS EMISSIONS REDUCTION, RENEWABLE ENERGY, PRODUCTION AND DISTRIBUTION. Mitigate the causes of climate change while providing for cleaner energy solutions and a more energy efficient way of life for residents and visitors.

Policy 10-1.1.1: Greenhouse Gas Emission Reduction. The Village of Pinecrest shall mitigate its contribution to global climate change by reducing government operations greenhouse gas emissions to 7% below 1997 levels by 2014. The Village will continue to regularly monitor and track progress of programs and initiatives that contribute to the ultimate reaching of these goals.

Policy 10-1.1.2: Develop Building Standards to Promote Alternative and Renewable Energy Sources. The Village of Pinecrest shall develop building and tree placement standards that promote increases in the proportion of electricity generated by solar energy sources within the community and shall monitor the initiatives of Miami-Dade County and other regional agencies in the development of other renewable sources for use within South Florida including wind, geothermal and ocean energy technologies.

Policy 10-1.1.3: Work with Legislative Representatives to Reduce Regulatory Encumbrances and Develop Incentives for Renewable and Alternative Energy Installations. The Village of Pinecrest shall, by 2016 promote and support the expansion of alternative and renewable energy from residential, commercial and municipal properties by working with legislative representatives to reduce regulatory encumbrances and to develop incentives for renewable and alternative energy installations.

Policy 10-1.1.4: Continue Expedited Permitting of Alternative Fuel and Electric Vehicle Charging Infrastructure. The Village of Pinecrest shall continue its expedited permitting processes for private installation of alternative fuel and electric vehicle charging infrastructure.

Policy 10-1.1.5: Require Permeable Driveways. Require new construction, redevelopment, additions, retrofits or modifications of property to incorporate permeable driveways consisting of porous concrete, open cell unit pavers (turf block), flagstone, or brick pavers; reduce total impervious area; and employ other techniques to reduce run-off, capture and reuse rain water, allow the infiltration of water into the underlying soil, and recharge the Biscayne Aquifer.

Objective 10-1.2: MITIGATION, PROTECTION AND ADAPTATION WITHIN THE BUILT ENVIRONMENT. Improve the climate resiliency and energy-efficiency of new and existing buildings and public infrastructure including municipal buildings.

Policy 10-1.2.1: Encourage Greener, Climate Resilient Construction. The Village of Pinecrest shall, by 2016, encourage greener, more efficient and climate resilient construction practices locally by:

a) Building all new construction of village-owned facilities to published Leadership in Energy and Environmental Design™ (LEED) standards; Florida Green Building Coalition (FGBC) green building standards, or Green Building Initiative (GBI) Green Globes rating standards;

b) Requiring licensed personnel in the Building and Planning Department to maintain LEED Green Associate certification and obtain at least 8 continuing education units (CEUs) of emerging energy efficiency and renewable energy technologies by 2016;

c) Re-evaluating finish floor elevation standards with respect to projected sea level rise scenarios and flooding potential following completion of a comprehensive stormwater basin master plan.

d) Looking for opportunities to access reclaimed and reuse water at municipal facilities and to retrofit municipal buildings to incorporate more sustainable building solutions to improve energy efficiency

Policy 10-1.2.2: Complete a Vulnerability Assessment for the Identification of Property and Infrastructure at Risk from Sea Level Rise. The Village of Pinecrest shall complete a vulnerability assessment to further identify property, public investments and infrastructure at risk from sea level rise, storm surge, groundwater contamination and other climate change related impacts by 2016, and shall update this assessment periodically as new sea level rise projections are published. Specifically, the Village shall complete a stormwater vulnerability assessment to further analyze vulnerability to facilities and services, including but not limited to: property; buildings; water and sewer lines; stormwater systems; roads, bridges, and all transportation infrastructure; electric sub stations; and municipal offices and facilities.

Objective 10-1.3: MITIGATION, PROTECTION AND ADAPTATION WITHIN THE TRANSPORTATION SYSTEM. Enhance transportation choices that reduce fossil fuel use, improve the mobility of people, goods and services; provide a diverse, efficient, and equitable choice of transportation options; and increase the Village's resiliency to the impacts of climate change.

Policy 10-1.3.1: Minimize Environmental Impacts Associated With Construction of New Roadways. New roadways shall be designed to prevent and control soil erosion, minimize clearing and grubbing operations, minimize storm runoff, minimize exposure and risk of climate change impacts such as increased flood conditions, and avoid unnecessary changes in drainage patterns.

Policy 10-1.3.2: Diversify Fuel Options for Fleet Vehicles. The Village of Pinecrest shall continue to support initiatives which seek to diversify fuel options for fleet vehicles, and expand infrastructure for charging electric and hybrid electric vehicles.

Policy 10-1.3.3: Enhance Bicycle and Pedestrian Mobility. Improve pedestrian and bicycle mobility and connectivity throughout the Village of Pinecrest while avoiding loss of mature street trees as feasible.

Policy 10-1.3.4: Prepare a Multi-Modal Transportation Plan for the Village of Pinecrest. Complete a multi-modal transportation plan to examine options for traffic calming and expanding availability of mass transit within the Village of Pinecrest.

Policy 10-1.3.5: Complete a Bicycle and Pedestrian Mobility Plan to Enhance Access and Connectivity Adjacent to Pinecrest Parkway. Complete a Bicycle and Pedestrian Mobility Plan for the improvement of pedestrian and bicycle connectivity adjacent to Pinecrest Parkway.

Objective 10-1.4: Water, Sewer and Solid Waste. Coordinate with Miami-Dade County in the improvement of the resiliency of existing water resources, and water and wastewater infrastructure to the impacts of climate variability and change in order to protect future water quality and minimize the potential for flood damage and water shortages.

Policy 10-1.4.1: Identify Septic Tanks at Risk of Malfunctioning and Causing Contamination. The Village of Pinecrest shall coordinate with the Miami-Dade County Department of Regulatory and Economic Resources, Division of Environmental Resource Management (DERM) to identify any existing septic tanks that may be currently at risk of malfunctioning due to high groundwater levels or flooding and shall develop programs to abandon these systems and/or connect users to the public sewer system. Properties connected to tidal waters through the Snapper Creek canal, located downstream of the Snapper Creek S-22 Salinity Control Structure shall be considered priority shall be connected to the sanitary

collection system as soon as possible to prevent sanitary nuisance conditions and water quality violations and or failure of private septic systems that discharge into the groundwater in this area.

Policy 10-1.4.2: Identify Wells at Risk of Malfunctioning and Contamination. The Village of Pinecrest shall identify existing water wells that may be currently at risk of malfunctioning or contamination due to high groundwater levels or flooding and shall develop programs to abandon these systems and/or connect users to the public water system.

Policy 10-1.4.3: Complete the Phase III Potable Water Project. Coordinate with Miami-Dade County in the completion of Phase III of the Village's potable water system as necessary to provide potable central water service to all properties in the Village of Pinecrest.

Policy 10-1.4.4: Manage, Reduce and Reuse Stormwater Runoff. The Village shall continue to develop regulations that require new construction, and redevelopment to manage stormwater runoff, incorporate porous materials, reduce total impervious area, and employ other techniques to reduce runoff, capture and reuse rainwater, and recharge the Biscayne Aquifer.

Objective 10-1.5: MITIGATION, PROTECTION AND ADAPTATION WITHIN THE NATURAL ENVIRONMENT. Protect and enhance the Village's natural environment as necessary to maintain a healthy, enjoyable, and climate resilient environment.

Policy 10-1.5.1: Complete a Tree Canopy Survey. The Village of Pinecrest, in cooperation with local academic, governmental and non-profit agencies, shall perform a tree canopy study by 2016 to determine canopy composition and extent, and seek funds to repeat the study every five years in order to measure progress toward the Village's goal of expanding green infrastructure and maintaining Tree City USA status.

Policy 10-1.5.2: Plant Native Trees to Sequester High Levels of Carbon. Pinecrest shall continue to encourage and require the planting of native and other drought tolerant trees known to sequester and store high levels of carbon on available public and private lands, including school and government properties, and conservation lands and shall pursue programs and funding strategies designed to create carbon emission offsets through tree plantings and/or carbon mitigation programs.

Objective 10-1.6: ADAPTATION ACTION STRATEGIES. Develop and implement adaptation strategies for the Village of Pinecrest to address impacts associated with coastal flooding, tidal events, storm surge, flash floods, stormwater runoff, salt water intrusion and other impacts related to climate change or exacerbated by sea level rise with the intent to increase the Village's comprehensive adaptability and resiliency capacities.

Policy 10-1.6.1: Options. Adaptation Action Areas adaptation strategy options may include but not be limited to:

a. Protection
b. Accommodation
c. Managed Retreat
d. Avoidance
e. Other Options

Policy 10-1.6.2: Collaborate with the South Florida Water Management District in the Review of Policies Regarding Operation of Flood Control Structures. Work in collaboration with the South Florida Water Management District to review, develop and implement strategies to address impacts of rising sea levels on the operation of the flood and salinity control structures at the S22 and S123 outfalls.

Policy 10-1.6.3: Backflow Preventers. Consider the installation of backflow preventers on drainage systems that discharge to Biscayne Bay or drainage canals, coordinating with Miami-Dade County DERM as necessary or required.

Policy 10-1.6.4: Reassess the Village's Required Minimum Finished Floor Elevation. Consider increasing the minimum required ~~base flood~~ finished floor elevation of all new structures within designated Adaptation Action Areas by one additional foot (freeboard).

Policy 10-1.6.5: Stormwater Drainage Infrastructure. Construct additional stormwater drainage infrastructure necessary to accommodate projected increases in stormwater including drainage wells, injection wells, swales, French drains, and other related structures as recommended in the Village's Stormwater Master Plan.

Policy 10.1.6.6: Collaborate with Governmental Agencies in the Implementation of Mitigation Strategies. Collaborate and coordinate with appropriate local, regional, and state governmental agencies including the City of Coral Gables, Miami-Dade County, the South Florida Water Management District, and the South Florida Regional Planning Council toward the implementation of Adaptation Action Area adaptation strategies.

Policy 10.1.6.7: Consider the Creation and Mapping of a Regulatory Floodway along the Cutler Drain (C-100 canal) and SW 70 Canal. Consider creation and mapping of the floodway to allow the creation and preservation of floodplain storage and future flow paths, delineated by the 100-year storm map inundated areas, shown on Figure 10 of the Data, Inventory and Analysis, hereby adopted by reference.

Policy 10.1.6.8: Reduce Chloride Contamination of the Village's Freshwater Aquifer Resources. Amend the Village's Land Development Regulations to prevent excavation of lakes and canals in the Village in instances where such excavations would penetrate the projected 250 parts per million isochlor as the salt front migrates westward along the

aquifer base within the Village.

Policy 10-1.6.9: Review the County's established Salt Barrier Line. Coordinate with Miami-Dade County in the review of the Salt Barrier Line as previously established for the segment of the line located between the Village and Biscayne Bay to help identify measures and improvements necessary to protect against salt water intrusion in the area of the established line.

Objective 10-1.7: ADAPTATION ACTION AREAS. The Village of Pinecrest shall continue to identify and designate Adaptation Action Areas as provided by Section 163.3164(1), Florida Statutes, and develop policies for adaptation as required for the protection of areas and facilities in the Village of Pinecrest that are vulnerable to the impacts of rising sea levels and climate change.

Policy 10-1.7.1: Areas for Consideration. Consideration of Adaptation Action Areas designation shall include but shall not be limited to:

a. Areas which have a hydrological connection to coastal waters and are vulnerable to flooding.
b. Locations which are within areas designated as evacuation areas for storm surge.
c. Other areas impacted by stormwater/flood control issues.

Policy 10-1.7.2: Basis for Designation. As the basis for the designation of Adaptation Action Areas, the Village will continue to utilize the best available data and resources such as the Unified Sea level Rise Projection for Southeast Florida in order to identify the risks and vulnerabilities associated with climate change and sea level rise and opportunities to formulate timely and effective adaptation strategies.

Policy 10-1.7.3: Adaptation Action Areas Identified. Those Areas as identified in Figure 11 of the data, Inventory and Analysis, *Adaptation Action Areas*, that are projected to be impacted by 6 or More Inches of Flooding, are hereby adopted and designated as Adaptation Action Areas.

Objective 10-1.8: INTERAGENCY COORDINATION. Continue to coordinate with Governmental agencies within the South Florida region and other non-governmental entities and academic institutions in the ongoing assessment of existing and projected conditions related to our changing climate and rising sea levels, and continue to collaborate as necessary in the identification and development of effective solutions and strategies to adapt and improve resiliency.

Policy 10-1.8.1: Continue Coordination with Miami-Dade County and Other Participating Counties in the Identification of Modeling Resources and in the Development of Goals, Objectives, and Policies to Address Climate Change. The Village

of Pinecrest shall coordinate with Miami-Dade County and other participating counties in the Southeast Florida Regional Climate Change Compact in the identification of modeling resources and in the development of initiatives and goals to address climate change. Additional climate change related objectives and policies that support regional climate change goals shall be integrated into the Comprehensive Development Master Plan as appropriate.

Policy 10-1.8.2: Continue To Coordinate With Other Governmental and Academic Entities In The Ongoing Analysis of Sea Level Rise. The Village of Pinecrest shall continue to coordinate regionally with Southeast Florida counties and municipalities, academia, and state and federal government agencies in the analysis of sea level rise, drainage, storm surge and hurricane impacts and the planning of mitigation and adaptation measures.

Policy 10-1.8.3: Continue To Monitor And Coordinate With The Southeast Florida Regional Climate Change Compact. The Village of Pinecrest shall continue to actively monitor the Southeast Florida Regional Climate Change Compact, and shall coordinate with neighboring municipalities to make our community more climate change resilient by sharing technical expertise, assessing regional vulnerabilities, advancing agreed upon mitigation and adaptation strategies, and developing policies and programs.