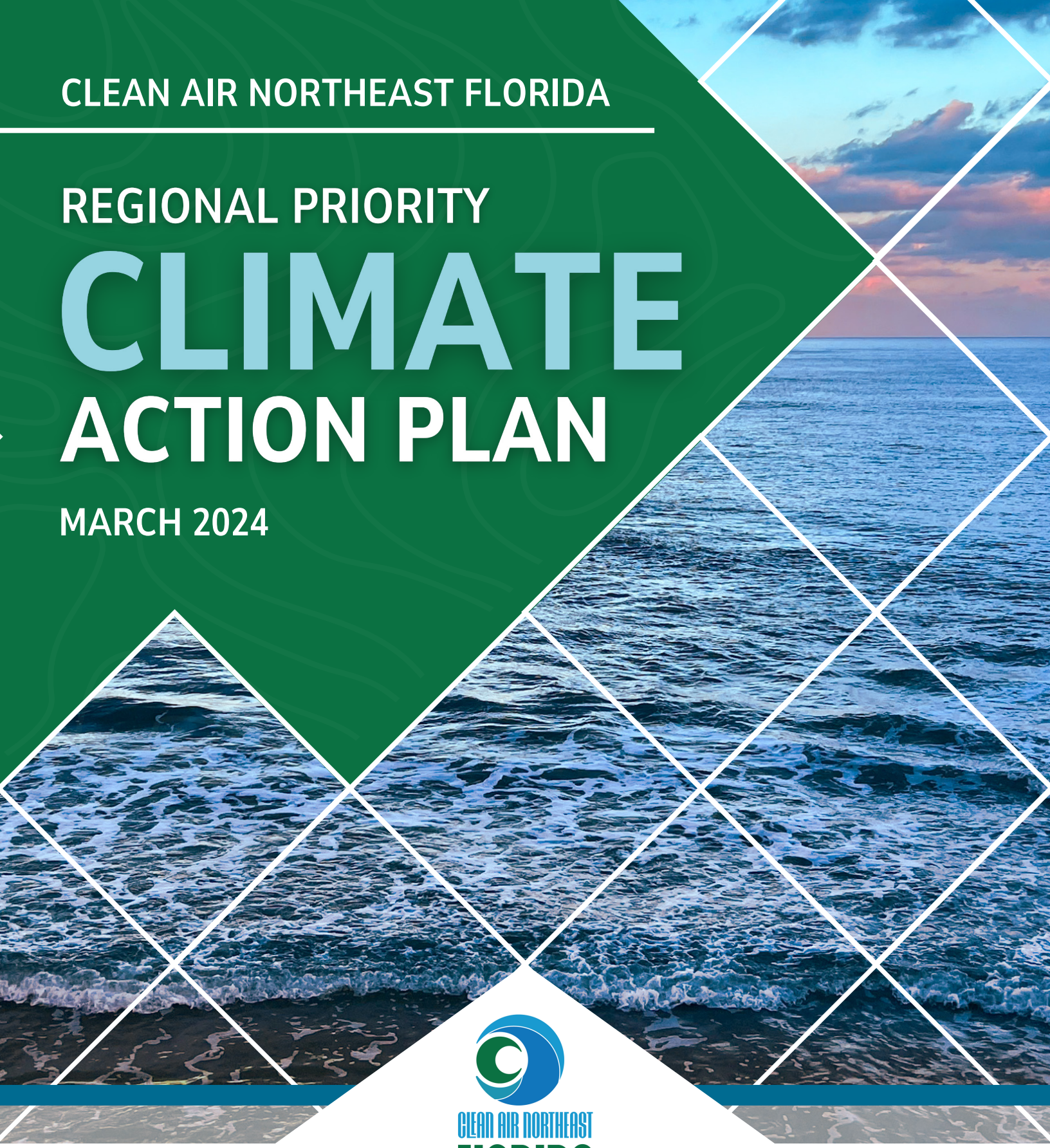
CLEAN AIR NORTHEAST FLORIDA

REGIONAL PRIORITY CLIMATE ACTION PLAN

MARCH 2024



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REGIONAL CLIMATE ACTION PLAN

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Clean Air Northeast Florida Regional Priority Climate Action Plan

March 2024

ACKNOWLEDGMENTS

The Priority Climate Action Plan lays the framework to combat climate change and its impacts in Northeast Florida by measuring, planning, and reducing greenhouse gas (GHG) emissions and related climatic impacts in the region. None of this would have been possible without the significant contributions in time, energy, and thought of many. We would like to sincerely thank the groups and individuals listed below for their support and contributions to the plan.

CLEAN AIR NORTHEAST FLORIDA STEERING COMMITTEE

Ashantae Green, Sustainability Manager, City of Jacksonville

James Richardson, EPB Program Administrator, City of Jacksonville

Judy Holm, Fuse Fellow, City of Jacksonville

Carly Smith, Sustainability Aide, City of Jacksonville

Naomi Braff, Community Rating System Coordinator, Nassau County

Westly Woodward, Principal Resiliency Planning Analyst, St. Johns County

Maeven Rogers, Sustainability and Resiliency Officer, City of Palm Coast

Elizabeth Johnson, Sustainability Specialist, City of St. Augustine

Christine Roken, Office Manager, Clay County

HANSON PROFESSIONAL SERVICES INC.

Steve Alm, PE, LEED AP

Christa Barsanti

Bill Bradford, PE,

Burns Bradford, PE

Mathew Coalson, CEM

Wade Conlan, PE, CxA, BCxP, LEED AP

Tad Gass, PG

Kalvin Kwan

Michelle Paul

Amanda Polematidis, PE, CxA, LEED AP BD+C

Nancy Miller

Griffin Reilly

Mark Scott, PE

Mandi Tucker

An Vo

Ross Volenec

ADDITIONAL WRITTEN CONTRIBUTIONS PROVIDED BY THE CLIMATE ACTION PLAN TEAM

Sarah Boren, MEM, LEED AP BD+C, Homes, and LEED for Cities and Communities Pro, Together Sustainable

Erin Deady, PA, Erin Deady Law

Cantrece Jones, Acuity Design Group, Inc.

SPECIFIC CONTRIBUTIONS AND SUPPORT

Fara Ilami, MS, PMP, NEFRC

Andrew Prokopiak, NEFRC

PARTNERS

Northeast Florida Regional Council

Crowley

Duval County Public Schools

Goodwill Industries of North Florida

Florida State College of Jacksonville

ICLEI

Fuse Corps

JaxUSA

JEA

Jacksonville Transit Authority

Jacksonville Port Authority

North Florida Transportation Planning Organization

Miller Electric

University of North Florida

Urban Sustainability Directors Network

Southeast Sustainability Directors Network

Subject Matter Expert (SME) Panelists

Darren Eakins, Alstom Rail Signaling

Dave McKee, JEA

Shannel Davis-Bryant, Sage Growth Solutions

Ben Moore, Reynolds, Smith & Hills

Josh Gellers
Ph.D., University of North Florida

Nikita Reed, City of Jacksonville

Miles Keogh
National Association of Clear Air Agencies

Americus Spencer-Harold
Spencer Constriction & Engineering

Melissa Long, City of Jacksonville

Alexander Traversa
Jacksonville Transportation Authority

Brian Matthews, City of Palm Coast

Bill Updike, Smart Surfaces Coalition

Northeast Florida Regional Council Working Group Members

Larry Arceneaux

Ian LaHiff

Sarah Reed

Charlie Latham

Lori Ann Santamaria

Doug Conkey

Dave McKee

Lauren Scott

Megan Covey

Naomi Braff

Lisa Sterling

Kelsey Cox

Sam Sullivan

Kay Ehas

Mark McManus

Angela TenBroeck

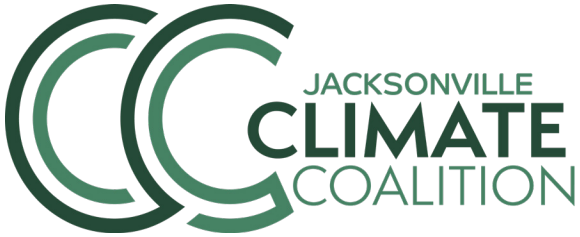
Arne Olsen

Todd Grant

Doug Peeters

Folks Huxford

Non-Governmental Organizations (NGOs) and Community Groups



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ABBREVIATIONS AND ACRONYMS

Abbreviations and Acronyms	Definition
AFOLU	Agriculture, Forestry, and Other Land Use
BAU	Business as Usual
BLTS	Bicycle Level of Traffic Stress
CAPs	Criteria Air Pollutants
CCAP	Comprehensive Climate Action Plan
CEJST	Climate and Economic Justice Screening Tool
CH_4	Methane
CIP	Capital Improvement Plan
CLAM	Conservation Lands Acquisition and Management
CNG	Compressed Natural Gas
CO_2	Carbon Dioxide
COAB	City of Atlantic Beach
COJ	City of Jacksonville
CPRG	Climate Pollution Reduction Grant
DCPS	Duval County Public Schools
DERs	Distributed Energy Resources
EJ	Environmental Justice
EPA	U.S. Environmental Protection Agency
EVs	Electric Vehicles
F.A.C.	Florida Administrative Code
FDOT	Florida Department of Transportation
FEECA	Florida Energy Efficiency and Conservation Act
F-gases	Fluorinated gases
FLIGHT	Facility Level Information on GHGs Tool
FPL	Florida Power and Light
FPUC	Florida Public Utilities Company
FY	Fiscal Year
GEI	Google's Environmental Insights
GHGs	Greenhouse Gases
GPC	Global Protocol for Community-Scale
HAPs	Hazardous Air Pollutants
HFCs	Hydrofluorocarbons
ICC	International Code Council
ICE	Internal Combustion Engine
IOUs	Investor-Owned Utilities
JAXPORT	Jacksonville Port Authority
JEA	Jacksonville Electric Authority
JTA	Jacksonville Transportation Authority
kWh	Kilowatt Hour
LEED	Leadership in Energy and Environmental Design

LFG	Landfill Gas
LIDACs	Low-Income and Disadvantaged Communities
LGGIT	EPA's Local GHG Inventory Tool
MARPOL	International Convention for the Prevention of Pollution from Ships
MSAs	Metropolitan Statistical Areas
MSW	Municipal Solid Waste
$mtCO_2e$	Metric Tons of Carbon Dioxide Equivalents
MW	Megawatts
MWh	Megawatt Hour
NEFL	Northeast Florida
NEFRC	Northeast Florida Regional Council
NF_3	Nitrogen Trifluoride
NOAA	National Oceanic and Atmospheric Administration
N_2O	Nitrous Oxide
NREL	National Renewable Energy Laboratory
OUC	Orlando Utilities Commission
P-ACBs	Permeable Articulating Concrete Blocks
PCAP	Priority Climate Action Plan
PSC	Florida Public Service Commission
RFLPP	Rural and Family Lands Protection Program
RMP	Risk Management Plan
RNG	Renewable Natural Gas
SF_6	Sulfur Hexafluoride
SLOPE	State and Local Planning for Energy
SME	Subject Matter Expert
SO_2	Sulfur Dioxide
SSO	Sanitary Sewer Overflow
UNF	University of North Florida
TECO	Tampa Electric Company
TPO	Transportation Planning Organization
UPWP	Unified Planning Work Program

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The Priority Climate Action Plan (PCAP) is a vital initial step in the journey toward sustainable environmental management, specifically tailored to Northeast Florida's unique context. As the inaugural deliverable to the United States Environmental Protection Agency (EPA) under the planning grant phase of Phase 1, the PCAP is a comprehensive narrative report. This report meticulously outlines a range of near-term, high-impact, implementation-ready actions to reduce greenhouse gases. Furthermore, it incorporates a detailed quantitative analysis of the expected reductions in greenhouse gases because of these actions.

Table 1 details all economic sectors' total NEFL GHG emissions in metric tons of carbon dioxide equivalents ($mtCO_2e$).

TABLE 1 NEFL GHG Emissions in $mtCO_2e$ by Sector

Sector	GHG Emissions, $mtCO_2e$
Transportation	7,372,833
Industry	1,905,683
Agriculture, Forestry, and Other Land Use	1,561,181
Residential	3,662,179
Commercial	3,861,188
Waste and Wastewater	709,861
Total	**18,402,469**

SECTORS	GREENHOUSE GASES ACROSS ALL SECTORS
Transportation and Mile Sources	**Carbon Dioxide (CO_2)**
Electricity Generation and/or Use	**Methane (CH_4)**
Agriculture, Forestry, and Other Land Use	**Nitrous Oxide (N_2O)**
Industrial	**Fluorinated Gases (F-gases), including:**
Solid Waste and Wastewater	**Hydrofluorocarbons (PFCs)**
Commercial and Residential Buildings	**Nitrogen Triflouride (NF_3)**
	Sulfur Hexafluoride (SF_6)

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INTRODUCTION

I. INTRODUCTION

Climate change presents an unprecedented challenge and opportunity for our region. As we stand at the crossroads of environmental uncertainty and technological advancement, the urgency to act has never been greater. The current state of our planet is a clear signal that the time for delay is over. The hazards and risks associated with inaction grow more daunting each day, threatening our communities, economies, and ecosystems with extreme weather events, rising sea levels, and devastating natural disasters. These challenges disproportionately impact the most vulnerable among us, laying bare the stark inequalities that pervade our societies.

In the face of these challenges, a profound opportunity exists to reshape our community for the better. We have the tools, the knowledge, and the collective will to implement greenhouse gas (GHG) reduction strategies that are not only effective but also equitable. By prioritizing actions that reduce emissions and enhance resilience, we can create a sustainable, just, and prosperous future for all. Our vision is clear: a world where progress and sustainability go hand in hand, where no one is left behind in the transition to a decarbonized economy. This is not just a vision; it is a necessity, a moral imperative that we must pursue with determination and hope. The time to act is now, and every step we take towards this goal brings us closer to a safer, healthier, and more equitable Northeast Florida region for future generations.

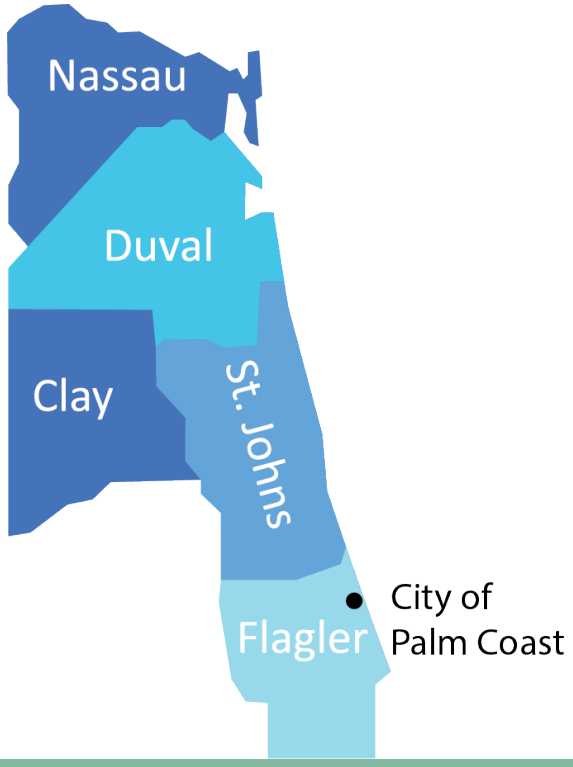

FIGURE 1

GEOGRAPHIC SCOPE OF NORTHEAST FLORIDA MSA

This creation of a Priority Climate Action Plan is a step forward in the Jacksonville Metropolitan Statistical Area (MSA). Made possible through a $1 million Non-competitive planning grant award through the EPA Climate Pollution Reduction Grants Program (CPRG). This four-year program emphasizes equity and regional collaboration across the MSA. The MSA is comprised of, Duval, Clay, St. Johns, Nassau Counties and the City of Palm Coast with deep collaboration with cities of Jacksonville, St. Augustine and Atlantic Beach.

Located in Northeast Florida, Jacksonville MSA is uniquely positioned to leverage the resources of the EPA's Climate Pollution Reduction Grant as momentum in regional sustainability and resilience leadership to accelerate positive change. As the lead entity, the City of Jacksonville is the largest city (by land mass) in the contiguous United States and largest municipality in the region. Jacksonville's current administration remains committed to championing significant actions to bring Jacksonville and the Northeast Florida region forward to mitigate climate impacts and adapt to climate change as quickly as possible, through sustainability and climate resilience measures.

The commitment is similar for the surrounding counties and cities comprising the MSA region, as seen with the onboarding of professional staff and city funded investments in sustainability and resilience measures. Funding through the CPRG has catalyzed current actions to accelerate efforts and propel the northeast Florida region to new and unprecedented levels. There are several major milestones in the region that are important to highlight regarding the alignment and synchronization with the goals of the CPRG:

- St Augustine hired a Chief Resiliency Officer in 2019
- The City of Jacksonville hired its first-ever Chief Resilience Officer in 2021, and published a comprehensive resilience plan "Resilient Jacksonville" in October 2023
- The City of Atlantic Beach Awarded LEED for Cities Gold Certification in 2022
- The City of Palm Coast hired its first-ever Chief Sustainability and Resiliency Officer in 2023
- The City of Jacksonville hired its first-ever Sustainability Manager in 2023
- St. Augustine hired its first-ever Sustainability Specialist in 2023
- St. Augustine hired a Chief Resiliency Officer in 2021
- The first-ever MSA-wide baseline GHG inventory was conducted and completed in January 2024
- Clean Air Northeast Florida Incentive was established in 2023 to serve as a regional resource for climate and sustainability information, collaboration, and action. The www.cleanairnortheastflorida.com website launched in February 2024.

As the grantee to the EPA's Climate Pollution Reduction Act Planning Grant, the City of Jacksonville has partnered with the Northeast Florida Regional Council to produce this PCAP to support investment in policies, practices, and technologies that reduce pollutant emissions, create high-quality jobs, spur economic growth, and enhance the quality of life in Northeast Florida. This project, a historic first for the area, has been funded by the EPA. The contents of this document do not necessarily reflect the views and policies of the EPA, nor does the EPA endorse trade names or recommend the use of commercial products mentioned in this document.

The measures contained herein should be construed as broadly available to any entity within the geographic scope of this PCAP eligible to receive funding under the EPA's CPRG Implementation Grant General Competition and other funding streams, as applicable.

This PCAP is organized into six sections:

1. Introduction
2. Greenhouse Gas (GHG) Emissions Inventory
3. Priority Measures
4. Low-Income/Disadvantaged Community Benefits Analysis
5. Coordination and Outreach
6. Conclusion

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GREENHOUSE GAS EMISSIONS INVENTORY

II. GREENHOUSE GAS EMISSIONS INVENTORY

Hanson Professional Services has developed an inventory of priority sources of GHG emissions within the Northeast Florida region. This data is built upon the governmental inventories that the Audubon Society worked to develop with each participating municipality. This inventory was prepared using the following data resource(s):

- EPA's Local GHG Inventory Tool (LGGIT)[1],
- Facility-specific GHG data published by the EPA in the Facility Level Information on Greenhouse Gases Tool (FLIGHT)[2],
- Data reported to the EPA's Greenhouse Gas Reporting Program[3]
- EPA's National Emissions Inventory[4]
- United States Department of Energy State and Local Planning for Energy (SLOPE) Platform[5]
- The World Resources Institute and World Business Council for Sustainable Development Global Protocol for Community-Scale (GPC) Greenhouse Gas Inventories[6]
- Data reported in the United States Census Bureau's data tables:
    - American Community Survey[7]
    - County Business Patterns[8]
- Data reported in the United States Energy Information Administration's State Profile and Energy Estimates[9]
- Google's Environmental Insights Platform[10]
- Florida's Department of Environmental Protection Report for MSW Management[11]
- Census data from the USDA National Agricultural Statistics Service[12]

The NEFL inventory includes the following sectors and gases:

SECTORS	GREENHOUSE GASES (ACROSS ALL SECTORS)
Transportation	Carbon Dioxide (CO_2)
Industry	Methane (CH_4)
Agriculture	Nitrous Oxide (N_2O)
Residential	Fluorinated Gases (F-gases), including:
Commercial	Hydrofluorocarbons (HFCs)
Solid Waste and Wastewater	Sulfur Hexafluoride (SF_6)
	Nitrogen Trifluoride (NF_3)

1. https://www.epa.gov/statelocalenergy/local-greenhouse-gas-inventory-tool
2. https://ghgdata.epa.gov/ghgp/main.do
3. https://www.epa.gov/ghgreporting/data-sets
4. https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei
5. https://maps.nrel.gov/slope
6. https://ghgprotocol.org/ghg-protocol-cities
7. https://data.census.gov/table?q=S1101andy=2019
8. https://data.census.gov/table?q=CBP2019.CB1900CBP
9. https://www.eia.gov/state/data.php?sid=FL
10. https://insights.sustainability.google/
11. https://floridadep.gov/sites/default/files/Baker_2019.pdf
12. https://www.nass.usda.gov/Publications/AgCensus/2017/

Table 2 details total Northeast Florida MSA GHG emissions in metric tons of carbon dioxide equivalents ($mtCO_2e$) for all economic sectors and counties.

TABLE 2 NEFL 2019 GHG Emissions in $mtCO_2e$ by Sector and County

SECTOR/COUNTY	SECTOR/COUNTY
Transportation	**7,372,833**
Baker County	249,443
Clay County	820,095
Duval County	3,287,934
Nassau County	761,343
City of Palm Coast	549,889
St. Johns County	1,704,129
Industry	**1,905,683**
Baker County	-
Clay County	-
Duval County	553,406
Nassau County	681,821
City of Palm Coast	-
St. Johns County	-
Agriculture, Forestry, and Other Land Use	**890,725**
Baker County	285,494
Clay County	131,536
Duval County	191,016
Nassau County	307,075
City of Palm Coast	17,590
St. Johns County	628,480
Residential	**3,662,179**
Baker County	53,863
Clay County	517,480
Duval County	2,300,950
Nassau County	158,659
City of Palm Coast	164,072
St. Johns County	467,155
Commercial	**3,861,188**
Baker County	29,557
Clay County	313,212
Duval County	2,996,265
Nassau County	104,750
City of Palm Coast	62,097
St. Johns County	355,307
Solid Waste and Wastewater[13]	**709,861**
Baker County	5,949
Clay County	113,792
Duval County	360,442
Nassau County	23,277
City of Palm Coast	9,538 + 9628
St. Johns County	187,225

13. Wastewater for Palm Coast, FL only

The following list highlights which sectors and counties will need the most focused reductions:

Residential and Commercial Buildings: Collectively, residential and commercial buildings are the largest contributors to GHG emissions in Northeast Florida, making up 41% of the sector-based inventory. This is primarily due to the high volume of residents and businesses in Duval County. Neighboring counties such as Clay and St. Johns also significantly contribute to emissions in this sector.

Transportation: Transportation is the second-largest contributor of GHG emissions after residential and commercial buildings. It makes up 40% of the sector-based inventory. Out of the regions analyzed, Duval and St. Johns Counties contribute the most due to high gasoline and diesel use.

Agriculture, Forestry, and Land: The agriculture, forestry, and land sectors comprise 8% of all GHG emissions. This is primarily due to more rural counties like St. Johns, Nassau, and Baker. A significant factor in this sector is the conversion of forests to settlements, grasslands, or wetlands.

Industry: The next largest contributor to GHG emissions is the industry sector, which makes up 7% of all emissions. All industrial activities take place in Duval County and Nassau County. The emissions from this sector include, but are not limited to, natural gas, oil, agricultural byproducts, and wood residuals.

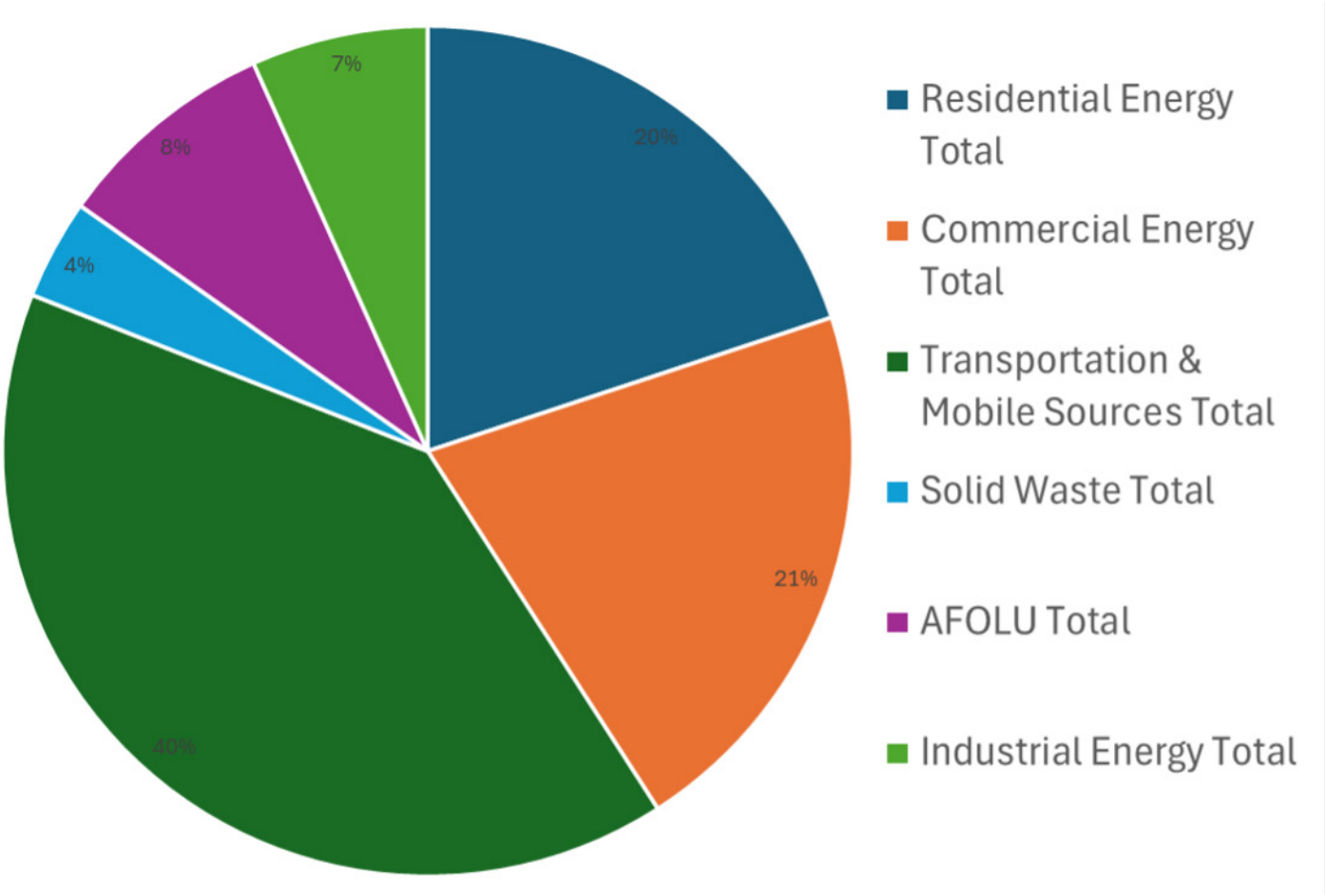
Waste and Materials Management: Solid waste is the smallest percentage of GHG emissions at 4%. This is highest in counties with many residents or an active tourism industry.

The residential, commercial, and transportation sectors account for 81% of emissions. Duval County contributes 45% of transportation emissions and 70% of residential and commercial emissions within these sectors. After Duval, St. Johns County has the second-highest emissions in these sectors.

This inventory is the basis for determining what reduction measures should be implemented to impact GHG emissions significantly.

FIGURE 2

NEFL GHG Emissions by Sector



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PRIORITY MEASURES

III. PRIORITY MEASURES

The measures in this section have been identified as "priority measures" for the purposes of pursuing funding through CPRG implementation grants. This list is not exhaustive of Northeast Florida's priorities. Instead, the selected priority measures included in this PCAP meet the following criteria:

- The measure is implementation-ready, meaning that the design work for the policy, program, or project is complete enough that a full scope of work and budget can be included in a CPRG implementation grant application.
- The measure can be completed in the near term, meaning that all funds will be expended, and the project completed within the five-year performance period for the CPRG implementation grants.
- The measure positively impacts low-income and disadvantaged (LIDAC) communities.
- The measure advances the following priorities:
  - Significant and sustained emission reductions,
  - Maximizing reach to the entire MSA, and
  - Public health.

Table 3 on the following page summarizes NEFL PCAP priority measures. Based on the GHG emissions inventory, commercial and residential buildings and transportation are the highest contributing categories. Therefore, most measures address those sectors.

For each priority measure, this PCAP provides additional details about the following information

- An estimate of the cumulative GHG emission reductions from 2025 through 2030,
- An estimate of the cumulative GHG emission reductions from 2025 through 2050,
- Geographic scope,
- Metrics for tracking progress,
- Authority to implement,
- Benefits, Methods and assumptions.

Table 3 NEFL PCAP Priority Measures

Priority Measure		Cumulative GHG Emission Reductions ($mtCO_2e$)	Implementing Agency or Agencies	Geographic Scope
	2030	2050		
Electrical Grid				
Increase Clean Energy	0.59 $mtCO_2e$ per capita	0.57 $mtCO_2e$ per capita	Regional Utility Providers	MSA-wide
Residential and Commercial Buildings				
Residential Solar and Energy Efficiency Programs	46,260	231,304	NEFL MSA Leads	MSA-wide
Municipal Solar Expansion	434,600	1,885,000	NEFL MSA Leads	MSA-wide
Municipal Built Environment and Infrastructure Decarbonization	34,109	57,109	City of Jacksonville, City of Atlantic Beach, City of St. Augustine	3 Cities
Transportation				
North Florida TPO's Clean Fuels Initiative	72,345	482,297	North Florida's TPO, JEA, JTA, COJ, City of St. Augustine, Nassau County, St. Johns County	3 Counties
Mass Transit Expansion and Mobility Hubs, assuming 15% conversion per year	102,000	3,200,000	Jacksonville Transit Authority	5 Counties
City of Jacksonville Bicycle and Pedestrian Programs	7,695	38,475	City of Jacksonville	1 City
Fleet Transition to Electric Vehicles (EV) per 1,000 vehicles	1,000	187,000	Nassau County, City of St. Augustine, City of Jacksonville, City of Atlantic Beach, Duval County Public Schools	1 County and 3 Cities

Priority Measure		Cumulative GHG Emission Reductions ($mtCO_2e$)	Implementing Agency or Agencies	Geographic Scope
	2030	2050		
Agriculture, Forestry, and Land				
Increase Clean Energy	0.59 $mtCO_2e$ per capita	0.57 $mtCO_2e$ per capita	Regional Utility Providers	MSA-wide
Residential and Commercial Buildings				
Land Acquisition	46,060	46,061	Nassau County, City St. Augustine	MSA-wide
Industrial				
Green Shipping Corridor	19,468	34,157	JAXPORT	1 City
Waste and Materials Management				
Wastewater Treatment Efficiency Upgrades	215.5	933.8	City of Palm Coast	Palm Coast
Composting and Waste Diversion (50% adoption rate)	365,507	1,583,865	City of Jacksonville, City of Atlantic Beach, City of St. Augustine	3 Cities
Landfill Gas Recovery and Conversion	1,802,220	9,011,100	City of Jacksonville	1 City

ELECTRICAL GRID

Before diving into the increasing clean energy measure, it is important to note Florida's unique statewide vertically integrated electricity. The Florida Public Service Commission (PSC)[14] , an arm of the legislative branch of government, only permits one electricity provider in any region and oversees that only legally defined utilities are allowed to create, transmit, distribute, and sell electricity within the state. There are pros and cons to this system including on the positive side providing a safe, adequate, and reliable grid yet on the downside, not incentivizing innovation and competition (e.g., virtual power purchase agreements, community solar, solar leasing, microgrids and blockchain).

The following provides a summary of utilities regulation in Florida pertinent to several of the measures discussed herein. The role of the PSC is to ensure Florida's consumers receive utility services, including electric, natural gas, telephone, water, and wastewater, in a safe, affordable, and reliable manner. To do so, the PSC exercises authority over public utilities in one or more of the following areas: rate base or economic regulation; competitive market oversight; and monitoring of safety, reliability, and service issues. The PSC monitors the safety and reliability of the electric power grid and may order the addition or repair of infrastructure as necessary.

The PSC has broad jurisdiction over the rates and services of investor-owned electric and gas utilities. However, the PSC does not fully regulate municipal electric utilities (utilities owned or operated on behalf of a municipality) or rural electric cooperatives. The PSC has jurisdiction over these types of utilities regarding rate structure, territorial boundaries, bulk power supply operations, and planning. Municipally owned utility rates and revenues are regulated by their respective local governments. Section 366.041(2), F.S., requires public utilities to provide adequate service to customers. As compensation for fulfilling that obligation, s. 366.06, F.S., requires the PSC to allow the investor-owned utilities (IOUs) to recover honestly and prudently invested costs of providing service, including investments in infrastructure and operating expenses used to provide electric service.

In 1980, Florida enacted the Florida Energy Efficiency and Conservation Act (FEECA), requiring the PSC to review the conservation goals of each utility. In 2014, the PSC approved new numerical conservation goals for seven utilities subject to FEECA, scheduling demand reductions for each utility based on a cost-effectiveness methodology. Utilities subject to FEECA include Florida Power and Light Company; Duke Energy Florida, LLC; Tampa Electric Company, Florida Public Utilities Company; JEA; and Orlando Utilities Commission. FEECA goals for electric utilities were last established by the PSC in 2019 for 2020-2024. Commissioners directed rule review following approval of utility programs to implement the goals in 2020. The Legislature adopted FEECA to promote four key priorities:

- Reducing the growth rates of weather-sensitive peak demand and electricity usage
- Increasing the efficiency of the production and consumption of electricity and natural gas
- Encouraging demand-side renewable energy systems
- Conserving expensive resources, particularly petroleum fuel

14. https://www.psc.state.fl.us

The Legislature emphasized the critical need to utilize "efficient and cost-effective" conservation systems. The Legislature set forth in Section 366.82, F.S., specific statutory guidelines for the PSC to implement FEECA's objectives through the establishment of utility conservation goals and approval of utility plans to meet those goals.

Chapter 186, F.S, requires that each electric utility in Florida, with a minimum existing generating capacity of 250 megawatts (MW), must annually submit a Ten-Year Power Plant Site Plan. This Site Plan should include an estimate of the utility's future electric power generating needs, a projection of how these estimated generating needs could be met, and disclosure of information pertaining to the utility's preferred and potential power plant sites. Ten Year Site Plans are submitted to the PSC pursuant to Section 186.801, F.S. describing power needs and locations of proposed power plants. Within nine months of receipt of those plans, the PSC must make a preliminary study and classify the plan as "suitable" or "unsuitable," and can suggest alternatives. Utilities can change their Site Plans at any time and submit written notice to the PSC. These Site Plans reflect the utilities' plans for their grid to meet demand through various energy sources.

Clean Energy Increase by Local Utility Companies

Description

Within NEFL, three utility providers have been identified as interested in providing more clean energy to their customers: Florida Power and Light (FPL), Jacksonville Electric Authority (JEA), and Clay Electric Cooperative. To reduce GHG emissions, utility companies across the region have developed strategies to increase clean energy. This includes escalating solar and wind power supply while considering increased electricity demand due to population increases over time.

- FPL, a subsidiary of Juno Beach, Florida-based NextEra Energy, Inc., primarily serves Baker County, Nassau County, St. Johns County, and Palm Coast City. According to the NextEra Zero Carbon Blueprint, between 2005 and 2019, FPL has decreased its reliance on non-renewable energy sources by 58%[15] . Looking ahead, FPL has set ambitious goals: by 2030, it aims to power its electric grid with 82% clean energy. Furthermore, by 2050, FPL aspires to achieve the milestone of using 100% clean energy for its electric grid.
- JEA, which provides services to Duval County (minus a few small cities such as the City of Neptune Beach and Jacksonville Beach), has set some more tempered goals for itself. Per the JEA 2023 Electric Generation Integrated Resource Plan, by the year 2030, JEA aims to expand its power supply portfolio to 35% clean energy [16]. However, with population growth and anticipated EV expansion through 2050, JEA's projected current outlook still includes possible investments into natural gas systems in addition to increased solar and nuclear power.
- Other regional utilities, including Florida Public Utilities, Beaches Energy, and Clay Electric Cooperative, offer various energy-saving and environmentally friendly resources.

Impact

Grid decarbonization will have several impacts on the community, covering economic, health, environmental, and social aspects. It can lead to economic growth through the creation of green jobs in clean energy. This can include jobs in manufacturing, installation, and maintenance, contributing to the local economy and reducing unemployment rates. Reduced reliance on fossil fuels and lowering greenhouse gas emissions can lead to improved public health outcomes, including reductions in air pollution, which can decrease the prevalence of respiratory illnesses, heart conditions, and other health issues related to poor air quality. Grid decarbonization can help communities become more resilient to the impacts of climate change, putting communities in a better position to withstand extreme weather events. Renewable energy, when accessible to low-income households, can promote social equity by ensuring that clean energy benefits are shared across all segments of the community. Energy security can be enhanced through the reduced dependency on imported fuels. By transitioning to locally sourced clean energy, communities can be more self-sufficient, less vulnerable to global market fluctuations, and more resilient in the face of energy supply disruptions. There are also several innovation and education opportunities in the move to increased clean energy; communities can be hubs for clean energy research and development, and educational programs can prepare the workforce for the new green economy.

15. NEER-124_120522_ZCB_SHARED_FCB_08_17_22_Studio_v1.pdf (nexteraenergy.com)
16. https://www.jea.com/About/JEA_2023_Electric_Integrated_Resource_Plan/

Implementation

Jacksonville Electric Authority (JEA)

Clean Energy Sources: JEA is exploring clean energy options including solar, lithium battery storage, biomass, hydrogen, and nuclear options.

Schedule & Milestones: Part of JEA's implementation plan highlights opportunities with solar, residential rooftop solar PV, and battery storage installations. JEA has examined within three other planning scenarios 5% of their residential load to be met by rooftop PV by 2030, although it is not in their Current Outlook scenario. JEA carried out a solar siting study to assess potential sites for developing approximately 4,000 MW of new solar assets. This would require 24,000-32,000 acres of land. Florida is mostly flat which is an ideal ground condition for solar development, but the state does pose high flood risk and has lots of forested areas. As a result of this study, 101 potential sites throughout the state have been identified with the following favorable conditions: 200 or more acres, transmission lines within 1 mile, slopes of 15% or less, no seismic activity concerns, medium to low risk of natural disasters, and more.

The expansion of customer-cited residential and commercial solar battery storage was explored for its potential to reduce load. According to their estimates, this would reduce up to 690,000 MWh of cumulative load by 2050. Gasification of woody biomass through bubbling fluidized beds is a mentioned renewable energy source. The biomass would be forest residues that could replace the Northside 1 and 2 source fuels of coal and petroleum coke. Unlike coal and petroleum coke, which are finite fossil fuels, biomass can be replenished over time, making it a more sustainable option, as it can be continuously produced and used without depleting natural resources.

Funding: Solar and solar storage options require capital costs for solar technology, land, installation, engineering, and more. They also require yearly operation and maintenance costs or long-term major maintenance costs. JEA expects these costs to decrease over time due to technology and construction advances, external contributions, and funding that will substantially accelerate implementation.

Metrics for Tracking Progress: JEA currently has several outlook scenarios for their near-term, mid-term, and long-term build plans. These scenarios represent possible futures for JEA while recognizing the fluidity of future conditions. The net-zero scenario outlines a building plan through 2051 and outlines the amount of solar and solar storage to be implemented yearly to achieve net zero by 2050. Time for transmission planning, land acquisition, and permitting are all processes considered. Taking the goal of net zero into account with these limiting factors, a year-by-year plan can be developed to calculate GHG reductions, make predictions, and continue to develop their year-by-year Current Outlook and plan future goals. It is recommended that JEA more clearly subcategorizes energy generation from solar PV and battery into the following: residential customer-sited, commercial customer-sited, and JEA-owned solar PV and battery storage installations.

Regarding the incorporation of biomass into Northside 1 and 2, it is recommended that JEA continues to report on its land acquisitions, new solar developments, and the energy output of existing PV mass of biomass compared to coal and petroleum coke and quantify power generation among its combustion plants and tracks the energy generation output among its fuel sources. An added metric to consider are the reductions of other emissions by reducing the amount of coal and petroleum coke, which have greater emissions of SO2, NOx, VOCs, and NH3 compared to that of woody biomass.

Authority to Implement: A municipal electric utility is an electric utility system owned and/or operated by a municipality engaged in serving residential, commercial, and/or industrial customers, usually within the boundaries of the municipality. Municipally owned utility rates and revenues are regulated by their city commission. Most municipal electric utilities are represented by the Florida Municipal Electric Association. JEA [17] owns and operates an Electric System with four generating plants and all transmission and distribution facilities, including 744 circuit miles of transmission lines and 7,336 miles of distribution lines. The governing body is made up of a seven-member board of directors appointed by Jacksonville's mayor and confirmed by the Jacksonville City Council. As a community-owned utility, JEA is not subject to the same state regulations as investor-owned utilities, but it is regulated in certain areas of environmental and health matters, power plant location, electric safety, and electric rate structure matters. The Local Ordinance controls JEA's planning processes and procedures to operate.

17. Code of Ordinances section regarding the creation of JEA, Article 21, Jacksonville Code of Ordinances: https://library.municode.com/fl/jacksonville/codes/code_of_ordinances?nodeId=CHRELA_PTACHLACHJAFL_ART21JE

Florida Power and Light (FPL)

Renewable Energy Sources: FPL plans to modernize their generation fleet with state-of-the-art natural gas units. The next step is to deploy solar in most parts of FPL's service area. As of late 2021, FPL had approximately 3,164 MW of solar generation capacity and expects to have 12,626 MW by 2031. FPL is also looking to incorporate low-cost battery energy storage, hydrogen fuel cell storage, and expand nuclear power plants.

Schedule & Milestones: FPL current has 60 solar power plants and one of the world's largest solar-powered batteries. Like JEA, they are looking to expand their plants and recommend residential rooftop solar PV to their customers. FPL has meaningful milestones in five-year increments to track the progress of achieving net zero by 2050. FPL's five-year goals are as follows: 65% reduction by 2025, 77% reduction by 2030, 83% reduction by 2035, 92% reduction by 2040, and 100% reduction by 2045

Funding: Over the past decade, NextEra Energy has invested approximately $110 billion in infrastructure capital deployment across the U.S. They are working with FPL to fund the infrastructure required to achieve net zero carbon emissions in NEFL by 2050.

Metrics for Tracking Progress: FPL tracks service reliability metrics and power plant availability metrics. Reliability metrics will help provide a strong and resilient energy grid despite frequent storms. These metrics, along with tracking emissions over time, will help determine if FPL is on track for a net zero goal by 2050.

Authority to Implement: Investor-owned utilities serve over 70% of Florida's electric consumers. Most of Florida's solar generation is currently large scale, although the number of rooftop systems has been increasing. While Florida does not have a Renewable Portfolio Standard or allow Power Purchase Agreements, two policies attributed to facilitating more widespread solar development, large utility-scale solar development has been on the rise. Florida utilities also have individual energy efficiency goals set by the PSC. Generally, FPL operations are conducted according to its Ten-Year Site Planning process, and they are regulated by Florida Statutes and the PSC.

Benefits

- **GHG Reduction:** Table 4 shows projected commercial and residential GHG emissions in $mtCO_2e$ for 2030 and 2050. These values were forecasted based on the GHG inventory and the decarbonization plans of FPL and JEA. This forecast indicates that FPL's Zero Carbon Blueprint would positively impact GHG emissions for these sectors. However, Clay County and Duval County experienced an increase in GHG emissions over time due to increased population paired with no decarbonization plan from their utility provider.
- **Biomass Landfill Diversion:** The combustion of biomass by JEA can be considered carbon neutral as long as the biomass is sourced sustainably, and plants are replanted to absorb CO_2 equal to what is emitted. Furthermore, if the biomass is waste material that was diverted from the landfill, this not only helps in managing waste but also turns it into a valuable energy source. Bubbling fluidized bed systems using biomass typically produce lower levels of harmful emissions compared to burning coal or petroleum coke, as biomass will produce fewer SO_2 and NOx emissions.

Table 4 GHG Emissions Projections, in mtCO2e, for Residential and Commercial Electrical Usage

County	2019	2030	2050
Baker	83,420	33,900	0
Clay	830,694	3,320,078	3,791,019
Duval	5,297,213	5,129,389	7,061,974
Nassau	263,407	124,512	0
City of Palm Coast	226,169	109,246	0
St. Johns	822,464	446,635	0

Residential Energy Efficiency and Solar Expansion

Northeast Florida is committed to reducing GHG emissions throughout the region by expanding residential energy efficiency programs, education, toolkits, and increased access to energy efficiency upgrades. Energy efficiency education and tools will include energy efficiency workshops for community members to learn resource-saving strategies. Workshops will be held in disadvantaged communities in trusted public facilities that are easily accessible by the community. The program will provide efficiency Tool kits that may include energy audit equipment, energy and water efficiency devices, and educational materials, and education materials at libraries, community centers, city halls, and other trusted locations.

Schedule and Milestones: Assuming the following distribution of energy toolkits, based on population, a utilization rate of 50% every two weeks, and a residential energy reduction of 5% per household, we can estimate a regional GHG reduction of 46,260 $mtCO_2e$ through 2030 and 231,304 $mtCO_2e$ through 2050 [18].

Table 5 GHG Emissions Projections, in $mtCO_2e$, for Residential and Commercial

Location	Population	Number of EE Toolkits	Household Checkouts/Year	Energy Reduction, kWh	Average CO_2 Reduction per Year	2030	2050
Baker	28,263	70	0	219,588	66.2	331	1,656
Clay	219,252	280	3,791,019	878,350	265.0	1,325	6,625
Duval	995,560	1,260	7,061,974	11,857,728	7,529.7	37,648	188,241
Nassau	88,625	280	0	2,635,051	795.0	3,975	19,875
City of Palm Coast	87,696	70	0	219,588	66.2	331	1,656
St. Johns	264,672	280	0	1,756,700	530.0	2,650	13,250

Impact: Residents may be unaware of changes they can make to improve their energy efficiency and therefore lower their utility bills. Similarly, workshops for community members can further educate on how to increase efficiency. This is especially important in lower-income communities to promote more affordable energy options. Residential energy upgrades, such as improved insulation, energy-efficient appliances, and LED lighting, can complement solar energy systems by reducing overall energy consumption. These upgrades can significantly decrease the amount of electricity required from the grid, leading to further reductions in energy bills and enhancing the cost-effectiveness of solar installations. While there is an initial investment, the combined savings on energy bills can quickly offset the upfront costs, leading to substantial savings over time. Energy upgrades can improve comfort in homes by maintaining more consistent indoor temperatures and reducing drafts. This improves the living environment for residents and can lead to healthier and more comfortable living spaces. Widespread residential energy upgrades can lead to a reduction in the overall energy demand within the community. This can lessen the strain on the local power grid, especially during peak usage times, contributing to a more stable and reliable energy supply for the entire community.

18. Energy Data Facts | Residential Program Guide

Residential solar energy expansion contributes to greater energy independence for the community. By producing energy locally at the community scale, residents can reduce their vulnerability to external energy price fluctuations and supply disruptions, leading to a more stable and secure energy supply. Solar energy can enhance community resilience, especially in the face of power outages and natural disasters. Homes with solar panels, particularly those equipped with battery storage systems, can maintain power during grid failures, providing crucial energy security.

Homes equipped with energy-efficient upgrades, like high-efficiency HVAC systems or double-paned windows, and solar energy systems often experience an increase in property values. Solar installations are viewed as upgrades, similar to renovations, which can make properties more attractive to potential buyers and contribute to the overall economic health of the community.

Funding

There is wide availability of various incentives, rebates, and financing options for homeowners looking to implement solar energy systems and energy efficiency upgrades. One easy-to-search database can be found at: www.dsireusa.org listing over 40 incentives for downtown Jacksonville from JEA's residential and commercial energy efficiency rebates to the IRS's Residential Renewable Energy Investment Tax Credit. These programs can help make residential energy improvements more accessible to a wider range of community members, encouraging broader participation and engagement.

Table 6 GHG Emissions Projections, in $mtCO_2e$, for Municipal Solar Expansion

Municipal Solar Expansion	Average CO_2 Reduction per Year	2030	2050
Community Facility EE and Solar upgrades (per facility)	9,900 – 16,400	59,000 - 98,400	257,400 – 426,400
Large Scale Solar (per 1MW installation)	62,600	375,600	1,627,600

Metrics: For this measure, participating community centers will monitor household checkouts per year and incentivize user feedback on their energy bill reduction and subsequent home energy efficiency improvements that resulted from their initial self-performed energy audit.

LIDAC Impact

Improving community centers can have a large impact on communities. Having efficient and reliable high-performing centers to build community resiliency is especially important in locations that are prone to natural disasters. Incorporating solar to community centers can decrease energy costs, which can allow nonprofit programs at the community centers to reinvest in their programming for community members. The potential for solar energy expansion can improve social equity. Initiatives like solar projects can offer clean energy benefits to a broader range of residents, including renters and those without ideal roof conditions for solar panels, ensuring that all community members have access to renewable energy and its benefits. This can allow more funding to be allotted to other community-related improvements. Furthermore, converting to solar in community centers and other locations across counties can improve the health of residents living in the area due to lower GHG emissions.

Authority to Implement

Rule 25-17.0021, F.A.C., Goals for Electric Utilities, implements the PSC's statutory mandate to adopt goals for electric utilities, approve utility plans, and collect periodic reports from utilities related to promoting efficiency and conservation of electric energy as provided in Sections 366.80-366.83 and 403.519, F.S., together as FEECA. FEECA emphasizes reducing the growth rates of weather-sensitive peak demand, reducing and controlling the growth rates of electricity consumption, and reducing the consumption of scarce resources, such as petroleum fuels. The PSC is required by FEECA to establish numeric conservation goals at least once every five years for utilities subject to FEECA. The utilities are required to develop plans and programs to reach those goals and submit them for approval by the Commission. The six electric utilities currently subject to FEECA are Florida Power and Light Company (FPL), Duke Energy Florida, LLC (Duke), Tampa Electric Company (TECO), Florida Public Utilities Company (FPUC), JEA, and Orlando Utilities Commission (OUC).

The PSC's interconnection and net metering rule (Rule 25-6.065, F.A.C.) promotes the development of customer-sited renewable generation by establishing a billing mechanism that allows customers to offset their usage through self-generating energy. Any excess energy delivered to the grid is applied as a kilowatt-hour credit to the customer's monthly energy usage. Since the rule's adoption in 2008, the number of renewable systems has increased from 577 to 189,952 interconnections. Florida's IOUs– Florida Power and Light Company; Duke Energy Florida, LLC; Tampa Electric Company; and Florida Public Utilities– are required by the rule to offer an expedited interconnection agreement process so that homeowners and businesses can generate their own energy quickly and safely. Municipal electric utilities and rural electric cooperatives are also required, by statute, to provide a standardized interconnection agreement and net metering program for customer-sited renewable generation systems

MUNICIPAL BUILT ENVIRONMENT DECARBONIZATION

Buildings

In the region, our local governments can additionally lead by example by committing to reduce the embodied carbon in infrastructure and energy usage of the buildings in their portfolio. To reduce embodied carbon, local governments can prioritize the use of recycled materials and sustainable construction practices, such as modular construction and the reuse of existing structures. Implementing stringent green procurement policies can ensure that materials sourced for new infrastructure or renovations have lower carbon footprints, supporting a circular economy. Additionally, municipalities can invest in life cycle assessments to better understand and minimize the overall environmental impact of their building projects, from material extraction through construction and eventual demolition

The City of Atlantic Beach, the City of Jacksonville, and the City of St. Augustine are leading the charge of decarbonizing their existing building inventory through regular maintenance of energy systems, retro-commissioning, energy audits, energy efficiency, and optimization upgrades to their building BAS systems, lighting, HVAC, electrical, and plumbing systems. Additionally, the City of Jacksonville has established commitments for new construction of municipal buildings to achieve LEED certification. By focusing on lowering their energy consumption first while maintaining code-required indoor environmental quality, they can also further identify opportunities to offset their energy use by installing on-site renewable energy systems. Similarly, Duval County Public Schools (DCPS) has expressed interest in decarbonizing the public schools within the county.

The City of Jacksonville, the City of Atlantic Beach, and the City of St. Augustine are expected to increase in population, naturally increasing the utility use for municipal buildings. Without a decarbonization plan, all three cities would see increases in electricity use and, thus, carbon emissions. Implementing a decarbonization plan would help cities stabilize their emissions over time or decrease them. DCPS expects a decrease in electricity usage over time, but a decarbonization plan would help them measure their carbon and energy reductions so they can confirm they are on track to achieve their goal, and if not meeting their goal, they could implement measures to reduce their carbon emissions more rapidly.

Schedule & Milestones

Table 7 illustrates the expected operational carbon emissions for the three cities and DCPS from 2019 to 2030 and 2050. This forecast is based on a recommended goal for municipal building energy of 65% reductions by 2030 and 100% reductions by 2050. DCPS has not identified an operational carbon reduction goal, so their estimate was based on 65% reductions by 2030 and 90% reductions by 2050. Their results could improve or worsen by altering this goal. By achieving these reductions, the City of Jacksonville, the City of Atlantic Beach, St. Augustine, and DCPS can expect to dramatically reduce their carbon emissions for municipal and educational buildings in 2050. Other cities or school districts should be able to implement similar plans and achieve comparable decarbonization results.

Table 7 GHG Emissions Projections, in mtCO2e, for Municipal and Educational Building Decarbonization

Organizations with Decarbonization Strategies	2019	2030	2050
City of Jacksonville	55,434	22,259	589
City of Atlantic Beach	242	96	0
St. Augustine	1,430	1,000	0
Duval County Public Schools	48,071	11,273	2932

Infrastructure

In addition to making improvements on the building side, municipalities can make infrastructure changes. The first measure is Permeable Articulating Concrete Blocks (P-ACBs), or permeable paving. This is an interlocking paver that is engineered to have high stormwater infiltration rates. P-ACBs have higher solar reflectance than traditional asphalt pavement (close to that of conventional concrete) with added stormwater management benefits (and associated energy consumption reductions). Additional benefits of P-ACBs include reduced surface and ambient temperature, reduced air pollution, and reduced energy consumption for surrounding buildings.

Secondly, cool pavement can be a good alternative to using dark asphalt. Cool pavements are engineered to reflect more sunlight than conventional dark asphalt, using coatings, sealants, and reflective particles. The benefits of cool pavements include reduced pavement surface temperature, air pollution, ambient temperatures, and energy consumption for surrounding buildings.

Similarly to P-ACBs and cool pavement, low-carbon concrete for sidewalks can be important in reducing GHG emissions and urban heat. With current and in-development innovations, concrete can be carbon neutral or even carbon negative by upgrading manufacturing processes. The benefits of low-carbon concrete include a reduced carbon footprint and a relatively high albedo, reducing extreme urban heat.

Lastly, green infrastructure such as rain gardens, trees, and bioswales are valuable tools for reducing greenhouse gas emissions and improving public health, pedestrian comfort, and the overall quality of life in cities. The benefits of green infrastructure include a decrease in emissions, pollution, stormwater runoff, and urban heat islands. For example, planting additional trees will help reduce surface temperatures by up to 7°F during the day and 22°F at night. This will lead to an overall lower carbon footprint, in alignment with the region's greenhouse gas reduction goals[19]. For the first twenty years of a tree planting, it is assumed that a tree absorbs 10kg of CO_2 per year for the first 20 years[20] . Mature trees, by contrast, absorb 48 kg of CO_2 per year[21].

Schedule & Milestones

Table 8 shows the 5-year and 25-year total costs per $mtCO_2e$ reduced for these strategies.

Table 8 GHG Emissions Projections, in $mtCO^2e$, for Municipal and Educational Building Decarbonization 2030 (5-year plan)

Decarbonization Strategies	2030 (5-year plan)	2050 (25-year plan)
Permeable Articulating Concrete Blocks[22]	83 $mtCO_2e$ / 1000 sq ft	418 $mtCO_2e$ / 1000 sq ft
Cool Pavements	83 $mtCO_2e$ / 1000 sq ft	418 $mtCO_2e$ / 1000 sq ft
Green Infrastructure (Rain Gardens)[23]	*	328 $mtCO_2e$ / 10,000 sq ft
Green Infrastructure (Trees)	1 $mtCO_2e$ / 100 trees annually	4.8$mtCO_2e$ / 100 trees annually
*Green infrastructure costs are based on the cost of 10,000 sq ft. of rain garden and 100 trees. Therefore, the cost listed under the 25-year plan can fluctuate depending on the maturity and species of the plantings.		

19. https://www.americanforests.org/article/american-forests-launches-nationwide-tree-equity-scores/
20. How Much CO2 Does A Tree Absorb? - One Tree Planted
21. Trees Are Climate Change, Carbon Storage Heroes | US Forest Service (usda.gov)
22. https://iopscience.iop.org/article/10.1088/1748-9326/7/2/024004/meta#erl422949fig4
23. https://greenvalues.cnt.org/index.php and https://www.sciencedirect.com/science/article/abs/pii/S0959652623039641

Funding

Energy efficiency roadmaps are being incorporated into facility improvement plans by municipal organizations, school districts, and companies throughout the nation, and the listed organizations are no exception. As the return on investment with energy efficiency upgrades provide a relatively quick payback, these roadmaps become self-funded. Several federal grants also exist to support capital improvements should the cost effectiveness to decarbonize be prohibitive, which can be found on the Funding and Incentives Resource Hub | Better Buildings Initiative (energy.gov) website.

In its current state, certain infrastructure decarbonization measures can be expensive and not cost effective due to a myriad of factors, including lack of coordination and goal setting during the schematic design phase, lack of appropriate maintenance, lack of market supply and demand, and its indirect effects on GHG reductions. However, grant programs do exist to support municipalities and spur local and regional market transformation, including Grant Program: Reducing Embodied Greenhouse Gas Emissions for Construction Materials and Products | US EPA website.

LIDAC Impact

Converting to renewable energy sources will have several positive impacts on communities, especially in low-income areas. Additionally, net-zero buildings will reduce energy consumption. This reduction in consumption will provide savings for residents whose taxes go toward municipal and educational buildings. Jobs can also be created within the renewable energy industry which will help provide career opportunities for those living in the area.

The infrastructure changes will help NEFL experience cooler temperatures, and this will specifically help low-income areas. For example, Jacksonville observed an 11.8°F temperature difference across the city, and many of the hottest areas of the city were observed in some of the more socially vulnerable communities, including Eastside and New Town. About half of the school properties and 60% of afterschool care facilities are in areas highly vulnerable to extreme heat, and 34% of households (30,741 households) with individuals over 65 years old are in highly heat-vulnerable areas. Extreme heat events are the leading cause of weather-related deaths in the U.S. and implementing strategies to cool NEFL will help provide a safer environment for residents.[24]

Authority to Implement

Generally, these building designs would be controlled by local building code and the Florida Building Code. The Florida Building Code, 8th Edition (2023), was updated by the Florida Building Commission on June 20, 2023, and was adopted as the building code for the State of Florida.

The Florida Building Code draws on national model building codes and consensus standards amended where necessary for Florida's specific needs. The International Code Council (ICC) is an association that develops model codes and standards for the design, building, and compliance process to "construct safe, sustainable, affordable, and resilient structures." The ICC publishes I-Codes: a complete set of comprehensive models, coordinated building safety and fire prevention codes, for all aspects of construction, that have been developed by ICC members. All 50 states have adopted the I-Codes. The Florida Building Code incorporates all building construction-related regulations for public and private buildings in the State of Florida other than those specifically exempted by Section 553.73, F.S. It is harmonized with the Florida Fire Prevention Code, which is developed by the Department of Financial Services, Office of the State Fire Marshall, to establish unified and consistent standards. In addition to providing standardization of the design, construction, and compliance processes, the Code establishes regulations for the safety, health, and general welfare of building occupants as well as for firefighters and emergency responders during building emergencies. Structural strength means of egress, stability, sanitation, adequate light and ventilation, and energy conservation are addressed. As a performance-based code, builders have flexibility in the means and materials they utilize to meet various compliance standards.

24. https://www.resilientjacksonville.com/resources

Under some conditions, local governments may amend requirements to be more restrictive than the statewide Code. Any proposed local technical amendments are subject to strict criteria outlined in s. 553.73, F.S., and may not discriminate against materials, products, or construction techniques of demonstrated capabilities. Proposed local amendments are subject to Commission review and adoption into the code or repeal during the triennial update and are subject to appeal to the Commission according to procedures established in s. 553.73, F.S. All local amendments to the Florida Building Code must be adopted by local ordinance and reported to the Florida Building Commission. Without such local technical amendments, some clean energy/green building strategies may be limited to incentive-based regulations such as permit fee waivers, expedited permitting or other strategies.

For any state buildings (each state agency occupying space within buildings owned or managed by the Department of Management Service) located within these jurisdictions, Section 255.257(4) requires the following standards for construction:

A. Each state agency shall use a sustainable building rating system or a national model green building code for each new building and renovation to an existing building.
B. No state agency shall enter into new leasing agreements for office space that does not meet Energy Star building standards, except when the appropriate state agency head determines that no other viable or cost-effective alternative exists.
C. All state agencies shall develop energy conservation measures and guidelines for new and existing office space where state agencies occupy more than 5,000 square feet. These conservation measures shall focus on programs that may reduce energy consumption and, when established, provide a net reduction in occupancy costs.

TRANSPORTATION

The transportation sector is pivotal in addressing climate change challenges in NEFL. Transportation and mobile emissions are the largest single contributor to greenhouse gas emissions in the NEFL region, contributing 40% of the total emissions in the region. This regional PCAP plan identifies specific strategies developed in coordination with the stakeholders in the following counties: Baker, Clay, Duval, Nassau, Orange, and St. John's Counties, as well as the City of Palm Coast. Significant portions are adopted from the JTA and the North Florida TPO in their efforts to mitigate GHG emissions. It focuses on implementing mode shift strategies, commuter rail expansion by the Jacksonville Transit Authority, and North Florida TPO's clean fuels initiative. The carbon emissions related to the Jacksonville International Airport or other Jacksonville Aviation Authority activities were not available by the publication of this PCAP but will be provided for the Clean Air Northeast Florida CCAP in July 2025.

North Florida TPO's Clean Fuels Initiative

Description: The North Florida Transportation Planning Organization seeks to transition public and private fleets in the region to more environmentally friendly fuel sources. The goal is to reduce GHG emissions, decrease reliance on traditional fossil fuels, and foster a sustainable transportation network.

The initiative, as highlighted in the North Florida TPO's Clean Fuels Master Plan[25], involves evaluating the potential for incorporating alternative fuels such as CNG, propane (Autogas), electricity, and biofuels into regional stakeholders' fleet operations.

Objective: The initiative examines the operational and economic feasibility of transitioning fleets to clean fuels, considering factors like fuel expenditure, vehicle age, replacement potential, and existing fleet management facilities.

Implementation: The strategy includes setting up the necessary infrastructure for alternative fuels, offering financial incentives for adoption, and conducting outreach to educate stakeholders on the benefits of clean fuel technologies.

Metrics for Tracking Progress: Monitoring alternative fuel usage and the number of alternative fuel vehicles being used in the region will be the best method of tracking progress. This can be achieved by tracking fuel usage from both public and private fueling stations and registrations of alternative fuel vehicles.

Impact and Benefits

Schedule & Milestones: By replacing traditional gasoline and diesel with cleaner alternatives, the initiative aims to significantly reduce the carbon footprint of the region's transportation sector. Through collaboration with participating organizations, the Clean Fuels Coalition supports organizational alternative fuels goal setting and utilizing grant funding and partnerships to develop supporting infrastructure, like biodiesel fueling stations and EV charging for fleets. This measure is estimated to result in a 72,345 $mtCO_2e$ reduction through 2030 and a 482,297 $mtCO_2e$ reduction through 2050.

Economic Viability: Considering current conditions and incentives, the assessment provides a base case scenario demonstrating the economic feasibility of transitioning to clean fuels.

Community Engagement: The initiative involves collaboration with various stakeholders, including city governments, county commissioners, school districts, and transit authorities, to ensure a comprehensive regional approach to clean fuel adoption.

LIDAC Impact: Widespread fossil fuels combustion releases pollutants linked to adverse health effects, including respiratory disorders, cancer, or premature death. Additionally, fossil fuels release carbon dioxide and other greenhouse gases into the atmosphere, contributing to global warming and the rise of sea levels. While everyone is affected by air pollution, low-income communities tend to be more severely impacted because they are more likely to live near facilities that produce pollution, such as landfills, power stations, major roads, and other airborne particulate matter sources. Transitioning to cleaner fuels will improve air quality, mitigate climate change, create jobs, enrich economic development, and reduce transportation costs.

25. https://northfloridatpo.com/uploads/Clean-Fuels-Master-Plan-Report_Final_240209.pdf

Challenges and Funding

- Infrastructure Development: A critical step is to establish the required clean fuel infrastructure, which includes setting up fueling stations for CNG and electric vehicles.
- Financial Planning: Securing funding and managing costs are central challenges addressed through partnerships with the Florida Department of Environmental Protection and other entities involved in emissions reduction efforts.

Mass Transit Expansion and Mobility Hubs

Description: The Jacksonville Transportation Authority has identified a shift towards sustainable transportation by expanding mass transit services, mobility hubs, and multimodal transportation. These efforts are encapsulated in JTA's(MOVE2027 (strategic plan and its Sustainability Action Plan, reflecting a commitment to regional connectivity, reduced carbon emissions, and enhanced public transit options[26] [27].

- **Objective:** To reduce greenhouse gas emissions and promote a more sustainable and efficient transportation system by shifting from single-occupancy vehicle use to more sustainable modes such as public transit, walking, and biking, JTA aims to facilitate a significant reduction in the region's carbon footprint.
- **Strategy and Implementation:** To encourage this mode shift, JTA is investing in hybrid electric and CNG buses, recycling programs, bike-sharing programs, and transit signal priority systems.
- **Impact:** Past efforts have already shown success, with GHG emissions avoidance from mode shifting to transit recorded between 2013 and 2017.

Mass Transit Expansion

In the baseline inventory year of 2019, GEI estimates that up to 23% of travel within the NEFL region is considered outbound travel[28]. GEI considers outbound travel as trips that leave the region boundaries, and this is projected to contribute to 1.6M mtCO2e annually between now and 2050. Considering that several of the NEFL counties consist of residential development that supports the Duval County workforce, it can be assumed that much of this travel can be attributed to commuter transportation, and it can also be assumed that much of this travel will increase similarly with population growth to the region. To effectively drive down emissions, the Northeast Florida region must take great action to develop intercounty mass transit. JTA's First Coast Commuter Rail intends to establish a regional rail network in Northeast Florida, and the JTA Express Select is an existing program that offers morning and afternoon weekday intercounty shuttle service. Both programs aim to enhance the connection between Jacksonville's urban core and the surrounding areas.

The MOVE2027 strategic plan details both JTA's initiative to support regional rail development by completing necessary planning and environmental review processes (Strategy 5.01) and JTA's intention to expand the regional transit network (Strategy 5.03). JTA's approach includes coordinating various modes of transportation, such as rail, waterborne services, and a comprehensive transit network, to create an integrated system that effectively serves the growing population.

26. jtafla.com/media/34fnjggb/move2027.pdf
27. https://www.transit.dot.gov/sites/fta.dot.gov/files/2022-04/Jacksonville-Transportation-Authority-Sustainability-Action-Plan.pdf
28. Google Environmental Insights Explorer - Make Informed Decisions (sustainability.google)

Schedule & Milestones

According to the JTA Sustainability Action Plan, the 2017 Passenger Miles Traveled was 153M miles. To overcome the transportation emissions and population growth for the region, three gasoline passenger vehicles to diesel bus transit user conversion scenarios are posed:

- Assuming an expansion rate of JTA programs across the region of 10% per year, this would result in 6.9M gallons of gasoline saved and 61,000 $mtCO_2e$ reduction by 2030 and 111M gallons of gasoline saved and 989,000 $mtCO_2e$ reduction by 2050.
- Assuming an expansion rate of JTA programs across the region of 15% per year, this would result in 11.4M gallons of gasoline saved and 102,000 $mtCO_2e$ reduction by 2030 and 361M gallons of gasoline saved and 3.2M $mtCO_2e$ reduction by 2050.
- Assuming an expansion rate of JTA programs across the region of 20% per year, this would result in 16.8M gallons of gasoline saved and 150,000 $mtCO_2e$ reduction by 2030 and 1B gallons of gasoline saved and 3.2M $mtCO_2e$ reduction by 2050.

Benefits of Multimodal Transportation

The mode shift and regional transit network expansion are expected to yield multiple co-benefits:

Enhanced Accessibility: By providing diverse transit options and mobility hubs, JTA addresses the mobility needs of all demographic groups, including the aging population and those who prefer non-auto transportation.

Economic Growth and Resilience: Companies and cities that invest in and promote the use of mass transit can reap significant benefits in terms of employee well-being and business success. At the individual level, a study from the Brookings Institute shows that, in an assessment of the 100 largest metropolitan areas, only 27% of the workforce can access a typical job by transit in 90 minutes or less[29] . Research shows that shorter commute times are a significant predictor of upward economic mobility[30] . Increased mass transportation reduces absenteeism in the workplace and increases overall productivity. This continuity ensures that projects and tasks are completed on schedule, enhancing the reputation of local businesses and customer experience. Indirectly, fewer car travelers will reduce the amount of parking lot development, which would increase real estate for the development of more affordable housing, businesses, and green spaces. Gainesville, FL has joined cities across the nation to diminish or remove minimum parking requirements[31].

Sustainability and Quality of Life: These transportation initiatives, when in place, would revolutionize the area, leading to less congested streets, reduced noise levels, reduced air pollution, and lower individual and community transportation costs. Commuting via mass transit includes walking to and from stations or stops, which would contribute to daily physical activity. This can improve overall public health and reduce the likely chronic illnesses associated with sedentary lifestyles, such as obesity and cardiovascular illness, which are shown to have a higher incidence of occurrence in low-income and disadvantaged communities.

Funding

The Jacksonville Transportation Authority (JTA) is funded through a combination of local, state, and federal sources. JTA's budget is outlined in detail within their Budget Variance Package[32]. Here are a few examples:

Local Option Gas Tax: JTA has issued approximately $100 million in fixed rate bond proceeds secured by JTA's share of the Local Option Gas Tax. The Jacksonville City Council approved a 10-year, 6¢ per gallon gasoline surcharge in 1986 to pay for new roadways and other transportation projects. Prior to its expiration in 1996, the council extended the tax for 20 additional years, until 20162[33] . In 2021, the City Council approved a further extension and increase to 12¢ per gallon.

Federal Funding: The JTA also receives funding from federal sources such as the CARES Act funds ($14.4 million), a Federal Transit Authority grant for bus and bus facilities ($13.7 million), and Coronavirus Response and Relief Supplemental Appropriations Act funds ($10.5 million)[34].

29. https://www.brookings.edu/wp-content/uploads/2016/06/11-transit-labor-tomer-full-paper.pdf
30. https://scholar.harvard.edu/files/hendren/files/mobility_geo.pdf
31. U.S. cities are getting rid of parking minimums : NPR
32. fy23-budget_jta-variance-package_coj.pdf (jtafla.com)
33. https://www.transit.dot.gov/sites/fta.dot.gov/files/5.15_930_JTA_ROI.pdf
34. https://www.bizjournals.com/jacksonville/news/2021/06/07/jta-jobs-for-jax-capital-budget.html

City of Jacksonville Bicycle and Pedestrian Path Programs

Description: The proposed bike-pedestrian programs consist of several projects, including the development of protected/separated bike lanes city-wide, continued development of Jacksonville's Emerald Trail, expansion of COJ's shared use paths network (beginning with the Core-2-Coast and the Emerald Trail, implementation of an E-bike voucher pilot program and an E-bike share program, and construction of shower/locker facilities for government offices.

- **Objective:** Increase active transportation mode share by expanding a safe and connected bicycle facilities network, expand/enhance a trail network that is comfortable, safe, and appropriate for all ages/abilities, and create an E-bike voucher program to provide modal options for underserved communities, offer residents and visitors alike a lower-emissions modal option for commuting, and construct shower/locker facilities for government offices, providing staff with facilities to support an elevation in active transportation.
- **Schedule & Milestones:** COJ bicycle and Pedestrian paths are part of a larger regional master plan of North Florida TPO[35]. Their goals include:
    - Provide an extensive, connected, and convenient on-road network of bicycle and pedestrian facilities throughout the North Florida TPO region. All agencies responsible for constructing and maintaining roadways within the region should continually review and potentially revise their roadway design standards. Maintain a unified inventory and associated map of bicycle and pedestrian facilities within the region every five years. Conduct at least one detailed "priority zone" subarea study identified in this plan per year to identify bicycle and pedestrian needs in those locations. Conduct at least one regional trail connection study for gaps outlined in this plan per year to identify appropriate bicycle and pedestrian facility improvements along those corridors.
    - Improve multi-modal transportation efficiency in the North Florida TPO region. Develop and implement a plan to increase the number of local employers that provide incentives such as bicycle parking, shower/locker facilities, financial incentives, Use bicycle and pedestrian facilities as part of an overall Congestion Management Plan strategy to maintain or improve motor vehicle levels of service in congested corridors that do not meet adopted LOS standards and flexible schedules to employees who commute to work via bicycle or pedestrian travel. Work with JTA and other public transportation providers to ensure that all existing and future transit shelters and other high-volume stop locations have bicycle racks and other basic amenities.
    - Provide an equitable bicycle and pedestrian network by focusing bicycle and pedestrian planning and facilities to those that need it most. Include an equity element in bicycle and pedestrian planning and programming efforts that focuses on low-income communities, and communities of color that have been disproportionately impacted by inadequate infrastructure. Include demographic elements in bicycle and pedestrian planning and programming efforts that focus on users that are more likely to benefit from and utilize the system including general population density locations, areas of high employment density, areas with a high percentage of zero car households, and concentrated areas of student populations.
- **Impact:** The programs are designed to encourage active transportation, create a lower bicycle level of traffic stress (BLTS) and improved safety, reduce dependency on cars for short trips, provide modal options for underserved communities, tourists, and residents, and lower overall carbon emissions in alignment with the city's GHG reduction goals. Bike lanes and walking paths provide added layers of accessibility and encourage active, healthy lifestyles.
- **Estimated Emissions Reduction:** These programs, in total, are estimated to result in a 1,539 $mtCO_2e$ reduction per year, reducing emissions by 7,695 $mtCO_2e$ through 2030 and 38,475 $mtCO_2e$ through 2050.
- **Feasibility:** Nationwide, most major metropolitan cities have advanced these efforts at a much larger scale and faster pace than COJ. Protected bike lanes are a proven safety countermeasure, resulting in higher ridership and associated benefits. E-bike voucher programs, such as the City of Denver's incentive program, have reduced transportation emissions and increased active transportation mode share.

35. FINAL_BikePedMasterPlan.pdf (northfloridatpo.com)

- **Community Engagement and Feedback:** Regional outreach, master plans, and public surveys have indicated that residents want more bicycle infrastructure that is safe, connected, and suitable for users of all ages and abilities.
- **Metrics for Tracking Progress:** To track the progress of these programs, it is recommended that each be monitored to ensure optimization of utilization. Monitoring of bike usage along with public surveys can be compared to historical data to recognize progress. The E-bike voucher program can be tracked based on the number of vouchers utilized by the public. The progress of the E-bike share program can be tracked through the total fees and/or subscriptions collected by the initiative.

Benefits:

- **Public Health:** An increase in active transportation mode share means healthier communities through increased mobility and enhanced physical well-being of residents.
- **Environmental Stewardship:** The initiative supports COJ's environmental commitment by fostering a reduction in miles driven, thereby reducing GHG emissions.
- **Economic Development:** The development of these programs is expected to stimulate local economies through increased tourism and recreation-related commerce.
- **LIDAC Impact:** These programs will provide residents and underserved communities with an active transportation option to commute to employment centers, healthcare, retail, schools, places of worship, and other essential services. It is estimated that 80% of new ridership would be from low-income or zero-car households, currently using vehicle ride share or other internal combustion engine (ICE) vehicles for weekly short trips. The E-bike voucher program is specifically designed for lower-income residents, zero car households, and other EJ communities that currently rely on shared car services and other ICE vehicles. These bike programs will create healthier communities, increase safety for bike transportation, increase options and access for underserved communities, reduce transportation costs, and reduce emissions in the region resulting in better overall air quality.

Funding

Within the North Florida TPO Bike Ped Master Plan, several projects within Duval, St. Johns, Nassau, and Clay counties are in various states of progress, from planned, partially funded, in progress, and existing. Funding comes from multiple sources, including partnerships with JTA, non-profit organizations, municipal funding, and grants.

Fleet Transition to Electric Vehicles

Description: Northeast Florida is committed to transitioning fleet vehicles to EVs. This is a proven method of reducing GHG emissions and would dramatically reduce emissions in the region.

- **Objective:** Decrease emissions generated by the transportation sector, improve the region's air quality, and serve as a positive example for other entities to follow.
- **Schedule & Milestones:** Several Northeast Florida stakeholders are investing in electric vehicles to replace fleet vehicles used every day, including DCPS, JEA, JTA, the City of Atlantic Beach, the City of Jacksonville, and the City of St. Augustine. DCPS is the 6th largest school district in FL and 20th in the nation, with 197 schools servicing 129,000 students (minority enrollment at 70% with 40% economically disadvantaged) and 12,000 employees. The transition aims to reduce the region's carbon footprint by replacing vehicles operating on traditional fossil fuels. Assuming that the existing fleet will be replaced at a rate of 10% per year, implementation of this strategy would be over 10 to 15 years. Electric motors are typically 85% to 90% efficient, whereas internal combustion engines are 20% to 30% efficient. A fleet of 1,000 vehicles with a mix of light-duty, medium-duty, and heavy-duty diesel and gasoline engines would have an estimated carbon footprint of 12,000 to 15,000 $mtCO^2e$ annually, while a fully electrified fleet supplied energy would use 4M kWh of energy annually and a regional footprint of 2,540 $mtCO_2e$. This would result in approximately 12,000 $mtCO_2e$ annually. It is estimated that these transitions, per 1,000 fleet vehicles, will result in a 1,000 mtCO2e reduction through 2030 and up to 186,900 mtCO2e reduction through 2050.
- **Challenges:** Developing infrastructure to properly charge, maintain, and operate these vehicles will be a significant effort. Funding is also a central challenge for this endeavor. With increased demand for EVs in a region without an electric utility decarbonization strategy, this will only displace GHG emissions from the streets to the power generation plants. Upgrading EV fleet parking lots and service areas with Level 2 charging stations may require the installation of larger transformers that can handle the electrical demand. Advanced coordination of business with their electric utility provider is essential for the successful implementation of this strategy.
- **Metrics for Tracking Progress:** It is recommended that each organization monitor cost, environmental, operational, transition, regulatory and compliance, performance, and stakeholder metrics to better evaluate the effectiveness, costs, and benefits of the EV fleet transition. Cost metrics include total cost of ownership, fuel savings annually, and maintenance costs. Environmental metrics include carbon emissions and energy consumption for EVs in kWh per 100 miles. Operational metrics include vehicle uptime/downtime, fleet utilization, and charging infrastructure utilization. Fleet transition metrics include adoption rate within the organization, infrastructure development, and employee training and engagement. Regulatory and compliance metrics include range efficiency under various conditions and vehicle reliability. Stakeholder metrics include driver, customer, and community feedback.

Benefits

- **Economic:** Future resale values for EVs, which affect the total cost of ownership calculations, increase the financial viability of transitioning the fleet. The demand for a wide range of EV models, from passenger cars and delivery vans to heavy-duty trucks, to meet the diverse needs of EV fleets will also increase the local market availability of EVs. As EV technology matures and production scales up, the total cost of ownership of EVs will decrease, making them more economically viable, including lower costs for batteries, maintenance, and energy consumption.
- **Public Health:** Reducing emissions means healthier communities and wildlife through increased air quality. Improvements in air quality will also reduce asthma attacks, heart attacks and strokes, lung cancer, and premature deaths, especially in those living nearest to transportation corridors.
- **Environmental Stewardship:** The initiative supports the region's environmental commitment by decreasing the volume of fuel burned, thereby reducing GHG emissions.
- **LIDAC Impact:** Focused job training and educational programs for low-income and disadvantaged populations will support the regional transition of EV adoption and create a knowledgeable workforce of drivers and maintenance staff. Reduced exposure to vehicle fuels and emissions is connected to improved health outcomes.

Funding

Local governments may use income from its infrastructure surtax (if applicable to that jurisdiction) to provide loans, grants, or rebates to residential or commercial property owners to install electric vehicle supply equipment, propane fueling infrastructure, and natural gas fueling infrastructure if a local government ordinance authorizing this use is approved by referendum.

Table 9 Cumulative GHG Emissions Reduction, in $mtCO_2e$, for the Transportation Sector GHG Reduction Strategies 2050 (25-year plan)

Transportation GHG Reduction Strategies		2030	2050
North Florida TPO's Clean Fuels Initiative		72,345	482,297
Mass Transit Expansion and Mobility Hubs	10% Conversion annually	61,000	919,000
	15% Conversion annually	102,000	3.2M
	20% Conversion annually	150,000	9.5M
COJ Bicycle and Pedestrian Paths		7,695	38,475
Fleet Transition to EVs(per 1000 vehicles)		187,000 annually	

Cumulative Transportation Measures Authority to Implement

Section 163.3177(6)(b), F.S., establishes the requirements for transportation and mobility planning in local government comprehensive plans. Comprehensive plans must focus on providing a multimodal transportation system that emphasizes public transportation systems, where feasible, and encourages economic development through flexible transportation and mobility options for Florida communities. In accordance with the Growth Policy Act, local governments may establish a system that assesses landowners the costs of maintaining specified levels of service for components of the local government's transportation system when the projected impacts of their development would adversely impact the system. This system, known as a concurrency management system, must be based on the local government's comprehensive plan. Specifically, the local government comprehensive plan must provide the principles, guidelines, standards, and strategies, including adopted levels of service, to guide the application of its transportation concurrency management system. It is important to point out that whether a local government chooses to use a transportation concurrency system, it is required to retain the level of service standards for its roadways for purposes of capital improvement planning. If a local government elects to repeal transportation concurrency, it is encouraged to adopt an alternative mobility funding system.

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Local governments may use income from its infrastructure surtax (if applicable to that jurisdiction) to provide loans, grants, or rebates to residential or commercial property owners to install electric vehicle supply equipment, propane fueling infrastructure, and natural gas fueling infrastructure if a local government ordinance authorizing this use is approved by referendum. The Florida Department of Transportation (FDOT) had to create a master plan for the development of electric vehicle supply charging stations along the State Highway System by July 1, 2021. FDOT also established staging areas that will include EV charging stations at key locations along the State Highway system to be used as emergency evacuation stops. FDOT published the Electric Vehicle Master Plan in 2021. Florida has taken important steps toward an electrified transportation future. Under the National Electric Vehicle Infrastructure Formula Program, established by the Bipartisan Infrastructure Law, the U.S. Department of Transportation will provide the FDOT with an estimated $198 million over five years to address EV charging needs for passenger vehicles and light–duty trucks.

Industrial

In the Northeast Florida region, Nassau and Duval County stand out as significant contributors to industrial sector emissions, primarily due to the activities of large manufacturing companies in the region. Within the industrial sector GHG inventory, these companies include Westrock Paper Mill[36], Rayonier Performance Fibers Plant[37], CMC Steel production[38], the Symrise facility[39], Anchor Glass Factory[40], Anheuser Busch Canning[41], U.S. Gypsum Manufacturing[42] and IFF Chemical Holdings[43]. These companies collectively play a major role in the area's environmental challenges, and each of them have sustainability commitments that will contribute to identification of regional sector targets for the Clean Air Northeast Florida CCAP, to be released in July 2025.

The Jacksonville Port Authority (JAXPORT) is a major hub for maritime activities in Northeast Florida, contributing significantly to the local and regional economy. It manages several cargo terminals and has been investing in infrastructure improvements to increase its capacity and efficiency. JAXPORT's activities significantly influence carbon emissions in the Northeast Florida area through its maritime and associated logistics operations. The port has been part of projects aimed at enhancing environmental sustainability. Additionally, the port's improvements include the introduction of LNG-powered container ships and new electric container cranes, which contribute to emission reductions by enhancing energy efficiency and reducing reliance on traditional fuels. Such initiatives indicate JAXPORT's commitment to reducing its carbon footprint and contributing to environmental sustainability in the region. The carbon emissions related to JAXPORT activities were not available by the publication of this PCAP but will be provided for the Clean Air Northeast Florida CCAP in July 2025.

Crowley, a logistics, marine, and energy solutions company, holds a long-term partnership with JAXPORT, and both groups are looking to work together to decrease GHG emissions. In 2022, Crowley and JAXPORT were awarded a federal grant to support a 14.6-million-dollar project to reduce emissions and add electric power equipment at Crowley's terminal[44]. The grant, funded 50% by the U.S. Department of Transportation and matched by Crowley, will facilitate the addition of zero-emissions equipment and charging stations. This initiative, part of the larger JAXPORT EXPRESS project, signifies a significant move towards sustainability and efficiency in supply chain operations, underscoring a joint commitment to a cleaner, decarbonized environment.

Green Shipping Corridor

Description: The shipping business conducted through JAXPORT and Crowley is an important economic sector to Jacksonville. However, that comes at the cost of high GHG emissions in the area. The following chart shows the average carbon dioxide emissions per ton-mile of freight, and trucks and water transportation are among the top highest emitters. Crowley has established a five-phase initiative to reduce GHG emissions by transitioning trucking and shipping to net-zero.

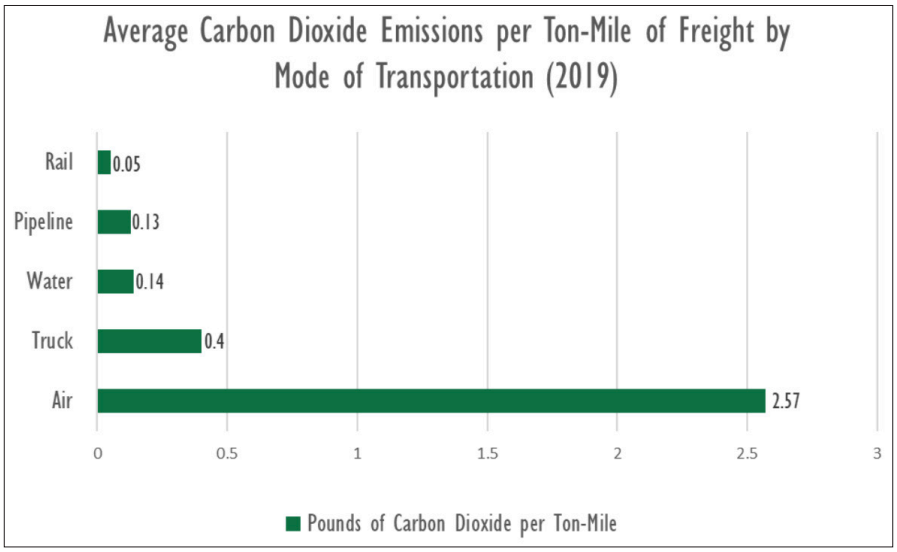


FIGURE 3

JAXPORT Crowley 2019 GHG Emissions by Mode of Transportation, in lbs CO_2e / Ton-Mile

36. westrock.com/-/media/pdf/sustainability/westrock-sustainability-report-2022-pdf.pdf?sc_lang=en
37. Sustainable from the Start - RYAM
38. CMC_2021_Sustainability_Report.pdf
39. Sustainability and Responsibility | Symrise CR 2021
40. Sustainability | Premiere U.S. Glass Manufacturing | Anchor Glass Container Corp.
41. Environmental Sustainability | Anheuser-Busch
42. Sustainability - American Gypsum
43. Sustainable Solutions | IFF
44. Crowley, JAXPORT Awarded Grant to Make Terminal More Sustainable | Crowley

- **Objective:** Decrease emissions by implementing carbon capture processes, electric vehicles, and renewable LNG into Crowley's business.
- **Schedule & Milestones:** Crowley proposed a five-phase plan to slowly incorporate all the changes to this strategy.

Phase 1: Carbon Capture on Class 8 Trucks

- Deploy a carbon capture system on Class 8 diesel trucks that operate between Jacksonville and Atlanta. This phase would first be implemented for newer diesel trucks in the fleet that would not need replacing soon.
- 120 tons CO_2e per year per Class 8 truck.

Phase 2: Zero-Emission Class 8 Trucks

- Deploy battery-electric Class 8 trucks that operate between Jacksonville and Atlanta. These trucks could reliably operate for 400 miles on a single charge or recharge in a similar amount of time it takes to refuel a diesel truck. This phase would first be implemented for trucks in the fleet that need replacing.
- 400 tons CO_2e per year per truck.

Phase 3: JAXPORT Emissions Reductions

- Build upon an existing project that seeks to deploy zero-emission cargo handling equipment, terminal support vehicles, renewable microgrid-backed DC fast charging infrastructure, and zero-emission drayage trucks for local service.
- 120 tons CO_2e per year per Class 8 truck
- 60 tons CO_2e per year per truck
- 40 tons CO_2e per year per UTR

Phase 4: Carbon Capture on U.S. Ships/Vessels

- Implement a carbon capture system to oceangoing ships/vessels that operate between Jacksonville, Puerto Rico, and the Caribbean. It would capture emissions from the exhaust stream and compress and store the emissions aboard the vessel for offloading in port. Whereafter, the captured gases would be sent for permanent sequestration or purification and subsequent utilization.
- 260 $mtCO_2e$ per year, but 2,000+ $mtCO_2e$ per year by 2030

Phase 5: Renewable LNG for Oceangoing Vessels

- The final phase seeks to liquify renewable methane and use it as a net-zero fuel for Con-Ro vessels servicing the Caribbean and Central America.
- 19,200 $mtCO_2e$ per year

- **Challenges:** Challenges of this strategy include coordination with municipalities in other states, countries, or territories to incorporate components like EV charging stations or carbon offloading from vessels. Additionally, there are cost barriers to some components. For example, there is a significant cost barrier to procuring renewable natural gas due to the regulatory incentive available to compete with less efficient modes of transportation.
- **Metrics for Tracking Progress:** There are several important metrics to track the progress of this reduction strategy. Cost metrics include total cost of ownership, fuel savings annually, and maintenance costs. Environmental metrics include carbon emissions and energy consumption for Class 8 trucks, oceangoing ships, cargo handling equipment, terminal support vehicles, and more. Operational metrics include vehicle uptime/downtime, fleet utilization, and charging infrastructure utilization. Fleet transition metrics include adoption rate within the organization, infrastructure development, and employee training and engagement.

Benefits

- **Economic:** The demand for a wide range of EV models, from passenger cars and delivery vans to heavy-duty trucks, to meet the diverse needs of EV fleets will also increase the local market availability of EVs. As EV technology matures and production scales up, the total cost of ownership of EVs will decrease, making them more economically viable for individuals and businesses, including lower costs for batteries, maintenance, and energy consumption. Additionally, the implementation of this strategy will provide opportunities for new jobs, including vessel construction, vessel operation crew, and port terminal operations.
- **Public Health:** Reducing emissions means healthier communities and wildlife through increased air quality. Improvements in air quality will also reduce asthma attacks, heart attacks and strokes, lung cancer, and premature deaths, especially in those living nearest to transportation corridors.
- **Environmental Stewardship:** The initiative supports the region's environmental commitment by decreasing the volume of fuel burned, thereby reducing GHG emissions.
- **LIDAC Impact:** Crowley has several programs to help low-income communities, including Crowly Impact, Crowley Cares, and the volunteering efforts of Crowley employees. Furthermore, the company has invested in the Crowley Center for Transportation and Logistics at UNF and is working expeditiously to leverage further investment to expand cross-sector collaboration to advance the workforce pipeline and develop new curriculum pathways for all ages and backgrounds. We see a future state in which local students are introduced to topics and concepts at key developmental stages to support interest in and commitment to pursuing the various educational pathways for meaningful careers in sustainable transportation, trade, and logistics. To support this future, Crowley also offers scholarships for trade schools, certifications, and college degrees. The financial and informational support that Crowley offers can provide more educational and career opportunities to residents of NEFL.

Table 10 Emissions Reduction by Phase, in $mtCO_2e$

		Reduction per Unit, $mtCO_2e$	Number	Adoption Rate	2030		2050	
					Vehicles Converted	Annual GHG Reduction	Vehicles Converted	Annual GHG Reduction
Phase 1 + Phase 2		109	135	15%	75	8,186	135	14,715
Phase 3	UTR	37	2	15%	1	41	2	73
	Local Drayage	52	4	15%	2	115	4	206
Phase 4 + Phase 5		2,000	10	15%	6	11,126	10	19,163

Funding

The Jacksonville Port Authority seeks partnerships with Crowley and other organizations for grant pursuits to pilot emerging technologies for carbon capture and carbon reduction.

Authority to Implement:

The Jacksonville Port Authority was created by a special act of the Florida Legislature in 1963 to develop, maintain, and market Jacksonville's port facilities. The specific powers and duties of the Port are controlled by statute and local code[45]. Within the authority of the Port is the power to control projects, issue bonds, and enter into agreements with various Port service providers. All these authorities can be used to control land-based port operations that can achieve any GHG reduction goals or strategies the Port adopts. It should also be noted that various Federal agencies are involved in the development of rulemaking on GHG Standards for medium and heavy-duty trucks.

It should be noted also that ship air pollution standards are contained in the International Convention for the Prevention of Pollution from Ships (MARPOL) and regulated by the International Maritime Organization, a UN Agency. Specifically, Annex VI of MARPOL sets NOx limits for marine engines and sulfur limits for marine fuels to reduce SOx and PM. Compliance is ensured by periodic inspections and surveys, as well as flag state and port state control. EPA standards for exhaust and evaporative emissions reduce the environmental impact of marine spark-ignition engines and vessels. The emission standards require manufacturers to control exhaust emissions from the engines and evaporative emissions from fuel tanks and fuel lines.

45. https://library.municode.com/fl/jacksonville/codes/code_of_ordinances?nodeId=CHRELA_PTBRELA_ART5JAPOAU_S3PO#:~:text=The%20Jacksonville%20Port%20Authority%20shall,boundary%20lines%20as%20hereinafter%20provided.

SOLID WASTE & WASTEWATER

City of Palm Coast Wastewater Efficiency

The City of Palm Coast faces a challenge in wastewater operations during heavy rainfall events, emphasizing the negative impact on efficiency, energy consumption, and costs. The primary issues include stormwater infiltration leading to increased pumping demands, safety concerns, and financial implications due to the deployment of pump trucks.

The proposed solution involves implementing pipe and maintenance hole lining to mitigate the impact of stormwater inflow and infiltration, particularly during high rainfall events.

The proposed pipe and maintenance hole lining implementation in the City of Palm Coast's wastewater infrastructure presents a promising avenue for reducing GHG emissions.

Energy Efficiency: The project's primary goal is to enhance energy efficiency by minimizing stormwater infiltration during heavy rainfall events. By addressing this issue, the City aims to optimize wastewater operations, resulting in lower energy consumption. The National Renewable Energy Laboratory (NREL) identifies infiltration, inflow, and leaks in wastewater systems as areas where energy is often wasted. The proposed solution directly targets these inefficiencies, potentially leading to substantial energy savings[46].

Decreased Pumping Demands: The energy systems affected are the lift stations, transfer pumps, and pumps within the wastewater treatment plant. The project's focus on preventing stormwater from entering the wastewater system can reduce the demands on pumping stations during rainfall events. This reduction in pumping demands translates to lower energy usage and, thus, a positive impact on GHG emissions.

Reduced Diesel Fuel: During intense or prolonged rain, drainage systems are overwhelmed and can lead to street flooding. In these scenarios, sanitary sewer overflows (SSOs) release raw sewage before it reaches the wastewater treatment facility . Because raw sewage contains bacteria and solids that can endanger human health and the environment, The City of Palm Coast has developed a systemic response to deploy trucks to pump this water and divert it from neighborhoods and back to water treatment facilities.

Financial Energy Savings: In addition to energy savings, the improvements will have reduced the use of chemicals during the treatment process, such as sodium hypochlorite and other sterilizing agents.

Trenchless Pipe Repair: A trenchless pipe repair method that uses cured-in-place pipe lining enhances the project's eco-friendliness. This method minimizes disruptions associated with traditional excavation, resulting in a more sustainable approach to infrastructure improvements.

Metrics for Tracking Progress: It is recommended that volume reduction, energy consumption, GHG emissions, costs, water quality, system performance, and stakeholder impact metrics. Reduced inflow and infiltration volume can be gauged by comparing pre- and post-upgrade flow rates during wet weather conditions. Track the number and volume of SSOs before and after upgrades. Energy usage at the lift stations, transfer pumps, and wastewater treatment pumps should be monitored and tracked with 1-inch rainfall events. Diesel consumption by the emergency response trucks should be tracked annually. Cost metrics should incorporate costs associated with operating and maintaining the wastewater systems before and after upgrades, energy costs, emergency response costs, and avoidance of SSO penalties. It will also be necessary to evaluate the wastewater system's effective capacity, assess changes in the expected lifespan of the infrastructure, and collect community feedback on the occurrence of SSOs and odors.

Benefits

LIDAC: Low-income and disadvantaged communities stand to benefit from enhanced public health, economic benefits, improved systems resilience and environmental conditions, and odor reduction. The City of Palm Coast plans to redirect 25% of the financial energy savings generated within the program's first ten years to waive water utility connection fees for new workforce/affordable housing construction. This community-focused approach contributes to long-term sustainability and aligns with broader environmental and social goals. The reduction of SSOs will contribute to cleaner water in ponds, streams, and recreational areas. Strengthened infrastructure improves resiliency to extreme weather events and reduces property damage. Finally, investment in these upgrades will lead to temporary jobs during the construction phase and potential permanent positions for system maintenance and operation.

46. Energy Efficiency Strategies for Municipal Wastewater Treatment Facilities (nrel.gov)
47. NPDES: Stormwater Best Management Practice, Preventing Stormwater Contamination from Sanitary Sewage (epa.gov)

GHG Reduction Calculations

To calculate the GHG reduction, information regarding rainfall exceeding one inch in the year 2023 within the City of Palm Coast was sourced from the National Oceanic and Atmospheric Administration (NOAA) database. Additionally, data pertaining to a specific rainfall event surpassing 1 inch and the average energy consumption in kWh emitted from the five master pump stations were acquired from the Palm Coast Wastewater Department. The conversion factor utilized to translate kWh to CO_2e stands at 0.004.

Table 11 Cumulative GHG Emissions Reduction, in $mtCO_2e$, for the City of Palm Coast Wastewater Efficiency Strategy

	Average Annual GHG Reduction	2030	2050
5 Master Pump Stations	35.9	215.5	933.78

Funding

The City of Palm Coast has allocated funds in its five-year Capital Improvement Plan (CIP) for maintenance holes and piping, with additional annual funding sought to optimize operations in extreme weather conditions. City of Palm Coast seeks additional grant funding to expedite their improvements timeline.

Solid Waste – Commercial Composting Program

Description: In the Northeast Florida region, several cities actively participate in a survey to assess their readiness and plans for GHG reduction measures. These cities include Jacksonville, Atlantic Beach, and St. Augustine, each presenting unique programs to address environmental sustainability. Waste management strategies for the cities include composting, and both Jacksonville and St. Augustine also strive to implement waste-to-energy innovations.

Objective: To increase composting and waste-to-energy innovations around multiple cities.

- Impact: Yard and food waste are leading causes of methane in landfills. This initiative aims to create compost and fertilizer for local agriculture, community gardens, and clean energy production.

Schedule & Milestones

- **City of Jacksonville:** Building upon an already existing program, the City of Jacksonville aims to assess its readiness and plans for GHG reduction measures. A specific measure, the "Expansion of COJ Commercial Composting Program," focuses on diverting organic waste to create compost and fertilizer for local agriculture, community gardens, and clean energy production. COJ has no timeline for its implementation as of yet and aims to achieve funding through grant opportunities.
- **City of St. Augustine – Composting:** The City of St. Augustine has expressed interest in participating in a composting waste and material management program. As part of their commitment to environmental sustainability, the city is exploring opportunities to contribute to waste reduction efforts and promote a greener community. Currently no timeline for this measure exists.
- **City of St. Augustine – Waste Diversion:** The City of St. Augustine commits to a GHG reduction measure focused on waste diversion. The program aims to reduce organic waste from restaurants and hotels in the city's historic district, which serves over 5,000,000 visitors annually. This initiative falls within the EPA's economic sector classification of Waste and Materials Management and is categorized as a near-term program to be implemented in the next five years.
- **City of Atlantic Beach:** The City of Atlantic Beach has expressed interest in participating in a composting waste and material management program for local beaches or residential areas. This program would include a drop-off or curbside collection option for residents or businesses. City of Atlantic Beach is exploring public-private partnerships for its implementation.

Benefits

- **GHG Reduction:** Composting and waste diversion prevent organic materials from entering landfills. When introduced to landfills, these materials are emitted into the atmosphere as methane, a harmful GHG. It is assumed that GHG released by organic waste is reduced by 30% when it is diverted from landfills to create compost and fertilizer for local agriculture and community gardens per the California Air Resources Board and that the amount of yearly GHG reductions will stay consistent at 2019 levels. The average restaurant produces 25 wet tons of food waste each year. Table 11 displays varying adoption scenarios and their associated annual GHG reduction.
- **Agriculture:** Composting and waste diversion creates an opportunity to reallocate organic materials from food and yard waste that would otherwise go to landfills. It can create healthy fertilizer for local agriculture, reduce erosion, and conserve water.
- **LIDAC Impact:** By diverting organic waste to create compost and fertilizer for local agriculture and community gardens, the program can contribute to addressing food insecurity in low-income areas. This is particularly crucial for communities that may have limited access to fresh and healthy food options. The program also offers potential economic opportunities for residents, including job creation and workforce development. By participating in composting activities or related industries, members of the LIDAC community can gain valuable skills and employment opportunities, contributing to economic development and empowerment. Finally, by reducing the amount of organic waste sent to landfills, the program helps mitigate methane emissions, which are potent greenhouse gases. This contributes to improved air quality and public health, benefiting all residents, particularly those in vulnerable communities who may be disproportionately affected by air pollution.
- **Community Engagement and Education:** The program provides opportunities for community engagement and education on sustainable waste management practices. By involving residents in composting initiatives and educational campaigns, the program fosters a sense of ownership and environmental stewardship within the LIDAC community.
- **Support for Local Initiatives:** The program supports local initiatives aimed at environmental sustainability and waste reduction. By partnering with community organizations and leaders, the City of Jacksonville can ensure that the Compost Program's benefits reach the LIDAC community effectively.

Table 12 Cumulative GHG Emissions Reduction, in $mtCO_2e$, for the Municipal Composting GHG Reduction Strategies

Municipality	Adoption Rate	Average Annual GHG Reduction	Estimated Total Reduction by 2030	Estimated Total Reduction by 2050
City of Jacksonville*	10%	11,953	717	310,773
	30%	35,840	215,040	931,842
	50%	59,703	358,217	1,552,274
City of Atlantic Beach	10%	102	612	2,652
	30%	306	1,836	7,957
	50%	510	3,060	13,262
City of St. Augustine	10%	141	846	3,666
	30%	423	2,538	10,998
		705	4,230	18,330

Funding

Each organization is actively seeking grants and public-private partnerships to cover their program's capital costs. These organizations are ready to assume long-term program costs and program expansion.

Solid Waste – Trail Ridge Landfill Upgrades

Description

Landfills emit harmful gases to the atmosphere, and the City of Jacksonville Trail Ridge landfill serves Duval County, Alachua, Baker, and Nassau Counties. Trail Ridge Landfill releases an estimated 12,873 $mtCO_2e$ in methane annually. With a global warming potential at least 28 times greater than CO_2 and short atmospheric life, methane is a potent greenhouse gas that is a key contributor to global climate change. Reducing methane emissions from landfills is an effective way to achieve near-term beneficial impact in mitigating global climate change. Trail Ridge Landfill upgrades address community-wide methane emissions and aim to upgrade the landfill for more efficient gas collection and conversion to Renewable Natural Gas (RNG).

- **Objective:** The first objective is to collect Landfill Gas (LFG) and reuse it in generators for power or purification. Secondly, a geosynthetic liner would be installed on top of the closed areas of the landfill to prevent gas emissions.
- **Impact:** In addition to the GHG reduction value, methane contributes to tropospheric ozone levels as an ozone precursor.

Schedule & Milestones

- **Gas Conversion:** The City of Jacksonville is seeking an agreement with a local company to receive LFG from the Trail Ridge Landfill. The city would install gas lines within the waste cells, which could then be piped to a third party for treatment and reuse. For example, the gas could travel to a manufacturing facility for additional process heating. No timeline for this measure exists as of yet.
- **Geosynthetic Liner:** Many areas of the Trail Ridge Landfill have reached capacity and are closed off at the top by impermeable clay. However, this clay may develop cracks over time, releasing atmospheric gases. A geosynthetic liner would help prevent these gases from escaping. This liner can be installed on top of landfill areas that have reached their capacity. Similarly, the liner can be welded to various infrastructures like gas wells that have the potential to allow gases to escape.

Benefits

- **Gas Conversion:** This project takes gases, primarily methane, that would otherwise be emitted into the atmosphere. Reentry of landfill gas as a power source further diversifies the power grid and reduces our dependence on foreign fuel sources. Utilizing existing Municipal Solid Waste (MSW) landfills to produce electricity is an economical strategy for creating new renewable energy generation capacity to meet the power requirements of the community. LFG can function as a “baseload renewable,” offering an online availability rate of over 90%.
- **Reduced Air Pollution Through Non-Renewable Source Offsetting:** Generating energy from LFG reduces reliance on non-renewable resources like coal, oil, and natural gas. This helps in avoiding emissions of CO2 and other pollutants such as sulfur dioxide, particulate matter, nitrogen oxides, and hazardous air pollutants from power plants and fossil fuel users.
- **Health and Safety:** The process of incinerating LFG to generate electricity effectively eliminates most non-methane organic compounds, including hazardous air pollutants and Volatile Organic Compounds (VOCs), which are found in low concentrations in uncontrolled LFG. This significantly mitigates potential health hazards posed by these compounds. Moreover, collecting the gas enhances safety by preventing the risk of explosions due to gas build-up in or around structures near the landfill.
- **Reduced Environmental Compliance Costs:** Presently, the Clean Air Act mandates that the EPA enforce regulations requiring larger landfills to gather and burn LFG. There are multiple ways to comply with these regulations, such as flaring the gas or setting up an LFG energy recovery system. However, only the implementation of an LFG energy recovery system allows communities and landfill owners to convert pollution into a beneficial resource, thereby offsetting the expenses related to regulatory compliance.

Table 13 Cumulative GHG Emissions Reduction, in $mtCO_2e$, for the Transportation Sector GHG Reduction Strategies

Landfill	Capture Rate	Average Annual GHG Reduction	2030	2050	Homes Provided Energy Each Year by Captured Methane
Trail Ridge	60%	360,444	1,802,220	9,011,100	2,053

Funding

City of Jacksonville is currently exploring opportunities for methane capture for renewable energy. It is also actively seeking grant opportunities to help establish these technologies in the Northeast Florida region.

LIDAC Impact

Through this initiative, the community stands to experience improved air quality and potential cost savings, alongside reductions in emissions. Long-term exposure to LFG is associated with a decline in lung function and increased rates of asthma[48]. By upgrading the landfill for more efficient gas collection and converting it into Renewable Natural Gas (RNG), the project not only addresses community-wide emissions but also supports enhanced air quality in surrounding areas, leading to better public health outcomes. Additionally, the expansion of landfill energy generation potential holds promises for further environmental and economic gains. From the Landfill Methane Outreach Program's LFG cost-Web, for $5 million dollars of expenditures, there is an economic output between $12-13 million and up to 80 jobs created. With collaboration from local businesses and JEA, the project aims to pioneer scalable solutions in landfill gas utilization, highlighting its transformative impact. Supported by key stakeholders, including the Director of Public Works and COJ Environmental Programs Manager, this initiative underscores Jacksonville's commitment to sustainability and the well-being of its LIDAC community.

Cumulative Wastewater and Solid Waste Measures Authority to Implement

For local governments, solid waste and wastewater functions are generally delegated to the local government and can be outsourced through franchise agreements, operated internally, or other structures. Therefore, the authority to implement solid waste strategies is going to be variable across the region.

48. ATSDR - Landfill Gas Primer - Chapter 3: Landfill Gas Safety and Health Issues (cdc.gov) 20210111-CLAM_Final_Word (nassaucountyfl.com)

Agriculture, Forestry, and Other Land Use

The State of Florida is one of the fastest growing in the country. As of 2022, Florida's population reached 22,244,823, over nine times greater than its 1946 population of 2,440,000. Such incredible growth has undeniable benefits but also places a strain on infrastructure and encroaches on our unique natural resources. With some counties projecting population growth in the range of 40-60% in the next decade, it is necessary to implement strategic measures to maintain Florida's most important asset - its rich natural and cultural heritage.

Some local municipalities have already established new parks under this model. Marineland created a "Geo Park" to preserve environmentally sensitive land and is seeking funding to develop additional parks. The City of St Augustine acquired Fish Island Preserve in November 2019 as part of the Northeast Florida Blueway Forever Project, preserving land in imminent danger of development.

Land Acquisition

Description: In collaboration with the North Florida Land Trust, Nassau County has developed a comprehensive Conservation Lands Acquisition and Management (CLAM) conservation plan[49] . The primary goals are addressing water issues, species and habitat protection, outdoor recreation, and quality of life, and the secondary goals include preserving working lands such as farms, ranches, and timberlands. Coupled with sustainable farming and agricultural practices, Nassau County can maximize the land's ability to function as a carbon sink to the area.

Land acquisition can also lead to the creation of alternative transit corridors, as seen in the City of Jacksonville's Emerald Trail plan. Creating new pedestrian and biking corridors would connect residents, businesses, and amenities, potentially reducing transportation-related carbon emissions and increasing the viability of intermodal passenger transport.

Schedule & Milestones

- **Objective:** Nassau County would like to acquire 100,000+ acres of land, which has been identified and prioritized for acquisition to preserve wildlife and enhance resiliency[50]. This land acquisition plan has overwhelming support from county residents, who voted to expand their budget by $30M.
- **Impact:** Preserving undeveloped land benefits air quality, and carbon capture improves public health and well-being and can lead to expanded tourism opportunities. Maintaining wildlife habitats and provisioning for wildlife corridors allows wildlife to avoid roadways and human infrastructure, protects biodiversity, and enhances ecosystem resilience. Forested lands are crucial in absorbing and sequestrating carbon dioxide and other greenhouse gases. According to the USDA, forested lands have an uptake average of 0.6 metric tons of carbon per hectare per year, whereas agricultural lands have an uptake average of 0.1 metric tons of carbon per hectare per year[51] [52]. Potential carbon storage for agroforestry ranges in the U.S. from 15 to 198 metric tons of carbon per hectare per year. As the Nassau County CLAM plan grouped Agriculture and Forestry as one type of land, the average uptake value was estimated to be 0.5. Natural Areas and their soils also have a more modest uptake average of 0.1 metric tons of carbon per hectare per year. According to the Nassau County Land Development Plan, developed land for population growth through 2030 is anticipated to be 10.4 hectares and could expand to another 9 hectares with the same development to population growth projections applied53. However, with a land acquisition rate of 5 hectares of forested and agricultural lands over the next 25 years, and new development focused on non-forested lands, GHG reduction from natural land carbon sinks will remain stable through 2030 and 2050.

49. 20210111-CLAM_Final_Word (nassaucountyfl.com)
50. 082522-CLAM-Map (nassaucountyfl.com)

Table 14 GHG Emissions Reduction, in $mtCO_2e$, for Nassau County Land Use and Development

Land Use Type	2019 Land Area, hectares	2019 Average Annual GHG Reduction	2030 Land Area, hectares	2030 Annual GHG Reduction	2050 Land Area, hectares	2050 GHG Reduction
Agriculture and Forestry	77,336	38,668	77,338	275,755	77,341	38,671
Natural Areas	73,924	7,392	73,914	7,391	73,905	7,391
Developed / Urban Land	20,630		20,640		20,649	

Benefits

- **Public Health:** Promoting rural lifestyles and providing equitable access to conservation lands through a county-wide network of trails and blue ways, enhancing alternate transportation options and quality of life.
- **Ecological Resilience:** Preserving sensitive environments maintains Florida's bountiful natural beauty and biodiversity. Conservation areas allow wildlife to range while reducing potentially dangerous interactions with human roadways and development.
- **Alternate Transportation Options:** Developing new pedestrian and bicycle transit corridors reduces reliance on traditional transportation options, significantly impacting carbon emissions.
- **LIDAC Impact:** Air pollution can lead to respiratory diseases, including Chronic Obstructive Pulmonary Disease and asthma, and has further been linked to neurological disorders and inflammation. Low-income communities are disproportionately impacted by air pollution from stationary sources such as factories and power plants, as well as mobile sources brought about by proximity to truck routes and highways. These communities are also less likely to benefit from political representation and the enforcement of emissions regulations. The creation of vegetated parks and corridors through land acquisition would lead to a direct reduction in air particulates and may lead to reduced reliance on vehicle travel, thereby improving air quality and quality of life for residents.

  Disadvantaged communities also face greater heat than their counterparts. Mad-made surfaces, such as concrete, tend to absorb heat, and structures can create an "urban canyon" effect by blocking wind. Higher temperatures increase reliance on power generation and cooling, which in turn become a source of heat. Cities experience 1-7°F temperatures higher than the surrounding countryside, and EPA data shows that the frequency of heat waves has increased from two per year in the 1960s six per year in the 2010s and 2020s. Furthermore, a 2021 study was able to show a correlation between low-income and minority communities and elevated urban surface temperatures compared with other communities within the same city.

  Increasing vegetation through land development helps to mitigate the factors contributing to the urban heat island effect. Trees provide shade and can even cool their surroundings through transpiration and evaporative cooling - an effect of energy being absorbed by water when it changes states from liquid to gas. The EPA estimates urban forests are, on average, 2.9°F cooler than unforested urban areas. Expanding parkland, planting street trees, and installing "green/ cool roofs" coupled with the use of reflective coatings would provide heat relief for our communities, particularly those that are most vulnerable.

51. Greenhouse Gas Emissions and Removals From Forest Land, Woodlands, Urban Trees, and Harvested Wood Products in the United States, 1990–2021 (usda.gov)
52. Carbon sequestration in agricultural lands of the United States (usda.gov)
53. Microsoft Word - 9-Future Land Use Element DandA _Clean Copy_.doc (nassaucountyfl.com)

Funding

In November 2022, 68% of voters were in favor of a referendum for Nassau County to issue up to $30M in general obligation bonds for the Nassau County CLAM program. Nassau county will continue to seek funding for the several acres of lands they intend to acquire through grants and county and regional resiliency programs.

Authority to Implement:

The authority to implement various land acquisition and management strategies is a function of local government partnerships and resources. Partnerships with other entities and individual landowners are key to successful programs. A key program to leverage local land acquisition and land management activities is the Rural and Family Lands Protection Program. The Rural and Family Lands Protection Program (RFLPP) is an agricultural land preservation program designed to protect important agricultural lands through the acquisition of permanent agricultural land conservation easements. The program is written in Section 570.70, Florida Statutes, and Chapter 5I-7, Florida Administrative Code (F.A.C.). A Technical Review Team reviews projects, ranking them through a formal process by the Rural and Family Lands Protection Program Selection Committee and approved by the Governor and Cabinet.

4

LOW-INCOME AND DISADVANTAGED COMMUNITY (LIDAC) BENEFIT ANALYSIS

IV. LOW-INCOME AND DISADVANTAGED COMMUNITY (LIDAC) BENEFIT ANALYSIS

Many LIDACs in NEFL will benefit from the implementation of the priority measures included in this PCAP. The measures will reduce public health inequities, increase economic opportunities through clean energy jobs, and improve the natural environment and community resilience. The goals of the Justice40 Initiative set forth in Executive Order 14008, which aims to deliver 40% of the overall benefits of relevant federal investments to disadvantaged communities, will also be advanced through the measures. It is vital to remember that by addressing social, environmental, and economic acute and chronic stressors in a region, the large cost of climate adaptation and mitigation efforts is decreased. This section covers the methodology used to determine LIDACs in the region, which locations have certain burdens, and how the proposed priority measures will positively impact the LIDACs and reduce certain burdens.

Methodology

For the purposes of the CPRG, LIDACs are defined as any community that is identified as disadvantaged by the Council on Environmental Quality Climate and Economic Justice Screening Tool (CEJST)[54] and/or EPA's Environmental Justice EJScreen[55] tool. The CEJST is a geospatial mapping tool that uses an interactive map and datasets to identify communities that are overburdened and underserved. These communities are marginalized by society, underserved by infrastructure and other basic services, and overburdened by pollution. CEJST is based on the third smallest census track (1,200-8,000 people) and uses indicators of burden in eight categories: climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development. Census tract boundaries for statistical areas are determined by the U.S. Census Bureau once every ten years. As of the writing of this plan, CEJST utilized the census tract boundaries from 2010. A community is highlighted as disadvantaged on the CEJST map if it is in a census tract that is (1) at or above the threshold (usually 90th percentile) for one or more environmental, climate, or other burdens and (2) at or above the threshold for an associated socioeconomic burden (usually income at or above 65th percentile). The EJScreen is an environmental justice mapping and screening tool that provides nationally consistent datasets and an approach for combining environmental and demographic socioeconomic indicators. It uses the census block group level and can layer data such as pollution sources and level of education that can afford an even deeper understanding of a community. Both tools were used to identify and understand communities that are overburdened and underserved in NEFL so they can be prioritized in development and implementation opportunities. The categories, type of burden, thresholds, and descriptions are provided in Appendix D.

54. https://screeningtool.geoplatform.gov/en/#9/30.2857/-81.7015
55. https://ejscreen.epa.gov/mapper

Identification of LIDACs

With both tools, the NEFL MSA identified a total of 91 LIDACs totaling 426,578 in population or 25% of NEFL MSA population, including:

- 69 in Duval County (340,246 people or 20% of NEFL MSA population),
- 7 in Clay County (34,191 or 2%),
- 1 in Baker (8,181 or 0.5%),
- 1 in Nassau (6,661 people or 0.4%),
- 3 in St. Johns (16,021 people or 1%), and
- 10 in the City of Palm Coast (44,088 people or 3%).

FIGURE 4

Climate and Economic Justice Mapping of NEFL[56]

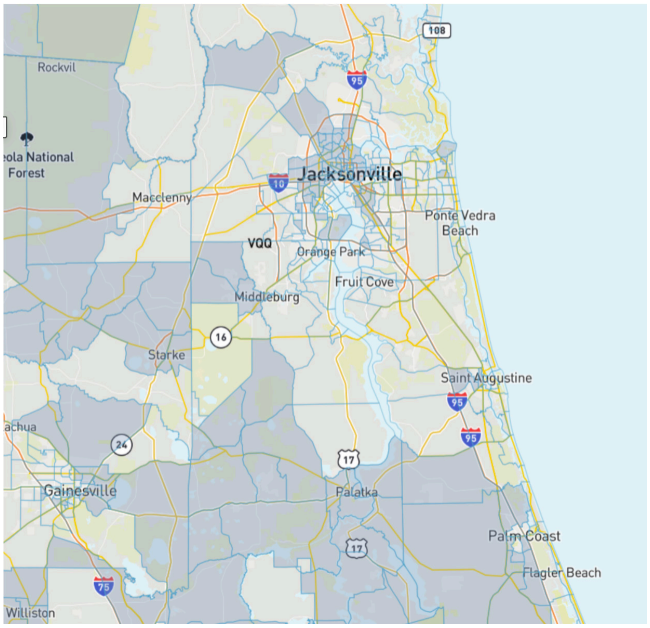


FIGURE 5

Baker, Nassau, Duval, Clay, and St. Johns Counties LIDAC Communities (in Dark Green and Yellow)[57]

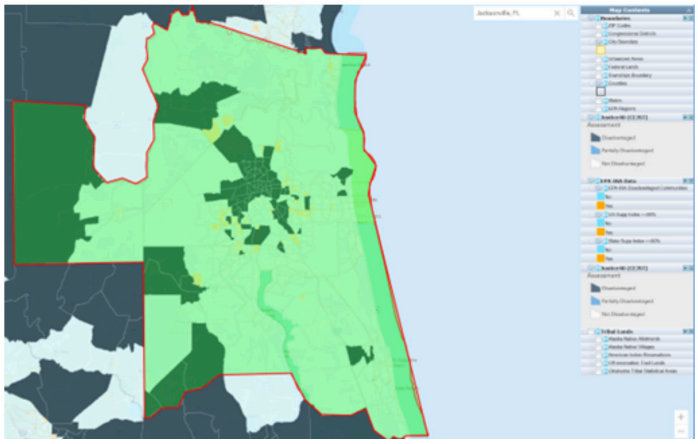
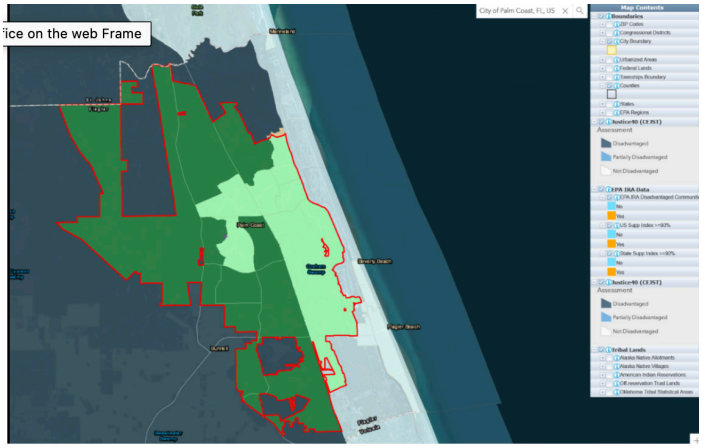


FIGURE 6

City of Palm Coast LIDAC Communities (in Dark Green and Yellow)[58]



56. https://screeningtool.geoplatform.gov/en/#9/30.2857/-81.7015
57. https://ejscreen.epa.gov/mapper/
58. https://ejscreen.epa.gov/mapper/

Table 15 Number of People Affected with a Disadvantaged Burden Addressed by a Proposed Measure(s) [59]

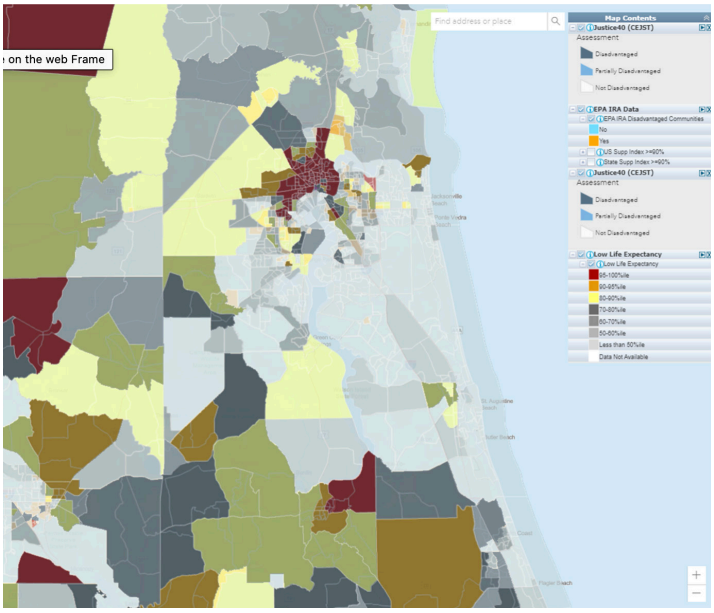
Burden	Number of LIDACs / Frequency of Burden (90th and Low Income/HS)	Number of People Affected	Location / Number of Census Tracts Impacted	Proposed Measure(s)
Low Life Expectancy	41	163,236	39 Duval; 1 Palm Coast; 1 Clay	All proposed measures
Proximity to Risk Management Plan (RMP) facilities	40	150,280	39 Duval; 1 St. Johns	Potential Landfill Gas Recovery
Projected Fire Risk	20	132,019	4 Clay, 11 Duval, 5 Palm Coast	All proposed measures will potentially indirectly help slow down and reduce the severity of acute weather events
Heart Disease	28	109,445	23 Duval; 3 Palm Coast; 1 Clay; 1 St. Johns	Bike/Pedestrian programs; Mode shift
Diabetes	29	106,400	28 Duval; 1 Palm Coast	Bike/Pedestrian programs; Mode shift
Low median income	26	98,578	26 Duval	Potentially energy efficiency and solar for buildings; Bike/ Pedestrian programs; Mass transit expansion; Mode shift; Workforce development tied to measure implementation
Asthma	23	82,706	23 Duval	Increase in renewable energy for electrical grid; Energy efficiency and solar for buildings; EV fleet transition; Bike/Pedestrian programs; Mass transit expansion; Mode shift
Travel Barriers	12	68,700	1 Baker, 6 Clay, 1 Duval, 1 Nassau, 2 Palm Coast, and 1 St. Johns	EV fleet transition; Bike/ Pedestrian programs; Mass transit expansion; Mode shift
Unemployment	18	66,962	18 Duval	Workforce development and training tied to measure implementation
Poverty	18	63,163	1 Clay, 17 Duval	Potentially energy efficiency and solar for buildings; Bike/ Pedestrian programs; Mass transit expansion; Mode shift; Workforce development tied to measure implementation

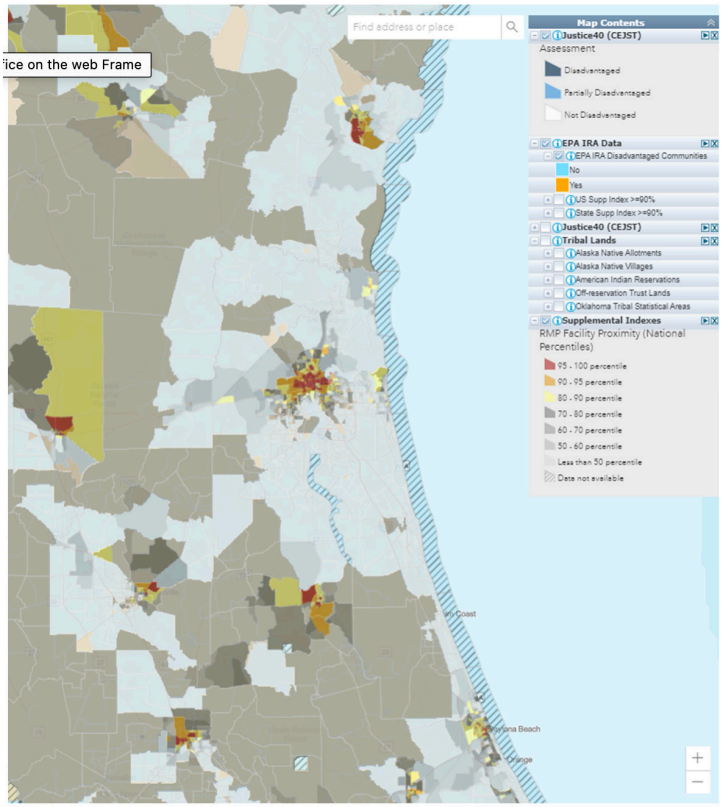
Housing cost/burden	17	61,149	16 Duval, 1 St. Johns	Potentially energy efficiency and solar for buildings
Projected Flood Risk	10	50,026	3 Duval, 5 Palm Coast, 2 St. Johns	All proposed will potentially indirectly will indirectly help slow down and reduce the severity of acute weather events
Energy Burden/Costs	15	49,784	15 Duval	Energy efficiency and solar for buildings
Historic Underinvestment	14	46,479	14 Duval	Energy efficiency and solar for buildings; EV fleet transition; Bike/Pedestrian programs; Mass transit expansion; Mode shift
Expected Building Loss	3	38,062	2 Flagler, 1 St. Johns	All proposed measures will potentially indirectly will indirectly help slow down and reduce the severity of acute weather events
Traffic Proximity and Volume	12	37,826	12 Duval	EV fleet transition; Bike/ Pedestrian programs; Mass transit expansion; Mode shift
Diesel PM Exposure	10	36,594	10 Duval	EV fleet transition; Bike/ Pedestrian programs; Mass transit expansion; Mode shift
Wastewater discharge	10	34,409	10 Duval	Wastewater treatment efficiency upgrades will slow down infiltration and discharge
Education less than a high school diploma +25 yo	7	20,222	7 Duval	Workforce development and training tied to measure implementation
Linguistic isolation	3	18,646	3 Duval	Intentional outreach with sensitivity to linguistic needs
Expected Population Loss	4	16,001	4 Duval	All proposed measures will potentially indirectly will indirectly help slow down and reduce the severity of acute weather events

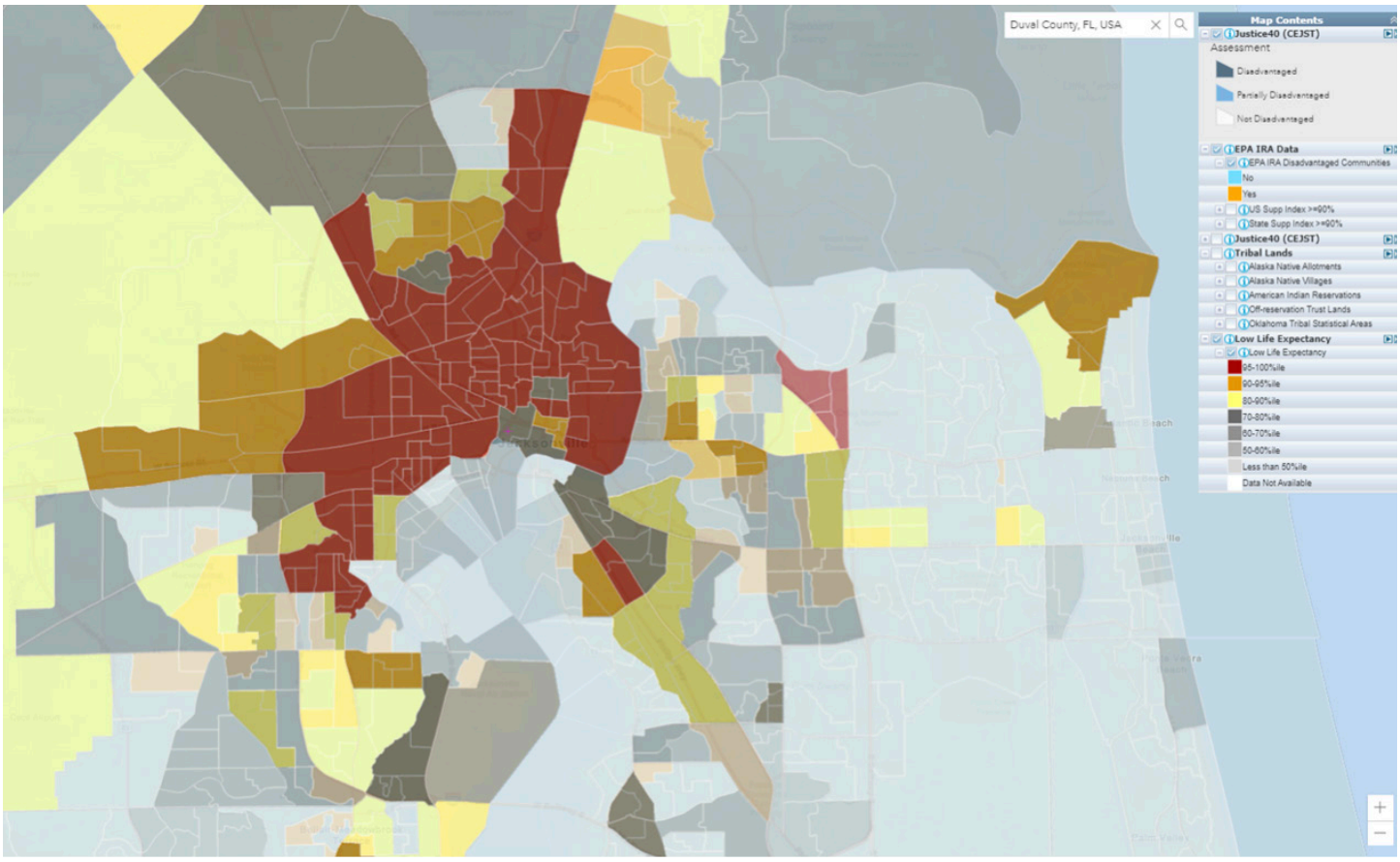
59. Data on burdens downloaded and analyzed from Climate and Economic Justice Screening Tool (CEJST) - https://screeningtool.geoplatform.gov/en/downloads. Maps showing locations of LIDACs and burdens are from the EPA EJ Screening mapping tool ejscreen.epa.gov/mapper/. Complete list of burdens by number of people affected can be found in Appendix XXX

Maps of Top Five Most Populous LIDACs with a Specific Disadvantaged Burden

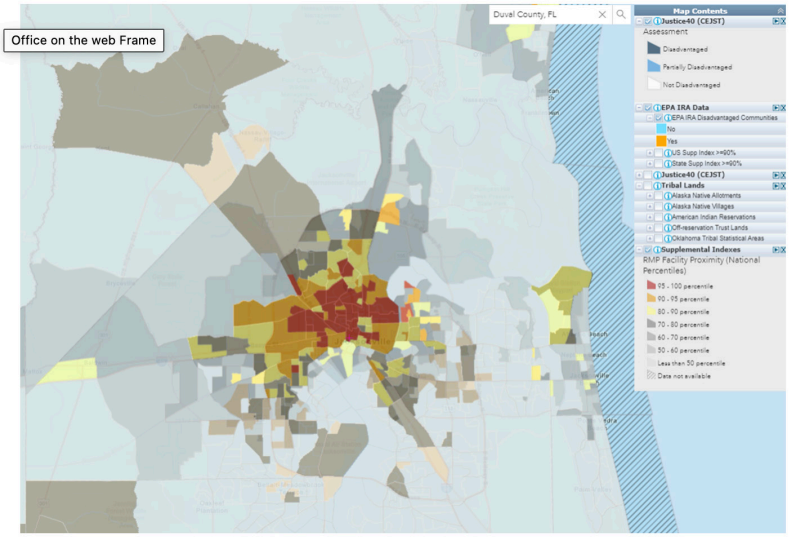
EPA EJ Screen NEFL MSA Map and Duval County Map of Low Life Expectancy Burden
(39 LIDACs in Duval, 1 Clay, 1 Palm Coast – affecting 163,236 people)



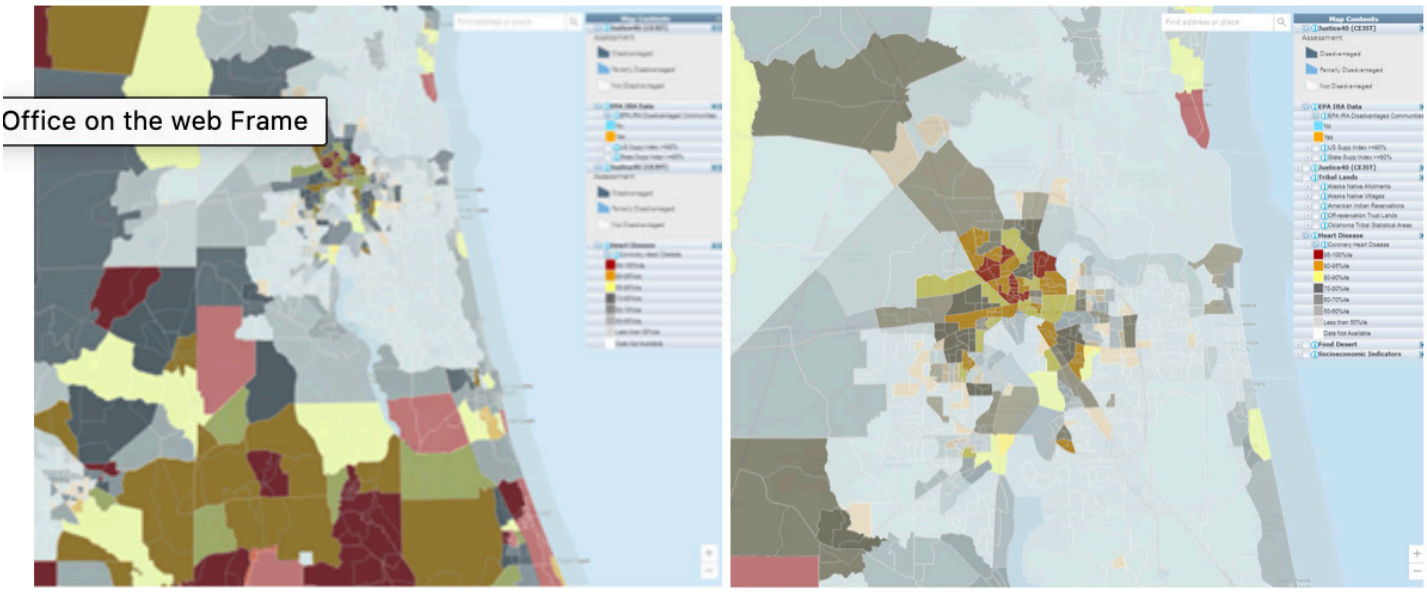




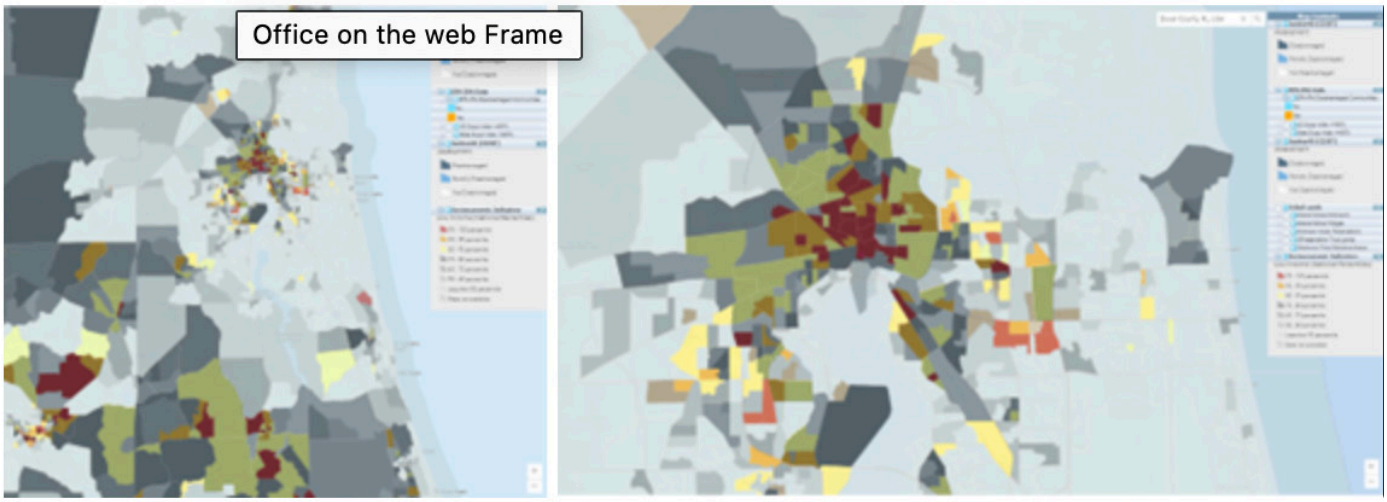
EPA EJ Screen NEFL MSA Map and Duval County Map of Proximity to Risk Management Plan (RMP) Facilities Burden (39 LIDACs in Duval; 1 St. Johns – affecting 150,280 people)



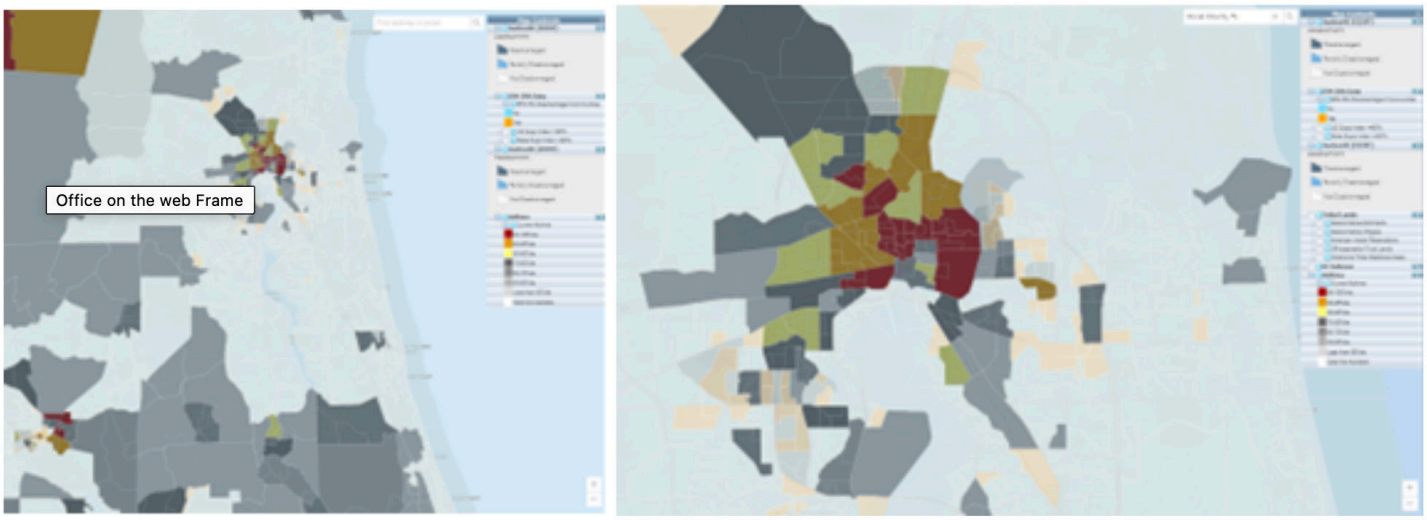
EPA EJScreen NEFL and Duval County Maps of Heart Disease Burden (23 LIDACs in Duval; 3 Palm Coast; 1 Clay; 1 St. Johns – affecting 109,445 people)



EPA EJScreen NEFL and Duval County Maps of Median Income Burden (26 LIDACs in Duval – affecting 98,578 people)



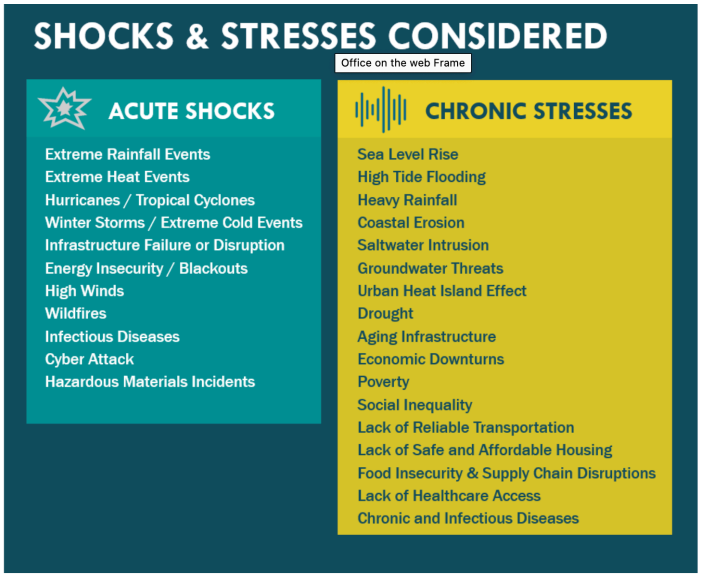
EPA EJScreen NEFL and Duval County Maps of Asthma Burden (23 LIDACs in Duval – affecting 82,706 people)



Climate Impacts and Risks

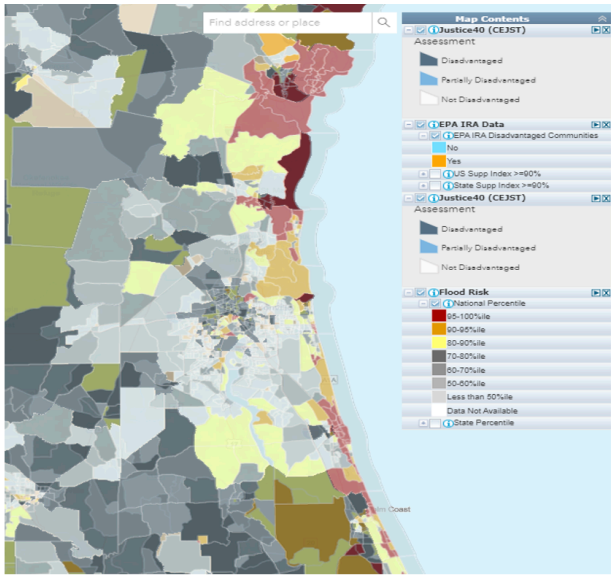
Like many regions, Northeast Florida is facing various climate impacts and risks that are expected to intensify with ongoing climate change. In 2023, the region benefited from studies completed for the City of Jacksonville's first resilience plan that covers the next 50 years. Below is a quick chart from the plan outlining the region's acute shocks and chronic stressors, as well as four maps from the EPA EJ Screen Mapping Tool demonstrating the four climate risks it measures – flooding, wildfire, 100-year floodplain, and sea level rise – and where these risks overlay with our regions LIDAC communities:

FIGURE 7 Duval County Acute Shocks and Chronic Stresses

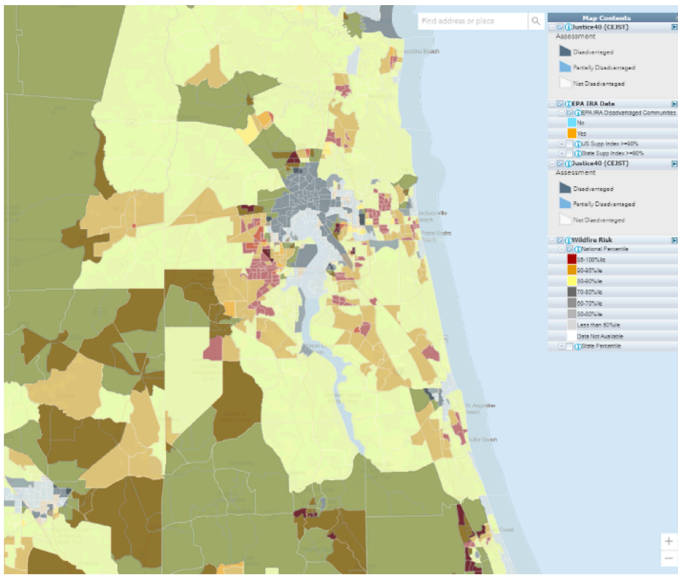


Source: Resilient Jacksonville October 2023 Report[60]

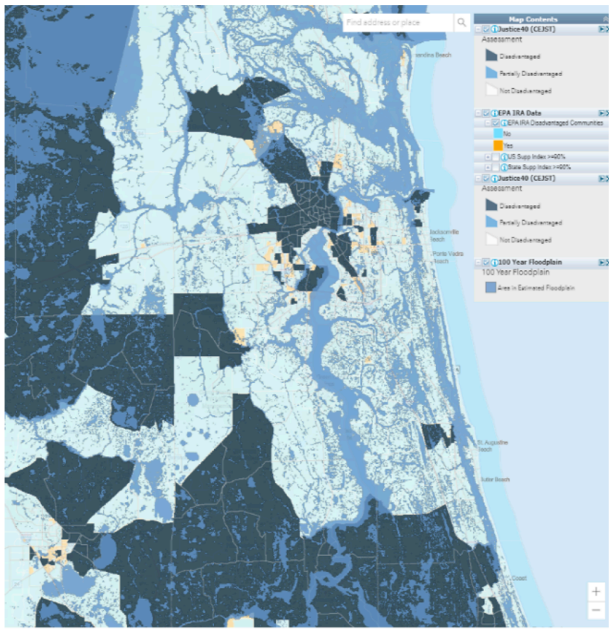
60. www.resilientjacksonville.com



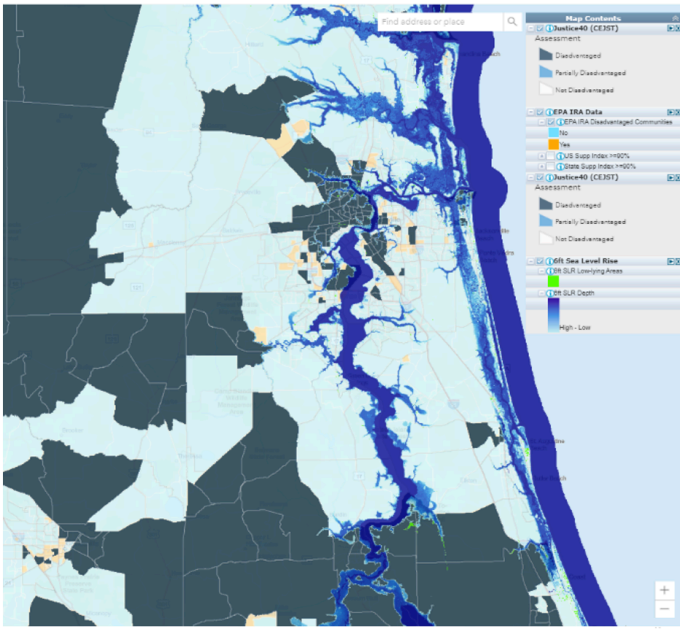
Flood Risk



Wildfire Risk



100-Year Floodplain



Sea Level Rise (6th Feet; NOAA)

IMPACT OF PCAP IMPLEMENTATION ON LIDACS WITH ANTICIPATED BENEFITS AND CHALLENGES

Table 15 LIDACs anticipated to be affected by implementing each priority measure included in this PCAP.

The anticipated benefits or potential disbenefits associated with measure implementation are also summarized in this section.

ELECTRICAL GRID MEASURE: INCREASE CLEAN ENERGY

Measure Description: Local utilities to reduce GHG emissions by increasing their percentage of clean energy

Communities Impacted by this Measure: While it is unlikely that a utility will place one of its planned large solar farms directly within a LIDAC in NEFL MSA for direct benefits, the indirect benefits listed below will help many in the MSA.

LIDAC Census Tracts Impacted: NEFL MSA Wide

12003040201, 12019030102, 12019030103, 12019030104, 12019030400, 12019031104, 019031105, 12019031106, 12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503, 12035060104, 12035060204, 12035060206, 12035060207, 12035060208, 12035060209, 12035060210, 12035060212, 12035060213, 12035060214, 12109020300, 12109021003, 12109021101

BENEFITS	POTENTIAL CHALLENGES/DISBENEFITS
Reduced energy costs	Upfront costs
Improved health outcomes	Citing and acquiring appropriate location
Increased job opportunities	Distribution infrastructure
Improved energy independence and resilience	

NAVIGATING/MITIGATING THE CHALLENGES
Customer Incentive Programs to increase demand for clean energy
Community Solar Projects located in LIDACs
Policy Support
Infrastructure Improvements
Education and Outreach
Targeted Job Training

BUILDING MEASURE: RESIDENTIAL ENERGY AUDIT and EFFICIENCY TOOLKIT

Measure Description: Host energy efficient and energy audit toolkits at public libraries for the public to check out as well as direct energy saving technology kits to pass out that include LED lightbulbs, smart power strips, and educational materials and resources (e.g., times and locations of workshops) in multiple languages.

Communities Impacted by this Measure: All LIDAC communities throughout the NEFL MSA will have access to these toolkits. It is vital to make tools and "how to" information freely and easily available to those who cannot afford to pay for a professional audit. The direct and indirect benefits of this measure are listed below.

LIDAC Census Tracts Impacted: NEFL MSA Wide wherever a library is located

12003040201, 12019030102, 12019030103, 12019030104, 12019030400, 12019031104, 12019031105, 12019031106, 12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503, 12035060104, 12035060204, 12035060206, 12035060207, 12035060208, 12035060209, 12035060210, 12035060212, 12035060213, 12035060214, 12109020300, 12109021003, 12109021

BENEFITS	POTENTIAL CHALLENGES/DISBENEFITS
Increased control and empowerment	Lack of accessibility and equitable distribution
Reduced electricity bills	Limited scope and impact
Improved comfort and health	Lack of awareness and direct promotion
Reduced environmental impact	Limited internet access and digital divide
Increased community engagement, knowledge and trust	

NAVIGATING/MITIGATING THE CHALLENGES
Culturally sensitive education and outreach
Use multimedia and diverse tools and resources
Share success stories and pictures from within each community
Combine with incentives and financial assistance programs

BUILDING MEASURE: HIGH PERFORMING CENTERS TO BUILD COMMUNITY RESILIENCY

Measure Description: Retrofit community assets such as schools, community centers, critical facilities, and libraries that serve disadvantaged residents to be energy efficient and install solar with backup batteries where feasible. These facilities will ensure vulnerable residents have access to safe spaces with services following events such as hurricanes, tornados, and electric grid failures. If designed well, high performing centers to build community resiliency can equitably enhance community resilience while reducing GHG emissions and improving local quality of life. They are a smart local investment with the potential to reduce the burden on local emergency response teams, improve access to health improvement initiatives, foster greater community cohesion, and increase the effectiveness of community-centered institutions and programs." (Source: USDN website)

Communities Impacted by this Measure: The community centers will be sited and managed within LIDAC communities in NEFL MSA. The direct and indirect benefits of this measure are listed below.

LIDAC Census Tracts Impacted: NEFL MSA Wide and wherever the identified community centers are located

12003040201, 12019030102, 12019030103, 12019030104, 12019030400, 12019031104, 12019031105, 12019031106, 12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503, 12035060104, 12035060204, 12035060206, 12035060207, 12035060208, 12035060209, 12035060210, 12035060212, 12035060213, 12035060214, 12109020300, 12109021003, 12109021

BENEFITS	POTENTIAL CHALLENGES/DISBENEFITS
Enhanced community resilience and social cohesion	Initial siting, costs, and maintenance
Reduced energy bills for the municipality	Complex and/or multiple partnerships
Improved air quality and climate mitigation	Ongoing usefulness to the comm
Increased community empowerment and trust	
Increased services and support of the community	

NAVIGATING/MITIGATING THE CHALLENGES
Foster ongoing intentional community input of facility features, services, and programs
Verify accessibility and cultural sensitivity of facility, services, and programs
Create a long-term maintenance and sustainable funding source plan

BUILDING MEASURE: COMMERCIAL SOLAR

Measure Description: Place commercial large-scale solar in strategic locations throughout the NEFL MSA.

Communities Impacted by this Measure: Where possible the large-scale solar projects will be placed in or near a LIDAC community and where significant energy savings and GHG emission reductions can be achieved. The direct and indirect benefits of this measure are listed below.

LIDAC Census Tracts Impacted: NEFL MSA Wide and wherever a library is located

12003040201, 12019030102, 12019030103, 12019030104, 12019030400, 12019031104, 12019031105, 12019031106, 12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503, 12035060104, 12035060204, 12035060206, 12035060207, 12035060208, 12035060209, 12035060210, 12035060212, 12035060213, 12035060214, 12109020300, 12109021003, 12109021101

BENEFITS	POTENTIAL CHALLENGES/DISBENEFITS
Reduced energy costs	Limited economic benefit sharing
Improved community resilience	Concerns about land use impact and negative aesthetics
Increased climate risk mitigation	Possible long-term gentrification and displacement impacts
Increased economic development and job creation	Concerns about equitable access to community
Enhanced skills development	

NAVIGATING/MITIGATING THE CHALLENGES
Foster ongoing intentional community input of facility features, services, and programs
Verify accessibility and cultural sensitivity of facility, services, and programs
Create a long-term maintenance and sustainable funding source plan

BUILDING MEASURE: MUNICIPAL BUILT ENVIRONMENT DECARBONIZATION

Measure Description: Reduce the embodied carbon in vertical and horizontal built environment in municipalities.

Communities Impacted by this Measure: Locating cool roofs, pavement, green infrastructure along with decarbonizing buildings in LIDAC communities throughout the City of Jacksonville, the City of Atlantic Beach and the City of St. Augustine will reduce urban heat impacts. The direct and indirect benefits of this measure are listed below.

LIDAC Census Tracts Impacted: LIDACs in the City of Jacksonville, the City of Atlantic Beach and the City of St. Augustine

12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800,
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BENEFITS	POTENTIAL CHALLENGES/DISBENEFITS
Lower energy bills can free up resources for essential services	Limited economic benefit sharing
Improved public health in air quality and ventilation	Increased building costs
Increased local job creation and training opportunities	Ongoing maintenance and technology upgrade financial burden
Leadership by example encourages broader adoption of sustainable practices by businesses and residents	Limited access to new jobs and skills training
Increased climate risk mitigation	Disruption during implementation of horizontal project

NAVIGATING/MITIGATING THE CHALLENGES
Involve residents in the planning and decision-making process to ensure their needs and concerns are heard and addressed
Provide clear information on the time and length of disruption to residents and businesses by the project
If the project is community solar, prioritize high energy burden residents with targeted, sensitive outreach
Prioritize hiring and training residents and small businesses from disadvantaged communities for retrofitting and maintenance jobs
Clearly communicate project goals, benefits, and potential impacts to the community throughout the process
Consider expanding public transportation access to connect residents to municipal buildings

TRANSPORTATION MEASURE: NORTH FLORIDA TPO'S CLEAN FUELS INITIATIVE

Measure Description: Examine the operational and economic feasibility of transitioning fleets of various stakeholders in three counties to clean fuels and increase adoption of cleaner alternative fuels than traditional fossil fuels.

Communities Impacted by this Measure: Where possible, we will partner with stakeholders in fleets located in LIDAC communities. The direct and indirect benefits of this measure are listed below.

LIDAC Census Tracts Impacted: LIDACs in Duval, Nassau, and St. Johns counties

12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503, 12109020300, 12109021003, 12109021101

BENEFITS	POTENTIAL CHALLENGES/DISBENEFITS
Lower energy bills can free up resources for essential services	Limited economic benefit sharing
Improved public health in air quality and ventilation	Increased building costs
Increased local job creation and training opportunities	Ongoing maintenance and technology upgrade financial burden
Leadership by example encourages broader adoption of sustainable practices by businesses and residents	Limited access to new jobs and skills training
Increased climate risk mitigation	Disruption during implementation of horizontal project

NAVIGATING/MITIGATING THE CHALLENGES
Involve residents in the planning and decision-making process to ensure their needs and concerns are heard and addressed
Provide clear information on the time and length of disruption to residents and businesses by the project
If the project is community solar, prioritize high energy burden residents with targeted, sensitive outreach
Prioritize hiring and training residents and small businesses from disadvantaged communities for retrofitting and maintenance jobs

TRANSPORTATION MEASURE: MASS TRANSIT EXPANSION AND MOBILITY HUB

Measure Description: Develop intercounty mass transit with a regional rail network and expanded bus express service. This will address the transportation GHG emissions from work commuter traffic from other counties into Duval County.

Communities Impacted by this Measure: Where possible, JTA will work with key stakeholders and local communities to be serviced by the mass transit expansion to design direct benefits for LIDAC communities. The direct and indirect benefits of this measure are listed below.

LIDAC Census Tracts Impacted: LIDACs in Baker, Clay, Duval, Nassau, and St. Johns counties

12003040201, 12019030102, 12019030103, 12019030104, 12019030400, 12019031104, 12019031105, 12019031106, 12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503, 12109020300, 12109021003, 12109021101

BENEFITS	POTENTIAL CHALLENGES/DISBENEFITS
Improved air quality and public health	Upfront and ongoing costs
Reduced climate change impacts and risks	Probable disruption and inconvenience during implementation
Increased job creation, job opportunities, and economic development	Limited impact on employment for local residents if they are unaware of opportunities, lack skills, or face barriers to entry
Reduced transportation costs	Concerns about safety and security
Increased access to opportunities and quality of life	Concerns about accessibility and equitability (e.g., design for those with disabilities, limited mobility, those lacking language proficiency, or other special needs)
Enhanced public spaces	Potential disruption to local cultures and social fabrics
Enhanced community connections	Potential gentrification and displacement impacts
Potential revitalization and increased community development	Probable maintenance and operational challenges

NAVIGATING/MITIGATING THE CHALLENGES
Clearly communicate project goals, benefits, potential impacts, and community engagement opportunities throughout the process
Provide targeted training and job placement assistance for workers in LIDACs to ensure they benefit from the expansion
Continue to work on adding amenities to the transit experience (e.g., free Wi-Fi) to encourage people not to take their car
Create a sustainable, long-term funding plan

TRANSPORTATION MEASURE: COJ BICYCLE-PEDESTRIAN PROGRAMS

Measure Description: Increase active transportation mode share by expanding a safe and connected bicycle facilities network, expand/enhance a trail network that is comfortable, safe, and appropriate for all ages/abilities, and create an E-bike voucher program to provide modal options for underserved communities, offer residents and visitors alike a lower-emissions modal option for commuting, and construct shower/locker facilities for government offices, providing staff with facilities to support an elevation in active transportation.

Communities Impacted by this Measure: The majority of these programs will be located and focused on directly serving the 61 LIDACS in the City of Jacksonville. The direct and indirect benefits of this measure are listed below.

LIDAC Census Tracts Impacted: LIDACs in the City of Jacksonville

12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400

BENEFITS	POTENTIAL CHALLENGES/DISBENEFITS
Increased access and mobility to jobs and those who cannot drive	Concerns about accessibility to paths and trails
Improved public health through more physical activity	Initial costs and construction disruptions
Reduced transportation costs	E-bike affordability and equitable access to charging infrastructure
Improved air quality and other environmental benefits	E-bike safety for riders and pedestrians
Enhanced community vitality, safety, and cohesion	Shower/locker facility utilization and costs
Enhanced public spaces	Potential disruption to local cultures and social fabrics
Enhanced community connections	Potential gentrification and displacement impacts

NAVIGATING/MITIGATING THE CHALLENGES
Actively involve residents in planning and decision-making to ensure their needs and concerns are heard and addressed
Design all elements with accessibility in mind, ensuring everyone can safely and comfortably use the new infrastructure
Consider bike repair stations
Prioritize safety through dedicated enforcement, lighting, and educational campaigns

TRANSPORTATION MEASURE: FLEET TRANSITION FOR EVs

Measure Description: Decrease emissions generated by the transportation sector, improve the region's air quality, and serve as a positive example for other entities to follow by transitioning public fleets to electric.

Communities Impacted by this Measure: The city EV fleet transitions will directly benefit their LIDACs with less air pollution. The DCPS plans to place their EV buses directly within school routes hoping to directly reduce asthma rates. Additional direct and indirect benefits of this measure are listed below.

LIDAC Census Tracts Impacted: LIDACs in Nassau County, the City of St. Augustine, the City of Jacksonville, the City of Atlantic Beach, Duval County Public School District

12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503, 12109021003, 12109020300

BENEFITS	POTENTIAL CHALLENGES/DISBENEFITS
Improved air quality, respiratory health, and healthcare costs	Limited infrastructure
Reduced climate change risk	Potential job displacement in traditional fossil fuel sectors
Increased job creation and economic development	Anti-EV sentiment
Reduced noise pollution	
Reduced operating costs	
Potential increased resilience with two-way charging	

NAVIGATING/MITIGATING THE CHALLENGES
Consider the long-term costs and accessibility of maintenance and repairs for EVs to ensure affordability
Track the transition's impact with data and monitoring on disadvantaged communities and city employees and budget, including air quality, health outcomes, job creation, and economic savings, to adapt the approach as needed

INDUSTRY MEASURE: REDUCE MARITIME SECTOR EMISSIONS

Measure Description: Reduce emissions from the maritime sector, including Jones Act ocean-going vessels, cruise ships, and commercial harbor craft including reducing medium- and heavy-duty truck vehicle miles traveled, traffic congestion, idling, and queueing.

Communities Impacted by this Measure: The Jacksonville Port Authority (JAXPORT) headquarters, refrigerated services, and a marine terminal are in two LIDAC communities with many trucks and marine vessels going by on a daily basis. The other locations run by JAXPORT impact most of Duval County and some of Nassau County.

LIDAC Census Tracts Impacted: LIDACs in Duval and Nassau Counties including two LIDACs directly impacted in downtown Jacksonville

12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503

BENEFITS	POTENTIAL CHALLENGES/DISBENEFITS
Improved local and regional air quality and health outcomes	Upfront costs in conversion and infrastructure
Increased climate change mitigation	Potential job displacement
Enhanced economic opportunities with job creation, upskilling, innovation, and new technologies	Long-term financial investment
Reduced noise pollution	State policies

NAVIGATING/MITIGATING THE CHALLENGES
Foster continual, transparent, and diverse multi-stakeholder engagement
Consider continual reinvestment in workforce development and new technologies

AFOLU MEASURE: PRESERVE AND EXPAND FOREST

Measure Description: Nassau County would like to acquire 100,000+ acres of land to preserve for wildlife and recreation.

Communities Impacted by this Measure: This measure will directly benefit the one LIDAC in Nassau County while indirectly benefiting the whole NEFL MSA.

LIDAC Census Tracts Impacted: LIDAC in Nassau County (12089050503)

BENEFITS	POTENTIAL CHALLENGES/DISBENEFITS
Expanded environmental protection	Potential maintenance cost burden
Enhanced flood mitigation	Potential loss of cultural significance
Improved public health	Potential livelihood loss (other uses of the land)
Increased recreational opportunities	Concerns about limited and equitable access
New educational opportunities for outdoor classroom work	
Potential economic development through ecotourism and sustainable forestry practices	

NAVIGATING/MITIGATING THE CHALLENGES
Actively involve residents in identifying needs, concerns, and potential benefits of the project
Conduct thorough assessments to understand the cultural significance of the land for potentially impacted communities
Ensure accessible transportation options and programs exist to connect disadvantaged communities
Regularly monitor the project's impact on the community and adapt the approach as needed

WASTE and MATERIALS MANAGEMENT MEASURE: WASTEWATER TREATMENT EFFICIENCY UPGRADES

Measure Description: The City of Palm Coast wants to implement pipe and maintenance hole lining to mitigate the impact of stormwater inflow and infiltration. The project's primary goal is to enhance energy efficiency by minimizing stormwater infiltration during heavy rainfall events.

Communities Impacted by this Measure: All the LIDACs in the City of Palm Coast will directly benefit from this measure. Additional direct and indirect benefits are listed below.

LIDAC Census Tracts Impacted: LIDACs in the City of Palm Coast

12035060104, 12035060204, 12035060206, 12035060207, 12035060208, 12035060209, 12035060210, 12035060212, 12035060213, 12035060214

BENEFITS	POTENTIAL CHALLENGES/DISBENEFITS
Reduced flooding and property damage	Inequitable benefits if LIDACs are not prioritized
Improved public health	Limited scope does not include upstream issues
Enhanced quality of life	Upfront and ongoing maintenance costs
Improved infrastructure	Concerns about disruption and inconvenience
Potential job creation	Concerns about gentrification in the long-term
Probable municipal savings that can be used elsewhere	

NAVIGATING/MITIGATING THE CHALLENGES
Prioritize vulnerable communities
Implement a comprehensive plan that addresses upstream issues, integrates green infrastructure solutions like infiltration with traditional drainage improvements, and considers long-term climate change impacts
Clearly communicate project goals, benefits, and potential impacts to the community throughout the process. Address concerns and build trust through ongoing engagement
Track progress and verify city achieved energy efficiency benefits

WASTE and MATERIALS MANAGEMENT MEASURE: COMPOSTING and WASTE DIVERSION

Measure Description: Reduce methane emissions through composting and waste diversion.

Communities Impacted by this Measure: All the LIDACs in the City of Jacksonville, the City of Atlantic Beach, and the City of St. Augustine will directly benefit from this measure. Additional direct and indirect benefits are listed below.

LIDAC Census Tracts Impacted: LIDACs in the City of Jacksonville, the City of Atlantic Beach, and the City of St. Augustine

12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12109021003, 12109020300

BENEFITS	POTENTIAL CHALLENGES/DISBENEFITS
Reduced flooding and property damage	Inequitable benefits if LIDACs are not prioritized
Improved public health	Limited scope does not include upstream issues
Enhanced quality of life	Upfront and ongoing maintenance costs
Improved infrastructure	Concerns about disruption and inconvenience
Potential job creation	Concerns about gentrification in the long-term
Probable municipal savings that can be used elsewhere	

WASTE and MATERIALS MANAGEMENT MEASURE: LANDFILL GAS RECOVERY and CONVERSION

Measure Description: Collect Landfill Gas (LFG) and reuse it in generators for power or purification and install a geosynthetic liner on top of the closed areas of the landfill to prevent gas emissions.

Communities Impacted by this Measure: All the LIDACs in the City of Jacksonville will directly benefit from this measure. Additional direct and indirect benefits are listed below.

LIDAC Census Tracts Impacted: LIDACs in the City of Jacksonville, the City of Atlantic Beach, and the City of St. Augustine lay downwind of a landfill.

12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400

BENEFITS	POTENTIAL CHALLENGES/DISBENEFITS
Reduced greenhouse gas emissions	Concerns about ongoing environmental justice issues
Improved air quality and health outcomes	Concerns about unintended consequences
Renewable energy source	Lack of trust in institutions
Increased job creation and economic development	Transparency and trust
Potential revenue generation	Concerns about long-term maintenance and costs

NAVIGATING/MITIGATING THE CHALLENGES
Conduct a thorough environmental justice assessment to identify existing disparities and ensure the project does not exacerbate them
Prioritize hiring and training residents from the community for project jobs, creating local employment opportunities
Ensure a portion of the revenue generated from selling RNG is directed back to the community for investments in local infrastructure, social programs, or environmental initiatives
Develop a sustainable funding model for ongoing maintenance and ensure independent monitoring of environmental impacts and community health outcomes

5

COORDINATION AND OUTREACH

V. COORDINATION AND OUTREACH

The Northeast Florida MSA conducted extensive intergovernmental coordination and outreach over six months to develop this PCAP. This section describes the framework NEFL MSA used to support robust and meaningful engagement strategies, ensure comprehensive stakeholder representation, and overcome obstacles to engagement, including linguistic, cultural, institutional, geographic, and other barriers.

FIGURE 8 Kids Hope Alliance Community Engagement event on 2/22/2024.

Identification of Stakeholders

NEFL MSA identified stakeholders: representatives of the entities, groups, and individuals whom the implementation of this PCAP may impact. Stakeholders include:

- Metropolitan planning organizations
- Transportation planning organizations
- Regional planning councils
- Economic development organizations
- Environmental advocates
- Industrial associations
- Utilities
- Agricultural and working lands groups
- Waste management entities
- Consumer advocates
- Local elected officials
- Community-based organizations
- Chambers of commerce
- Other interested organizations
- Residents of NEFL MSA

To identify stakeholders, NEFL MSA contacted local elected officials, community organizations, and advocacy organizations known to be interested in clean energy infrastructure and practices. The list of identified stakeholders as of the publication of this PCAP is included in the Acknowledgements. The City of Jacksonville, as the lead organization, will update this list of stakeholders as needed.

Interagency and Intergovernmental Coordination

As the lead agency, the City of Jacksonville contacted all the sustainability and resilience officers within the NEFL MSA to participate in a bi-weekly call and group on MS Teams. It was also created in partnership with the NEFL Regional Council, a NEFL CPRG Working Group made up of regional stakeholders across all sectors, including public, private, academia, and nonprofit subject matter experts. The group meets at least once a month to discuss progress on the CPRG and offer insight and feedback from different perspectives.

Outreach Plan

Effectively communicating to LIDACs the benefits of initiatives, such as reductions in GHG emissions, job creation, clean energy job training, decreased energy costs, green space creation, and stakeholder engagement, is crucial to capture their interest and engagement. Here is how we are trying to achieve these goals:

Transparent and Accessible Information:

We are providing concise and easily understandable information about the initiative and its benefits. To improve comprehension, we are using plain language, infographics, and visuals to break down complex concepts.

Tailored Messaging:

Customizing our communication to address the specific concerns and interests of LIDACs. We are trying to highlight how the initiative directly impacts their daily lives, communities, and well-being.

Storytelling:

Sharing success stories and case studies from similar communities or individuals who have benefited from the initiative, personalizing the narrative to make it relatable and emotionally engaging.

Community Representatives:

Identifying and involving trusted community representatives, including community leaders and influencers, to advocate for the initiative. These representatives can bridge the gap between the initiative and LIDACs, adding credibility and trust.

Interactive Workshops and Seminars:

Hosting workshops, seminars, or webinars in LIDAC communities to explain the benefits in detail. Encouraging participation by addressing questions and concerns from residents.

Visual Impact Assessment:

Providing visual representations, such as maps or graphs, to illustrate the reductions in GHGs, criteria pollutants, and hazardous air pollutants (HAPs) in specific communities or areas. Showing tangible improvements over time to build confidence in the initiative's effectiveness.

Job Creation Tracking:

Sharing data on the number of jobs created within identified communities due to the initiative and highlight success stories of individuals who have found employment opportunities within their own neighborhoods.

Clean Energy Training and Apprenticeships:

Showcasing the investment in clean energy job training and apprenticeship programs in LIDAC communities. Highlighting the success stories of participants who have improved their career prospects.

Energy Cost Reductions:

Providing data and examples of how the initiative has decreased energy costs for residents in LIDAC communities, using real-life utility bill comparisons to demonstrate savings.

Green Space Creation:

Emphasizing the creation of green spaces for urban heat island mitigation and their recreational and health benefits. Sharing before-and-after photos to illustrate the transformation.

Stakeholder Engagement:

Reporting on the number of stakeholder events, participants, and dollars spent to engage with organizations and residents in LIDAC communities. Sharing feedback and outcomes from these engagements to demonstrate a commitment to community input.

Qualitative Descriptions:

Using qualitative descriptions to capture the human and community-centric aspects of the initiative's impact. Sharing testimonials, quotes, or anecdotes from community members expressing their experiences and perspectives.

Feedback Mechanism:

Establishing an accessible feedback mechanism for LIDACs to ask questions, voice concerns, and share their own stories related to the initiative. Actively listening and responding to their feedback to build trust and show that their input matters.

Jobs Lost and Workforce Transition Strategies:

Challenge: Jobs lost due to changes in the economy or industry.

Strategy: Developing comprehensive workforce transition programs:

- Training Programs: Offering skill-building programs and vocational training tailored to the needs of the affected workforce.
- Career Counseling: Providing career counseling and guidance to help individuals identify new opportunities and navigate career transitions.
- Job Placement Services: Partnering with local businesses and organizations to create job placement initiatives for displaced workers.
- Entrepreneurship Support: Supporting individuals interested in starting their own businesses, including access to capital and resources.

Resistance to Infrastructure Development and Siting Strategies:

Challenge: Community resistance to infrastructure development projects.

Strategy: Implementing outreach and appropriate siting strategies:

- Community Engagement: Conducting regular community meetings to gather input and address concerns from residents.
- Transparency: Ensuring transparency in project planning and decision-making processes.
- Impact Assessment: Conducting comprehensive environmental and social impact assessments to identify and mitigate potential adverse effects.

- Alternative Solutions: Exploring alternative sites and technologies that minimize community disruption while achieving project goals.

Energy Security and Reliability Concerns for Intermittent Generation Assets:

Challenge: Concerns regarding the reliability of intermittent energy sources.

Strategy: Enhancing energy security and reliability through increased transmission and storage:

- Grid Enhancements: Upgrading grid infrastructure to accommodate intermittent generation and enhance grid resilience.
- Battery Storage: Deploying advanced battery storage solutions to store excess energy and provide backup during low-generation periods.
- Distributed Energy Resources (DERs): Encouraging the adoption of DERs like solar panels and home energy storage to empower communities and reduce dependence on the grid.
- Backup Generation: Developing contingency plans and backup generation options to address intermittent energy supply concerns during critical situations.

Gentrification and Strategies to Combat Displacement and Increased Cost of Living:

Challenge: Gentrification leading to displacement and increased living costs for current residents.

Strategy: Implementing strategies to combat gentrification and support existing residents:

- Affordable Housing: Developing affordable housing initiatives to ensure that long-term residents can continue to afford to live in their communities.
- Rent Control: Exploring policies like rent control or rent stabilization to protect residents from sudden increases in housing costs.
- Economic Empowerment: Invest in local businesses, job creation, and economic development within LIDACs to provide opportunities and support for residents.
- Community Land Trusts: Promote the establishment of community land trusts to maintain control over land and housing in the community's interest.

Establish a Clear Communication Plan:

Creating a communication plan outlining the methods and frequency of engagement with LIDACs. Ensure that it is accessible, transparent, and culturally sensitive. Developing a designated communication channel, such as a dedicated email address, phone line, or online platform, to facilitate direct and efficient communication between LIDACs, the lead agency, and its partners.

Regular Consultation Meetings:

Scheduling regular consultation meetings with LIDACs to discuss ongoing projects, policy developments, and program updates. These meetings should occur at intervals agreed upon with the LIDACs, considering their availability and preferences. Providing LIDACs with relevant documents, reports, and materials before these meetings to facilitate informed discussion.

LIDAC Representation:

Encouraging the representation of LIDAC members on relevant decision-making bodies, advisory committees, or working groups related to the project's implementation. This ensures their perspectives are integrated into critical decisions. Supporting LIDACs in building capacity, including providing training or resources, to enable them to participate in these roles effectively.

Community Engagement Events:

Organizing community engagement events, workshops, or public forums to involve a broader indigenous community in discussing the project's progress and impacts. Ensuring that these events are inclusive, culturally sensitive, and accessible.

Feedback Mechanisms:

Implementing feedback mechanisms to promptly capture input and concerns from LIDACs and establish a formal process for addressing and responding to feedback. Periodically assessing the effectiveness of engagement efforts through surveys or evaluations to identify areas for improvement.

Resource Allocation:

Allocating resources, such as funding, technical support, or administrative assistance, to enable LIDACs to participate and effectively contribute to the project's active implementation.

Document and Share Progress:

Maintaining records of all interactions and engagements with LIDACs, ensuring that these records are accessible and shared with the Indigenous communities. The hope is that this will build trust and transparency.

Flexibility and Adaptability:

Flexibility in adjusting the engagement approach based on the evolving needs and preferences of LIDACs. Understanding that engagement strategies may need to adapt as the project progresses.

Accountability and Reporting:

Establishing mechanisms for regular reporting on engagement activities and outcomes, both internally and externally. Ensuring progress is documented and communicated to all stakeholders, including Indigenous communities, regulatory bodies, and the public.

By implementing this comprehensive approach, the City of Jacksonville and its partners are trying to demonstrate their commitment to genuine collaboration and meaningful engagement with LIDACs throughout the project's implementation process, fostering a respectful and productive relationship

Outreach and Coordination Documentation

Table 17 provides a log of interagency, intergovernmental coordination, and stakeholder and public engagement efforts associated with developing this PCAP. Meeting and outreach materials and resources are available at www.cleanairnortheastflorida.com.

Table 17 Community Outreach Events

Date	Topic	Organizations Involved	Coordination / Outreach Method	Location	Outcome(s) and Next Steps
11/1/23	Thriving Together: Culture and Community	NAACP and others	The NAACP recognized Community Leaders for their contributions to the community. Ashantae Green networked and talked about CPRG	Hyatt Regency Jacksonville Riverfront (225 East Coastline Drive Jacksonville, FL 32202)	Followed up with those interested in learning more about the CPRG
11/29/23	CPRG	Resilient First Coast Full Collaborative - Many regional stakeholders involved in sustainability and resilience	Direct invitations, emails, and phone calls; In-person	St. Johns County Emergency Management (100 EOC Dr, St Augustine, FL 32092)	Invited to join the NEFL CPRG Working Group
11/29/23	CPRG	National Association of County Agricultural Agents (NACAA)	Zoom meetings promoted via email and newsletter	Online	One-hour info and sharing call; followed up with those who wanted further information
1/03/24, 1/29/24	NEFL MSA CPRG Office Hours	NEFL MSA	Direct invitations to community influencers, email, and social media	Microsoft Teams	Answered questions, received feedback, encouraged continued involvement
1/05/24, 2/7/24, 3/25/24	NEFL Climate Pollution Reduction Grant Working Group	Northeast Florida Regional Council + Working Group Members	Monthly meetings	Microsoft Teams	Received draft PCAP feedback and encouraged completion of the survey
1/25/24	CPRG Subject Matter Expert Panel	COJ, Stakeholders	In mid-December, community members submitted 70+ regional GHG reduction strategies. These were evaluated during this meeting.	Ed Ball Building, Jacksonville, FL	Submitted strategies (Google Drive) were reviewed/ discussed
1/26/24, 2/9/24, 2/23/24	Together for Tomorrow: LIDAC Challenges and Opportunities	General public and specific climate experts and groups	Direct invitations to community influencers, email, and social media	Zoom	Received feedback on PCAP and general focus areas
2/09/24	Together for Tomorrow: LIDAC Challenges and Opportunities	General public and specific climate experts and groups	Direct invitations to community influencers, email, and social media	Zoom	Received feedback on GHG measures and additional needs in the MSA
2/15/24	NAACP Community Outreach Q and A	NAACP, NEFL Sierra Club, and Jax Climate Coalition	NAACP email invites	Zoom	Received direct feedback on GHG measures and additional stakeholders
2/22/24	Kids Hope Alliance	General public and specific climate experts and groups	Direct invitations to community influencers, email, and social media	Kids Hope Alliance 1095 A. Philip Randolph Blvd. Jacksonville, Florida 32206	Received feedback on PCAP and additional needs in the MSA

6

CONCLUSION

VI. CONCLUSION

The Clean Air Northeast Florida Regional PCAP represents a significant milestone as the first major deliverable to EPA under Phase 1 of the planning grant phase as part of the Climate Pollution Reduction Grans awarded to the City of Jacksonville in the Northeast Florida MSA. This narrative report includes a focused list of near-term, high-impact, implementation-ready actions to reduce greenhouse gases and a quantitative analysis of expected reductions. The PCAP is instrumental in laying the groundwork for NEFL's application for Phase II implementation funding grants, demonstrating the region's readiness to utilize federal funding effectively to meet climate goals by enhancing existing efforts. In addition to the PCAP, another critical deliverable in this initiative includes preparing for the CPRG Implementation Grant application. The compressed timeline for the PCAP's delivery by March 1, 2024, facilitated meaningful engagement with eligible applicants for this grant opportunity, further underscoring the plan's significance in driving forward climate action initiatives in the region.

Upon submitting the Implementation Grant application, the Clean Air Northeast Florida Team will continue developing the Comprehensive Climate Action Plan due in the summer of 2025. The CCAP aims to build upon the implementation of the PCAP to achieve the region's 2030 milestone and further our MSA's climate goals, particularly for 2040 and 2050.

If you have questions about this PCAP or suggestions for the upcoming CCAP and status report, contact Ashantae Green at CPRG@coj.net.

APPENDICES

Northeast Florida 2019 Community Greenhouse Gas Emissions*, by sector and fuel type

Sector	Fuel Or Source	Usage	Usage Units	Emissions
Residential Energy	Electricity	9668068028	kWh	3552831
Residential Energy	Natural Gas	2011918457	MMBtu	664884
Residential Energy	LPG	479097	MMBtu	30458
Residential Energy	Wood	218304	MMBtu	10776
Residential Energy	Distillate Fuel Oil No. 2	133008	MMBtu	9904
Residential Energy Total		34915166.11	MMBtu	3662179
Commercial Energy	Electricity	8001576	MWh	3017941
Commercial Energy	LPG	4162904	MMBtu	264645
Commercial Energy	Gasoline	2360857	MMBtu	167022
Commercial Energy	Distillate Fuel Oil No. 2	1122345	MMBtu	83566
Commercial Energy	Kerosene	663	MMBtu	50
Commercial Energy	Propane	678959	MMBtu	42136
Commercial Energy	Natural Gas	5374076	MMBtu	285828
Commercial Energy Total		13699831.3	MMBtu	3861188
Transportation & Mobile Sources	Diesel	2535693175	VMT	2323120
Transportation & Mobile Sources	Gasoline	11768259949	VMT	5003783
Transportation & Mobile Sources	Other	0		45930
Transportation & Mobile Sources Total		0		7372833
Solid Waste	Waste Sent to Landfill	3742632	Tons	700223
Solid Waste Total		0		700223
AFOLU	Other	0		1561191
AFOLU Total		0		1561191
Industrial Energy	Natural Gas	9129321	MMBtu	576361
Industrial Energy	Residual Fuel Oil No. 6	0	MMBtu	701
Industrial Energy		0	MMBtu	622872
Industrial Energy	Distillate Fuel Oil No. 2	0	MMBtu	16476
Industrial Energy	Propane	0	MMBtu	62
Industrial Energy	Other	0		18755
Industrial Energy Total		0		1235227

*based on AR5 100-year GWP

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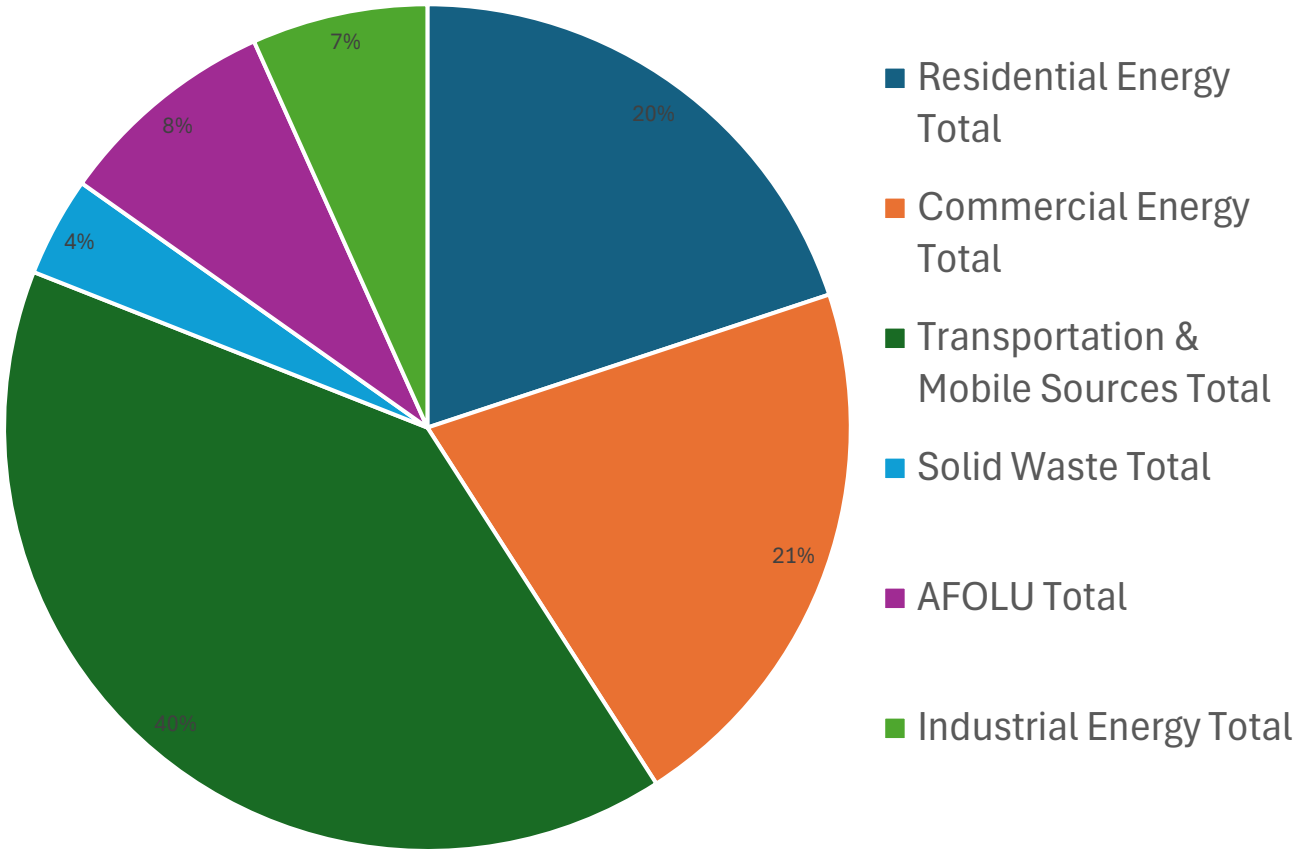
Northeast Florida Emissions, by Sector



Baker County, Florida 2019 Community Greenhouse Gas Emissions*, by sector and fuel type

Sector	Fuel Or Source	Usage	Usage Units	Emissions
Residential Energy	Electricity	171591485	kWh	52088
Residential Energy	Natural Gas	22945	MMBtu	1220
Residential Energy	LPG	8503	MMBtu	541
Residential Energy	Wood	405	MMBtu	4
Residential Energy	Distillate Fuel Oil No. 2	135	MMBtu	10
Residential Energy Total		617458.147	MMBtu	53863
Commercial Energy	Electricity	72276	MWh	21940
Commercial Energy	LPG	37602	MMBtu	2390
Commercial Energy	Gasoline	21325	MMBtu	1509
Commercial Energy	Distillate Fuel Oil No. 2	10138	MMBtu	755
Commercial Energy	Kerosene	6	MMBtu	0
Commercial Energy	Propane	6133	MMBtu	381
Commercial Energy	Natural Gas	48543	MMBtu	2582
Commercial Energy Total		123747.247	MMBtu	29557
Transportation & Mobile Sources	Diesel	44188221	VMT	65066
Transportation & Mobile Sources	Gasoline	426659113	VMT	176116
Transportation & Mobile Sources	Other			8261
Transportation & Mobile Sources Total				249443
Solid Waste	Waste Sent to Landfill	29272	Tons	5949
Solid Waste Total				5949
AFOLU	Other			285494
AFOLU Total				285494

*based on AR5 100-year GWP

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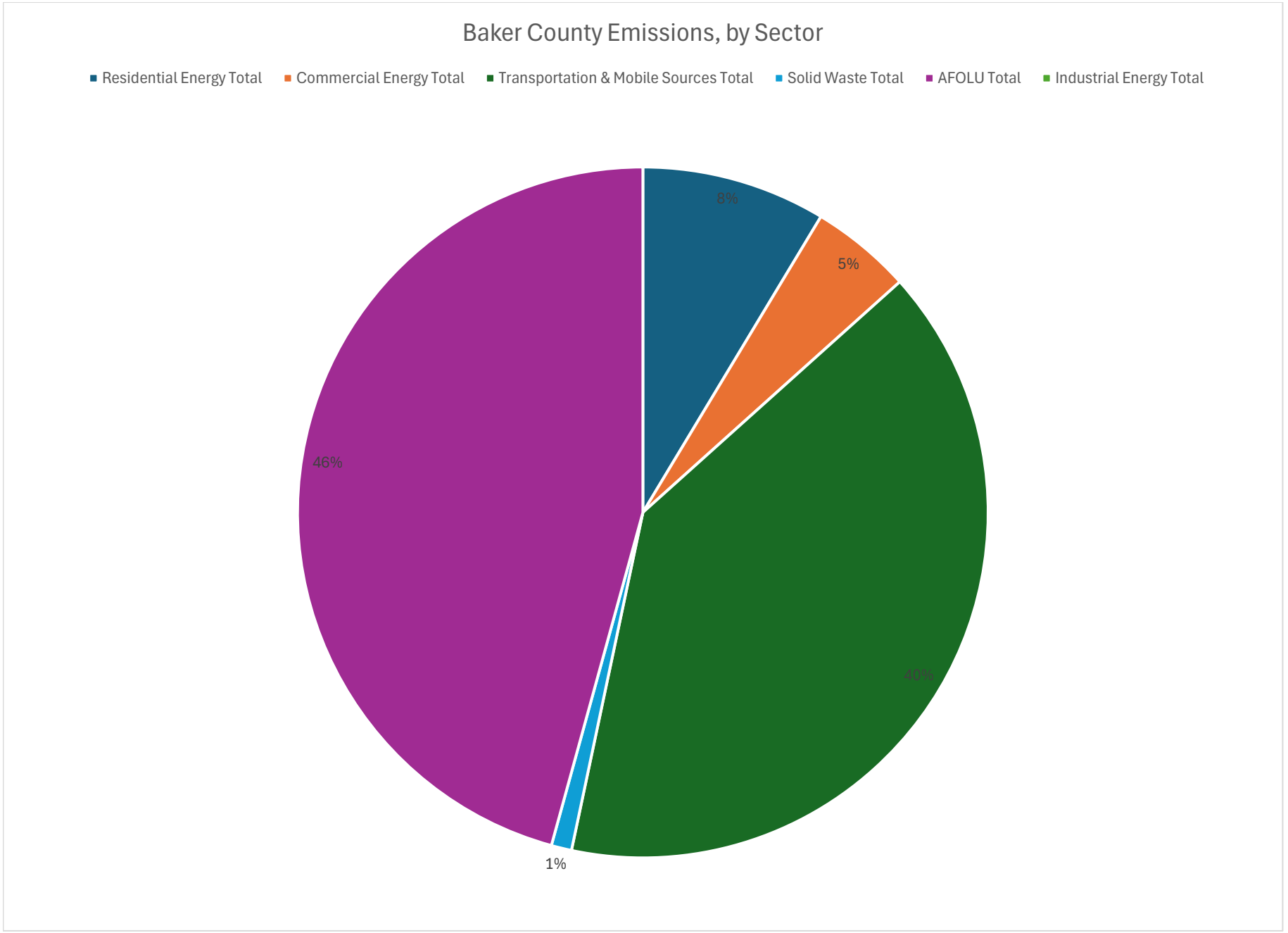

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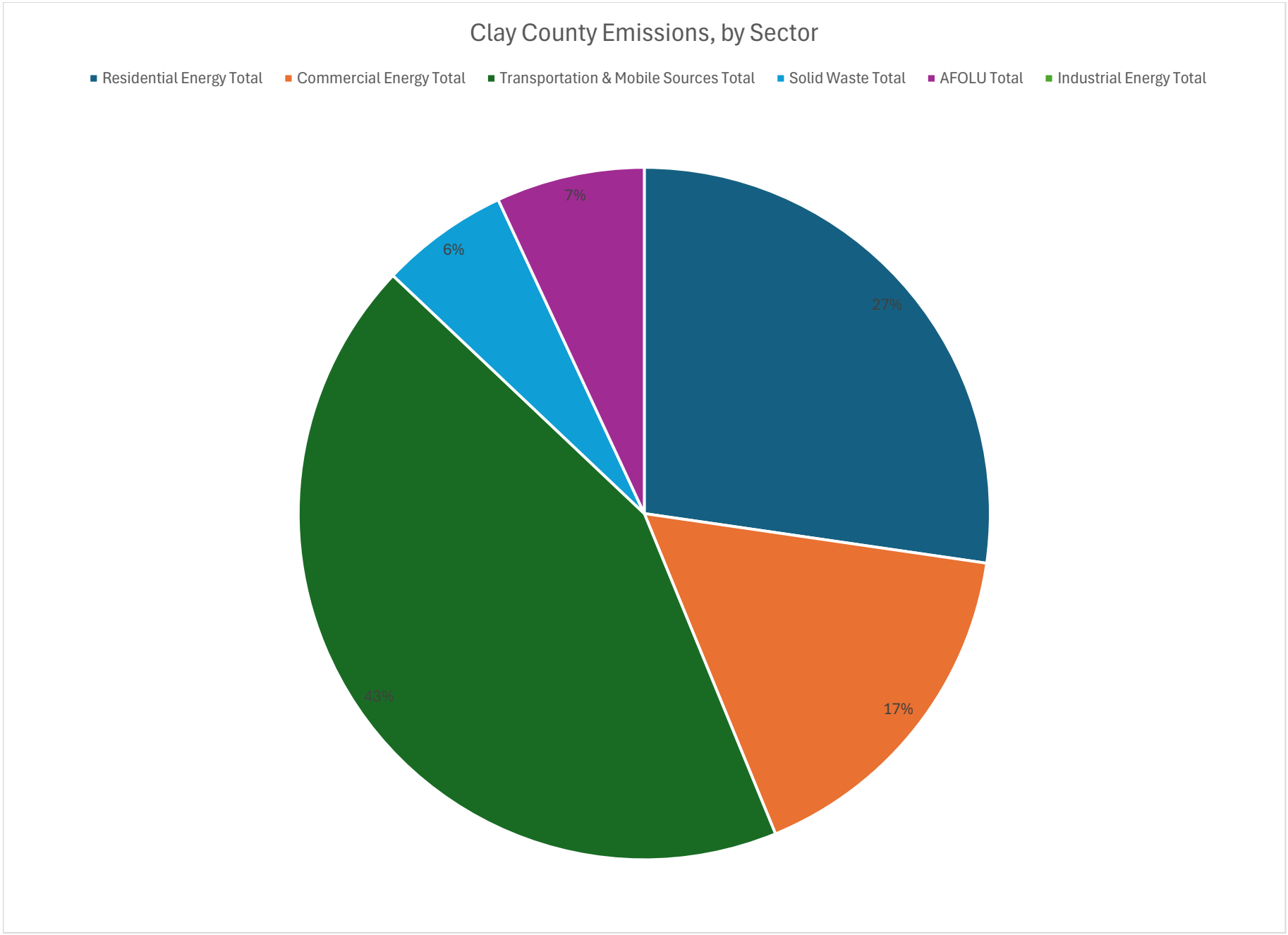
Clay County, Florida 2019 Community Greenhouse Gas Emissions*, by sector and fuel type

Sector	Fuel Or Source	Usage	Usage Units	Emissions
Residential Energy	Electricity	1285856509	kWh	504179
Residential Energy	Distillate Fuel Oil No. 2	1011	MMBtu	75
Residential Energy	Wood	3034	MMBtu	30
Residential Energy	Natural Gas	171943	MMBtu	9145
Residential Energy	LPG	63720	MMBtu	4051
Residential Energy Total		4627050.41	MMBtu	517480
Commercial Energy	Electricity	629597	MWh	246863
Commercial Energy	LPG	327554	MMBtu	20823
Commercial Energy	Gasoline	185762	MMBtu	13142
Commercial Energy	Distillate Fuel Oil No. 2	88311	MMBtu	6575
Commercial Energy	Kerosene	52	MMBtu	4
Commercial Energy	Propane	53423	MMBtu	3315
Commercial Energy	Natural Gas	422854	MMBtu	22490
Commercial Energy Total		1077958.15	MMBtu	313212
Transportation & Mobile Sources	Diesel	149129124	VMT	219589
Transportation & Mobile Sources	Gasoline	1439915385	VMT	594366
Transportation & Mobile Sources	Other			6140
Transportation & Mobile Sources Total				820095
Solid Waste	Waste Sent to Landfill	228819	Tons	113792
Solid Waste Total				113792
AFOLU	Other			131536
AFOLU Total				131536

*based on AR5 100-year GWP



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Duval County, Florida 2019 Community Greenhouse Gas Emissions*, by sector and fuel type

Sector	Fuel Or Source	Usage	Usage Units	Emissions
Residential Energy	Electricity	5694287559	kWh	2232708
Residential Energy	Distillate Fuel Oil No. 2	129882	MMBtu	9671
Residential Energy	Natural Gas	761431	MMBtu	40498
Residential Energy	LPG	282178	MMBtu	17939
Residential Energy	Wood	13437	MMBtu	134
Residential Energy Total		20615837.15	MMBtu	2300950
Commercial Energy	Electricity	6022871	MWh	2361544
Commercial Energy	LPG	3133462	MMBtu	199202
Commercial Energy	Gasoline	1777042	MMBtu	125718
Commercial Energy	Distillate Fuel Oil No. 2	844800	MMBtu	62901
Commercial Energy	Kerosene	499	MMBtu	38
Commercial Energy	Propane	511059	MMBtu	31716
Commercial Energy	Natural Gas	4045123	MMBtu	215146
Commercial Energy Total		10312005.55	MMBtu	2996265
Transportation & Mobile Sources	Diesel	599091276	VMT	882145
Transportation & Mobile Sources	Gasoline	5784522314	VMT	2387728
Transportation & Mobile Sources	Other			18061
Transportation & Mobile Sources Total				3287934
Solid Waste	Waste Sent to Landfill	2752896	Tons	360442
Solid Waste Total				360442
AFOLU	Other			191016
AFOLU Total				191016
Industrial Energy	Natural Gas	9129321	MMBtu	503859
Industrial Energy	Residual Fuel Oil No. 6	0	MMBtu	0
Industrial Energy		0	MMBtu	29746
Industrial Energy	Distillate Fuel Oil No. 2	0	MMBtu	1044
Industrial Energy	Propane	0	MMBtu	0
Industrial Energy	Other			18757
Industrial Energy Total				553406

*based on AR5 100-year GWP

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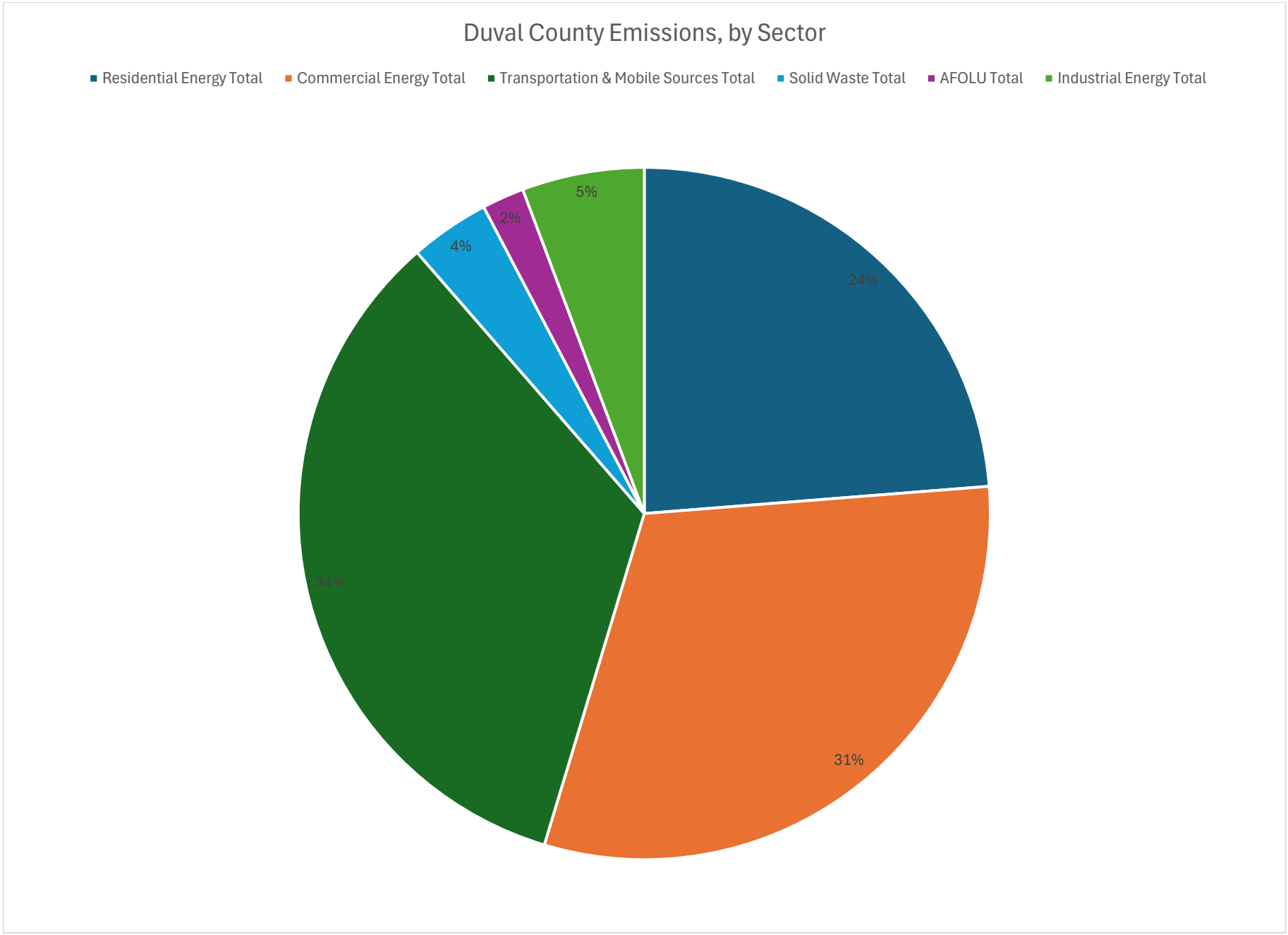

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Nassau County, Florida 2019 Community Greenhouse Gas Emissions*, by sector and fuel type

Sector	Fuel Or Source	Usage	Usage Units	Emissions
Residential Energy	Electricity	505437923	kWh	153430
Residential Energy	Wood	1193	MMBtu	12
Residential Energy	Distillate Fuel Oil No. 2	398	MMBtu	30
Residential Energy	Natural Gas	67586	MMBtu	3595
Residential Energy	LPG	25047	MMBtu	1592
Residential Energy Total		1818778.193	MMBtu	158659
Commercial Energy	Electricity	256143	MWh	77755
Commercial Energy	LPG	133261	MMBtu	8472
Commercial Energy	Gasoline	75575	MMBtu	5347
Commercial Energy	Distillate Fuel Oil No. 2	35928	MMBtu	2675
Commercial Energy	Kerosene	21	MMBtu	2
Commercial Energy	Propane	21735	MMBtu	1349
Commercial Energy	Natural Gas	172033	MMBtu	9150
Commercial Energy Total		438553.874	MMBtu	104750
Transportation & Mobile Sources	Gasoline	1331156611	VMT	549473
Transportation & Mobile Sources	Diesel	137865198	VMT	203003
Transportation & Mobile Sources	Other			8867
Transportation & Mobile Sources Total				761343
Solid Waste	Waste Sent to Landfill	194034	Tons	23277
Solid Waste Total				23277
AFOLU	Other			307075
AFOLU Total				307075
Industrial Energy	Natural Gas	0	MMBtu	72502
Industrial Energy	Residual Fuel Oil No. 6	0	MMBtu	701
Industrial Energy		0	MMBtu	593126
Industrial Energy	Distillate Fuel Oil No. 2	0	MMBtu	15432
Industrial Energy	Propane	0	MMBtu	62
Industrial Energy	Other			-2
Industrial Energy Total				681821

*based on AR5 100-year GWP

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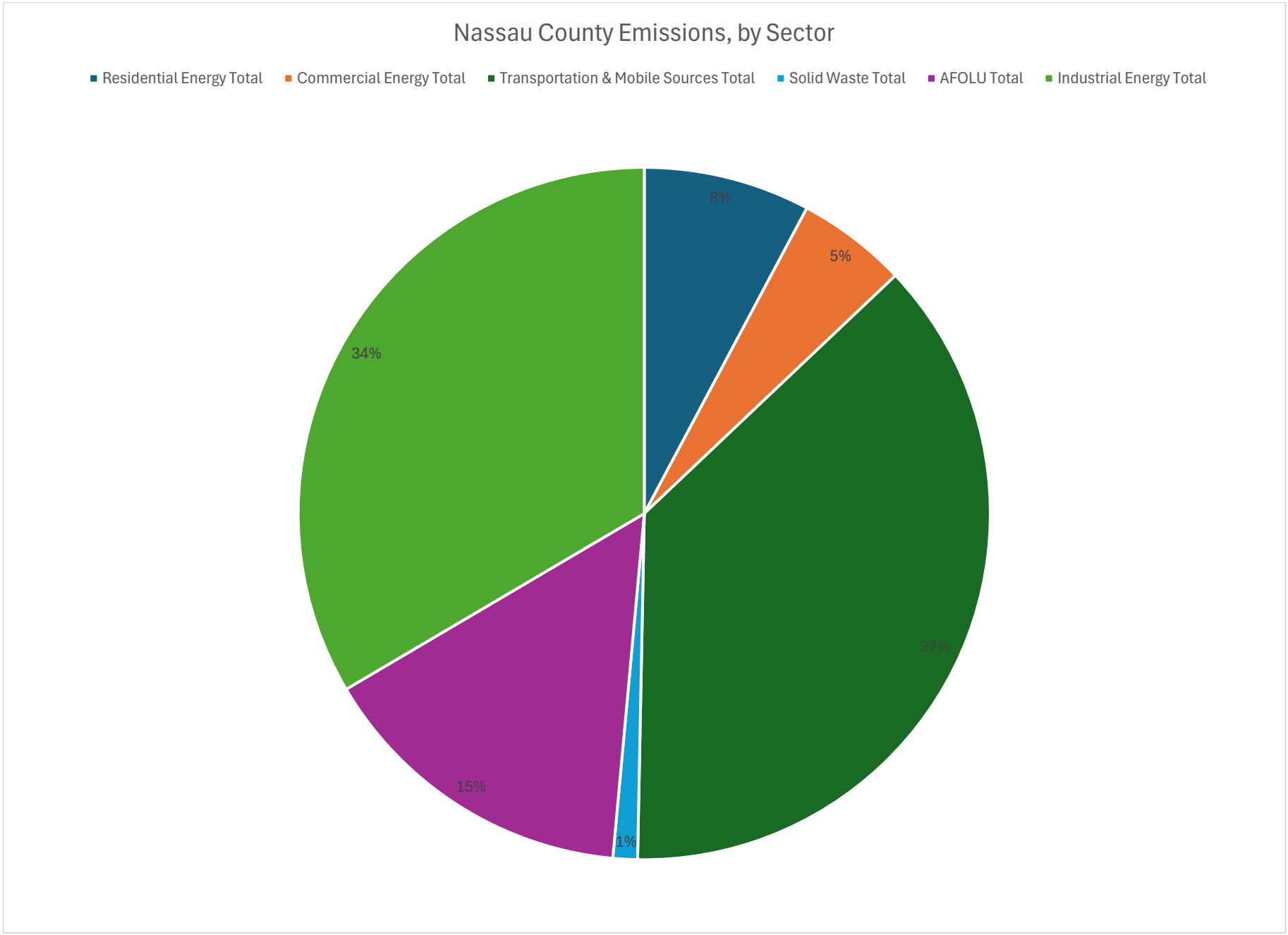

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Palm Coast, Florida 2019 Community Greenhouse Gas Emissions*, by sector and fuel type

Sector	Fuel Or Source	Usage	Usage Units	Emissions
Residential Energy	Electricity	522681618	kWh	158665
Residential Energy	Natural Gas	69892	MMBtu	3717
Residential Energy	Distillate Fuel Oil No. 2	411	MMBtu	31
Residential Energy	LPG	25901	MMBtu	1647
Residential Energy	Wood	1233	MMBtu	12
Residential Energy Total		1880826.68	MMBtu	164072
Commercial Energy	Electricity	151846	MWh	46094
Commercial Energy	LPG	79000	MMBtu	5022
Commercial Energy	Gasoline	44802	MMBtu	3170
Commercial Energy	Distillate Fuel Oil No. 2	21299	MMBtu	1586
Commercial Energy	Kerosene	13	MMBtu	1
Commercial Energy	Propane	12885	MMBtu	800
Commercial Energy	Natural Gas	101984	MMBtu	5424
Commercial Energy Total		259983.518	MMBtu	62097
Transportation & Mobile Sources	Diesel	100748060	VMT	148349
Transportation & Mobile Sources	Gasoline	972772302	VMT	401540
Transportation & Mobile Sources	Other			0
Transportation & Mobile Sources Total				549889
Solid Waste	Waste Sent to Landfill	83502	Tons	9538
Solid Waste Total				9538
AFOLU	Other			17590
AFOLU Total				17590
Industrial Energy	Natural Gas	0	MMBtu	0
Industrial Energy	Residual Fuel Oil No. 6	0	MMBtu	0
Industrial Energy		0	MMBtu	0
Industrial Energy	Distillate Fuel Oil No. 2	0	MMBtu	0
Industrial Energy	Propane	0	MMBtu	0
Industrial Energy	Other			0
Industrial Energy Total				0

*based on AR5 100-year GWP

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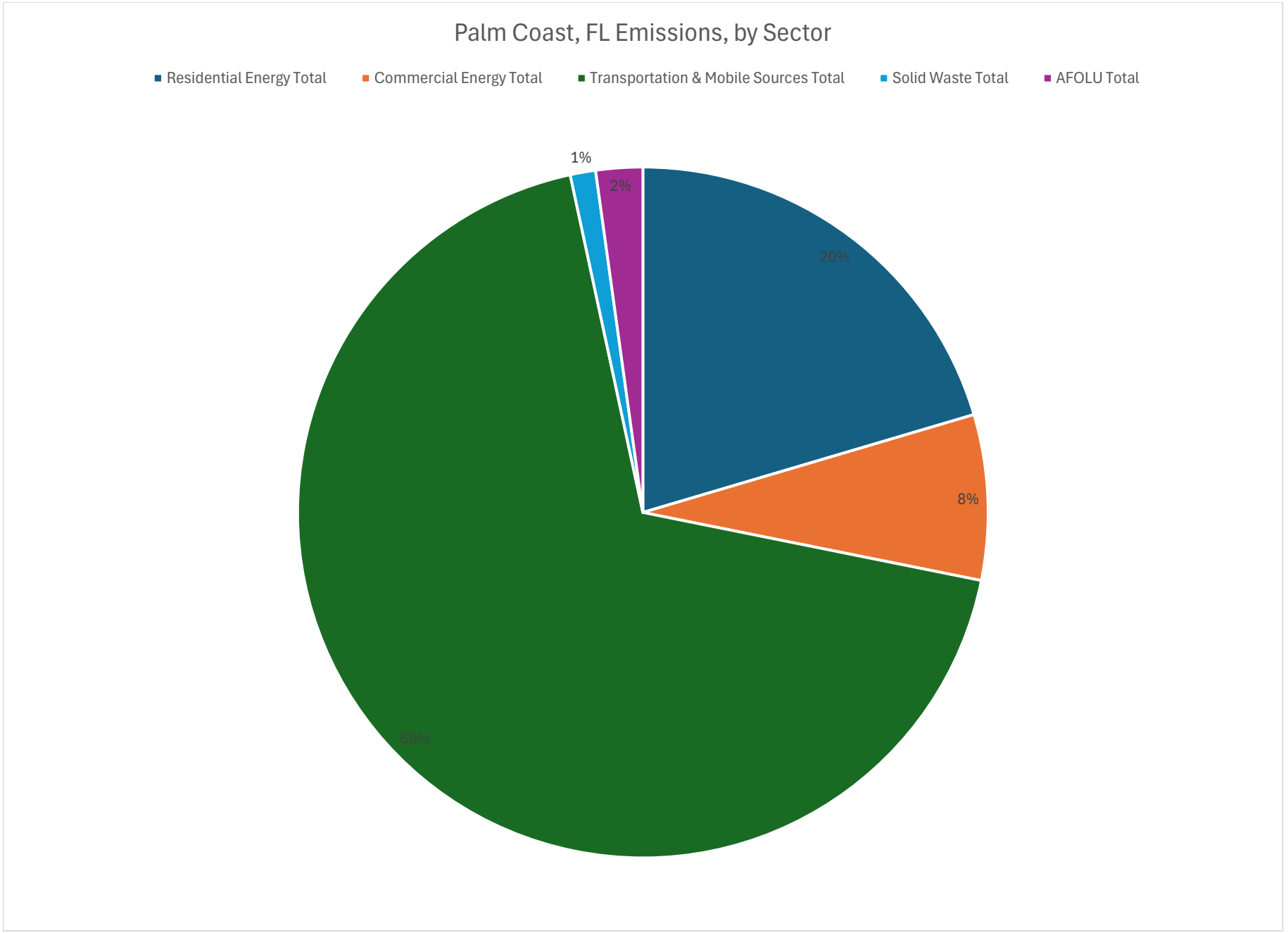

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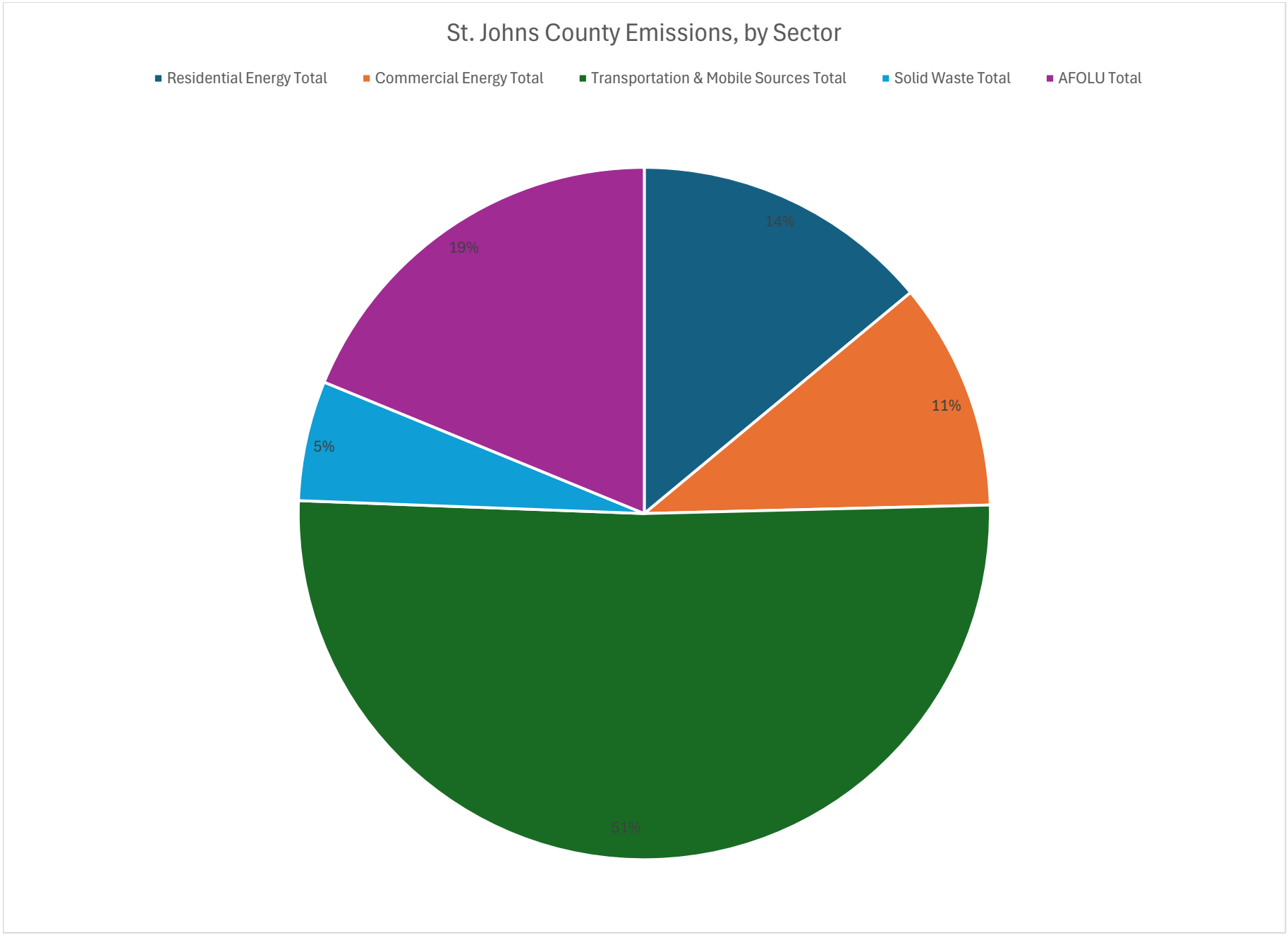
St. Johns County, Florida 2019 Community Greenhouse Gas Emissions*, by sector and fuel type

Sector	Fuel Or Source	Usage	Usage Units	Emissions
Residential Energy	Electricity	1488212934	kWh	451761
Residential Energy	Natural Gas	199002	MMBtu	10584
Residential Energy	Wood	3512	MMBtu	35
Residential Energy	Distillate Fuel Oil No. 2	1171	MMBtu	87
Residential Energy	LPG	73748	MMBtu	4688
Residential Energy Total		5355215.531	MMBtu	467155
Commercial Energy	Electricity	868843	MWh	263745
Commercial Energy	LPG	452025	MMBtu	28736
Commercial Energy	Gasoline	256351	MMBtu	18136
Commercial Energy	Distillate Fuel Oil No. 2	121869	MMBtu	9074
Commercial Energy	Kerosene	72	MMBtu	5
Commercial Energy	Propane	73724	MMBtu	4575
Commercial Energy	Natural Gas	583539	MMBtu	31036
Commercial Energy Total		1487582.964	MMBtu	355307
Transportation & Mobile Sources	Diesel	311379883	VMT	458498
Transportation & Mobile Sources	Gasoline	3006525637	VMT	1241030
Transportation & Mobile Sources	Other			4601
Transportation & Mobile Sources Total				1704129
Solid Waste	Waste Sent to Landfill	454109	Tons	187225
Solid Waste Total				187225
AFOLU	Other			628480
AFOLU Total				628480

*based on AR5 100-year GWP



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Baker County 2019 Detailed Inventory

Residential

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Electricity Energy Equivalent (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	US Community Protocol	Energy Equivalent (MMBtu)	Biogenic CO2 Emissions	Biogenic CO2 Emissions
245552	3760110	2019-Baker-County-Residential-Energy-FPL	Emissions from Grid Electricity (USCP Required)	Scope 2	I.1.2	Florida Power and Light 2019 (FPL and eGRID2018 factors)	IPCC 5th Assessment 100 Year Values	Residential Energy	Activity	American Community Survey ACSST5Y2019	apolematidis@hanson-inc.com	2023 Dec 20 01:52pm	51758.7329	5.13695695	0.70049413	52088.1987	2019 Baker RESIDENTIAL FPL	585636.4688	0.08838031	MT/MMBtu	8.7716E-06	MT/MMBtu	1.1961E-06	MT/MMBtu	BE.2.1			
246111	3771157	2019-Baker-County-Residential-Fuel-LPG	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 4 09:53pm	535.527127	0.09242533	0.00924253	540.564308	2019 Baker RESIDENTIAL LPG	62.98	kg/MMBtu		0.01086957	kg/MMBtu	0.00108696	kg/MMBtu	BE.1.2	8503.13	0	kg/MMBtu
246113	3771199	2019-Baker-County-Residential-Fuel-Fuel Oil	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 4 09:54pm	9.9823812	0.00146707	9.7804E-05	10.0493772	2019 Baker RESIDENTIAL Fuel Oil	73.96	kg/MMBtu		0.01086957	kg/MMBtu	0.00072464	kg/MMBtu	BE.1.2	134.97	0	kg/MMBtu
247895	3801521	2019-Baker-County-Residential-Fuel-Wood	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity		rvolenec@hanson-inc.com	2024 Jan 17 08:22pm	0	0.12795156	0.00170062	4.03330851	2019 RESIDENTIAL Baker fuel	0	kg/MMBtu		0.316	kg/MMBtu	0.0042	kg/MMBtu		404.91	93.8	kg/MMBtu
247896	3801545	2019-Baker-County-Residential-Fuel-NGas	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 08:24pm	1216.54125	0.11472475	0.0022945	1220.36158	2019 RESIDENTIAL Baker fuel	53.02	kg/MMBtu		0.005	kg/MMBtu	0.0001	kg/MMBtu	BE.1.1	22944.95	0	kg/MMBtu

Transportation

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	On Road VMT	Fossil Fuel Energy Equivalent (MMBtu)	Biofuel Energy (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	US Community Protocol Reference	Energy Equivalent (MMBtu)
246032	3769621	2019-Baker-Transportation-Gasoline-GEI	On Road Transportation (USCP Required)	Scope 1	II.1.1	Florida Power and Light 2019 (FPL and eGRID2018 factors) and 2019 US National Defaults (updated 2020)	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	The above data is pulled from Google's Environmental Insights platform for Baker County and calculated through ClearPath's guidance documentation and spreadsheet.	mcoalson@hanson-inc.com	2024 Jan 3 06:53pm	174683.55	8.31696849	4.52599987	176115.815	2019 Baker transportation Gasoline	426659113.1	2486952.6	0	0.07024	MT/MMBtu	0.0684136	MT/MMBtu	1.949E-08	MT/mile	1.061E-08	MT/mile	TR.1.A	
246126	3771441	2019-Baker-Transportation-Diesel-GEI	On Road Transportation (USCP Required)	Scope 1	II.1.1	Florida Power and Light 2019 (FPL and eGRID2018 factors) and 2019 US National Defaults (updated 2020)	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	The above data is pulled from Google's Environmental Insights platform for Baker County and calculated through ClearPath's guidance documentation and spreadsheet.	mcoalson@hanson-inc.com	2024 Jan 4 10:27pm	65008.7867	0.20327156	0.19417586	65065.9349	2019 Baker transportation Diesel	44188221.35	879275.6	0	0.07393448	MT/MMBtu	0.07377323	MT/MMBtu	4.6E-09	MT/mile	4.394E-09	MT/mile	TR.2.C	
247840	3800559	2019-Baker-Rail-Gasoline-FDOT	Rail Transportation (USCP Recommended)	Scope 1	II.2.1	Florida Power and Light 2019 (FPL and eGRID2018 factors)	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	Where available Sustainability or ESG reports were used to determine Total GHG Emissions in units of Metric Tons of CO2e. Sustainability or ESG reports were available for the following Railroad Companies and are attached: CSX, Union Pacific, Norfolk Southern. Where Sustainability or ESG reports were not available the AVG emissions per mile of track and AVG gallons of diesel per mile of track in the given County was used to calculate the total annual gallons Diesel and annual GHG emissions. All data is based off the 2019 year.	mcoalson@hanson-inc.com	2024 Jan 17 04:32pm	8261			8261				0	MT/MMBtu			0	MT/MMBtu			165368.1

AFOLU

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Land Area (hectares / year)	Canopy Area of Trees Outside Forest (hectares)	US Community Protocol Reference
246052	3770126	2019-Baker-County-AFOLU-Undisturbed Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 4 01:59pm					2019 AFOLU Baker	107402		
246053	3770130	2019-Baker-AFOLU-Forest to Grassland	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 4 02:01pm					2019 AFOLU Baker	3363		
246054	3770134	2019-Baker-County-AFOLU-Non-Forest to Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 4 02:47pm					2019 AFOLU Baker	7422		
246055	3770138	2019-Baker-AFOLU-Forest to Settlement	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 4 02:48pm					2019 AFOLU Baker	894		
246056	3770142	2019-Baker-County-AFOLU-Forest to Other Non-Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 4 02:49pm					2019 AFOLU Baker	11		
246057	3770146	2019-Baker-County-AFOLU-Forest to Wetland	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 4 02:50pm					2019 AFOLU Baker	331		
246058	3770152	2019-Baker-County-AFOLU-Outside of Forests	Emissions and Removals from Trees Outside of Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 4 03:04pm					2019 AFOLU Baker	11149		
247333	3792504	2019-Baker-AFOLU-Enteric Fermentation	Emissions from Agricultural Activities (USCP optional)	Scope 1	V.1		IPCC 5th Assessment 100 Year Values	AFOLU	Source	2017 USDA Agricultural Census	rvolenec@hanson-inc.com	2024 Jan 15 04:03pm	0	768	0	21504	2019 AFOLU Baker			A.1
248453	3811195	2019-Baker-County-AFOLU-Enteric Fermentation	Emissions from Agricultural Activities (USCP optional)	Scope 1	V.1		IPCC 5th Assessment 100 Year Values	AFOLU	Source	2017 USDA Agricultural Census (ARS GWP = 28)	rvolenec@hanson-inc.com	2024 Jan 22 07:20am	0	21503.6	0	602100.8				A.1

Commercial

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Electricity Energy Equivalent (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	US Community Protocol Reference	Energy Equivalent (MMBtu)	CO2 Emissions Factor (kg/MMBtu)	CH4 Emissions Factor (kg/MMBtu)	N2O Emissions Factor (kg/MMBtu)	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units
246266	3774020	2019-Baker-Commercial-Elec-Census-EIA	Emissions from Grid Electricity (USCP Required)	Scope 2	I.2.2	Florida Power and Light 2019 (FPL and eGRID2018 factors)	IPCC 5th Assessment 100 Year Values	Commercial Energy	Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	apolematidis@hanson-inc.com	2024 Jan 5 07:16pm	21801.2809	2.16373615	0.29505493	21940.0551	2019 Baker Commercial Electricity	246675.7679	0.08838031	MT/MMBtu	8.7716E-06	MT/MMBtu	1.1961E-06	MT/MMBtu	BE.2.1					
246941	3787139	2019-Baker-Commercial-Fuel-Natural Gas-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 10 08:38pm	2573.74986	0.242715	0.0048543	2581.83227	2019 Baker fuel Commercial	48543	53.02	0.005	0.0001	0	kg/MMBtu						
246975	3787539	2019-Baker-Commercial-Fuel-LPG-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 10 09:45pm	2368.17396	0.40871739	0.04087174	2390.44906	2019 Baker Commercial Fuel	37602	62.98	0.0108696	0.001087	0	kg/MMBtu						
246976	3787563	2019-Baker-Commercial-Fuel-Distillate Fuel Oil-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 10 09:45pm	749.80648	0.11019565	0.00734638	754.838748	2019 Baker Commercial Fuel	10138	73.96	0.0108696	0.000725	0	kg/MMBtu						
246978	3787591	2019-Baker-Commercial-Fuel-Kerosene-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 10 09:46pm	0.4512	6.6667E-05	4.4444E-06	0.45424444	2019 Baker Commercial Fuel	6	75.2	0.0111111	0.000741	0	kg/MMBtu						
246979	3787615	2019-Baker-Commercial-Fuel-Gasoline-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 10 09:47pm	1497.4415	0.23884	0.01706	1508.64992		21325	70.22	0.0112	0.0008	0	kg/MMBtu						
246981	3787643	2019-Baker-Commercial-Fuel-Propane-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 10 09:47pm	376.93418	0.0673956	0.00673956	380.60724	2019 Baker Commercial Fuel	6133	61.46	0.010989	0.001099	0	kg/MMBtu						

Solid Waste

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Waste Generated (wet tons)	Mixed MSW Emissions Factor (MT CH4/wet short ton)	Newspaper Emissions Factor (MT CH4/wet short ton)	Office Paper Emissions Factor (MT CH4/wet short ton)	Corrugated Cardboard Emissions Factor (MT CH4/wet short ton)	Magazines/Third Class Mail Emissions Factor (MT CH4/wet short ton)	Food Scraps Emissions Factor (MT CH4/wet short ton)	Grass Emissions Factor (MT CH4/wet short ton)	Leaves Emissions Factor (MT CH4/wet short ton)	Branches Emissions Factor (MT CH4/wet short ton)	Dimensional Lumber Emissions Factor (MT CH4/wet short ton)	Mixed MSW LFG Capture Rate (%)	Newspaper LFG Capture Rate (%)	Office Paper LFG Capture Rate (%)	Corrugated Containers LFG Capture Rate (%)	Magazines/Third Class Mail LFG Capture Rate (%)	Food Scraps LFG Capture Rate (%)	Grass LFG Capture Rate (%)	Leaves LFG Capture Rate (%)	Branches LFG Capture Rate (%)	Dimensional Lumber LFG Capture Rate (%)	Oxidation Rate

Baker County 2019 Detailed Inventory

247155	3790596	2019 Baker County Solid Waste Landfill Waste Generator	Landfilled Waste (USCP Required, Preferred, where applicable)	Scope 1	III.1.1	2019 Baker MSW Factor Set	IPCC 5th Assessment 100 Year Values	Solid Waste	Source	Source: FDEP 2019 Baker County Report for MSW Management, Baker County Census Quick Facts	avo@hanson-inc.com	2024 Jan 11 07:29pm	212.462851	5948.95982	29272	0.0648	0.042	0.1556	0.1048	0.0476	0.0648	0.0228	0.026	0.058	0.0068	60	59	58	54	52	50	39	47	51	57	0.1

Clay County 2019 Detailed GHG Inventory

Residential

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Electricity Energy Equivalent (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	US Community Protocol Reference	Energy Equivalent (MMBtu)	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units
246093	3770808	2019-Clay-County-Residential-Energy	Emissions from Grid Electricity (USCP Required)	Scope 2	I.1.2	FRCC All (FRCC) eGRID 2019	IPCC 5th Assessment 100 Year Values	Residential Energy	Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 4 09:18pm	502199.226	32.0790467	4.08278776	504179.378	2019 Clay RESIDENTIAL FPL	4388588.766	0.11443297	MT/MMBtu	7.3096E-06	MT/MMBtu	9.3032E-07	MT/MMBtu	BE.2.1			
247897	3801569	2019-Clay-County-Residential-Fuel-NGas	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 08:36pm	9116.40514	0.8597138	0.01719428	9145.0336	2019 RESIDENTIAL Clay Fuel		53.02	kg/MMBtu	0.005	kg/MMBtu	0.0001	kg/MMBtu	BE.1.1	171942.76	0	kg/MMBtu
247898	3801593	2019-Clay-County-Residential-Fuel-FuelOil	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 08:37pm	74.8053628	0.0109938	0.00073292	75.3074132	2019 RESIDENTIAL Clay Fuel		73.96	kg/MMBtu	0.01086957	kg/MMBtu	0.00072464	kg/MMBtu	BE.1.2	1011.43	0	kg/MMBtu
247899	3801617	2019-Clay-County-Residential-Fuel-Wood	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 08:37pm	0	0.95883248	0.01274398	30.2244631	2019 RESIDENTIAL Clay Fuel		0	kg/MMBtu	0.316	kg/MMBtu	0.0042	kg/MMBtu	BE.1.2	3034.28	93.8	kg/MMBtu
247900	3801641	2019-Clay-County-Residential-Fuel-LPG	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 08:40pm	4013.08308	0.69260826	0.06926083	4050.83023	2019 RESIDENTIAL Clay Fuel		62.98	kg/MMBtu	0.01086957	kg/MMBtu	0.00108696	kg/MMBtu	BE.1.2	63719.96	0	kg/MMBtu

Transportation

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	On Road VMT	Fossil Fuel Energy Equivalent (MMBtu)	Biofuel Energy (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	US Community Protocol Reference	Energy Equivalent (MMBtu)
246036	3769745	2019-Clay-Transportation-Gasoline-GEI	On Road Transportation (USCP Required)	Scope 1	II.1.1	FRCC All (FRCC) eGRID 2019 and 2019 US National Defaults (updated 2020)	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	The above data is pulled from Google's Environmental Insights platform for Clay County and calculated through ClearPath's guidance documentation and spreadsheet.	mcoalson@hanson-inc.com	2024 Jan 3 09:21pm	589532.777	28.0686162	15.2746224	594366.473	2019 Gasoline transportation Clay	1439915385	8393120.4	0	0.07024	MT/MMBtu	0.0684136	MT/MMBtu	1.949E-08	MT/mile	1.061E-08	MT/mile	TR.1.A	
246127	3771466	2019-Clay-Transportation-Diesel-GEI	On Road Transportation (USCP Required)	Scope 1	II.1.1	FRCC All (FRCC) eGRID 2019 and 2019 US National Defaults (updated 2020)	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	The above data is pulled from Google's Environmental Insights platform for Clay County and calculated through ClearPath's guidance documentation and spreadsheet.	mcoalson@hanson-inc.com	2024 Jan 4 10:45pm	219395.647	0.68601336	0.65531662	219588.514	2019 Clay transportation Diesel	149129124	2967433.31	0	0.07393448	MT/MMBtu	0.07377323	MT/MMBtu	4.6E-09	MT/mile	4.394E-09	MT/mile	TR.2.C	
247842	3800605	2019-Clay-Rail-Diesel-FDOT	Rail Transportation (USCP Recommended)	Scope 1	II.2.1	FRCC All (FRCC) eGRID 2019	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	Where available Sustainability or ESG reports were used to determine Total GHG Emissions in units of Metric Tons of CO2e. Sustainability or ESG reports were available for the following Railroad Companies and are attached: CSX, Union Pacific, Norfolk Southern. Where Sustainability or ESG reports were not available the AVG emissions per mile of track and AVG gallons of diesel per mile of track in the given County was used to calculate the total annual gallons Diesel and annual GHG emissions. All data is based off the 2019 year.	mcoalson@hanson-inc.com	2024 Jan 17 05:41pm	6140			6140	2019 Clay Rail Diesel				0	MT/MMBtu			0	MT/MMBtu	0	MT/MMBtu		117788.6

AFOLU

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Land Area (hectares / year)	Canopy Area of Trees Outside Forest (hectares)	US Community Protocol Reference
246267	3774039	2019-Clay-County-AFOLU-Undisturbed Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 07:25pm					2019,AFOLU,Clay	87997		
246268	3774043	2019-Clay-County-AFOLU-Forest to Grassland	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 07:28pm					2019 AFOLU Clay	2504		
246269	3774047	2019-Clay-County-AFOLU-Non-Forest to Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 07:29pm					2019,AFOLU,Clay	6501		
246279	3774261	2019-Clay-County-AFOLU-Forest to Settlement	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 08:23pm					2019,AFOLU,Clay	292		
246280	3774265	2019-Clay-County-AFOLU-Forest to Other Non-Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 08:27pm					2019,AFOLU,Clay	122		
246281	3774269	2019-Clay-County-AFOLU-Forest to Wetland	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 08:27pm					2019,AFOLU,Clay	123		
246283	3774303	2019-Clay-County-AFOLU-Outside of Forests	Emissions and Removals from Trees Outside of Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 08:32pm					2019 AFOLU Clay	13091		
247786	3799793	2019-Clay-County-AFOLU-Enteric Fermentation x2019-Clay-County-AFOLU-Enteric	Emissions from Agricultural Activities (USCP optional)	Scope 1	V.1		IPCC 5th Assessment 100 Year Values	AFOLU	Source	2017 USDA Agricultural Census	rvolenec@hanson-inc.com	2024 Jan 16 09:53pm	0	718.97	0	20131.16	2019 AFOLU Clay			A.1	
248454	3811209	Fermentation	Emissions from Agricultural Activities (USCP optional)	Scope 1	V.1		IPCC 5th Assessment 100 Year Values	AFOLU	Source	2017 USDA Agricultural Census (AR5 GWP = 28)	rvolenec@hanson-inc.com	2024 Jan 22 07:25am	0	20131.3	0	563676.4				A.1	

Commercial

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Electricity Energy Equivalent (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	US Community Protocol Reference	Energy Equivalent (MMBtu)	CO2 Emissions Factor (kg/MMBtu)	CH4 Emissions Factor (kg/MMBtu)	N2O Emissions Factor (kg/MMBtu)	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units
246912	3786596	2019-Clay-Commercial-Elec-Census-EIA	Emissions from Grid Electricity (USCP Required)	Scope 2	I.2.2	FRCC All (FRCC) eGRID 2019	IPCC 5th Assessment 100 Year Values	Commercial Energy	Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 10 07:27pm	245893.009	15.7069404	1.99906515	246862.556	2019 Clay Commercial Electricity	2148795.222	0.11443297	MT/MMBtu	7.3096E-06	MT/MMBtu	9.3032E-07	MT/MMBtu	BE.2.1					
246935	3787015	2019-Clay-Commercial-Fuel-Natural Gas-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 10 08:32pm	22419.7191	2.11427	0.0422854	22490.1243	2019 Clay Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		422854	53.02	0.005	0.0001	0	kg/MMBtu
247096	3789260	2019-Clay-Commercial-Fuel-LPG-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 01:36pm	20629.3509	3.56036957	0.35603696	20823.3911	2019 Clay Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		327554	62.98	0.0108696	0.001087	0	kg/MMBtu
247097	3789284	2019-Clay-Commercial-Fuel-Distillate Fuel Oil-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 01:36pm	6531.48156	0.95990217	0.06399348	6575.31709	2019 Clay Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		88311	73.96	0.0108696	0.000725	0	kg/MMBtu
247098	3789308	2019-Clay-Commercial-Fuel-Kerosene-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 01:37pm	3.9104	0.00057778	3.8519E-05	3.93678519	2019 Clay Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		52	75.2	0.0111111	0.000741	0	kg/MMBtu
247099	3789332	2019-Clay-Commercial-Fuel-Gasoline-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 01:38pm	13044.2076	2.0805344	0.1486096	13141.8441	2019 Clay Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		185762	70.22	0.0112	0.0008	0	kg/MMBtu
247100	3789356	2019-Clay-Commercial-Fuel-Propane-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 01:39pm	3283.37758	0.58706593	0.05870659	3315.37267	2019 Clay Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		53423	61.46	0.010989	0.001099	0	kg/MMBtu

Solid Waste

Clay County 2019 Detailed GHG Inventory

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Waste Generated (wet tons)
247334	3792537	2019 Clay County Solid Waste Landfill Waste Generator	Landfilled Waste (USCP Required, Preferred, where applicable)	Scope 1	III.1.1	2019 Clay MSW Factor Set	IPCC 5th Assessment 100 Year Values	Solid Waste	Source		avo@hanson-inc.com	2024 Jan 15 04:05pm		4063.9853		113791.588		228819

Id	Mixed MSW Emissions Factor (MT CH4/wet short ton)	Newspaper Emissions Factor (MT CH4/wet short ton)	Office Paper Emissions Factor (MT CH4/wet short ton)	Corrugated Cardboard Emissions Factor (MT CH4/wet short ton)	Magazines/Third Class Mail Emissions Factor (MT CH4/wet short ton)	Food Scraps Emissions Factor (MT CH4/wet short ton)	Grass Emissions Factor (MT CH4/wet short ton)	Leaves Emissions Factor (MT CH4/wet short ton)	Branches Emissions Factor (MT CH4/wet short ton)	Dimensional Lumber Emissions Factor (MT CH4/wet short ton)
247334	0.0648	0.042	0.1556	0.1048	0.0476	0.0648	0.0228	0.026	0.058	0.0068

Id	Mixed MSW LFG Capture Rate (%)	Newspaper LFG Capture Rate (%)	Office Paper LFG Capture Rate (%)	Corrugated Containers LFG Capture Rate (%)	Magazines/Third Class Mail LFG Capture Rate (%)	Food Scraps LFG Capture Rate (%)	Grass LFG Capture Rate (%)	Leaves LFG Capture Rate (%)	Branches LFG Capture Rate (%)	Dimensional Lumber LFG Capture Rate (%)	Oxidation Rate
247334	60	59	58	54	52	50	39	47	51	57	0.1

Duval County 2019 Detailed GHG Inventory

Residential

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Electricity Energy Equivalent (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	US Community Protocol Reference	Energy Equivalent (MMBtu)	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units
245903	3766653	2019-Duval-Residential-Elec-Census-EIA	Emissions from Grid Electricity (USCP Required)	Scope 2	I.1.2	FRCC All (FRCC) eGRID 2019	IPCC 5th Assessment 100 Year Values	Residential Energy	Activity	American Community Survey ACSST5Y2019	apolematidis@hanson-inc.com	2023 Dec 26 11:10pm	2223939.29	142.058865	18.0802192	2232708.19	2019 RESIDENTIAL DUVAL Electricity		0.11443297	MT/MMBtu			7.3096E-06	MT/MMBtu	9.303E-07	MT/MMBtu	BE.2.1	19434429
245901	3766605	2019-Duval-Residential-NG-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	apolematidis@hanson-inc.com	2023 Dec 26 10:47pm	40371.0928	3.807157	0.07614314	40497.8712	2019 RESIDENTIAL DUVAL natural gas	761431.4	53.02	kg/MMBtu	0	kg/MMBtu	0.005	kg/MMBtu	0.0001	kg/MMBtu	BE.1.1	
245902	3766629	2019-Duval-Residential-LPG-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	apolematidis@hanson-inc.com	2023 Dec 26 11:04pm	17771.5402	3.06714696	0.3067147	17938.6997	2019 RESIDENTIAL DUVAL LPG	282177.52	62.98	kg/MMBtu	0	kg/MMBtu	0.01086957	kg/MMBtu	0.001087	kg/MMBtu	BE.1.2	
245904	3766673	2019-Duval-Residential-FO-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity		apolematidis@hanson-inc.com	2023 Dec 26 11:45pm	9606.07272	1.41176087	0.09411739	9670.54313	2019 RESIDENTIAL DUVAL fuel	129882	73.96	kg/MMBtu	0	kg/MMBtu	0.01086957	kg/MMBtu	0.0007246	kg/MMBtu	BE.1.2	
247902	3801690	2019-Duval-Residential-WOOD-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 08:46pm	0	4.24609832	0.05643548	133.846156	2019 RESIDENTIAL DUVAL fuel	13437.02	0	kg/MMBtu	93.8	kg/MMBtu	0.316	kg/MMBtu	0.0042	kg/MMBtu	BE.1.2	

Transportation

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	On Road VMT	Fossil Fuel Energy Equivalent (MMBtu)	Biofuel Energy (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	US Community Protocol Reference	Energy Equivalent (MMBtu)
245984	3768163	2019-Duval-Transportation-Gasoline-GEI	On Road Transportation (USCP Required)	Scope 1	II.1.1	FRCC All (FRCC) eGRID 2019 and 2019 US National Defaults (updated 2020)	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	The above data is pulled from Google's Environmental Insights platform for Duval County and calculated through ClearPath's guidance documentation and spreadsheet.	mcoalson@hanson-inc.com	2024 Jan 2 05:23pm	2368309.65	112.759082	61.3622127	2387727.89	2019 DUVAL transportation Gasoline GEI 2019 DUVAL transportation Gasoline	5784522314	33717392.5	0	0.07024	MT/MMBtu	0.0684136	MT/MMBtu	1.949E-08	MT/mile	1.061E-08	MT/mile	TR.1.A	
246130	3771527	2019-Duval-Transportation-Diesel-GEI	On Road Transportation (USCP Required)	Scope 1	II.1.1	FRCC All (FRCC) eGRID 2019 and 2019 US National Defaults (updated 2020)	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	The above data is pulled from Google's Environmental Insights platform for Duval County and calculated through ClearPath's guidance documentation and spreadsheet.	mcoalson@hanson-inc.com	2024 Jan 4 10:48pm	881370.55	2.75589775	2.6325808	882145.349	2019 Diesel transportation DUVAL	599091275.9	11920967.3	0	0.07393448	MT/MMBtu	0.07377323	MT/MMBtu	4.6E-09	MT/mile	4.394E-09	MT/mile	TR.2.C	
247843	3800620	2019-Duval-Rail-Diesel-FDOT	Rail Transportation (USCP Recommended)	Scope 1	II.2.1	FRCC All (FRCC) eGRID 2019	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	Where available Sustainability or ESG reports were used to determine Total GHG Emissions in units of Metric Tons of CO2e. Sustainability or ESG reports were available for the following Railroad Companies and are attached: CSX, Union Pacific, Norfolk Southern. Where Sustainability or ESG reports were not available the AVG emissions per mile of track and AVG gallons of diesel per mile of track in the given County was used to calculate the total annual gallons Diesel and annual GHG emissions. All data is based off the 2019 year.	mcoalson@hanson-inc.com	2024 Jan 17 05:43pm	18061			18061	DUVAL Rail Diesel 2019				0	MT/MMBtu			0	MT/mile	0	MT/mile		356606.9

AFOLU

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Land Area (hectares / year)	Canopy Area of Trees Outside Forest (hectares)	US Community Protocol Reference
246286	3774361	2019-Duval-County-AFOLU-Undisturbed Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 08:43pm					2019 AFOLU Duval	77880		
246287	3774365	2019-Duval-County-AFOLU-Forest to Grassland	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 08:46pm					2019 AFOLU Duval	1747		
246288	3774369	2019-Duval-County-AFOLU-Non-Forest to Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 08:47pm					2019 AFOLU Duval	3230		
246289	3774373	2019-Duval-County-AFOLU-Forest to Settlement	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 08:48pm					2019 AFOLU Duval	916		
246290	3774377	2019-Duval-County-AFOLU-Forest to Other Non-Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 08:51pm					2019 AFOLU Duval	60		
246291	3774381	2019-Duval-County-AFOLU-Forest to Wetland	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 08:55pm					2019 AFOLU Duval	425		
246292	3774387	2019-Duval-County-AFOLU-Outside of Forests	Trees Outside of Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 08:57pm					2019 AFOLU Duval	23875		
247793	3799843	2019-Duval-County-AFOLU-Enteric Fermentation	Emissions from Agricultural Activities (USCP optional)	Scope 1	V.1		IPCC 5th Assessment 100 Year Values	AFOLU	Source	2017 USDA Agricultural Census	rvolenec@hanson-inc.com	2024 Jan 16 10:05pm	0	1077.43	0	30168.04	2019 AFOLU Duval		A.1	
248455	3811223	2019-Duval-County-AFOLU-Enteric Fermentation	Emissions from Agricultural Activities (USCP optional)	Scope 1	V.1		IPCC 5th Assessment 100 Year Values	AFOLU	Source	2017 USDA Agricultural Census (AR5 GWP = 28)	rvolenec@hanson-inc.com	2024 Jan 22 07:27am	0	30168	0	844704			A.1	

Commercial

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Electricity Energy Equivalent (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	US Community Protocol Reference	Energy Equivalent (MMBtu)	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units
246913	3786632	2019-Duval-Commercial-Elec-Census-EIA	Emissions from Grid Electricity (USCP Required)	Scope 2	I.2.2	FRCC All (FRCC) eGRID 2019	IPCC 5th Assessment 100 Year Values	Commercial Energy	Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 10 07:30pm	2352269.58	150.256237	19.1235211	2361544.49	2019 DUVAL Commercial Electricity	20555873.72	0.11443297	MT/MMBtu	7.3096E-06	MT/MMBtu	9.3032E-07	MT/MMBtu	BE.2.1			
246936	3787039	2019-Duval-Commercial-Fuel-Distillate Fuel Oil-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 10 08:33pm	62481.408	9.1826087	0.61217391	62900.7471	2019 DUVAL Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		844800	73.96	0.0108696	0.000725	0 kg/MMBtu
247101	3789380	2019-Duval-Commercial-Fuel-LPG-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 01:44pm	197345.437	34.0593696	3.40593696	199201.672	2019 DUVAL Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		3133462	62.98	0.0108696	0.001087	0 kg/MMBtu
247102	3789404	2019-Duval-Commercial-Fuel-Natural Gas-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 01:45pm	214472.421	20.225615	0.4045123	215145.934	2019 DUVAL Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		4045123	53.02	0.005	0.0001	0 kg/MMBtu
247103	3789428	2019-Duval-Commercial-Fuel-Kerosene-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 01:46pm	37.5248	0.00554444	0.00036963	37.7779963	2019 DUVAL Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		499	75.2	0.0111111	0.000741	0 kg/MMBtu
247104	3789452	2019-Duval-Commercial-Fuel-Gasoline-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 01:47pm	124783.889	19.9028704	1.4216336	125717.903	2019 DUVAL Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		1777042	70.22	0.0112	0.0008	0 kg/MMBtu
247105	3789476	2019-Duval-Commercial-Fuel-Propane-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 01:47pm	31409.6861	5.61603297	0.5616033	31715.7599	2019 DUVAL Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		511059	61.46	0.010989	0.001099	0 kg/MMBtu

Solid Waste

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Waste Generated (wet tons)	Mixed MSW Emissions Factor (MT CH4/wet short ton)	Newspaper Emissions Factor (MT CH4/wet short ton)	Office Paper Emissions Factor (MT CH4/wet short ton)	Corrugated Cardboard Emissions Factor (MT CH4/wet short ton)	Magazines/Third Class Mail Emissions Factor (MT CH4/wet short ton)	Food Scraps Emissions Factor (MT CH4/wet short ton)	Grass Emissions Factor (MT CH4/wet short ton)	Leaves Emissions Factor (MT CH4/wet short ton)	Branches Emissions Factor (MT CH4/wet short ton)	Dimensional Lumber Emissions Factor (MT CH4/wet short ton)	Mixed MSW LFG Capture Rate (%)	Newspaper LFG Capture Rate (%)	Office Paper LFG Capture Rate (%)	Corrugated Containers LFG Capture Rate (%)	Magazines/Third Class Mail LFG Capture Rate (%)	Food Scraps LFG Capture Rate (%)	Grass LFG Capture Rate (%)	Leaves LFG Capture Rate (%)	Branches LFG Capture Rate (%)	Dimensional Lumber LFG Capture Rate (%)	Oxidation Rate
246914	3786673	2019 Duval County Solid Waste Landfill Waste Generator	Landfilled Waste (USCP Required, Preferred, where applicable)	Scope 1	III.1.1	2019 Duval MSW Factor Set	IPCC 5th Assessment 100 Year Values	Solid Waste	Source		avo@hanson-inc.com	2024 Jan 10 07:32pm		12872.9422		360442.381		2752896	0.0648	0.042	0.1556	0.1048	0.0476	0.0648	0.0228	0.026	0.058	0.0068	60	59	58	54	52	50	39	47	51	57	0.1

Duval County 2019 Detailed GHG Inventory

Industrial

Id	Output Record Ids	With CoZe Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Energy Equivalent (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units	US Community Protocol Reference
247128	3790012	Symrise - Natural Gas	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Industrial Energy	Source		greilly@hanson-inc.com	2024 Jan 11 04:42pm	29091.4	0.55	0.055	29121.375	2019 - Duval - Industrial		0	0 MT/MMBtu		0 MT/MMBtu		0 MT/MMBtu		0	0
247281	3791429	Symrise - Biogenic Process Derived Fuel	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Industrial Energy	Source	Fuel: Biogenic Process Derived Fuel (PDF) (Blend (liquid))	greilly@hanson-inc.com	2024 Jan 12 02:07pm	12915.4	0.52	0.103	12957.255	2019 - Duval - Industrial		0	0 MT/MMBtu		0 MT/MMBtu		0 MT/MMBtu		0	0
247282	3791447	Anchor Glass Container Corporation - Plant 07 - Stationary Combustion	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Industrial Energy	Source	HAVE NOT BEEN INCLUDED Glass Manufacturing: -Furnace 4 : CO2 Emissions = 7596 (Metric Tons) -Furnace 3 : CO2 Emissions = 11160.6 (Metric Tons)	greilly@hanson-inc.com	2024 Jan 12 02:11pm	48120.2	25.48	24.115	55224.115	2019 - Duval - Industrial	912932.1	0	0 MT/MMBtu		0 MT/MMBtu		0 MT/MMBtu		0	0
247285	3791486	IFF Chemical Holdings Inc. - Used Oil	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Industrial Energy	Source	Fuel: Used Oil	greilly@hanson-inc.com	2024 Jan 12 02:16pm	11691.5	0.47	0.095	11729.835	2019 - Duval - Industrial		0	0 MT/MMBtu		0 MT/MMBtu		0 MT/MMBtu		0	0
247287	3791507	CMC Steel Florida - Natural Gas	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Industrial Energy	Source	Iron and Steel Production (NOT INCLUDED) Fuel: "Not Stated" Emissions: 58290.6 (Metric Tons)	greilly@hanson-inc.com	2024 Jan 12 02:28pm	43066.7	0.81	0.081	43110.845	2019 - Duval - Industrial		0	0 MT/MMBtu		0 MT/MMBtu		0 MT/MMBtu		0	0
247288	3791525	Trail Ridge Landfill Inc. - Distillate Fuel Oil No. 2	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Industrial Energy	Source		greilly@hanson-inc.com	2024 Jan 12 02:36pm	1041.2	0.04	0.008	1044.44	2019 - Duval - Industrial		0	0 MT/MMBtu		0 MT/MMBtu		0 MT/MMBtu		0	0
248452	3811177	WestRock CP, LLC - Seminole Mill - Natural Gas	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Industrial Energy	Source	This company also produces 2,402.87 (Metric Tons) of Methane, but it's from an Industrial Waste Landfill.	greilly@hanson-inc.com	2024 Jan 22 04:23am	255799.5	4.82	0.482	256062.19	2019 - Duval - Industrial		0	0 MT/MMBtu		0 MT/MMBtu		0 MT/MMBtu		0	0
248460	3811296	Anheuser-Busch LLC - Natural Gas	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Industrial Energy	Source		greilly@hanson-inc.com	2024 Jan 22 02:54pm	54118.4	1.02	0.102	54173.99	2019 - Duval - Industrial		0	0 MT/MMBtu		0 MT/MMBtu		0 MT/MMBtu		0	0
248461	3811314	Anheuser-Busch LLC - Other Biomass Gases	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Industrial Energy	Source	Fuel: Other Biomass Gases	greilly@hanson-inc.com	2024 Jan 22 03:05pm	5034.5	0.31	0.061	5059.345	2019 - Duval - Industrial		0	0 MT/MMBtu		0 MT/MMBtu		0 MT/MMBtu		0	0
248462	3811332	US GYPSUM - Jacksonville Plant - Natural Gas	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Industrial Energy	Source		greilly@hanson-inc.com	2024 Jan 22 03:07pm	41601	0.78	0.078	41643.51	2019 - Duval - Industrial		0	0 MT/MMBtu		0 MT/MMBtu		0 MT/MMBtu		0	0
248463	3811350	IFF Chemical Holdings Inc. - Natural Gas	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Industrial Energy	Source		greilly@hanson-inc.com	2024 Jan 22 03:11pm	24497.6	0.46	0.046	24522.67	2019 - Duval - Industrial		0	0 MT/MMBtu		0 MT/MMBtu		0 MT/MMBtu		0	0

Nassau County 2019 Detailed Inventory

Residential

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Electricity Energy Equivalent (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	US Community Protocol Reference	Energy Equivalent (MMBtu)	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units
246095	3770845	2019-Nassau-County-Residential-Energy-FPL	Emissions from Grid Electricity (USCP Required)	Scope 2	I.1.2	Florida Power and Light 2019 (FPL and eGRID2018 factors)	IPCC 5th Assessment 100 Year Values	Residential Energy	Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 4 09:24pm	152459.934	15.1313618	2.06336752	153430.404	2019 Nassau RESIDENTIAL FPL	1725044.106	0.08838031	MT/MMBtu	8.7716E-06	MT/MMBtu	1.1961E-06	MT/MMBtu	BE.2.1			
247905	3801754	2019-Nassau-County-Residential-Fuel-NGas	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 08:49pm	3583.42987	0.3379319	0.00675864	3594.683	2019 RESIDENTIAL Nassau fuel		53.02	kg/MMBtu	0.005	kg/MMBtu	0.0001	kg/MMBtu	BE.1.1	67586.38	0	kg/MMBtu
247906	3801778	2019-Nassau-County-Residential-Fuel-FuelOil	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 08:49pm	29.4042772	0.00432141	0.00028809	29.6016217	2019 RESIDENTIAL Nassau fuel		73.96	kg/MMBtu	0.01086957	kg/MMBtu	0.00072464	kg/MMBtu	BE.1.2	397.57	0	kg/MMBtu
247907	3801802	2019-Nassau-County-Residential-Fuel-LPG	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 08:50pm	1577.44243	0.27224696	0.0272247	1592.27988	2019 RESIDENTIAL Nassau fuel		62.98	kg/MMBtu	0.01086957	kg/MMBtu	0.00108696	kg/MMBtu	BE.1.2	25046.72	0	kg/MMBtu
247908	3801826	2019-Nassau-County-Residential-Fuel-Wood	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 08:51pm	0	0.3768932	0.00500934	11.8804847	2019 RESIDENTIAL Nassau fuel		0	kg/MMBtu	0.316	kg/MMBtu	0.0042	kg/MMBtu	BE.1.2	1192.7	93.8	kg/MMBtu

Transportation

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	On Road VMT	Fossil Fuel Energy Equivalent (MMBtu)	Biofuel Energy (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	US Community Protocol Reference	Energy Equivalent (MMBtu)
246037	3769770	2019-Nassau-Transportation-Gasoline-GEI	On Road Transportation (USCP Required)	Scope 1	II.1.1	Florida Power and Light 2019 (FPL and eGRID2018 factors) and 2019 US National Defaults (updated 2020)	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	The above data is pulled from Google's Environmental Insights platform for Nassau County and calculated through ClearPath's guidance documentation and spreadsheet.	mcoalson@hanson-inc.com	2024 Jan 3 09:36pm	545004.562	25.9485553	14.1209093	549473.162	2019 Gasoline transportation Nassau	1331156611	7759176.56	0	0.07024	MT/MMBtu	0.0684136	MT/MMBtu	1.949E-08	MT/mile	1.061E-08	MT/mile	TR.1.A	
246135	3771624	2019-Nassau-Transportation-Diesel-GEI	On Road Transportation (USCP Required)	Scope 1	II.1.1	Florida Power and Light 2019 (FPL and eGRID2018 factors) and 2019 US National Defaults (updated 2020)	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	The above data is pulled from Google's Environmental Insights platform for Nassau County and calculated through ClearPath's guidance documentation and spreadsheet.	mcoalson@hanson-inc.com	2024 Jan 4 10:56pm	202824.394	0.63419783	0.60581966	203002.694	2019 transportation Diesel Nassau	137865197.7	2743299.02	0	0.07393448	MT/MMBtu	0.07377323	MT/MMBtu	4.6E-09	MT/mile	4.394E-09	MT/mile	TR.2.C	
247845	3800654	2019-Nassau-Rail-Diesel-FDOT	Rail Transportation (USCP Recommended)	Scope 1	II.2.1	Florida Power and Light 2019 (FPL and eGRID2018 factors)	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	Where available Sustainability or ESG reports were used to determine Total GHG Emissions in units of Metric Tons of CO2e. Sustainability or ESG reports were available for the following Railroad Companies and are attached: CSX, Union Pacific, Norfolk Southern. Where Sustainability or ESG reports were not available the AVG emissions per mile of track and AVG gallons of diesel per mile of track in the given County was used to calculate the total annual gallons Diesel and annual GHG emissions. All data is based off the 2019 year.	mcoalson@hanson-inc.com	2024 Jan 17 05:44pm	8867			8867	2019,Nassau,Rail,Diesel				0	MT/MMBtu			0	MT/mile	0	MT/mile	TR.2.A	170041.5

AFOLU

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Land Area (hectares / year)	Canopy Area of Trees Outside Forest (hectares)	US Community Protocol Reference
246295	3774447	2019-Nassau-County-AFOLU-Undisturbed Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 09:25pm					2019 AFOLU Nassau	101194		
246297	3774455	2019-Nassau-County-AFOLU-Forest to Grassland	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 09:26pm					2019 AFOLU Nassau	5484		
246298	3774459	2019-Nassau-County-AFOLU-Non-Forest to Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 09:29pm					2019 AFOLU Nassau	6756		
246299	3774463	2019-Nassau-County-AFOLU-Forest to Settlement	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 09:30pm					2019 AFOLU Nassau	226		
246300	3774467	2019-Nassau-County-AFOLU-Forest to Other	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 09:31pm					2019 AFOLU Nassau	55		
246301	3774471	2019-Nassau-County-AFOLU-Forest to Wetland	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 09:31pm					2019 AFOLU Nassau	413		
246296	3774453	2019-Nassau-County-AFOLU-Outside of Forests	Emissions and Removals from Trees Outside of Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 09:26pm					2019 AFOLU Nassau		14575	
247795	3799881	2019-Nassau-County-AFOLU-Enteric Fermentation	Emissions from Agricultural Activities (USCP optional)	Scope 1	V.1		IPCC 5th Assessment 100 Year Values	AFOLU	Source	2017 USDA Agricultural Census	rvolenec@hanson-inc.com	2024 Jan 16 10:17pm	0	1164	0	32592	2019 AFOLU Nassau			A.1	
248456	3811237	2019-Nassau-County-AFOLU-Enteric Fermentation	Emissions from Agricultural Activities (USCP optional)	Scope 1	V.1		IPCC 5th Assessment 100 Year Values	AFOLU	Source	2017 USDA Agricultural Census (AR5 GWP = 28)	rvolenec@hanson-inc.com	2024 Jan 22 07:30am	0	32591.9	0	912573.2				A.1	

Commercial

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Electricity Energy Equivalent (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	US Community Protocol Reference	Energy Equivalent (MMBtu)	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units
246915	3786694	2019-Nassau-Commercial-Elec-Census-EIA	Emissions from Grid Electricity (USCP Required)	Scope 2	I.2.2	Florida Power and Light 2019 (FPL and eGRID2018 factors)	IPCC 5th Assessment 100 Year Values	Commercial Energy	Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 10 07:34pm	77262.7913	7.66818681	1.04566184	77754.6009	2019 Nassau Commercial Electricity	874208.1911	0.08838031	MT/MMBtu	8.7716E-06	MT/MMBtu	1.1961E-06	MT/MMBtu	BE.2.1			
246937	3787063	2019-Nassau-Commercial-Fuel-Natural Gas-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 10 08:35pm	9121.18966	0.860165	0.0172033	9149.83315	2019 Nassau Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		172033	53.02	0.005	0.0001	0 kg/MMBtu
247106	3789500	2019-Nassau-Commercial-Fuel-LPG-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 01:50pm	8392.77778	1.44848913	0.14484891	8471.72044	2019 Nassau Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		133261	62.98	0.0108696	0.001087	0 kg/MMBtu
247107	3789524	2019-Nassau-Commercial-Fuel-Distillate Fuel Oil-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 01:50pm	2657.23488	0.39052174	0.02603478	2675.06871	2019 Nassau Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		35928	73.96	0.0108696	0.000725	0 kg/MMBtu
247108	3789548	2019-Nassau-Commercial-Fuel-Kerosene-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 01:51pm	1.5792	0.00023333	1.5556E-05	1.58985556	2019 Nassau Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		21	75.2	0.0111111	0.000741	0 kg/MMBtu
247109	3789572	2019-Nassau-Commercial-Fuel-Gasoline-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 01:52pm	5306.8765	0.84644	0.06046	5346.59872	2019 Nassau Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		75575	70.22	0.0112	0.0008	0 kg/MMBtu
247110	3789596	2019-Nassau-Commercial-Fuel-Propane-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 01:52pm	1335.8331	0.23884615	0.02388462	1348.85022	2019 Nassau Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		21735	61.46	0.010989	0.001099	0 kg/MMBtu

Solid Waste

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Waste Generated (wet tons)	Mixed MSW Emissions Factor (MT CH4/wet short ton)	Newspaper Emissions Factor (MT CH4/wet short ton)	Office Paper Emissions Factor (MT CH4/wet short ton)	Corrugated Cardboard Emissions Factor (MT CH4/wet short ton)	Magazines/Third Class Mail Emissions Factor (MT CH4/wet short ton)	Food Scraps Emissions Factor (MT CH4/wet short ton)	Grass Emissions Factor (MT CH4/wet short ton)	Leaves Emissions Factor (MT CH4/wet short ton)	Branches Emissions Factor (MT CH4/wet short ton)	Dimensional Lumber Emissions Factor (MT CH4/wet short ton)	Mixed MSW LFG Capture Rate (%)	Newspaper LFG Capture Rate (%)	Office Paper LFG Capture Rate (%)	Corrugated Containers LFG Capture Rate (%)	Magazines/Third Class Mail LFG Capture Rate (%)	Food Scraps LFG Capture Rate (%)	Grass LFG Capture Rate (%)	Leaves LFG Capture Rate (%)	Branches LFG Capture Rate (%)	Dimensional Lumber LFG Capture Rate (%)	Oxidation Rate

Nassau County 2019 Detailed Inventory

Id	Output Record Ids	With CoZe	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Energy Equivalent (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units	US Community Protocol Reference
247335	3792569		2019 Baker County Solid Waste Landfill Waste Generator Industrial	Landfilled Waste (USCP Required, Preferred, where applicable)	Scope 1	III.1.1	2019 Nassau MSW Factor Set	IPCC 5th Assessment 100 Year Values	Solid Waste	Source		avo@hanson-inc.com	2024 Jan 15 04:13pm	831.3201			23276.9628		194034	0.0648	0.042	0.1556	0.1048	0.0476	0.0648	0.0228	0.026	0.058	0.0068	60
247289	3791543		WestRock CP, LLC - Fernandina Beach Mill - Distillate Fuel Oil No. 2	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Energy Industrial	Source		greilly@hanson-inc.com	2024 Jan 12 02:49pm	14969	0.61	0.122	15018.41	2019 - Nassau - Industrial	0	0	MT/MMBtu	0	MT/MMBtu	0	MT/MMBtu	0	0		
247290	3791561		WestRock CP, LLC - Fernandina Beach Mill - Wood and Wood Residuals	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Energy Industrial	Source	Fuel: Wood and Wood Residuals (dry basis)	greilly@hanson-inc.com	2024 Jan 12 02:50pm	283166.3	21.74	10.868	286655.04	2019 - Nassau - Industrial	0	0	MT/MMBtu	0	MT/MMBtu	0	MT/MMBtu	0	0		
247291	3791579		WestRock CP, LLC - Fernandina Beach Mill - Bituminous	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Energy Industrial	Source	Fuel: Bituminous	greilly@hanson-inc.com	2024 Jan 12 02:53pm		15.28	2.222	427.84588	2019 - Nassau - Industrial	0	0	MT/MMBtu	0	MT/MMBtu	0	MT/MMBtu	0	0		
247292	3791597		WestRock CP, LLC - Fernandina Beach Mill - Natural Gas	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Energy Industrial	Source		greilly@hanson-inc.com	2024 Jan 12 02:54pm	48552.9	7	0.455	48869.475	2019 - Nassau - Industrial	0	0	MT/MMBtu	0	MT/MMBtu	0	MT/MMBtu	0	0		
247293	3791615		WestRock CP, LLC - Fernandina Beach Mill - Propane	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Energy Industrial	Source		greilly@hanson-inc.com	2024 Jan 12 02:56pm	61.3	0	0.001	61.565	2019 - Nassau - Industrial	0	0	MT/MMBtu	0	MT/MMBtu	0	MT/MMBtu	0	0		
247294	3791633		Rayonier Performance Fibers LLC - Fernandina Mill - Residual Fuel Oil No. 2	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Energy Industrial	Source		greilly@hanson-inc.com	2024 Jan 12 03:09pm	411.9	0.02	0.003	413.255	2019 - Nassau - Industrial	0	0	MT/MMBtu	0	MT/MMBtu	0	MT/MMBtu	0	0		
247298	3791726		Rayonier Performance Fibers LLC - Fernandina Mill - Residual Fuel Oil No. 6	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Energy Industrial	Source		greilly@hanson-inc.com	2024 Jan 12 04:32pm	698.9	0.03	0.005	701.065	2019 - Nassau - Industrial	0	0	MT/MMBtu	0	MT/MMBtu	0	MT/MMBtu	0	0		
247299	3791744		Rayonier Performance Fibers LLC - Fernandina Mill - Wood and Wood Residuals	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Energy Industrial	Source	Fuel: Wood and Wood Residuals (dry basis)	greilly@hanson-inc.com	2024 Jan 12 04:33pm	295658.6	22.69	11.347	299300.875	2019 - Nassau - Industrial	0	0	MT/MMBtu	0	MT/MMBtu	0	MT/MMBtu	0	0		
247300	3791762		Rayonier Performance Fibers LLC - Fernandina Mill - Agricultural Byproducts	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Energy Industrial	Source	Fuel: Agricultural Byproducts	greilly@hanson-inc.com	2024 Jan 12 04:35pm	48.2	0.01	0.002	49.01	2019 - Nassau - Industrial	0	0	MT/MMBtu	0	MT/MMBtu	0	MT/MMBtu	0	0		
247301	3791780		Rayonier Performance Fibers LLC - Fernandina Mill - Tires	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Energy Industrial	Source	Fuels: Tires	greilly@hanson-inc.com	2024 Jan 12 04:36pm	6540.3	2.43	0.32	6693.14	2019 - Nassau - Industrial	0	0	MT/MMBtu	0	MT/MMBtu	0	MT/MMBtu	0	0		
247302	3791798		Rayonier Performance Fibers LLC - Fernandina Mill - Natural Gas	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.3.1		IPCC 5th Assessment 100 Year Values	Energy Industrial	Source		greilly@hanson-inc.com	2024 Jan 12 04:37pm	23608.2	0.44	0.044	23632.18	2019 - Nassau - Industrial	0	0	MT/MMBtu	0	MT/MMBtu	0	MT/MMBtu	0	0		

City of Palm Coast 2019 Detailed GHG Inventory

Residential

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Electricity Energy Equivalent (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	US Community Protocol Reference	Energy Equivalent (MMBtu)	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units													
246096	3770865	2019-Palm-Coast-Residential-Energy-FPL	Emissions from Grid Electricity (USCP Required)	Scope 2	I.1.2	Florida Power and Light 2019 (FPL and eGRID2018 factors)	IPCC 5th Assessment 100 Year Values	Residential Energy	Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 4 09:30pm	157661.309	15.6475886	2.13376208	158664.889	2019 PalmCoast RESIDENTIAL FPL				57.3507894	5.10094482	21.1449808	1.88069565	0.0883803		8.772E-06	1.196E-06	No			31105	84365			1783896	0	5.23E+08	665	66	9
247909	3801850	2019-Palm-Coast-Residential-Fuel-NGas	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 08:55pm	3705.68338	0.3494609	0.00698922	3717.32043	2019 RESIDENTIAL PalmCoast fuel	69892.18	0	0	178.296378	9.48296028	65.7499341	3.49700887	53.02	0	0.005	0.0001	No	Natural Gas	69892.18	392	1063	Low	Low						
247910	3801874	2019-Palm-Coast-Residential-Fuel-FuelOil	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 08:56pm	30.4071748	0.0044688	0.00029792	30.6112502	2019 RESIDENTIAL PalmCoast fuel	411.13	0	0	25.695625	1.91320314	9.56116279	0.71188954	73.96	0	0.0108696	0.0007246	No	Distillate Fuel Oil No. 2	411.13	16	43	Low	Low						
247912	3801913	2019-Palm-Coast-Residential-Fuel-LPG	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 08:57pm	1631.25884	0.281535	0.0281535	1646.60249	2019 RESIDENTIAL PalmCoast fuel	25901.22	0	0	386.585373	24.5761566	142.314396	9.04726645	62.98	0	0.0108696	0.001087	No	LPG	25901.22	67	182	Low	Low						
247913	3801937	2019-Palm-Coast-Residential-Fuel-Wood	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 08:58pm	0	0.38975124	0.00518024	12.2857978	2019 RESIDENTIAL PalmCoast fuel	1233.39	0	115.691982	11.9746602	0.11927959	4.42075269	0.04403512	0	93.8	0.316	0.0042	No	Wood	1233.39	103	279	Low	Low						

Transportation

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags
246038	3769795	2019-Palm_Coast-Transportation-Gasoline-GEI	On Road Transportation (USCP Required)	Scope 1	II.1.1	Florida Power and Light 2019 (FPL and eGRID2018 factors) and 2019 US National Defaults (updated 2020)	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	The above data is pulled from Google's Environmental Insights platform for Palm Coast County and calculated through ClearPath's guidance documentation and spreadsheet.	mcoalson@hanson-inc.com	2024 Jan 3 09:37pm	398274.206	18.962484	10.3191686	401539.735	2019 Gasoline transportation PalmCoast
246139	3771712	2019-Palm_Coast-Transportation-Diesel-GEI	On Road Transportation (USCP Required)	Scope 1	II.1.1	Florida Power and Light 2019 (FPL and eGRID2018 factors) and 2019 US National Defaults (updated 2020)	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	The above data is pulled from Google's Environmental Insights platform for Palm Coast County and calculated through ClearPath's guidance documentation and spreadsheet.	mcoalson@hanson-inc.com	2024 Jan 4 11:04pm	148218.437	0.46345417	0.44271619	148348.734	2019 PalmCoast transportation Diesel

Id	On Road VMT	Fossil Fuel Energy Equivalent (MMBtu)	Biofuel Energy (MMBtu)	Biogenic-CO2 (MT)	Biofuel CH4 (MT)	Biofuel N2O (MT)	Emissions per Capita (MT CO2 per Person)	Miles per person	Emissions per Mile (g CO2e per mile)	CO2 Emissions Factor	Biogenic CO2 Emissions Factor	CH4 Emissions Factor	N2O Emissions Factor	Calculation Method	VMT Location	Travel Type	Type of VMT or Emissions Data	Type of Freight VMT or Emissions Data	Fuel Type	Is this a T&D Loss Record? (Required for EVs)	VMT	Percent Motorcycles	Percent Passenger Vehicles	Percent Light Trucks	Percent Heavy Tucks	Fuel Use	T&D Loss Factor	Percent Biofuel
246038	972772302.3	5670190.86	0	0	0	0	2.83229224	6861.5263	412.77875	0.07024	0.0684136	1.95E-08	1.06E-08	VMT & MPG	In-Boundary	Passenger	Origin-Destination		Gasoline		9.73E+08	0.67	75.91	21.8	1.62		0	0
246139	100748059.8	2004726.78	0	0	0	0	Infinity	Infinity	1472.4724	0.0739345	0.0737732	4.6E-09	4.39E-09	VMT & MPG	In-Boundary	Freight		Origin-Destination	Diesel		1.01E+08	0	3.46	8.31	88.23		0	0

Id	CO2 On Road Average Emissions Factor	CH4 On Road Average Emissions Factor	N2O On Road Average Emissions Factor	Previously Calculated CO2	Previously Calculated CH4	Previously Calculated N2O	Previously Calculated Biogenic CO2	Biofuel CO2 Factor	Biofuel CH4 Factor	Biofuel N2O Factor	Population (optional)	Number of Passenger Trips (optional)	Notation Keys	Data Quality: Activity Data	Data Quality: Emissions Factor	CO2 lbs/MWh	CO2 kg/MWh	CH4 lbs/GWh	CH4 kg/GWh	N2O lbs/GWh	N2O kg/GWh
246038				0	0	0	0				141772					665		66		9	
246139				0	0	0	0									665		66		9	

Id	Gas Passenger Vehicle Fuel Economy	Gas Passenger Vehicle g CH4/mi	Gas Passenger Vehicle g N2O/mi	Gas Light Truck Fuel Economy (MPG)	Gas Light Truck g CH4/mi	Gas Light Truck g N2O/mi	Gas Heavy Truck Fuel Economy (MPG)	Gas Heavy Truck g CH4/mi	Gas Heavy Truck g N2O/mi	Gas Transit Bus Fuel Economy (MPG)	Gas Transit Bus g CH4/mi	Gas Transit Bus g N2O/mi	Gas Para Transit Bus Fuel Economy (MPG)	Gas Para Transit Bus g CH4/mi	Gas Para Transit Bus g N2O/mi	Gas Motorcycle Fuel Economy (MPG)	Gas Motorcycle g CH4/mi	Gas Motorcycle g N2O/mi	Electric Vehicle Fuel Economy (MPGe)
246038	24.37713	0.0183	0.0083	17.86788	0.0193	0.0148	5.371652	0.0785	0.0633	17.86788	0.0193	0.0148	17.86788	0.0193	0.0148	24.37713	0.0183	0.0083	
246139	24.37713	0.0183	0.0083	17.86788	0.0193	0.0148	5.371652	0.0785	0.0633	17.86788	0.0193	0.0148	17.86788	0.0193	0.0148	24.37713	0.0183	0.0083	

Id	Diesel Passenger Vehicle Fuel Economy	Diesel Passenger Vehicle g CH4/mi	Diesel Passenger Vehicle g N2O/mi	Diesel Light Truck Fuel Economy (MPG)	Diesel Light Truck g CH4/mi	Diesel Light Truck g N2O/mi	Diesel Heavy Truck Fuel Economy (MPG)	Diesel Heavy Truck g CH4/mi	Diesel Heavy Truck g N2O/mi	Diesel Transit Bus Fuel Economy (MPG)	Diesel Transit Bus g CH4/mi	Diesel Transit Bus g N2O/mi	Diesel Para Transit Bus Fuel Economy (MPG)	Diesel Para Transit Bus g CH4/mi	Diesel Para Transit Bus g N2O/mi	Diesel Motorcycle Fuel Economy (MPG)	Diesel Motorcycle g CH4/mi	Diesel Motorcycle g N2O/mi
246038	24.37713	0.0005	0.001	17.86788	0.001	0.0015	6.392468	0.0051	0.0048	17.86788	0.001	0.0015	17.86788	0.001	0.0015	24.37713	0.0005	0.001
246139	24.37713	0.0005	0.001	17.86788	0.001	0.0015	6.392468	0.0051	0.0048	17.86788	0.001	0.0015	17.86788	0.001	0.0015	24.37713	0.0005	0.001

AFOLU

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags
246310	3774507	2019-Palm Coast-AFOLU-Undisturbed Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 10:08pm					2019 AFOLU Palm Coast
246312	3774515	2019-Palm Coast-AFOLU-Forest to Grassland	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 10:09pm					2019 AFOLU Palm Coast
246313	3774519	2019-Palm Coast-AFOLU-Non-Forest to Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 10:09pm					2019 AFOLU Palm Coast
246315	3774527	2019-Palm Coast-AFOLU-Forest to Other Non-Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 10:12pm					2019 AFOLU Palm Coast
246316	3774531	2019-Palm Coast-AFOLU-Forest to Wetland	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 10:12pm					2019 AFOLU Palm Coast
246314	3774523	2019-Palm Coast-AFOLU-Forest to Settlement	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 10:11pm					2019 AFOLU Palm Coast
246311	3774513	2019-Palm Coast-AFOLU-Outside of Forests	Emissions and Removals from Trees Outside of Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 10:09pm					2019 AFOLU Palm Coast
247839	3800545	2019-Palm Coast-AFOLU-Enteric Fermentation	Emissions from Agricultural Activities (USCP optional)	Scope 1	V.1		IPCC 5th Assessment 100 Year Values	AFOLU	Source	2017 USDA Agricultural Census (Flagler County) Data has been scaled by a factor of 0.19 to account for Palm Coast land as a fraction of Flagler County land.	rvolenec@hanson-inc.com	2024 Jan 17 03:57pm	0	200.07	0	5601.96	2019 AFOLU Palm Coast
248457	3811251	x2019-Palm Coast-AFOLU-Enteric Fermentation	Emissions from Agricultural Activities (USCP optional)	Scope 1	V.1		IPCC 5th Assessment 100 Year Values	AFOLU	Source	2017 USDA Agricultural Census (Flagler County) (AR5 GWP = 28) Data has been scaled by a factor of 0.19 to account for Palm Coast land as a fraction of Flagler County	rvolenec@hanson-inc.com	2024 Jan 22 07:32am	0	5601.82	0	156850.96	

Id	Land Area (hectares / year)	Canopy Area of Trees Outside Forest (hectares)	US Community Protocol Reference																
246310											12355	-61327	Undisturbed Forest	12355	-61327				
246312											188	5550	Forest to Grassland	188	5550				
246313											300	-4491	Non-Forest to Forest	300	-4491				
246315											16	1803	Forest to other non-forest	16	1803				
246316											35	1417	Forest to Wetland	35	1417				
246314											44	3218	Forest to Settlement	44	3218				
246311												-28026				2222	2222	14370	-42396
247839			Infinity	Infinity	Infinity	Enteric Fermentation	0	200.07	0	US Community Protocol Method A.1 or A.2									
248457			Infinity	Infinity	Infinity	Enteric Fermentation	0	5601.82	0	US Community Protocol Method A.1 or A.2									

Commercial

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags
246917	3786738	2019-PalmCoast-Commercial-Elec-Census-EIA	Emissions from Grid Electricity (USCP Required)	Scope 2	I.2.2	Florida Power and Light 2019 (FPL and eGRID2018 factors)	IPCC 5th Assessment 100 Year Values	Commercial Energy	Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for	cbarsanti@hanson-inc.com	2024 Jan 10 07:43pm	45802.7188	4.54583375	0.61988642	46094.2721	2019 PalmCoast Commercial Electricity
247111	3789620	2019-PalmCoast-Commercial-Fuel-LPG-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for	cbarsanti@hanson-inc.com	2024 Jan 11 01:58pm	4975.42	0.85869565	0.08586957	5022.21891	2019 PalmCoast Commercial fuel
247115	3789716	2019-PalmCoast-Commercial-Fuel-Propane-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity		cbarsanti@hanson-inc.com	2024 Jan 11 02:01pm	791.9121	0.14159341	0.01415934	799.628941	2019 PalmCoast Commercial fuel
247112	3789644	2019-PalmCoast-Commercial-Fuel-Distillate Fuel Oil-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for	cbarsanti@hanson-inc.com	2024 Jan 11 01:59pm	1575.27404	0.23151087	0.01543406	1585.84637	2019 PalmCoast Commercial fuel
247114	3789692	2019-PalmCoast-Commercial-Fuel-Gasoline-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for	cbarsanti@hanson-inc.com	2024 Jan 11 02:01pm	3145.99644	0.5017824	0.0358416	3169.54437	2019 PalmCoast Commercial fuel
246939	3787091	2019-PalmCoast-Commercial-Fuel-Natural Gas-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for	cbarsanti@hanson-inc.com	2024 Jan 10 08:36pm	5407.19168	0.50992	0.0101984	5424.17202	2019 PalmCoast Commercial fuel
247113	3789668	2019-PalmCoast-Commercial-Fuel-Kerosene-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for	cbarsanti@hanson-inc.com	2024 Jan 11 02:00pm	0.9776	0.00014444	9.6296E-06	0.9841963	2019 PalmCoast Commercial fuel

Id																		
246917								3.3197171					No				1662	Low
247111	79000	0	Infinity	47.5330927	Infinity	3.02179237	5.68959309	0.361701	62.98	0.0108696	0.001087	0	No	LPG	79000	13885	1662	Low
247115	12885	0	Infinity	7.75270758	Infinity	0.48112451	0.92797983	0.0575894	61.46	0.010989	0.0010989	0	No	Propane	12885	13885	1662	Low
247112	21299	0	Infinity	12.8152828	Infinity	0.95417952	1.53395751	0.1142129	73.96	0.0108696	0.0007246	0	No	Distillate Fuel Oil No. 2	21299	13885	1662	Low
247114	44802	0	Infinity	26.9566787	Infinity	1.90706641	3.22664746	0.2282711	70.22	0.0112	0.0008	0	No	Gasoline	44802	13885	1662	Low
246939	101984	0	Infinity	61.3622142	Infinity	3.26364141	7.34490457	0.3906498	53.02	0.005	0.0001	0	No	Natural Gas	101984	13885	1662	Low
247113	13	0	Infinity	0.0078219	Infinity	0.00059218	0.00093626	7.088E-05	75.2	0.0111111	0.0007407	0	No	Kerosene	13	13885	1662	Low

Id																
246917		518245.7	Infinity	Infinity	37.32414	311.8205	27.73422	0.08838	8.77E-06	1.2E-06	151846	13885	Low	665	66	9
247111	Low															
247115	Low															
247112	Low															
247114	Low															
246939	Low															
247113	Low															

Solid Waste

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Waste Generated (wet tons)
247336	3792601	2019 Palm Coast Solid Waste Landfill Waste Generator	Landfilled Waste (USCP Required, Preferred, where applicable)	Scope 1	III.1.1	2019 Palm Coast MSW Factor Set	IPCC 5th Assessment 100 Year Values	Solid Waste	Source		avo@hanson-inc.com	2024 Jan 15 04:51pm		340.6534		9538.29519		83502

Id	Mixed MSW Emissions Factor (MT CH4/wet short ton)	Newspaper Emissions Factor (MT CH4/wet short ton)	Office Paper Emissions Factor (MT CH4/wet short ton)	Corrugated Cardboard Emissions Factor (MT CH4/wet short ton)	Magazines/Third Class Mail Emissions Factor (MT CH4/wet short ton)	Food Scraps Emissions Factor (MT CH4/wet short ton)	Grass Emissions Factor (MT CH4/wet short ton)	Leaves Emissions Factor (MT CH4/wet short ton)	Branches Emissions Factor (MT CH4/wet short ton)	Dimensional Lumber Emissions Factor (MT CH4/wet short ton)
247336	0.0648	0.042	0.1556	0.1048	0.0476	0.0648	0.0228	0.026	0.058	0.0068

Id	Mixed MSW LFG Capture Rate (%)	Newspaper LFG Capture Rate (%)	Office Paper LFG Capture Rate (%)	Corrugated Containers LFG Capture Rate (%)	Magazines/Third Class Mail LFG Capture Rate (%)	Food Scraps LFG Capture Rate (%)	Grass LFG Capture Rate (%)	Leaves LFG Capture Rate (%)	Branches LFG Capture Rate (%)	Dimensional Lumber LFG Capture Rate (%)	Oxidation Rate	Waste per Household	Waste per Business	CO2e per Household	CO2e per Business
247336	60	59	58	54	52	50	39	47	51	57	0.1	2.322016	43.26528	0.26524	4.942122

Id	Were emissions calculated externally from ClearPath?	Total Waste Generated	Landfill Methane Collection Scenario	Landfill Moisture Content	Waste Type to Calculate Emissions For	CH4 Released (for Previously Calculated records)	Disposal Location	Number of Households	Number of Businesses	Notation Keys	Data Quality: Activity Data	Data Quality: Emissions Factor
247336	No	83502	Typical	Wet	All		Inside the Jurisdicti	35961	1930			

Id	Percentage Mixed MSW	Percentage Newspaper	Percentage Office Paper	Percentage Corrugated Cardboard	Percentage Magazines / Third Class Mail	Percentage Food Scraps	Percentage Grass	Percentage Leaves	Percentage Branches	Percentage Dimensional Lumber
247336	0	0.1	0.19	8.1	0.03	0.128	0	0	0	14.99

St. Johns County 2019 Detailed GHG Inventory

Residential

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Electricity Energy Equivalent (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	US Community Protocol Reference	Energy Equivalent (MMBtu)	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units
246097	3770885	2019-StJohns-County-Residential-Energy-FPL	Emissions from Grid Electricity (USCP Required)	Scope 2	I.1.2	Florida Power and Light 2019 (FPL and eGRID2018 factors)	IPCC 5th Assessment 100 Year Values	Residential Energy	Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 4 09:33pm	448903.485	44.5528271	6.07538551	451760.941	2019 StJohns RESIDENTIAL FPL	5079225.032	0.08838031	MT/MMBtu	8.7716E-06	MT/MMBtu	1.1961E-06	MT/MMBtu	BE.2.1			
247914	3801961	2019-StJohns-County-Residential-Fuel-NGas	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 09:02pm	10551.0622	0.99500775	0.01990016	10584.1959	2019 RESIDENTIAL StJohns fuel		53.02	kg/MMBtu	0.005	kg/MMBtu	0.0001	kg/MMBtu	BE.1.1	199001.55	0	kg/MMBtu
247915	3801985	2019-StJohns-County-Residential-Fuel-FuelOil	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 09:02pm	86.577576	0.01272391	0.00084826	87.1586347	2019 RESIDENTIAL StJohns fuel		73.96	kg/MMBtu	0.01086957	kg/MMBtu	0.00072464	kg/MMBtu	BE.1.2	1170.6	0	kg/MMBtu
247916	3802009	2019-StJohns-County-Residential-Fuel-LPG	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 09:04pm	4644.62574	0.80160467	0.08016047	4688.31319	2019 RESIDENTIAL StJohns fuel		62.98	kg/MMBtu	0.01086957	kg/MMBtu	0.00108696	kg/MMBtu	BE.1.2	73747.63	0	kg/MMBtu
247917	3802033	2019-StJohns-County-Residential-Fuel-Wood	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.1.1		IPCC 5th Assessment 100 Year Values	Residential Energy	Source and Activity	American Community Survey ACSST5Y2019	rvolenec@hanson-inc.com	2024 Jan 17 09:05pm	0	1.10972564	0.01474952	34.9809402	2019 RESIDENTIAL StJohns fuel		0	kg/MMBtu	0.316	kg/MMBtu	0.0042	kg/MMBtu	BE.1.2	3511.79	93.8	kg/MMBtu

Transportation

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	On Road VMT	Fossil Fuel Energy Equivalent (MMBtu)	Biofuel Energy (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	US Community Protocol Reference	Energy Equivalent (MMBtu)
246040	3769834	2019-St_Johns-Transportation-Gasoline-GEI	On Road Transportation (USCP Required)	Scope 1	II.1.1	Florida Power and Light 2019 (FPL and eGRID2018 factors) and 2019 US National Defaults (updated 2020)	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	The above data is pulled from Google's Environmental Insights platform for St. Johns County and calculated through ClearPath's guidance documentation and spreadsheet.	mcoalson@hanson-inc.com	2024 Jan 3 10:09pm	1230937.2	58.6069258	31.893224	1241029.89	2019 Gasoline transportation StJohns	3006525637	17524732.3	0	0.07024	MT/MMBtu	0.0684136	MT/MMBtu	1.949E-08	MT/mile	1.061E-08	MT/mile	TR.1.A	
246141	3771758	2019-St_Johns-Transportation-Diesel-GEI	On Road Transportation (USCP Required)	Scope 1	II.1.1	Florida Power and Light 2019 (FPL and eGRID2018 factors) and 2019 US National Defaults (updated 2020)	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	The above data is pulled from Google's Environmental Insights platform for St. Johns County and calculated through ClearPath's guidance documentation and spreadsheet.	mcoalson@hanson-inc.com	2024 Jan 4 11:06pm	458095.568	1.43238794	1.3682935	458498.273	2019 StJohns Diesel transportation	311379882.5	6195966.36	0	0.07393448	MT/MMBtu	0.07377323	MT/MMBtu	4.6E-09	MT/mile	4.394E-09	MT/mile	TR.2.C	
247846	3800669	2019-StJohns-Rail-Diesel-FDOT	Rail Transportation (USCP Recommended)	Scope 1	II.2.1	Florida Power and Light 2019 (FPL and eGRID2018 factors)	IPCC 5th Assessment 100 Year Values	Transportation & Mobile Sources	Source and Activity	Where available Sustainability or ESG reports were used to determine Total GHG Emissions in units of Metric Tons of CO2e. Sustainability or ESG reports were available for the following Railroad Companies and are attached: CSX, Union Pacific, Norfolk Southern. Where Sustainability or ESG reports were not available the AVG emissions per mile of track and AVG gallons of diesel per mile of track in the given County was used to calculate the total annual gallons Diesel and annual GHG emissions. All data is based off the 2019 year.	mcoalson@hanson-inc.com	2024 Jan 17 05:45pm	4601			4601	2019,StJohns,Rail,Diesel				0	MT/MMBtu			0	MT/MMBtu	0	MT/MMBtu		88179.33

AFOLU

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Land Area (hectares / year)	Canopy Area of Trees Outside Forest (hectares)	US Community Protocol Reference
246302	3774475	2019-StJohns-County-AFOLU-Undisturbed Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 09:46pm					2019 AFOLU StJohns	91245		
246303	3774479	2019-StJohns-County-AFOLU-Forest to Grassland	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 09:46pm					2019 AFOLU StJohns	2163		
246305	3774487	2019-StJohns-County-AFOLU-Non-Forest to Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 09:49pm					2019 AFOLU StJohns	3341		
246306	3774491	2019-StJohns-County-AFOLU-Forest to Settlement	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 09:50pm					2019 AFOLU StJohns	1142		
246307	3774495	2019-StJohns-County-AFOLU-Forest to Non-Forest	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 09:51pm					2019 AFOLU StJohns	88		
246308	3774499	2019-StJohns-County-AFOLU-Forest to Cropland	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 09:52pm					2019 AFOLU StJohns	2		
246309	3774503	2019-StJohns-County-AFOLU-Forest to Wetland	Emissions and Removals from Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 09:52pm					2019 AFOLU StJohns	535		
246304	3774485	2019-StJohns-County-AFOLU-Outside of Forests	Emissions and Removals from Trees Outside of Forests (USCP Recommended)	Scope 1	V.2		IPCC 5th Assessment 100 Year Values	AFOLU		LEARN Report 2016-2019 (Gainesville reference)	rvolenec@hanson-inc.com	2024 Jan 5 09:48pm					2019 AFOLU StJohns		12222	
247796	3799895	2019-StJohns-County-AFOLU-Enteric Fermentation	Emissions from Agricultural Activities (USCP optional)	Scope 1	V.1		IPCC 5th Assessment 100 Year Values	AFOLU	Source	2017 USDA Agricultural Census	rvolenec@hanson-inc.com	2024 Jan 16 10:21pm	0	552.43	0	15468.04	2019 AFOLU StJohns			A.1
248458	3811265	x2019-StJohns-County-AFOLU-Enteric Fermentation	Emissions from Agricultural Activities (USCP optional)	Scope 1	V.1		IPCC 5th Assessment 100 Year Values	AFOLU	Source	2017 USDA Agricultural Census (AR5 GWP = 28)	rvolenec@hanson-inc.com	2024 Jan 22 07:34am	0	15468	0	433104				A.1

Commercial

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Electricity Energy Equivalent (MMBtu)	CO2 Emissions Factor	CO2 Emissions Factor Units	CH4 Emissions Factor	CH4 Emissions Factor Units	N2O Emissions Factor	N2O Emissions Factor Units	US Community Protocol Reference	Energy Equivalent (MMBtu)	CO2 Emissions Factor (kg/MMBtu)	CH4 Emissions Factor (kg/MMBtu)	N2O Emissions Factor (kg/MMBtu)	Biogenic CO2 Emissions Factor	Biogenic CO2 Emissions Factor Units
246916	3786716	2019-StJohns-Commercial-Elec-Census-EIA	Emissions from Grid Electricity (USCP Required)	Scope 2	I.2.2	Florida Power and Light 2019 (FPL and eGRID2018 factors)	IPCC 5th Assessment 100 Year Values	Commercial Energy	Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 10 07:37pm	262077.181	26.0106676	3.54690922	263745.411	2019 StJohns Commercial Electricity	2965334.471	0.08838031	MT/MMBtu	8.7716E-06	MT/MMBtu	1.1961E-06	MT/MMBtu	BE.2.1						
246940	3787115	2019-StJohns-Commercial-Fuel-Natural Gas-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 10 08:37pm	30939.2378	2.917695	0.0583539	31036.397	2019 StJohns Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		583539	53.02	0.005	0.0001	0	kg/MMBtu
247116	3789740	2019-StJohns-Commercial-Fuel-LPG-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 02:04pm	28468.5345	4.91331522	0.49133152	28736.3102	2019 StJohns Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		452025	62.98	0.0108696	0.001087	0	kg/MMBtu
247117	3789764	2019-StJohns-Commercial-Fuel-Distillate Fuel Oil-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 02:05pm	9013.43124	1.32466304	0.08831087	9073.92419	2019 StJohns Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		121869	73.96	0.0108696	0.000725	0	kg/MMBtu
247118	3789788	2019-StJohns-Commercial-Fuel-Kerosene-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 02:06pm	5.4144	0.0008	5.3333E-05	5.45093333	2019 StJohns Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		72	75.2	0.0111111	0.000741	0	kg/MMBtu
247119	3789812	2019-StJohns-Commercial-Fuel-Gasoline-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 02:07pm	18000.9672	2.8711312	0.2050808	18135.7053	2019 StJohns Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		256351	70.22	0.0112	0.0008	0	kg/MMBtu
247120	3789836	2019-StJohns-Commercial-Fuel-Propane-Census-EIA	Emissions from Stationary Fuel Combustion (USCP Required)	Scope 1	I.2.1		IPCC 5th Assessment 100 Year Values	Commercial Energy	Source and Activity	The above data is pulled from the United States Census Bureau's "On The Map" tool, the United States Census Bureau's "County Business Patterns Tables", and the U.S. EIA's "State Profile and Energy Estimates" for Florida.	cbarsanti@hanson-inc.com	2024 Jan 11 02:07pm	4531.07704	0.81015385	0.08101538	4575.23042	2019 StJohns Commercial fuel			kg/MMBtu		kg/MMBtu		kg/MMBtu		73724	61.46	0.010989	0.001099	0	kg/MMBtu

Solid Waste

St. Johns County 2019 Detailed GHG Inventory

Id	Output Record Ids With Co2e	Inventory Record	Calculator	Gpc Scope	GPC Ref Number	Factor Profiles	Global Warming Potential	Category	Activity Source	Notes	Created By	Created At	CO2 (MT)	CH4 (MT)	N2O (MT)	CO2e (MT)	Tags	Waste Generated (wet tons)	Mixed MSW Emissions Factor (MT CH4/wet short ton)	Newspaper Emissions Factor (MT CH4/wet short ton)	Office Paper Emissions Factor (MT CH4/wet short ton)	Corrugated Cardboard Emissions Factor (MT CH4/wet short ton)	Magazines/Third Class Mail Emissions Factor (MT CH4/wet short ton)	Food Scraps Emissions Factor (MT CH4/wet short ton)	Grass Emissions Factor (MT CH4/wet short ton)	Leaves Emissions Factor (MT CH4/wet short ton)	Branches Emissions Factor (MT CH4/wet short ton)	Dimensional Lumber Emissions Factor (MT CH4/wet short ton)	Mixed MSW LFG Capture Rate (%)	Newspaper LFG Capture Rate (%)	Office Paper LFG Capture Rate (%)	Corrugated Containers LFG Capture Rate (%)	Magazines/Third Class Mail LFG Capture Rate (%)	Food Scraps LFG Capture Rate (%)	Grass LFG Capture Rate (%)	Leaves LFG Capture Rate (%)	Branches LFG Capture Rate (%)	Dimensional Lumber LFG Capture Rate (%)	Oxidation Rate
247337	3792633	2019 St. Johns County Solid Waste Landfill Waste Generator	Landfilled Waste (USCP Required, Preferred, where applicable)	Scope 1	III.1.1	2019 St. Johns Factor Set	MSW IPCC 5th Assessment 100 Year Values	Solid Waste	Source		avo@hanson-inc.com	2024 Jan 15 04:58pm		6686.59551		187224.674		454109	0.0648	0.042	0.1556	0.1048	0.0476	0.0648	0.0228	0.026	0.058	0.0068	60	59	58	54	52	50	39	47	51	57	0.1

City/County	Primary Utility Provider		
	JEA	FPL	Clay Electric
Baker County		X	
Clay County			X
Duval County	X		
Nassau County		X	
St. Johns County		X	
Flagler County (includes Palm Coast)		X	

City/County	Decarb Percentage		
	2019	*2030*	*2050*
Baker County	0%	82%	100%
Clay County	0%	0%	0%
Duval County	0%	0%	0%
Nassau County	0%	82%	100%
St. Johns County	0%	82%	100%
Palm Coast	0%	82%	100%

City/County	Projected Buildings & Facilities GHG Emissions (MT CO2e)		
	2019	2030	2050
Baker County	83,420	33,900	-
Clay County	830,694	3,320,078	3791019
Duval County	5,297,213	5,129,389	7061974
Nassau County	263,407	124,512	0
St. Johns County	226,169	109,246	0
Palm Coast	822,464	446,435	-

Calculations	
GHG Reductions	Change in Population x Decarb Percentage x Electricity Use (Calculated with ICLEI Forecasting)

Cost and Quantity Information			
Budget	$ 10,000,000.00	EEToolkit Quantity per Facility	70
Training (Hours per Facility per Year)	16	Cost per EEToolkit	$ 300.00
Years	5	Total EEToolkit Count	9800
Staff Hourly Rate ($/Hr)	$25	Total Initial EEToolkit Cost	$ 2,940,000.00
Facility Training Over 5 Years ($ / Facility)	$2,000	FPL Emissions Rate (MT CO2e/kWh)	0.0003017
# of Facilities (Assume 35 per MSA)	140	FRCC 2019 Emissions Rate (MT CO2e/kWh)	0.000635
Assumed Training Costs Among the State	$280,000		
Maintenance/Yr (Assume 25% / Yr)	$ 3,675,000.00		

Location	Population	# of Libraries or Community Centers	Backpacks per Center	Total Backpacks	Energy Reduction (5-30%)	How active is your library system / community center? (1-poor; 5 - excellent)	Library Utilization	Household Checkouts per Year	Average Household Energy Usage (kWh/Yr)	Energy Reduction (kWh)	Emissions Rate (MT CO2e/kWh)	GHG Reudctions (MT CO2e/Yr)	Reductions by 2030 (MT CO2e)	Reductions by 2050 (MT CO2e)
Baker	28263	1	70	70	5%		50%	910	16,087	731958.5	0.0003017	250	1250	6250
Clay	219252	4	70	280	5%		50%	3640	16,087	2927834	0.0003017	1010	5050	25250
Duval	995560	18	70	1260	5%		50%	16380	16,087	13175253	0.000635	9560	47800	239000
Nassau	88625	4	70	280	5%		50%	3640	16,087	2927834	0.0003017	1010	5050	25250
Flagler (Palm Coast)	87696	1	70	70	5%		50%	910	16,087	731958.5	0.0003017	252	1260	6300
St Johns	264672	4	70	280	5%		50%	3640	16,087	2927834	0.0003017	1010	5050	25250

Location	2030				2050		
	Total Training Costs	Toolkits Cost	Toolkits Total Maintenance Costs	Cost/mtCO2e Reduction Through 2030	Total Training Costs	Toolkits Total Maintenance Costs	Cost/mtCO2e Reduction Through 2050
Baker	$2,000	$ 21,000.00	$ 26,250.00	$39.40	$8,000	$ 105,000.00	$ 25.96
Clay	$8,000	$ 84,000.00	$ 105,000.00	$39.01	$32,000	$ 420,000.00	$ 25.70
Duval	$36,000	$ 378,000.00	$ 472,500.00	$18.55	$144,000	$ 1,890,000.00	$ 12.22
Nassau	$8,000	$ 84,000.00	$ 105,000.00	$39.01	$32,000	$ 420,000.00	$ 25.70
Flagler (Palm Coast)	$2,000	$ 21,000.00	$ 26,250.00	$39.09	$8,000	$ 105,000.00	$ 25.75
St Johns	$8,000	$ 84,000.00	$ 105,000.00	$39.01	$32,000	$ 420,000.00	$ 25.70

Calculations	
Cost and Quantity Information	
Facility Training Over 5 Years ($ / Facility)	Staff Hourly Rate ($/Hr) x 5 Years x Training (Hrs / Facility / Yr)
Assumed Training Costs Among the State	# of Facilities x Facility Training Over 5 Years ($ / Facility)
Maintenance/Yr (Assume 25% / Yr)	25% x Staff Hourly Rate ($/Hr) x 5 Years
Total EEToolkit Count	EEToolkit Quantity per Facility x # of Facilities
Total Initial EEToolkit Cost	Total EEToolkit Count x Cost per EE Toolkit
Reductions	
Total Backpacks	# of Libraries or Community Centers x Backpacks per Center
Household Checkouts per Year	Backpacks per Center x Library Utilization x # of Libraries x 26 Potential Yearly Checkouts per Backpack (Assuming 2 week checkout period)
Energy Reduction (kWh)	Household Checkouts per Year x Average Household Energy Usage (kWh/Yr) x Energy Reduction
GHG Reudctions (MT CO2e/Yr)	Energy Reduction (kWh) x Emission Rate (MT CO2e/kWh) x Safety Factor
Reductions by 2030 or 2050 (MT CO2e)	Reductions per Year (MT CO2e/Yr) x (__ - 2025) (Insert 2030 or 2050 into blank)
Costs	
Total Training Costs	# of Libraries x Facility Training Over 5 Years ($/Facility)
Toolkits Cost	Total Backpacks x Cost per EEToolkit
Toolkits Total Maintenance Costs	25% x Toolkits Cost x 5 Years
Cost/mtCO2e Reduction Through 2030 or 2050	(Training Cost + Toolkit Cost + Maintenance Cost) / Reductions by 2030 or 2050
References	
JEA Emission Rate (2019)	https://npr.brightspotcdn.com/20/1c/3e08bc104b3ea5f3aa710757f12f/scnef-report-ghg-emissions-duval-county-2001-2020-v6.pdf
FPL Emission Rate (2019)	https://www.nexteraenergy.com/sustainability/overview/about-this-report/by-the-numbers.html
FL Average Emission Rate (2019)	https://www.eia.gov/electricity/state/archive/2019/florida/

*NEED BACKPACK CHECKOUTS FROM THE PAST 10 YEARS
*ADDITIONAL TRAINING REQUIRED FOR STAFF
*ADDITIONAL WORKSHOPS FOR COMMUNITY OUTREACH
*LIBRARY SURVEY FOLLOW UP TO HOW BACKPACKS AFFECTED THEIR HOUSEHOLD UTILITIES
*INCENTIVE IDEA: HOW LOW CAN YOU GO, HOUSEHOLD OF THE QUARTER TESTIMONIAL
*ASSUME 2 WEEK CHECKOUT TIME

additional cost for LED lightbulbs
UF IFAS extension office as additional location

City/County/School District	Population Estimates		
	2019	2030	2050
City of Jacksonville	913521	1033635.87	1293931.00
City of Atlantic Beach	13894	15720.86	19679.76
St. Augustine	14329	21313.06	43868.54
Duval County Public Schools	-	-	-

City/County/School District	Decarb Percentage		
	2019	*2030*	*2050*
COJ	0%	65%	100%
City of Atlantic Beach	0%	65%	100%
St. Augustine	0%	65%	100%
Duval County Public Schools	0%	65%	90%

City/County/School District	Projected Buildings & Facilities GHG Emissions (MT CO2e)		
	2019	2030	2050
COJ	55,434	22,259	589
City of Atlantic Beach	242	96	0
St. Augustine	1,430	1,000	0
Duval County Public Schools	48,071	11,273	2,932

Calculations	
GHG Reductions	Change in Population x Decarb Percentage x Electricity Use (Calculated with ICLEI Forecasting)

Sources	
Population Data	https://data.census.gov/table/DECENNIALCD1182020.P1

Summary of Strategies

The following infrastructure strategies will help reduce CO2e emissions, peak summer temperatures, improve air quality, and reduce impacts of flooding and stormwater, with benefits accruing first and foremost to LIDAC residents, as well as to all other metropolitan area residents. These infrastructure investments will lower energy demand for residents by reducing urban heat island and direct solar heat gain of buildings and paved surfaces, thereby directly reducing greenhouse gas emissions, improving public health, and advancing environmental justice. Investments will also build community resilience to future extreme weather events, reduce GHG emissions from stormwater management-related energy consumption, and save money. By leveraging funds that regional governments are already investing in updating their existing surface infrastructure, the EPA greatly enhances the impact of CPRG dollars spent, while focusing on infrastructure projects that have myriad co-benefits and lower life-cycle costs.

Green Infrastructure

Description

Green Infrastructure such as rain gardens, trees and bioswales are valuable tools for reducing greenhouse gas emissions and improving public health, pedestrian comfort, and the overall quality of life in cities. The benefits of green infrastructure include a decrease in emissions, pollution, stormwater runoff, and urban heat islands. *Note: For new construction, green infrastructure often costs less than conventional gray infrastructure. Cost assumptions from this methodology assume a project replaces existing gray infrastructure with green, irrespective of gray infrastructure replacement schedule.*

- **Objective:** To install green infrastructure such as rain gardens, trees and bioswales in the region. In addition, to encourage the installation of green infrastructure in the metro area by removing the financial barriers to construction.
- **Impact:** Through the installation of green infrastructure, the region will be providing relief from pollution, stormwater runoff, and urban heat islands. For example, planting additional trees will help reduce surface temperatures by up to 7°F during the day and 22°F at night. This will lead to an overall lower carbon footprint, in alignment with the region's greenhouse gas reduction goals.
- **Estimated Emissions Reduction:** It is estimated that this project will result in a $184.92 / MT CO2e reduction through 2030 and a $176.88 / MT CO2e reduction through 2050.
- **Budget:** $10 million total

Implementation and Phasing

- Review of existing green infrastructure rebate programs: 9/1/24
- Development of green infrastructure rebate program for COJ MSA: 10/1/24
- Review and refine rebate program with stakeholders: 10/1 - 12/31/24
- Seek additional funding sources (including utility partners and product sponsors): 10/1 - 12/1/24
- Recruit and train administrators and implementation team: 10/1 - 1/1/25
- Integrate program into new website; developing training materials and call centers: 10/1 - 1/1/25
- Launch ready, pending funding availability: 1/1/25

Engagement and Feedback: Regional outreach, master plans, and public surveys have indicated that residents and businesses are open to adopting green infrastructure and technologies that will help improve the quality of life and reduce carbon emissions.

Co-Benefits and Funding Strategy

- **Public Health:** Green infrastructure such as rain gardens, trees, and bioswales reduce CO2e emissions, air and water pollution, and provide habitat creation for plants and wildlife, creating spaces where residents can enjoy local nature and improve their mental health. In addition, the reduced stormwater runoff and flooding helps reduce the potential for mold growth in homes as well as contact with harmful waterborne pollutants, thus improving public health.
- **Environmental Stewardship:** This initiative supports the City of Jacksonville's environmental commitment by improving living conditions of (especially LIDAC) residents by reducing air

pollution, stormwater runoff, and urban heat, thereby improving health outcomes and reducing greenhouse gas emissions.

- **LIDAC & Environmental Justice:** A 2022 CAPA Strategies analysis for Jacksonville observed a difference of 11.8°F across the hottest and coolest parts of the city, and many of the hottest areas of the city were observed in some of the more socially vulnerable communities, including Eastside and New Town. About half of the school properties and 60% of afterschool care facilities are located in areas highly vulnerable to extreme heat, and 34% of households (30,741 households) with individuals over 65 years old are located in highly heat vulnerable areas. Extreme heat events are the leading cause of weather-related deaths in the U.S. Outdoor workers are particularly vulnerable. Nearly 20,000 residential properties in Jacksonville are currently vulnerable to coastal, riverine or stormwater flooding. This is predicted to increase to close to 22,500 by 2070.
- **Economic Development:** Ambient temperature reductions from green infrastructure will improve livability across the metropolitan area, encouraging more economic activity and tourism. Green infrastructure also leads to beautification which results in positive economic activity and further tourism benefits.
- **Funding Gaps:** This program can grow directly in conjunction with funding amounts.

Tables

$$/MT CO2e (25 years)	
Rain Gardens	**$184.92 / MT CO2e**
Trees	**$176.88 / MT CO2e**

Assumptions		
Costs	**Rain Garden Cost** (per SF) (https://greenvalues.cnt.org/index.php)	$6.07 / SF
	Tree Cost (per Tree) (https://smartsurfacescoalition.org/baltimore-report)	$283 / Tree
CO2e Reductions	**Rain Garden CO2e Reduction** (per SF) (https://www.sciencedirect.com/science/article/abs/pii/S0959652623039641)	32.825 kg CO2e / SF 0.032 MT CO2e / sqft
	Tree CO2e Reduction (per Tree) (Average value assumes 50% medium, 50% large trees at 25 years – estimate from City Forest Credits)	1,600 kg CO2e / Tree

Methodology / Assumptions	
$$/MT CO2e	[Cost (per SF)] / Total CO2e Reductions (per SF) = Rain Gardens: $6.07 / .032825 MT CO2e = **$184.92 / MT CO2e** Trees: $283 / 1.6 MT CO2e = **$176.88 / MT CO2e**

Permeable Articulating Concrete Blocks (Permeable Paving)

Description

Permeable Articulating Concrete Blocks (P-ACBs) are interlocking pavers engineered to allow high stormwater infiltration rates with long lifespans. P-ACBs have higher solar reflectance than traditional asphalt pavement (close to that of conventional concrete) with added stormwater management benefits (and associated energy consumption reductions). Additional benefits of P-ACBs include reduced surface and ambient temperature from evapotranspirative cooling, reduced air pollution, and reduced energy consumption for surrounding buildings.

- **Objective:** To install Permeable Articulating Concrete Blocks (P-ACBs) in the region. In addition, to encourage the adoption of P-ACBs in the metro area by removing the financial barriers to construction in order to build a new marketplace for these types of projects.
- **Impact:** Through the installation of P-ACBs, Jacksonville and the surrounding metro area will experience cooler surface and ambient temperatures along with a reduction in stormwater, air pollution, and energy consumption. P-ACBs have higher solar reflectance than traditional asphalt pavement which absorbs less heat leading to lower surface and ambient temperatures. As a permeable surface, the block will also absorb stormwater which will drastically reduce water pollution throughout the city and metro area.
- **Estimated Emissions Reduction:** It is estimated that this project will result in a $206.12 / MT CO2e reduction through 2030 and a $686.45 / MT CO2e reduction through 2050. This, however, only accounts for negative radiative forcing and does not include reduced costs from the consumption of energy due to reduced stormwater runoff.
- **Budget:** $10 million total

Implementation and Phasing

- Review of existing paving rebate programs: 9/1/24
- Development of paving rebate program for COJ MSA: 10/1/24
- Review and refine rebate program with stakeholders: 10/1 - 12/31/24
- Seek additional funding sources (including utility partners and product sponsors): 10/1 - 12/1/24
- Recruit and train administrators and implementation team: 10/1 - 1/1/25
- Integrate program into new website; developing training materials and call centers: 10/1 - 1/1/25
- Launch ready, pending funding availability: 1/1/25

Engagement and Feedback: Regional outreach, master plans, and public surveys have indicated that residents are open to adopting green infrastructure and technologies that will help reduce energy consumption and combat extreme heat.

Co-Benefits and Funding Strategy

- **Public Health:** An increase in permeable paving leads to healthier communities through the decrease in CO2e emissions, stormwater runoff, surface and ambient temperatures, and air pollution. This will have a positive impact on alleviating extreme heat-linked mortality, stress, and disease exacerbations from flooding-driven mold growth, as well as ozone production.

- **Environmental Stewardship:** This initiative supports the region's environmental commitment by living conditions of (especially LIDAC) residents by reducing air pollution, stormwater runoff, and urban heat, thereby improving health outcomes and reducing greenhouse gas emissions.
- **LIDAC & Environmental Justice:** A 2022 CAPA Strategies analysis for Jacksonville observed a difference of 11.8°F across the hottest and coolest parts of the city, and many of the hottest areas of the city were observed in some of the more socially vulnerable communities, including Eastside and New Town. About half of the school properties and 60% of afterschool care facilities are located in areas highly vulnerable to extreme heat, and 34% of households (30,741 households) with individuals over 65 years old are located in highly heat vulnerable areas. Extreme heat events are the leading cause of weather-related deaths in the U.S. Outdoor workers are particularly vulnerable. Nearly 20,000 residential properties in Jacksonville are currently vulnerable to coastal, riverine or stormwater flooding. This is predicted to increase to close to 22,500 by 2070.
- **Economic Development:** Surface and ambient temperature reductions will lower energy bills for surrounding buildings, providing savings. Surface and ambient temperature reductions will also improve livability across the metropolitan area, encouraging more economic activity and tourism. Installation of permeable pavers will reduce the municipal costs of managing stormwater leading to more positive outcomes for taxpayers.
- **Funding Gaps:** This program can grow directly in conjunction with funding amounts.

Tables

$$/MT CO2e (Only from negative radiative forcing – does not account for reduced stormwater management-related energy consumption)	**$206.12 / MT CO2e [5 years]**
	$686.45 / MT CO2e [25 years]

Methodology	
Negative Radiative Forcing Emissions Reduction per SF P-ACB	[Proposed Change in Reflectance] x [Negative Radiative Forcing Factor] = *5-year analysis:* [.27 increase in albedo] x [0.2787 kg CO2e / SF per 0.01 increase in albedo] = **7.52 kg CO2e / SF** *25-year analysis:* [.27 increase in albedo] x [0.4181 kg CO2e / SF per 0.01 increase in albedo] = **11.29 kg CO2e / SF**

$$/MT CO2e	[Cost Premium per SF / year] x [Analysis Period] / [Negative Radiative Forcing per SF] = *5-year:* ($0.31 / SF / year) x (5 years) / 7.52 kg CO2e / SF) = **$206.12 / MT CO2e** *25-year:* ($0.31 / SF / year) x (25 years) / 11.29 kg CO2e / SF) = **$686.45 / MT CO2e**

Assumptions		
Costs	**Cost Premium of P-ACBs** (compared to conventional asphalt – includes installation and maintenance costs, **does not account for avoided stormwater management costs**)	$0.31 / SF / year
Reflectance	**Average Asphalt Albedo during 5-7 year period**	0.08-0.12
	P-ACB Albedo	0.37
	Albedo Increase	0.27
	Negative Radiative Forcing (NRF) Factor [https://iopscience.iop.org/article/10.1088/1748-9326/7/2/024004/meta#erl422949fig4: Approximate CO2e reduction based on long term impact of albedo increase – calculation assumes 3 kg CO2e / m^2 (impact at 5 years) 4.5 kg CO2e / m^2 (at 25 years)	0.2787 kg CO2e / SF & 0.4181 kg CO2e / SF (for 5 and 25 years respectively, 0.01 increase in albedo)

Cool Pavements

Description

Cool pavements are engineered to reflect more sunlight than conventional dark asphalt, using coatings, sealants, and reflective particles. The benefits of cool pavements include reduced pavement surface temperature, air pollution, ambient temperatures, and energy consumption for surrounding buildings.

- **Objective:** To install cool pavements within the City of Jacksonville. In addition, to encourage the adoption of cool pavements in the metro area by removing the financial barriers to construction.
- **Impact:** Through the installation of cool pavements, Jacksonville and the surrounding metro area will experience cooler surface and ambient temperatures along with less air pollution and energy consumption. Using coatings, sealants, and reflective particles, cool pavements are engineered to reflect more sunlight than conventional dark asphalt which creates surfaces that do not trap as much heat. All together, this will reduce urban heat islands and CO2e emissions.
- **Estimated Emissions Reduction:** It is estimated that this project will result in a $205.13/ MT CO2e reduction through 2030 and a $341.88 / MT CO2e reduction through 2050. In addition, for parking lots, the shift from dark to light surfaces can result in a 15°F cooler surface temperature and 0.44 kg co2/m2/yr carbon savings.
- **Budget:** $10 million total

Implementation and Phasing

- Review of existing cool pavement rebate programs; 9/1/24
- Development of cool pavement rebate program for COJ MSA: 10/1/24
- Review and refine rebate program with stakeholders: 10/1 - 12/31/24
- Seek additional funding sources (including utility partners and product sponsors): 10/1 - 12/1/24
- Recruit and train administrators and implementation team: 10/1 - 1/1/25
- Integrate program into new website; developing training materials and call centers: 10/1 - 1/1/25
- Launch ready, pending funding availability: 1/1/25

Engagement and Feedback: Regional outreach, master plans, and public surveys have indicated that residents are open to adopting green infrastructure and technologies that will help reduce energy consumption and combat extreme heat.

Co-Benefits and Funding Strategy

- **Public Health:** An increase in cool pavements leads to healthier communities through the decrease in surface and ambient temperatures, along with air pollution. This will promote the physical well-being of residents, encouraging outdoor activities.
- **Environmental Stewardship:** This initiative supports the region's environmental commitment and improves the living conditions of (especially LIDAC) residents by reducing air pollution, energy consumption, and urban heat, thereby improving health outcomes and reducing CO2e emissions.

- **LIDAC & Environmental Justice:** A 2022 CAPA Strategies analysis for Jacksonville observed a difference of 11.8°F across the hottest and coolest parts of the city, and many of the hottest areas of the city were observed in some of the more socially vulnerable communities, including Eastside and New Town. About half of the school properties and 60% of afterschool care facilities are located in areas highly vulnerable to extreme heat, and 34% of households (30,741 households) with individuals over 65 years old are located in highly heat vulnerable areas. Extreme heat events are the leading cause of weather-related deaths in the U.S. Outdoor workers are particularly vulnerable.
- **Economic Development:** Surface and ambient temperature reductions will lower energy bills for surrounding buildings, providing savings. Surface and ambient temperature reductions will also improve livability across the metropolitan area, encouraging more economic activity and tourism.
- **Funding Gaps:** This program can grow directly in conjunction with funding amounts.

Tables

$$/MT CO2e	**$25.64** to **$205.13 / MT CO2e [5 years]**
	$68.38 to **$341.88 / MT CO2e [25 years]**

Methodology

Negative Radiative Forcing Emissions Reduction per SF Cool Pavement	[Proposed Change in Road Reflectance] x [Negative Radiative Forcing Factor] = *5-year analysis:* [.14 increase in albedo] x [0.2787 kg CO2e / SF per 0.01 increase in albedo] = **3.90 kg CO2e / SF** *25-year analysis:* [.14 increase in albedo] x [0.4181 kg CO2e / SF per 0.01 increase in albedo] = **5.85 kg CO2e / SF**
$$/MT CO2e	[Cost Premium per SF] / [Negative Radiative Forcing per SF] = *5-year:* ($0.10-0.80 / SF) / 3.90 kg CO2e / SF) = **$25.64** to **$205.13 / MT CO2e** *25-year:* ($0.40-2.00 / SF) / 5.85 kg CO2e / SF) = **$68.38** to **$341.88 / MT CO2e**

Assumptions

Costs	**Cost Premium of Solar Reflective ("Cool") Pavement Maintenance Coating** (compared to conventional slurry seal)	$0.10-0.40 / SF
Maintenance	**Maintenance Cadence** (Average duration between coating installations)	5-7 years
	Maintenance Cost Premium over 5- and 25-year period	$0.10-0.80 / SF, $0.40-2.00 / SF
Reflectance	**Average Asphalt Albedo during 5-7 year period**	0.08-0.12
	Average Cool Pavement Maintenance Coating Albedo (between coatings)	0.19-0.25
	Albedo Increase (assumes average coated reflectance of 0.22)	0.10-0.14
	Negative Radiative Forcing (NRF) Factor [https://iopscience.iop.org/article/10.1088/1748-9326/7/2/024004/meta#erl422949fig4: Approximate CO2e reduction based on long term impact of albedo increase – calculation assumes 3 kg CO2e / m^2 (impact at 5 years) 4.5 kg CO2e / m^2 (at 25 years)	0.2787 kg CO2e / SF & 0.4181 kg CO2e / SF (for 5 and 25 years respectively, 0.01 increase in albedo)

Low-Carbon Concrete

Description: Concrete is currently responsible for about 8% of global emissions. With current and in-development innovations, concrete can be carbon neutral or even carbon negative. The benefits of low carbon concrete include a reduced carbon footprint of concrete as well as a relatively high albedo leading to a reduction in extreme urban heat. *Note: Assuming a city will continue to maintain its roads, these are stable differences across whatever time period you pick as long as it is a minimum of 5-7 years. Note: This assumes the cool pavement maintenance coating is at least as durable as the slurry seal and only loses 5-10% of its starting albedo reflectance benefit per year between coatings. Finally, there is an avoidance of GWP due to decreased repaving across a 50-year period, but this effect is not only highly product- and geography-specific, but also a smaller contributor to the overall reduction in GWP when compared to radiative effects.*

- **Objective:** To transition to low-carbon concrete manufacturing processes within the City of Jacksonville and surrounding metro area. In addition, to encourage the adoption of low-carbon concrete in the metro area's new construction and and renovations by removing the financial barriers to construction.
- **Impact:** Through the implementation of low-carbon concrete, Jacksonville and the surrounding metro area will reduce GHG emissions.

Engagement and Feedback: Regional outreach, master plans, and public surveys have indicated that residents are open to adopting technologies that will help reduce energy consumption and GHG emissions.

Co-Benefits and Funding Strategy

- **Public Health:** An increase in low-carbon concrete leads to healthier communities through the decrease in air pollution. This will promote the physical well-being of residents, encouraging outdoor activities.
- **Environmental Stewardship:** This initiative supports the region's environmental commitment and improves the living conditions of (especially LIDAC) residents by reducing air pollution, energy consumption, and urban heat, thereby improving health outcomes and reducing CO2e emissions.
- **LIDAC & Environmental Justice:** A 2022 CAPA Strategies analysis for Jacksonville observed a difference of 11.8°F across the hottest and coolest parts of the city, and many of the hottest areas of the city were observed in some of the more socially vulnerable communities, including Eastside and New Town. About half of the school properties and 60% of afterschool care facilities are located in areas highly vulnerable to extreme heat, and 34% of households (30,741 households) with individuals over 65 years old are located in highly heat vulnerable areas. Extreme heat events are the leading cause of weather-related deaths in the U.S. Outdoor workers are particularly vulnerable.
- **Funding Gaps:** This program can grow directly in conjunction with funding amounts.

NEFL GHG Emissions Projections for Residential and Commercial Energy Usage

Year	Population	Category	CO2e					MT/person
2019	1484855	Residential Energy	3662180	Commercial Energy	3861187	Total	7523367	5.066735136
2020	0	Residential Energy	3696600	Commercial Energy	3107273	Total	6803873	
2021	0	Residential Energy	3877646	Commercial Energy	3215016	Total	7092662	
2022	0	Residential Energy	4105570	Commercial Energy	3345879	Total	7451449	
2023	0	Residential Energy	4392545	Commercial Energy	3505834	Total	7898379	
2024	0	Residential Energy	4754013	Commercial Energy	3702445	Total	8456458	```````
2025	0	Residential Energy	5209543	Commercial Energy	3945307	Total	9154850	
2026	0	Residential Energy	5199672	Commercial Energy	3946382	Total	9146054	
2027	0	Residential Energy	5193895	Commercial Energy	3949624	Total	9143519	
2028	0	Residential Energy	5191949	Commercial Energy	3954897	Total	9146846	
2029	0	Residential Energy	5193586	Commercial Energy	3962069	Total	9155655	
2030	2046114	Residential Energy	5198580	Commercial Energy	3971022	Total	9169602	4.481471707
2031	0	Residential Energy	5245733	Commercial Energy	4020122	Total	9265855	
2032	0	Residential Energy	5295018	Commercial Energy	4070761	Total	9365779	
2033	0	Residential Energy	5346403	Commercial Energy	4122933	Total	9469336	
2034	0	Residential Energy	5399865	Commercial Energy	4176637	Total	9576502	
2035	0	Residential Energy	5455378	Commercial Energy	4231867	Total	9687245	
2036	0	Residential Energy	5466448	Commercial Energy	4261938	Total	9728386	
2037	0	Residential Energy	5484926	Commercial Energy	4296183	Total	9781109	
2038	0	Residential Energy	5509956	Commercial Energy	4334177	Total	9844133	
2039	0	Residential Energy	5540805	Commercial Energy	4375557	Total	9916362	
2040	0	Residential Energy	5576829	Commercial Energy	4419999	Total	9996828	
2041	0	Residential Energy	5455855	Commercial Energy	4382071	Total	9837926	
2042	0	Residential Energy	5506921	Commercial Energy	4432567	Total	9939488	
2043	0	Residential Energy	5565293	Commercial Energy	4487200	Total	10052493	
2044	0	Residential Energy	5624694	Commercial Energy	4542733	Total	10167427	
2045	0	Residential Energy	5684873	Commercial Energy	4599046	Total	10283919	
2046	0	Residential Energy	5741844	Commercial Energy	4652994	Total	10394838	
2047	0	Residential Energy	5799524	Commercial Energy	4707662	Total	10507186	
2048	0	Residential Energy	5857920	Commercial Energy	4763061	Total	10620981	
2049	0	Residential Energy	5917044	Commercial Energy	4819200	Total	10736244	
2050	2411300	Residential Energy	5976904	Commercial Energy	4876089	Total	10852993	4.500888732

St. Johns County GHG Emissions Projections for Residential and Commercial Energy Usage

Year	Population	Category	CO2e	Year	Category	CO2e		CO2e
2019	264672	Residential Energy	467,156	2019	Commercial Energy	355308	Total	822464
2020		Residential Energy	444761	2020	Commercial Energy	259659	Total	704420
2021		Residential Energy	437870	2021	Commercial Energy	255636	Total	693506
2022		Residential Energy	431085	2022	Commercial Energy	251675	Total	682760
2023		Residential Energy	424406	2023	Commercial Energy	247775	Total	672181
2024		Residential Energy	417830	2024	Commercial Energy	243936	Total	661766 `
2025		Residential Energy	411356	2025	Commercial Energy	240156	Total	651512
2026		Residential Energy	381438	2026	Commercial Energy	222690	Total	604128
2027		Residential Energy	353696	2027	Commercial Energy	206493	Total	560189
2028		Residential Energy	327971	2028	Commercial Energy	191475	Total	519446
2029		Residential Energy	304118	2029	Commercial Energy	177549	Total	481667
2030	385500	Residential Energy	281999	2030	Commercial Energy	164636	Total	446635
2031		Residential Energy	269651	2031	Commercial Energy	157427	Total	427078
2032		Residential Energy	257843	2032	Commercial Energy	150533	Total	408376
2033		Residential Energy	246553	2033	Commercial Energy	143941	Total	390494
2034		Residential Energy	235756	2034	Commercial Energy	137638	Total	373394
2035		Residential Energy	225433	2035	Commercial Energy	131611	Total	357044
2036		Residential Energy	195973	2036	Commercial Energy	114412	Total	310385
2037		Residential Energy	170364	2037	Commercial Energy	99461	Total	269825
2038		Residential Energy	148100	2038	Commercial Energy	86463	Total	234563
2039		Residential Energy	128747	2039	Commercial Energy	75164	Total	203911
2040		Residential Energy	111922	2040	Commercial Energy	65342	Total	177264
2041		Residential Energy	4994	2041	Commercial Energy	2916	Total	7910
2042		Residential Energy	223	2042	Commercial Energy	130	Total	353
2043		Residential Energy	10	2043	Commercial Energy	6	Total	16
2044		Residential Energy	0	2044	Commercial Energy	0	Total	0
2045		Residential Energy	0	2045	Commercial Energy	0	Total	0
2046		Residential Energy	0	2046	Commercial Energy	0	Total	0
2047		Residential Energy	0	2047	Commercial Energy	0	Total	0
2048		Residential Energy	0	2048	Commercial Energy	0	Total	0
2049		Residential Energy	0	2049	Commercial Energy	0	Total	0
2050	513900	Residential Energy	0	2050	Commercial Energy	0	Total	0

Growth Rate Source: Rayer, S., & Comfort, C. (2024). Projections of Florida Population by County 2025–2050 with Estimates for 2023. *Florida Population Studies*, 57(198). Bureau of Economic and Business Research, College of Liberal Arts and Sciences, University of Florida.

Grid Electricity Factor Set Source: Nextera Energy. (2023). Zero Carbon Blueprint. Nextera Energy.

City of Palm Coast GHG Emissions Projections for Residential and Commercial Energy Usage

Year	Population	Category	CO2e	Year	Category	CO2e		CO2e
2019	87969	Residential Energy	164072	2019	Commercial Energy	62097	Total	226169
2020		Residential Energy	150077	2020	Commercial Energy	43599	Total	193676
2021		Residential Energy	141953	2021	Commercial Energy	41239	Total	183192
2022		Residential Energy	134270	2022	Commercial Energy	39007	Total	173277
2023		Residential Energy	127002	2023	Commercial Energy	36896	Total	163898
2024		Residential Energy	120128	2024	Commercial Energy	34899	Total	155027
2025		Residential Energy	113625	2025	Commercial Energy	33010	Total	146635
2026		Residential Energy	107130	2026	Commercial Energy	31123	Total	138253
2027		Residential Energy	101005	2027	Commercial Energy	29343	Total	130348
2028		Residential Energy	95231	2028	Commercial Energy	27666	Total	122897
2029		Residential Energy	89786	2029	Commercial Energy	26084	Total	115870
2030	109514	Residential Energy	84653	2030	Commercial Energy	24593	Total	109246
2031		Residential Energy	80412	2031	Commercial Energy	23361	Total	103773
2032		Residential Energy	76384	2032	Commercial Energy	22191	Total	98575
2033		Residential Energy	72557	2033	Commercial Energy	21079	Total	93636
2034		Residential Energy	68922	2034	Commercial Energy	20023	Total	88945
2035		Residential Energy	65470	2035	Commercial Energy	19020	Total	84490
2036		Residential Energy	56695	2036	Commercial Energy	16471	Total	73166
2037		Residential Energy	49096	2037	Commercial Energy	14263	Total	63359
2038		Residential Energy	42516	2038	Commercial Energy	12351	Total	54867
2039		Residential Energy	36817	2039	Commercial Energy	10696	Total	47513
2040		Residential Energy	31883	2040	Commercial Energy	9262	Total	41145
2041		Residential Energy	1419	2041	Commercial Energy	412	Total	1831
2042		Residential Energy	63	2042	Commercial Energy	18	Total	81
2043		Residential Energy	3	2043	Commercial Energy	1	Total	4
2044		Residential Energy	0	2044	Commercial Energy	0	Total	0
2045		Residential Energy	0	2045	Commercial Energy	0	Total	0
2046		Residential Energy	0	2046	Commercial Energy	0	Total	0
2047		Residential Energy	0	2047	Commercial Energy	0	Total	0
2048		Residential Energy	0	2048	Commercial Energy	0	Total	0
2049		Residential Energy	0	2049	Commercial Energy	0	Total	0
2050	136000	Residential Energy	0	2050	Commercial Energy	0	Total	0

Growth Rate Source: Community Development Department. (2021). 2021 Annual growth and development trends report for the City of Palm Coast. City of Palm Coast.

Grid Electricity Factor Set Source: Nextera Energy. (2023). Zero Carbon Blueprint. Nextera Energy.

Nassau County GHG Emissions Projections for Residential and Commercial Energy Usage

Year	Population	Category	CO2e	Year	Category	CO2e		CO2e
2019	88625	Residential Energy	158659	2019	Commercial Energy	104748	Total	263407
2020		Residential Energy	149386	2020	Commercial Energy	75705	Total	225091
2021		Residential Energy	145448	2021	Commercial Energy	73709	Total	219157
2022		Residential Energy	141614	2022	Commercial Energy	71766	Total	213380
2023		Residential Energy	137881	2023	Commercial Energy	69875	Total	207756
2024		Residential Energy	134247	2024	Commercial Energy	68033	Total	202280
2025		Residential Energy	130708	2025	Commercial Energy	66239	Total	196947
2026		Residential Energy	120353	2026	Commercial Energy	60992	Total	181345
2027		Residential Energy	110818	2027	Commercial Energy	56160	Total	166978
2028		Residential Energy	102039	2028	Commercial Energy	51711	Total	153750
2029		Residential Energy	93955	2029	Commercial Energy	47614	Total	141569
2030	116600	Residential Energy	86512	2030	Commercial Energy	43842	Total	130354
2031		Residential Energy	82288	2031	Commercial Energy	41702	Total	123990
2032		Residential Energy	78271	2032	Commercial Energy	39666	Total	117937
2033		Residential Energy	74449	2033	Commercial Energy	37729	Total	112178
2034		Residential Energy	70815	2034	Commercial Energy	35887	Total	106702
2035		Residential Energy	67357	2035	Commercial Energy	34135	Total	101492
2036		Residential Energy	58406	2036	Commercial Energy	29599	Total	88005
2037		Residential Energy	50644	2037	Commercial Energy	25665	Total	76309
2038		Residential Energy	43913	2038	Commercial Energy	22254	Total	66167
2039		Residential Energy	38077	2039	Commercial Energy	19297	Total	57374
2040		Residential Energy	33017	2040	Commercial Energy	16732	Total	49749
2041		Residential Energy	585	2041	Commercial Energy	296	Total	881
2042		Residential Energy	10	2042	Commercial Energy	5	Total	15
2043		Residential Energy	0	2043	Commercial Energy	0	Total	0
2044		Residential Energy	0	2044	Commercial Energy	0	Total	0
2045		Residential Energy	0	2045	Commercial Energy	0	Total	0
2046		Residential Energy	0	2046	Commercial Energy	0	Total	0
2047		Residential Energy	0	2047	Commercial Energy	0	Total	0
2048		Residential Energy	0	2048	Commercial Energy	0	Total	0
2049		Residential Energy	0	2049	Commercial Energy	0	Total	0
2050	145800	Residential Energy	0	2050	Commercial Energy	0	Total	0

Growth Rate Source: Rayer, S., & Comfort, C. (2024). Projections of Florida Population by County 2025–2050 with Estimates for 2023. *Florida Population Studies*, 57(198). Bureau of Economic and Business Research, College of Liberal Arts and Sciences, University of Florida.

Grid Electricity Factor Set Source: Nextera Energy. (2023). Zero Carbon Blueprint. Nextera Energy.

Duval County GHG Emissions Projections for Residential and Commercial Energy Usage

Year	Population	Category	CO2e	Year	Category	CO2e		CO2e
2019	957755	Residential Energy	2300949	2019	Commercial Energy	2996264	Total	5297213
2020		Residential Energy	2263997	2020	Commercial Energy	2394639	Total	4658636
2021		Residential Energy	2295724	2021	Commercial Energy	2428197	Total	4723921
2022		Residential Energy	2327896	2022	Commercial Energy	2462225	Total	4790121
2023		Residential Energy	2360518	2023	Commercial Energy	2496730	Total	4857248
2024		Residential Energy	2393598	2024	Commercial Energy	2531718	Total	4925316
2025		Residential Energy	2427141	2025	Commercial Energy	2567197	Total	4994338
2026		Residential Energy	2440128	2026	Commercial Energy	2580933	Total	5021061
2027		Residential Energy	2453184	2027	Commercial Energy	2594743	Total	5047927
2028		Residential Energy	2466310	2028	Commercial Energy	2608626	Total	5074936
2029		Residential Energy	2479506	2029	Commercial Energy	2622584	Total	5102090
2030	1149800	Residential Energy	2492773	2030	Commercial Energy	2636616	Total	5129389
2031		Residential Energy	2539090	2031	Commercial Energy	2685605	Total	5224695
2032		Residential Energy	2586267	2032	Commercial Energy	2735505	Total	5321772
2033		Residential Energy	2634320	2033	Commercial Energy	2786331	Total	5420651
2034		Residential Energy	2683266	2034	Commercial Energy	2838102	Total	5521368
2035		Residential Energy	2733122	2035	Commercial Energy	2890834	Total	5623956
2036		Residential Energy	2778294	2036	Commercial Energy	2938613	Total	5716907
2037		Residential Energy	2824212	2037	Commercial Energy	2987181	Total	5811393
2038		Residential Energy	2870889	2038	Commercial Energy	3036551	Total	5907440
2039		Residential Energy	2918338	2039	Commercial Energy	3086738	Total	6005076
2040		Residential Energy	2966571	2040	Commercial Energy	3137754	Total	6104325
2041		Residential Energy	3011097	2041	Commercial Energy	3184850	Total	6195947
2042		Residential Energy	3056291	2042	Commercial Energy	3232652	Total	6288943
2043		Residential Energy	3102164	2043	Commercial Energy	3281171	Total	6383335
2044		Residential Energy	3148725	2044	Commercial Energy	3330419	Total	6479144
2045		Residential Energy	3195985	2045	Commercial Energy	3380406	Total	6576391
2046		Residential Energy	3241846	2046	Commercial Energy	3428914	Total	6670760
2047		Residential Energy	3288366	2047	Commercial Energy	3478118	Total	6766484
2048		Residential Energy	3335553	2048	Commercial Energy	3528028	Total	6863581
2049		Residential Energy	3383417	2049	Commercial Energy	3578654	Total	6962071
2050	1291400	Residential Energy	3431968	2050	Commercial Energy	3630006	Total	7061974

Growth Rate Source: Rayer, S., & Comfort, C. (2024). Projections of Florida Population by County 2025–2050 with Estimates for 2023. *Florida Population Studies*, 57(198). Bureau of Economic and Business Research, College of Liberal Arts and Sciences, University of Florida.

Grid Electricity Factor Set Source: JEA. (2023). 2023 Electric Generation Integrated Resource Plan. Jacksonville Electric Authority.

Clay County GHG Emissions Projections for Residential and Commercial Energy Usage

Year	Population	Category	CO2e	Year	Category	CO2e		CO2e
2019	57571	Residential Energy	517481	2019	Commercial Energy	313213	Total	830694
2020		Residential Energy	638948	2020	Commercial Energy	312850	Total	951798
2021		Residential Energy	809742	2021	Commercial Energy	396476	Total	1206218
2022		Residential Energy	1026189	2022	Commercial Energy	502455	Total	1528644
2023		Residential Energy	1300493	2023	Commercial Energy	636764	Total	1937257
2024		Residential Energy	1648120	2024	Commercial Energy	806973	Total	2455093
2025		Residential Energy	2088669	2025	Commercial Energy	1022680	Total	3111349
2026		Residential Energy	2115970	2026	Commercial Energy	1036048	Total	3152018
2027		Residential Energy	2143628	2027	Commercial Energy	1049590	Total	3193218
2028		Residential Energy	2171647	2028	Commercial Energy	1063309	Total	3234956
2029		Residential Energy	2200033	2029	Commercial Energy	1077207	Total	3277240
2030	254500	Residential Energy	2228790	2030	Commercial Energy	1091288	Total	3320078
2031		Residential Energy	2251781	2031	Commercial Energy	1102545	Total	3354326
2032		Residential Energy	2275009	2032	Commercial Energy	1113918	Total	3388927
2033		Residential Energy	2298476	2033	Commercial Energy	1125408	Total	3423884
2034		Residential Energy	2322186	2034	Commercial Energy	1137018	Total	3459204
2035		Residential Energy	2346141	2035	Commercial Energy	1148746	Total	3494887
2036		Residential Energy	2361696	2036	Commercial Energy	1156363	Total	3518059
2037		Residential Energy	2377355	2037	Commercial Energy	1164030	Total	3541385
2038		Residential Energy	2393118	2038	Commercial Energy	1171748	Total	3564866
2039		Residential Energy	2408986	2039	Commercial Energy	1179517	Total	3588503
2040		Residential Energy	2424958	2040	Commercial Energy	1187338	Total	3612296
2041		Residential Energy	2437611	2041	Commercial Energy	1193534	Total	3631145
2042		Residential Energy	2450331	2042	Commercial Energy	1199761	Total	3650092
2043		Residential Energy	2463116	2043	Commercial Energy	1206022	Total	3669138
2044		Residential Energy	2475969	2044	Commercial Energy	1212314	Total	3688283
2045		Residential Energy	2488888	2045	Commercial Energy	1218640	Total	3707528
2046		Residential Energy	2499998	2046	Commercial Energy	1224080	Total	3724078
2047		Residential Energy	2511158	2047	Commercial Energy	1229544	Total	3740702
2048		Residential Energy	2522367	2048	Commercial Energy	1235033	Total	3757400
2049		Residential Energy	2533627	2049	Commercial Energy	1240546	Total	3774173
2050	290600	Residential Energy	2544936	2050	Commercial Energy	1246083	Total	3791019

Growth Rate Source: Rayer, S., & Comfort, C. (2024). Projections of Florida Population by County 2025–2050 with Estimates for 2023. *Florida Population Studies*, 57(198). Bureau of Economic and Business Research, College of Liberal Arts and Sciences, University of Florida.

Grid Electricity Factor Set Source: FRCC eGrid 2019 (861.028 CO2lbs/MWH ; 55 CH4 lbs / GWh ; 7 N2O lbs / GWh); assume business as usual

Baker County GHG Emissions Projections for Residential and Commercial Energy Usage

Year	Population	Category	CO2e	Year	Category	CO2e		CO2e
2019	28263	Residential Energy	53863	2019	Commercial Energy	29557	Total	83420
2020		Residential Energy	49431	2020	Commercial Energy	20821	Total	70252
2021		Residential Energy	46909	2021	Commercial Energy	19759	Total	66668
2022		Residential Energy	44516	2022	Commercial Energy	18751	Total	63267
2023		Residential Energy	42245	2023	Commercial Energy	17794	Total	60039
2024		Residential Energy	40090	2024	Commercial Energy	16886	Total	56976
2025		Residential Energy	38044	2025	Commercial Energy	16025	Total	54069
2026		Residential Energy	34653	2026	Commercial Energy	14596	Total	49249
2027		Residential Energy	31564	2027	Commercial Energy	13295	Total	44859
2028		Residential Energy	28751	2028	Commercial Energy	12110	Total	40861
2029		Residential Energy	26188	2029	Commercial Energy	11031	Total	37219
2030	30200	Residential Energy	23853	2030	Commercial Energy	10047	Total	33900
2031		Residential Energy	22511	2031	Commercial Energy	9482	Total	31993
2032		Residential Energy	21244	2032	Commercial Energy	8948	Total	30192
2033		Residential Energy	20048	2033	Commercial Energy	8445	Total	28493
2034		Residential Energy	18920	2034	Commercial Energy	7969	Total	26889
2035		Residential Energy	17855	2035	Commercial Energy	7521	Total	25376
2036		Residential Energy	15384	2036	Commercial Energy	6480	Total	21864
2037		Residential Energy	13255	2037	Commercial Energy	5583	Total	18838
2038		Residential Energy	11420	2038	Commercial Energy	4810	Total	16230
2039		Residential Energy	9840	2039	Commercial Energy	4145	Total	13985
2040		Residential Energy	8478	2040	Commercial Energy	3571	Total	12049
2041		Residential Energy	149	2041	Commercial Energy	63	Total	212
2042		Residential Energy	3	2042	Commercial Energy	1	Total	4
2043		Residential Energy	0	2043	Commercial Energy	0	Total	0
2044		Residential Energy	0	2044	Commercial Energy	0	Total	0
2045		Residential Energy	0	2045	Commercial Energy	0	Total	0
2046		Residential Energy	0	2046	Commercial Energy	0	Total	0
2047		Residential Energy	0	2047	Commercial Energy	0	Total	0
2048		Residential Energy	0	2048	Commercial Energy	0	Total	0
2049		Residential Energy	0	2049	Commercial Energy	0	Total	0
2050	33600	Residential Energy	0	2050	Commercial Energy	0	Total	0

Growth Rate Source: Rayer, S., & Comfort, C. (2024). Projections of Florida Population by County 2025–2050 with Estimates for 2023. *Florida Population Studies*, 57(198). Bureau of Economic and Business Research, College of Liberal Arts and Sciences, University of Florida.

Grid Electricity Factor Set Source: Nextera Energy. (2023). Zero Carbon Blueprint. Nextera Energy.

Bike Ped Projections

	Reduction/Year (mt CO2e)	2030	2050
Protected/separated bike lane citywide project/initiative	307.72	1538.6	7693
Expansion of COJ's shared-use paths (trails) network	658.7	3293.5	16467.5
E-bike Voucher Pilot Program	97.34	486.7	2433.5
E-bike Share (Micromobility) Program	439.67	2198.35	10991.75
Shower/locker facilities for government offices	35.15	175.75	878.75
Totals:	**1539**	**7695**	**38475**

[1]**https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle**

Estimated increase in mode share: 35% rise in cyclists that now feel comfortable enough to ride to work and jobs: (1,625*1.35)-1,625 = 569 new bike commuters
Estimated carbon/emissions reduction: 569 (new riders) * 26 (ICE vehicle miles per week from Denver data) * 52 (weeks per year) * 400g (estimated C02 per vehicle mile[1]) = 307,715,200g = 307.72 MT of C02e reduction per year.
Estimated increase in mode share: 75% rise in cyclists that now feel comfortable enough to ride to work and jobs: (1,625*1.75)-1,625 = 1,218 new bike commuters

Estimated carbon/emissions reduction: 1,218 (new riders) * 26 (ICE vehicle miles per week from Denver data) * 52 (weeks per year) * 400g (estimated C02 per vehicle mile[1]) = 658,694,400 = 658.7 MT of C02e reduction per year.

Estimated increase in mode share: 180 new riders = 0.11% increase in mode share during pilot program.
Estimated carbon/emissions reduction: 180 (new riders) * 26 (ICE vehicle miles per week from Denver data) * 52 (weeks per year) * 400g (estimated C02 per vehicle mile[1]) = 97,344,000g = 97.34 MT of C02e reduction per year.
Estimated increase in mode share: 50% rise in cyclists that now feel comfortable enough to use the Ebikes to ride to work and jobs: (1,625*1.5)-1,625 = 813 new bike commuters
Estimated carbon/emissions reduction: 813 (new riders) * 26 (ICE vehicle miles per week from Denver data) * 52 (weeks per year) * 400g (estimated C02 per vehicle mile[1]) = 439,670,400g = 439.67 MT of C02e reduction per year.
Estimated increase in mode share: 65 staff would ride a bicycle to work if facilities were improved, based on a recent staff survey.
Estimated carbon/emissions reduction: 65 (new riders) * 26 (ICE vehicle miles per week from Denver data) * 52 (weeks per year) * 400g (estimated C02 per vehicle mile[1]) = 35,152,000g = 35.15 MT of C02e reduction per year.

Clean Fuels Calculations

	Light-Duty	Light-Commercial	Medium-Duty	Heavy-Duty	Total	mtCO2e GHG Reductions with reccoemndations from Master Plan	Assumed 15% in next 5 years (2030)
City of St. Augustine	123	35	5	35	198	12,993	1,948.95
JEA	403	401	83	240	1127	33,548	5,032.20
JTA		127	263	22	412	43,104	6,465.60
Nassau County	141	100	9	50	300	17,684	2,652.60
St. Johns County	389	187	33	71	680	30,391	4,558.65
St. Johns County	2552	562	32	315	3461	344,577	51,686.55
Totals	**3608**	**1412**	**425**	**733**	**6178**	**482,297**	**72,345**

St. Johns County	Reduced GHG (mt CO2e)
Car GAS to EV	801
DUMP DIESEL TO B20	332
FIRE DIESEL TO B20	3,287
FREIGHT DIESEL TO B20	2,880
MD TRUCK GAS TO LPG	1,850
REFUSE DIESEL TO DIESEL HEV	7,596
STRAIGHT DIESEL TO B20	1,529
SUV GAS TO EV	3,877
VAN GAS TO EV	8,239
TOTAL	**30,391**

Nassau County	Reduced GHG (mt CO2e)
AMBULANCE GAS TO LPG	1,709
CAR GAS TO EV	98
DUMP DIESEL TO B20	2,060
FIRE DIESEL TO B20	2,337
LDTRUCK GAS TO EV	5,229
MDTRUCK GAS TO LPG	1,204
MDTRUCK D DIESEL TO EV	877
SHUTTLE GAS TO EV	1,134
STRAIGHT DIESEL TO B20	554
SUV GAS TO EV	1,863
VAN GAS TO EV	619
TOTAL	**17,684**

JTA	Reduced GHG (mt CO2e)
FREIGHT DIESEL TO B20	2,601
SHUTTLE GAS TO EV	17,876
TRANSIT DIESEL TO B20	22,627
TOTAL	**43,104**

JEA	Reduced GHG (mt CO2e)
BUCKET DIESEL TO B20	8,168
CAR GAS TO EV	31
DUMP DIESEL TO B20	1,858
FREIGHT DIESEL TO B20	2,508
MD TRUCK GAS TO EV	3,093
MD TRUCK D DIESEL TO B20	5,728
SHUTTLE GAS TO EV	441
STRAIGHT DIESEL TO B20	3,966
SUV GAS TO EV	977
VAN GAS TO EV	5,557
VAN D DIESEL TO EV	1,221
TOTAL	**33,548**

City of St. Augustine	Reduced GHG (mt CO2e)
CAR GAS TO HEV	84
DUMP DIESEL TO B20	797
FREIGHT DIESEL TO B20	650
MD TRUCK GAS TO LPG	669
POLICE CAR GAS TO HEV	299
POLICE SUV GAS TO EV	7,588
SHUTTLE GAS TO EV	260
STEP DIESEL T ODIESEL HEV	956
SUV GAS TO EV	308
SWEEP DIESEL TO B20	807
VAN GAS TO EV	575
TOTAL	**12,993**

City of Jacksonville	Reduced GHG (mt CO2e)
BUCKET DIESEL TO B20	442
CAR GAS TO EV	26,530
DUMP DIESEL TO B20	4,713
FIRE DIESEL TO B20	15,373
FREIGHT DIESEL TO B20	2,230
MD TRUCK GAS TO EV	45,322
MD TRUCK D DIESEL TO EV	4,573
POLICE CAR GAS TO EV	45,970
POLICE SUV GAS TO EV	14,261
REFUSE DIESEL TO DIESEL HEV	129,140
SHUTTLE GAS TO EV	3,902
SHUTTLE D DIESEL TO EV	4,684
STRAIGHT DIESEL TO B20	1,529
SUV GAS TO EV	24,952
SWEEPER DIESEL TO B20	1,883
VAN GAS TO EV	19,073
TOTAL	**344,577**

Fleet	Fleet Abbreviation
City of St. Augustine	CSA
JEA	JEA
JTA	JTA
Nassau County	NAC
St. Johns County	SJC
Duval County Public Schools	DCPS

Clean Fuels Calculations

City of Jacksonville COJ

Goals
Reduce Greenhouse Gas Emissions (GHG) by 20% per year.
Increase petroleum displacement (GGE) by more than 15% per year, on average, by 2027.
Collectively, these opportunities could result in a net benefit exceeding $104 million and potentially displace 14 million gallons of gas or diesel and reduce GHG emissions by 314 thousand mtCO2e.

Reference: https://northfloridatpo.com/uploads/Clean-Fuels-Master-Plan-Report_Final_240209.pdf

JAXPORT Green Cooridor

metric ton/short ton 0.90718

		Reduction per Unit, mtCO2e	number	adoption rate	2030		2050	
					vehicles converted	GHG reduction, annually	vehicles converted	GHG reduction, annually
Phase 1 + Phase 2		109	135	15%	75	8186	135	14715
Phase 3	UTR	37	2	15%	1	41	2	73
	Local Drayage	52	4	15%	2	115	4	206
Phase 4 + Phase 5		2000	10	15%	6	11126	10	19163

Nassau County Land Development

2019 Nassau County Land Types	Land Area, hectares	Carbon uptake average, $mtCO_2$ / ha / yr
Agriculture and Forestry	77336	0.5
Natural Areas	73924	0.1
Developed or Urban Land Uses	20630	

	Nassau Population
2019	88625
2030	116600
2050	145800

	Land Area, hectares	5 year land acquisition rate	2030 Land Area, hectares	Annual GHG reduced, mtCO2e	25 year land acquisition rate	2050 Land Area, hectares	Annual GHG reduced, mtCO2e
Agriculture Forestry	77336	2.58612E-05	77338	38669	6.98252E-05	77341	38671

	Land Area, hectares	2030 Land Recategorized to Developed Land	2030 Population Increase Rate	2030 Land Area, hectares	Annual GHG reduced, mtCO2e	2050 Population Increase	2050 Land Area, hectares	Annual GHG reduced, mtCO2e
Natural Areas	73924	10.44	0.315655853	73914	7391.4	0.250428816	73905	7391
Developed / Urban Land	20630			20640.44			20649	

Growth Rate Source: Rayer, S., & Comfort, C. (2024). Projections of Florida Population by County 2025–2050 with Estimates for 2023. *Florida Population Studies*, 57(198). Bureau of Economic and Business Research, College of Liberal Arts and Sciences, University of Florida.

20210111-CLAM_Final_Word (nassaucountyfl.com)

City of Palm Coast Wastewater Efficiency Calcs

10/13/2023			
Average Daily kWh Usage	High Rainfall kWh Usage (10/13)	Difference	
608.34	2,058.10	1,449.76	
306.49	534.72	228.23	
125.4	321.56	196.16	
317.12	888.37	571.25	
493.79	1,885.75	1,391.96	
	1,137.70	**767.47**	**0.332 MT CO2**

Station	Rainfall Amount (inches)	Dates	Pump Station Wetwell Levels	kWh	Cost	
Master Pump Station 24-2	0	10/10	Normal	469.29	$60.53	0.187716
	0.34	10/11	Normal	646.6	$82.99	0.25864
	2.75	10/12	Wet Well Full	1,887.36	$240.16	0.754944
	0.01	10/13	Wet Well Full	2,085.10	$265.21	0.83404
	0	10/14	Starting to cycle	1,335.93	$170.31	0.534372
	0	10/15	Normal	1,199.77	$153.06	0.479908
	0	10/16	Normal	872.20	$111.57	0.34888
	0	10/17	Normal	736.19	$94.34	0.294476
	0	10/18	Normal	709.92	$91.01	0.283968

Rainfall NOAA DATA 2023	
Month (2023)	Number of days >/= 1" of rainfall
January	0
February	1
March	3
April	5
May	3
June	6
July	5
August	5
September	6
October	2
November	2
December	1
Total	**39**

w/an average of 3 days of elevated energy per high rainfall event =

Average Days w/Elevated Energy per Year

117

The 5 Master Pump Station Plant	Average KWH/Day Per Year	MT CO2e (Base)	MT CO2e (Spike)	MT CO2e (Difference) AKA GHG Reduction	MT CO2e Reduction Per YR	MT CO2e in 2030	MT CO2e in 2050
122 Universal Trail	307						
21 Florida Park	317						
215 Pritchard Dr.	608						
56 Peninsula Ln.	126						
58 Round Tree Dr.	494						
Average	**370**	0.15	0.46	0.31	35.91	215.49	933.78

Conversion factor KWH MT CO2

Enter data:

Unit	Amount
○ Gallons of gasoline	1
○ Gasoline-powered passenger vehicles ⓘ	
○ Kilowatt-hours avoided ⓘ	
◉ Kilowatt-hours used ⓘ	
○ MCF of natural gas	
○ Therms of natural gas	

Convert data Clear Fields

Step 2 - View results

0.0004 Metric Tons **of Carbon Dioxide (CO_2) equivalent**

City of Jacksonville Solid Waste GHG Reduction Calculations:

Mixed MSW Emissions Factor[1]	0.0648	MT CH4/wet ton of mixed waste
Composting GHG Emissions Reduction Factor[2]	0.3	MT CO2e/wet ton of organic waste
Mixed MSW LFG Capture Rate[1]	60%	
Landfilled Mixed MSW[3]	1,182,079	wet tons/year
Yard Waste Collected[3]	274,590	wet tons/year
Food Waste Collected[3]	123,939	wet tons
Methane to CO2 Conversion[4]	1:28	MT CO2e/MT CH4

Home Energy Use (2021)[5] 12,154 KWh/home

216,000 MCF CH4 generates 8,500,000 KWh[6] eia

1 MT CH4 = 1 kg = 49,268 CF CH4[7] aqua-calc.com

Therefore Energy Generated by CH4 = (8,500,000 kWh / 216,000,000 CF CH4) x (49,268 CF CH4 / MT CH4) = 1,939 KWh/MT CH4

	Rate	Average Annual CO2e Reduction from Composting (MT CO2e)	Total CO2e Reduction from Composting by 2030 (MT CO2e)	Total CO2e Reduction from Composting by 2050 (MT CO2e)
Composting	10%	11,953	71,717	310,773
	30%	35,840	215,040	931,842
	50%	59,703	358,217	1,552,274

	Rate	Average Annual Methane Captured (MT CH4)	Average Annual Methane Captured (MT CO2e)	Total CO2e Captured for Combustion by 2030 (MT CO2e)	Total CO2e Captured for Combustion by 2050 (MT CO2e)	Amount of Homes Provided Energy each Year by Captured Methane (ea.)
Methane Capture & Combustion	60%	12,873	360,444	1,802,220	9,011,100	2,053

Reference 1: ClearPath Application, ICLEI, 2024.

Reference 2: "Calculation of the Lifecycle Greenhouse Gas Emissions Reduction Benchmark for the Organice Waste Reductions Regulation", California Air Resources Board, January 2022.

Reference 3: "Florida DEP County Reports: Duval County Report", FDEP, 2019.

Reference 4: "Global Warming Potential Values", Greenhouse Gas Protocol, ghgprotocol.org, February 16, 2016.

Reference 5: "Greenhouse Gases Equivalencies Calculator - Calculations and References", www.epa.gov, January 31, 2024.

Reference 6: "Biomass explained: Landfill gas and biogas", www.eia.gov, December 15, 2023.

Reference 7: "Calculate weight of compounds and materials per volume: Methane, gas", www.aqua-calc.com, 2024.

City of Atlantic Beach Solid Waste GHG Reduction Calculations:

Composting GHG Emissions Reduction Factor[1]	0.3	MT CO2e/wet short ton of organic waste
City of Atlantic Beach Population[2]	13,513	capita
Duval County Population[3]	970,672	capita
Food Waste Collected in Duval[4]	123,939	wet tons/year
Food Waste Produced per Capita per Year	255	pounds/capita/year
Amount of Restaurants[5]	67	each
Average Food Waste Produced per Year per Restaurant[6]	25	wet tons

	Rate	Average Annual CO2e Reduction from Composting (MT CO2e)	Total CO2e Reduction from Composting by 2030 (MT CO2e)	Total CO2e Reduction from Composting by 2050 (MT CO2e)
Composting	10%	102	612	2,652
	30%	306	1,836	7,957
	50%	510	3,060	13,262

Reference 1: "Calculation of the Lifecycle Greenhouse Gas Emissions Reduction Benchmark for the Organice Waste Reductions Regulation", California Air Resources Board, January 2022.

Reference 2: "U.S. Census Bureau QuickFacts: Atlantic Beach city, Florida", City of St Augustine, January 8, 2024.

Reference 3: "U.S. Census Bureau QuickFacts: Duval County, Florida", City of St Augustine, July 1, 2023.

Reference 4: "Florida DEP County Reports: Duval County Report", FDEP, 2019.

Reference 5: "The Real Yellow Pages", www.yellowpages.com, 2024.

Reference 6: "Food waste in restarants: What we know", Fourth.com, May 2, 2023.

City of St. Augustine Solid Waste GHG Reduction Calculations:

Composting GHG Emissions Reduction Factor[1]	0.3	MT CO2e/wet short ton of organic waste
Amount of Restaurants[2]	188	each
Average Food Waste Produced per Year per Restaurant[3]	25.0	wet tons/year

	Rate	Average Annual CO2e Reduction from Composting (MT CO2e)	Total CO2e Reduction from Composting by 2030 (MT CO2e)	Total CO2e Reduction from Composting by 2050 (MT CO2e)
Composting	10%	141	846	3,666
	30%	423	2,538	10,998
	50%	705	4,230	18,330

Reference 1: "Calculation of the Lifecycle Greenhouse Gas Emissions Reduction Benchmark for the Organice Waste Reductions Regulation", California Air Resources Board, January 2022.

Reference 2: "Jacksonville MSA Technical Survey", City of St Augustine, January 8, 2024.

Reference 3: "Food waste in restarants: What we know", Fourth.com, May 2, 2023.

Categories, burdens, thresholds and descriptions in the Climate and Economic Justice Screening Tool (CEJST)

Category	Type of Burden	Disadvantaged Threshold(s)	Description
Climate change	Expected agriculture loss rate	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Expected agricultural value at risk from losses due to fourteen types of natural hazards. These hazards have some link to climate change. They are: avalanche, coastal flooding, cold wave, drought, hail, heat wave, hurricane, ice storm, landslide, riverine flooding, strong wind, tornado, wildfire, and winter weather. The rate is calculated by dividing the agricultural value at risk by the total agricultural value. Source: FEMA and National Risk Index from 2014-2021
	Expected building loss rate	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Expected building value at risk from losses due to fourteen types of natural hazards. These hazards have some link to climate change. They are: avalanche, coastal flooding, cold wave, drought, hail, heat wave, hurricane, ice storm, landslide, riverine flooding, strong wind, tornado, wildfire, and winter weather. The rate is calculated by dividing the building value at risk by the total building value. Source: FEMA and National Risk Index from 2014-2021
	Expected population loss rate	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Expected fatalities and injuries due to fourteen types of natural hazards each year. These hazards have some link to climate change. They are: avalanche, coastal flooding, cold wave, drought, hail, heat wave, hurricane, ice storm, landslide, riverine flooding, strong wind, tornado, wildfire, and winter weather. Population loss is defined by the Spatial Hazard Events and Losses and National Centers for Environmental Information's (NCEI). It reports the number of fatalities and injuries caused by the hazard. An injury is counted as one-tenth (1/10) of a fatality. The NCEI Storm Events Database classifies both direct and indirect injuries. Both types are counted as population loss. The total number is divided by the population in the census tract to get the population loss rate. Source: FEMA and National Risk Index from 2014-2021
	Projected flood risk	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	A high precision, climate-adjusted model that projects flood risk for properties in the future. The dataset calculates how many properties are at risk of floods occurring in the next thirty years from tides, rain, riverine and storm surges, or a 26% risk total over the 30-year time horizon. The risk is defined as an annualized 1% chance. The tool calculates tract-level risk as the share of properties meeting the risk threshold. The risk does not consider property value. Source: First Street Foundation and Climate Risk Data Access from 2022
	Projected wildfire risk	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	A 30-meter resolution model projecting the wildfire exposure for any specific location in the contiguous U.S., today and with future climate change. The risk of wildfire is calculated from inputs associated with fire fuels, weather, human influence, and fire movement. The risk does not consider property value. Source: First Street Foundation and Climate Risk Data Access from 2022

Category	Type of Burden	Disadvantaged Threshold(s)	Description

Energy	Energy cost/burden	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Average household annual energy cost in dollars divided by the average household income. Source: Department of Energy (DOE) and LEAD Tool from 2018
	Particulate matter 2.5 in the air	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Fine inhalable particles with 2.5 or smaller micrometer diameters. The percentile is the weight of the particles per cubic meter. Source: Environmental Protection Agency (EPA) Office of Air and Radiation (OAR). *Source:* Fusion of model and monitor data from 2017 as compiled by EPA's EJScreen, sourced from EPA National Air Toxics Assessment (NATA) and the U.S. Department of Transportation (DOT) traffic data

Category	Type of Burden	Disadvantaged Threshold(s)	Description
Health	Asthma	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Share of people who answer "yes" to both of these questions: "Have you ever been told by a health professional that you have asthma?" and "Do you still have asthma?". Source: Centers for Disease Control and Prevention (CDC) and PLACES data from 2016-2019
	Diabetes	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Share of people ages 18 years and older who have been told by a health professional that they have diabetes other than diabetes during pregnancy. Source: Centers for Disease Control and Prevention (CDC) and PLACES data from 2016-2019
	Heart Disease	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Share of people ages 18 years and older who have been told by a health professional that they had angina or coronary heart disease. Source: Centers for Disease Control and Prevention (CDC) and PLACES data from 2016-2019
	Low Life Expectancy	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Average number of years people have left in their lives. Note: The tool reverses the percentiles for this burden. This means that census tracts with lower numbers have higher life expectancies and that census tracts with higher numbers have lower life expectancies. Source: Centers for Disease Control and Prevention (CDC) and U.S. Small-Area Life Expectancy Estimates Project (USALEEP) from 2010-2015

Category	Type of Burden	Disadvantaged Threshold(s)	Description
Housing	Historic underinvestment	Experienced underinvestment AND are at or above the 65th percentile for low income	Census tracts that experienced historic underinvestment based on redlining maps created by the federal government's Home Owners' Loan Corporation (HOLC) between 1935 and 1940. The tool uses the National Community Reinvestment Coalition's methodology for converting boundaries in the HOLC maps to census tracts. Census tracts meet the threshold when they have a score of 3.25 or more out of 4. Source: National Community Reinvestment Coalition (NCRC) and dataset of formerly redlined areas using digitized maps from the Home Owners Loan Corporation (HOLC), using 2010 census boundaries
	Housing costs	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Share of households that are both earning less than 80% of Housing and Urban Development's Area Median Family Income and are spending more than 30% of their income on housing costs. Source: Department of Housing and Urban Development (HUD) and Comprehensive Housing Affordability Strategy dataset from 2014-2018
	Lack of green space	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Share of land with developed surfaces covered with artificial materials like concrete or pavement, excluding crop land used for agricultural purposes. Places that lack green space are also known as nature-deprived. Source: Data from Multi-Resolution Land Characteristics (MRLC) consortium; data analysis provided by The Trust for Public Lands and

			American Forests and Percent Developed Imperviousness (CONUS) from 2019
	Lack of indoor plumbing	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Housing without indoor kitchen facilities or complete plumbing facilities. Source: Department of Housing and Urban Development (HUD) and Comprehensive Housing Affordability Strategy dataset from 2014-2018
	Lead paint	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Share of homes built before 1960, which indicates potential lead paint exposure. Tracts with extremely high home values (i.e. median home values above the 90th percentile) that are less likely to face health risks from lead paint exposure are not included. Source: U.S. Census and American Community Survey from 2015-2019

Category	Type of Burden	Disadvantaged Threshold(s)	Description
Legacy Pollution	Abandoned mine land	At least one AND are at or above the 65th percentile for low income	Presence of an abandoned mine left by legacy coal mining operations. Source: Department of the Interior (DOI) and Abandoned Mine Land Inventory System (e-AMLIS) from 2017
	Formerly used Defense sites	At least one AND are at or above the 65th percentile for low income	Properties that were owned, leased, or possessed by the United States, under the jurisdiction of the Secretary of Defense prior to October 1986. Source: U.S. Army Corps of Engineers and Formerly Used Defense Sites (FUDS) from 2019
	Proximity to hazardous waste facilities	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Number of hazardous waste facilities (Treatment, Storage, and Disposal Facilities and Large Quantity Generators) within 5 kilometers (or nearest beyond 5 kilometers), each divided by distance in kilometers. Source: Environmental Protection Agency (EPA) and Treatment, Storage, and Disposal Facilities (TSDF) data from 2020 calculated from EPA's RCRA database as compiled by EPA's EJScreen
	Proximity to Superfund sites (National Priorities List)	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Number of proposed or listed Superfund or National Priorities list (NPL) sites within 5 kilometers (or nearest one beyond 5 kilometers), each divided by distance in kilometers. Source: Environmental Protection Agency (EPA) and CERCLIS database from 2020 as compiled by EPA's EJScreen
	Proximity to Risk Management Plan (RMP) facilities	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Count of Risk Management Plan (RMP) facilities within 5 kilometers (or nearest one beyond 5 kilometers), each divided by distance in kilometers. These facilities are mandated by the Clean Air Act to file RMPs because they handle substances with significant environmental and public health risks. Source: Environmental Protection Agency (EPA) and RMP database from 2020 as compiled by EPA's EJScreen

Category	Type of Burden	Disadvantaged Threshold(s)	Description
Transportation	Diesel particulate matter exposure	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Mixture of particles in diesel exhaust in the air, measured as micrograms per cubic meter. Source: Environmental Protection Agency (EPA) and National Air Toxics Assessment (NATA) from 2014 as compiled by EPA's EJScreen
	Transportation Barriers	ARE at or above the 90th percentile AND are at or	Average relative cost and time spent on transportation relative to all other tracts. Note: this burden only applies for census tracts with

		above the 65th percentile for low income	populations greater than 20 people. Source: Department of Transportation (DOT) and Transportation access disadvantage from 2022
	Traffic proximity and volume	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Number of vehicles (average annual daily traffic) at major roads within 500 meters, divided by distance in meters. Source: Department of Transportation (DOT) and Traffic data from 2017 as compiled by EPA's EJScreen

Category	Type of Burden	Disadvantaged Threshold(s)	Description
Water and Wastewater	Underground storage tanks and releases	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Weighted formula of the density of leaking underground storage tanks and the number of all active underground storage tanks within 1,500 feet of the census tract boundaries. Source: Environmental Protection Agency (EPA) and calculated from EPA's UST Finder from 2021 as compiled by EPA's EJScreen
	Wastewater discharge	ARE at or above the 90th percentile AND are at or above the 65th percentile for low income	Risk-Screening Environmental Indicators (RSEI) modeled toxic concentrations at stream segments within 500 meters, divided by distance in kilometers. Source: Environmental Protection Agency (EPA) and Risk-Screening Environmental Indicators (RSEI) model from 2020 as compiled by EPA's EJScreen

Category	Type of Burden	Disadvantaged Threshold(s)	Description
Workforce Development	Linguistic isolation	ARE at or above the 90th percentile AND more than 10% of people ages 25 years or older whose high school education is less than a high school diploma	Share of households where no one over age 14 speaks English very well. Source: U.S. Census and American Community Survey from 2015-2019
	Low median income	ARE at or above the 90th percentile AND more than 10% of people ages 25 years or older whose high school education is less than a high school diploma	Low median income calculated as a share of the area's median income. Note: The tool reverses the percentiles for this burden. This means that census tracts with lower numbers have higher median incomes and census tracts with the higher numbers have lower median incomes. Source: U.S. Census and American Community Survey from 2015-2019
	Poverty	ARE at or above the 90th percentile AND more than 10% of people ages 25 years or older whose high school education is less than a high school diploma	Share of people living at or below 100% of the Federal poverty level. Source: U.S. Census and American Community Survey from 2015-2019
	Unemployment rate	ARE at or above the 90th percentile AND more than 10% of people ages 25 years or older whose high school education is less than a high school diploma	Number of unemployed people as a share of the labor force. Source: U.S. Census and American Community Survey from 2015-2019

Complete List of CEJST Disadvantaged Burdens Sorted by Number of People Affected

Burden	Number of LIDACs / Frequency of Burden (90th & low income/HS)	Number of People Affected	Location / Number of Census Tracts Impacted	Proposed Measure(s)
Underground storage tanks and releases	45	175,273	1 Clay, 44 Duval	NA
Low Life Expectancy	41	163,236	39 Duval; 1 Palm Coast; 1 Clay	All proposed measures
Proximity to Risk Management Plan (RMP) facilities	40	150,280	39 Duval; 1 St. Johns	Potentially Landfill Gas Recovery
Projected Fire Risk	20	132,019	4 Clay, 11 Duval, 5 Palm Coast	All proposed measures as they potentially will indirectly help slow down and reduce severity of acute weather events
Heart Disease	28	109,445	23 Duval; 3 Palm Coast; 1 Clay; 1 St. Johns	Bike/Pedestrian programs; Mode shift
Diabetes	29	106,400	28 Duval; 1 Palm Coast	Bike/Pedestrian programs; Mode shift
Poximity to Superfund sites (National Priorities List (NPL)	30	101,594	30 Duval	NA
Low median income	26	98,578	26 Duval	Potentially energy efficiency and solar for buildings; Bike/Pedestrian programs; Mass transit expansion; Mode shift; Workforce development tied to measure implementation
Asthma	23	82,706	23 Duval	Increase in renewable energy for electrical grid; Energy efficiency and solar for buildings; EV fleet transition; Bike/Pedestrian programs; Mass transit expansion; Mode shift
Travel Barriers	12	68,700	1 Baker, 6 Clay, 1 Duval, 1 Nassau, 2 Palm Coast, & 1 St. Johns	EV fleet transition; Bike/Pedestrian programs; Mass transit expansion; Mode shift
Unemployment	18	66,962	18 Duval	Workforce development and training tied to measure implementation
Poverty	18	63,163	1 Clay, 17 Duval	Potentially energy efficiency and solar for buildings; Bike/Pedestrian programs; Mass transit expansion; Mode shift; Workforce development tied to measure implementation

Housing cost/burden	17	61,149	16 Duval, 1 St. Johns	Potentially Energy efficiency and solar for buildings
Projected Flood Risk	10	50,026	3 Duval, 5 Palm Coast, 2 St. Johns	All proposed measures as they potentially will indirectly help slow down and reduce severity of acute weather events
Energy Burden/Costs	15	49,784	15 Duval	Energy efficiency and solar for buildings
Historic Underinvestment	14	46,479	14 Duval	Energy efficiency and solar for buildings; EV fleet transition; Bike/Pedestrian programs; Mass transit expansion; Mode shift
Expected Building Loss	3	38,062	2 Flagler, 1 St. Johns	All proposed measures as they potentially will indirectly help slow down and reduce severity of acute weather events
Traffic Proximity & Volume	12	37,826	12 Duval	EV fleet transition; Bike/Pedestrian programs; Mass transit expansion; Mode shift
Diesel PM Exposure	10	36,594	10 Duval	EV fleet transition; Bike/Pedestrian programs; Mass transit expansion; Mode shift
Wastewater discharge	10	34,409	10 Duval	Wastewater treatment efficiency upgrades will slow down infiltration and discharge
Formerly Used Defense Sites	5	31,459	3 Clay, 1 Duval, 1 Palm Coast	NA
Education less than a high school diploma (25 years or older)	7	20,222	7 Duval	Workforce development and training tied to measure implementation
Linguistic isolation	3	18,646	3 Duval	Intentional outreach with sensitivity to linguistic needs
Expected Population Loss	4	16,001	4 Duval	All proposed measures as they potentially will indirectly help slow down and reduce severity of acute weather events
Lead paint	4	11,333	4 Duval	NA
PM 2.5 in the Air	0	0	None in 90th percentile	Increase in renewable energy for electrical grid; Energy efficiency and solar for buildings; EV fleet transition; Bike/Pedestrian programs; Mass transit expansion; Mode shift
Expected Agriculture Loss	0	0	None in 90th percentile	NA
Lack of green space	0	0	None in 90th percentile and low income; 89th percentile	Potentially Preservation and Expansion of Forest
Lack of indoor plumbing	NA	0	Not enough data	NA

Abandoned mine land	0	0	No abandoned mine land in NE FL MSA	NA
Proximity to hazardous waste facilities	0	0	None in 90th percentile	NA

Complete List of LIDAC Census Tracts in NE FL MSA by Measure and by Burden

All 91 LIDAC Census Tracts in NE FL MSA

12003040201, 12019030102, 12019030103, 12019030104, 12019030400, 12019031104, 12019031105, 12019031106, 12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503, 12035060104, 12035060204, 12035060206, 12035060207, 12035060208, 12035060209, 12035060210, 12035060212, 12035060213, 12035060214, 12109020300, 12109021003, 12109021101

BY MEASURE

ELECTRICAL GRID MEASURE: INCREASE CLEAN ENERGY – MSA WIDE

12003040201, 12019030102, 12019030103, 12019030104, 12019030400, 12019031104, 12019031105, 12019031106, 12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503, 12035060104, 12035060204, 12035060206, 12035060207, 12035060208, 12035060209, 12035060210, 12035060212, 12035060213, 12035060214, 12109020300, 12109021003, 12109021101

BUILDING MEASURE: RESIDENTIAL ENERGY AUDIT & EFFICIENCY TOOLKIT – MSA Wide

12003040201, 12019030102, 12019030103, 12019030104, 12019030400, 12019031104, 12019031105, 12019031106, 12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503, 12035060104, 12035060204, 12035060206, 12035060207, 12035060208, 12035060209, 12035060210, 12035060212, 12035060213, 12035060214, 12109020300, 12109021003,

12109021101

BUILDING MEASURE: HIGH PERFORMING CENTERS TO BUILD COMMUNITY RESILIENCY – MSA Wide

12003040201, 12019030102, 12019030103, 12019030104, 12019030400, 12019031104, 12019031105, 12019031106, 12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503, 12035060104, 12035060204, 12035060206, 12035060207, 12035060208, 12035060209, 12035060210, 12035060212, 12035060213, 12035060214, 12109020300, 12109021003, 12109021101

BUILDING MEASURE: COMMERCIAL SOLAR – MSA Wide

12003040201, 12019030102, 12019030103, 12019030104, 12019030400, 12019031104, 12019031105, 12019031106, 12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503, 12035060104, 12035060204, 12035060206, 12035060207, 12035060208, 12035060209, 12035060210, 12035060212, 12035060213, 12035060214, 12109020300, 12109021003, 12109021101

BUILDING MEASURE: MUNICIPAL BUILT ENVIRONMENT DECARBONIZATION – 3 Cities: COJ, COAB & COSA

12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12109021003, 12109020300

TRANSPORTATION MEASURE: NORTH FLORIDA TPO'S CLEAN FUELS INITIATIVE – 3 Counties: Duval, Nassau & St. Johns

12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503, 12109020300, 12109021003, 12109021101

TRANSPORTATION MEASURE: MASS TRANSIT EXPANSION – 5 Counties: Baker, Clay, Duval, Nassau & St. Johns

12003040201, 12019030102, 12019030103, 12019030104, 12019030400, 12019031104, 12019031105, 12019031106, 12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503, 12109020300, 12109021003, 12109021101

TRANSPORTATION MEASURE: BICYCLE-PEDESTRIAN PROGRAMS – City of Jacksonville

12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400

TRANSPORTATION MEASURE: EV FLEET TRANSITION -- Nassau County, City of St. Augustine, City of Jacksonville, City of Atlantic Beach, Duval County Public School District

12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200,

12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503, 12109021003, 12109020300

INDUSTRY MEASURE: REDUCE MARITIME SECTOR EMISSIONS – 2 Counties: Duval & Nassau

12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12089050503

AFOLU MEASURE: PRESERVE AND EXPAND FOREST – Nassau County

12089050503

WASTE & MATERIALS MANAGEMENT MEASURE: WASTEWATER TREATMENT EFFICIENCY UPGRADES – City of Palm Coast

12035060104, 12035060204, 12035060206, 12035060207, 12035060208, 12035060209, 12035060210, 12035060212, 12035060213, 12035060214

WASTE & MATERIALS MANAGEMENT MEASURE: COMPOSTING & WASTE DIVERSION – 3 Cities: COJ, COAB, & COSA

12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400, 12109021003, 12109020300

WASTE & MATERIALS MANAGEMENT MEASURE: LANDFILL GAS RECOVERY & CONVERSION – 2 Cities: COJ & COAB

12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001100, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010401, 12031010402, 12031010500, 12031010700, 12031010800, 12031010900, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012601, 12031012602, 12031012704, 12031012900, 12031013200, 12031013300, 12031013402, 12031013502, 12031013800, 12031013902, 12031013904, 12031014311, 12031015200, 12031015300, 12031015400, 12031015502, 12031015700, 12031015925, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400

<u>BY BURDEN</u>

NE FL MSA Census Tracts Affected by Asthma

12031000100, 12031000200, 12031000300, 12031001300, 12031001400, 12031001500, 12031001600, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010402, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031015502, 12031017400

NE FL MSA Census Tracts Affected by Diabetes

12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001300, 12031001400, 12031001500, 12031001600, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010700, 12031010800, 12031011000, 12031011100, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031016300, 12031017200, 12031017400, 12035060210

NE FL MSA Census Tracts Affected by Low Life Expectancy

12019030400, 12031000100, 12031000200, 12031000300, 12031001000, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010304, 12031010402, 12031010700, 12031011000, 12031011100, 12031011200, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031011901, 12031012100, 12031012200, 12031012500, 12031012602, 12031013402, 12031013800, 12031015502, 12031016200, 12031016300, 12031017400, 12035060206

NE FL MSA Census Tracts Affected by Heart Disease

12019031104, 12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001500, 12031001600, 12031002600, 12031002801, 12031002802, 12031002901, 12031002902, 12031010700, 12031010800, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031012100, 12031016000, 12031016727, 12031017400, 12035060104, 12035060206, 12035060210, 12109020300

NE FL MSA Census Tracts Affected by Traffic Proximity and Volume

12031000300, 12031000600, 12031001300, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031011100, 12031012100, 12031016200, 12031017200

NE FL MSA Census Tracts Affected by Traffic Barriers

12003040201, 12019030102, 12019030103, 12019030104, 12019031104, 12019031105, 12019031106, 12031011300, 12089050503, 12035060204, 12035060206, 12109021101

NE FL MSA Census Tracts Affected by Diesel PM Exposure

12031000300, 12031000600, 12031001000, 12031001200, 12031015700, 12031016100, 12031016200, 12031016300, 12031017200, 12031017400

NE FL MSA Census Tracts Affected by Energy Cost

12031000200, 12031000300, 12031001300, 12031001500, 12031001600, 12031002600, 12031002701, 12031002801, 12031002802, 12031002901, 12031002902, 12031011400, 12031011500, 12031011600, 12031017400

NE FL MSA Census Tracts Affected by Expected Building Loss

12003040201, 12019031104, 12019031105, 12019031106, 12035060206, 12035060207, 12109021101

NE FL MSA Census Tracts Affected by Expected Population Loss

12031001000, 12031010402, 12031012601, 12031013904

NE FL MSA Census Tracts Affected by Projected Flood Risk

12031002501, 12031013800, 12031013904, 12035060104, 12035060206, 12035060207, 12035060212, 12035060213, 12109020300, 12109021101

NE FL MSA Census Tracts Affected by Projected Fire Risk

12019030102, 12019030103, 12019030104, 12019031104, 12031010304, 12031010500, 12031011901, 12031012704, 12031013300, 12031013402, 12031013502, 12031013904, 12031014311, 12031015925, 12031016000, 12035060204, 12035060207, 12035060208, 12035060210, 12035060214

NE FL MSA Census Tracts Affected by Historic Underinvestment

12031000200, 12031000300, 12031001000, 12031001500, 12031001600, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031017200, 12031017400

NE FL MSA Census Tracts Affected by Housing Cost/Burden

12031000100, 12031000200, 12031000300, 12031001300, 12031001500, 12031001600, 12031002501, 12031002600, 12031002701, 12031002901, 12031002902, 12031011500, 12031013200, 12031015300, 12031015502, 12031017400, 12109021003

NE FL MSA Census Tracts Affected by Lead Paint

12031001200, 12031002502, 12031011800, 12031012900

NE FL MSA Census Tracts Affected by Formerly Used Defense Sites

12019030102, 12019031105, 12019031106, 12031010304, 12035060207

NE FL MSA Census Tracts Affected by Formerly Used Defense Sites

12031000100, 12031000200, 12031000300, 12031001000, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010700, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031013200, 12031015200, 12031015300, 12031015400, 12031017200, 12031017400

NE FL MSA Census Tracts Affected by Proximity to Superfund Sites

12031000100, 12031000200, 12031000300, 12031001000, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010700, 12031011200, 12031011300, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031013200, 12031015200, 12031015300, 12031015400, 12031017200, 12031017400

NE FL MSA Census Tracts Affected by Proximity to Risk Management Plans (RMP) Facilities

12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010402, 12031011100, 12031011400, 12031011500, 12031011600, 12031011700, 12031011800, 12031012000, 12031012100, 12031012200, 12031012300, 12031013800, 12031013902, 12031013904, 12031015200, 12031015300, 12031015400, 12031015700, 12031017200, 12031017400, 12109020300

NE FL MSA Census Tracts Affected by Proximity to Linguistic Isolation

12031016000, 12031016100, 12031016200

NE FL MSA Census Tracts Affected by Proximity to Linguistic Isolation

12031016000, 12031016100, 12031016200,

NE FL MSA Census Tracts Affected by Low Median Income

12031000100, 12031000200, 12031000300, 12031001000, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002600, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031010402, 12031011100, 12031011300, 12031011400, 12031011500, 12031011600, 12031011800, 12031012200, 12031012601, 12031015502, 12031017400

NE FL MSA Census Tracts Affected by Education Less Than a High School Diploma

12031000200, 12031000300, 12031001000, 12031001600, 12031002600, 12031002802, 12031012100

NE FL MSA Census Tracts Affected by Poverty

12019030400, 12031000100, 12031000200, 12031000300, 12031000600, 12031001000, 12031001300, 12031001500, 12031001600, 12031002600, 12031002702, 12031002901, 12031002902, 12031010402, 12031011500, 12031011600, 12031017200, 12031017400

NE FL MSA Census Tracts Affected by Unemployment Rate

12031000100, 12031000200, 12031000300, 12031001600, 12031002501, 12031002600, 12031002702, 12031002801, 12031002902, 12031010401, 12031010700, 12031011000, 12031011300, 12031011500, 12031011600, 12031011800, 12031012602, 12031015300

NE FL MSA Census Tracts Affected by Underground Storage Tanks and Releases

12019030400, 12031000200, 12031000300, 12031000600, 12031001000, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031002501, 12031002502, 12031002600, 12031002701, 12031002702, 12031002801, 12031002802, 12031002901, 12031002902, 12031011100, 12031011200, 12031011400, 12031011500, 12031011600, 12031011800, 12031012000, 12031012100, 12031012200, 12031012300, 12031012500, 12031012602, 12031012900, 12031013902, 12031014311, 12031015300, 12031015400, 12031016000, 12031016100, 12031016200, 12031016300, 12031016601, 12031016726, 12031016727, 12031017200, 12031017400

NE FL MSA Census Tracts Affected by Wastewater Discharge and Releases

12031000100, 12031000200, 12031000300, 12031001200, 12031001300, 12031001400, 12031001500, 12031001600, 12031013200, 12031013402

NE FL MSA Climate Pollution Reduction Grant Priority Climate Action Plan List of Resources

- EPA's Local GHG Inventory Tool (LGGIT) -- https://www.epa.gov/statelocalenergy/local-greenhouse-gas-inventory-tool
- Facility-specific GHG data published by the EPA in the Facility Level Information on Greenhouse Gases Tool (FLIGHT) -- https://ghgdata.epa.gov/ghgp/main.do
- Data reported to the EPA's Greenhouse Gas Reporting Program -- https://www.epa.gov/ghgreporting/data-sets
- EPA's National Emissions Inventory -- https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei
- United States Department of Energy State and Local Planning for Energy (SLOPE) Platform -- https://maps.nrel.gov/slope
- The World Resources Institute and World Business Council for Sustainable Development Global Protocol for Community-Scale (GPC) Greenhouse Gas Inventories -- https://ghgprotocol.org/ghg-protocol-cities
- American Community Survey -- https://data.census.gov/table?q=S1101&y=2019
- County Business Patterns -- https://data.census.gov/table?q=CBP2019.CB1900CBP
- Data reported in the United States Energy Information Administration's State Profile and Energy Estimates -- https://www.eia.gov/state/data.php?sid=FL
- Google's Environmental Insights Platform -- https://insights.sustainability.google/
- Florida's Department of Environmental Protection Report for MSW Management -- https://floridadep.gov/sites/default/files/Baker_2019.pdf
- Census data from the USDA National Agricultural Statistics Service -- https://www.nass.usda.gov/Publications/AgCensus/2017/
- Florida Public Service Commission (PSC) -- https://www.psc.state.fl.us
- NextEra Zero Carbon Blueprint -- NEER-124_120522_ZCB_SHARED_FCB_08_17_22_Studio_v1.pdf (nexteraenergy.com)
- JEA's 2023 Electric Generation Integrated Resource Plan -- https://www.jea.com/About/JEA_2023_Electric_Integrated_Resource_Plan/
- Code of Ordinances section regarding the creation of JEA, Article 21, Jacksonville Code of Ordinances: https://library.municode.com/fl/jacksonville/codes/code_of_ordinances?nodeId=CHRELA_PTACHLACHJAFL_ART21JE
- DOE Office of Energy Efficiency and Renewable Energy "Energy Data Facts: Residential Program Guide" -- https://rpsc.energy.gov/energy-data-facts
- Nationwide evaluation of tree cover shows huge opportunity to reduce heat exposure and boost air quality and employment -- https://www.americanforests.org/article/american-forests-launches-nationwide-tree-equity-scores/
- How Much CO2 Does A Tree Absorb? | One Tree Planted -- https://onetreeplanted.org/blogs/stories/how-much-co2-does-tree-absorb
- Trees Are Climate Change, Carbon Storage Heroes | US Forest Service (usda.gov) -- https://www.fs.usda.gov/features/trees-are-climate-change-carbon-storage-heroes
- The long-term effect of increasing the albedo of urban areas | Environmental Research Letters -- https://iopscience.iop.org/article/10.1088/1748-9326/7/2/024004/meta#erl422949fig4
- Green Values Stormwater Management Calculator | Center for Neighborhood Technology -- https://greenvalues.cnt.org/index.php
- Carbon reduction potential of a rain garden: A cradle-to-grave life cycle carbon footprint assessment | Journal of Cleaner Production https://www.sciencedirect.com/science/article/abs/pii/S0959652623039641
- Smart Surfaces Baltimore Report -- https://smartsurfacescoalition.org/baltimore-report
- Resources regarding extreme heat in Jacksonville -- https://www.resilientjacksonville.com/resources
- North Florida Transportation Planning Organization Clean Fuels Master Plan Report -- https://northfloridatpo.com/uploads/Clean-Fuels-Master-Plan-Report_Final_240209.pdf
- Jacksonville Transportation Authority's MOVE2027 strategic plan -- jtafla.com/media/34fnjggb/move2027.pdf
- Jacksonville Transportation Authority's Sustainability Action Plan -- https://www.transit.dot.gov/sites/fta.dot.gov/files/2022-04/Jacksonville-Transportation-Authority-Sustainability-Action-Plan.pdf

- Google Environmental Insights Explorer data on NEFL Outbound Travel -- Google Environmental Insights Explorer - Make Informed Decisions (sustainability.google)
- Brookings Institute's Study on Transit and Labor -- https://www.brookings.edu/wp-content/uploads/2016/06/11-transit-labor-tomer-full-paper.pdf
- Shorter commute times and upward economic mobility research -- https://scholar.harvard.edu/files/hendren/files/mobility_geo.pdf
- Reducing or eliminating parking minimums -- U.S. cities are getting rid of parking minimums : NPR
- Westrock Sustainability Plan -- westrock.com/-/media/pdf/sustainability/westrock-sustainability-report-2022-pdf.pdf?sc_lang=en
- Rayonier Sustainable from the Start -- https://ryam.com/our-innovation/sustainable-from-the-start/
- CMC Steel 2021 Sustainability Report -- https://www.cmc.com/getmedia/f81a63c4-6285-4c8a-a573-35f79d71fe24/CMC_2021_Sustainability_Report.pdf
- Symrise Sustainability & Responsibility 2021 Report -- https://www.symrise.com/corporatereport/2021/en/sustainability-responsibility/sustainability-and-responsibility.html
- Anchor Glass Container Sustainability webpage -- https://anchorglass.com/about/sustainability/
- Anheuser-Busch Environmental Sustainability webpage -- https://www.anheuser-busch.com/community/environmental-sustainability
- American Gypsum Sustainability webpage -- https://www.americangypsum.com/resource-center/sustainability
- International Flavors and Fragrances Inc. Sustainable Solutions webpage -- https://www.iff.com/responsibilities/sustainable-solutions/
- Crowley, JAXPORT Awarded Grant to Make Terminal More Sustainable | Crowley -- https://www.crowley.com/news-and-media/press-releases/jaxport-express/
- Jacksonville Port Authority specific powers and duties -- https://library.municode.com/fl/jacksonville/codes/code_of_ordinances?nodeId=CHRELA_PTBRELA_ART5JAPOAU_S3PO#:~:text=The%20Jacksonville%20Port%20Authority%20shall,boundary%20lines%20as%20hereinafter%20provided
- National Renewable Energy Laboratory (NREL) energy efficiency strategies for wastewater treatment facilities -- Energy Efficiency Strategies for Municipal Wastewater Treatment Facilities (nrel.gov)
- EPA's Best Management Practices for Preventing Stormwater Contamination for Sanitary Sewage -- NPDES: Stormwater Best Management Practice, Preventing Stormwater Contamination from Sanitary Sewage (epa.gov)
- Center for Disease Control study of long term exposure to LFG -- ATSDR - Landfill Gas Primer - Chapter 3: Landfill Gas Safety and Health Issues (cdc.gov)
- Nassau County Conservation Lands Acquisition and Management (CLAM) conservation plan -- 20210111-CLAM_Final_Word (nassaucountyfl.com)
- Nassau County Conservation Lands Acquisition and Management (CLAM) conservation plan map -- 082522-CLAM-Map (nassaucountyfl.com)
- USDA GHG emissions and carbon sequestration resources -- Greenhouse Gas Emissions and Removals From Forest Land, Woodlands, Urban Trees, and Harvested Wood Products in the United States, 1990–2021 (usda.gov) and Carbon sequestration in agricultural lands of the United States (usda.gov)
- Nassau County land development and future grown plan -- Microsoft Word - 9-Future Land Use Element D&A Clean Copy .doc (nassaucountyfl.com)
- Council on Environmental Quality Climate and Economic Justice Screening Tool (CEJST) -- https://screeningtool.geoplatform.gov/en/#9/30.2857/-81.7015 and burdens spreadsheet https://screeningtool.geoplatform.gov/en/downloads

- EPA EJ Screen Mapping Tool -- https://ejscreen.epa.gov/mapper
- Resilient Jacksonville October 2023 Report -- www.resilientjacksonville.com