East Central Florida's Priority Climate Action Plan

February 2024

On behalf of the Orlando-Kissimmee-Sanford MSA

East Central Florida's Climate Action Plan Plan includes:
Brevard, Lake, Orange, Osceola, Marion, Seminole, Sumter, and Volusia counties

Prepared For:
State and Local Climate Energy Program
U.S. Environmental Protection Agency

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East Central Florida Regional Resilience Collaborative

Contents

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Definitions and Acronyms

ABBREVIATION	DEFINITION
AFOLU	Agriculture, Forestry, and Other Land Use
BAU	Business As Usual
CCAP	Comprehensive Climate Action Plan
CEJST	Climate and Economic Justice Screening Tool
CPRG	Climate Pollution Reduction Grants
ECFR2C	East Central Florida Regional Resilience Collaborative
ECFRPC	East Central Florida Regional Planning Council
EIE	Google's Environmental Insights Explorer
EJScreen	Environmental Justice Screening Tool
EPA	U.S. Environmental Protection Agency
EV	Electric Vehicle
FDEP	Florida Department of Environmental Protection Agency
FPL	Florida Power and Light
GHG	Greenhouse Gas
GHGRP	Greenhouse Gas Reporting Program (40 CFR Part 98)
GWP	Global Warming Potential
ICLEI	International Council for Local Environmental Initiatives - Local Governments for Sustainability
IPCC	Intergovernmental Panel on Climate Change
IRA	Inflation Reduction Act
LEARN Tool	ICLEI US Community Protocol's Land Emissions and Removals Navigator
LIDAC	Low-Income and disadvantaged communities
MSA	Metropolitan Statistical Area
MSW	Municipal Solid Waste
NLCD	National Land Cover Database
NEI	EPA's National Emissions Inventory
PCAP	Priority Climate Action Plan
RPC	Regional Planning Council
Solar PV	Solar Photovoltaic
USCP	U.S. Community Protocol for Accounting and Reporting of Greenhouse Emissions
USFS	United States Forest Service
USGS	United States Geological Survey
VMT	Vehicle Miles Traveled

Priority Climate Action Plan (PCAP): a narrative report that includes a focused list of near-term, high-priority, and implementation-ready measures to reduce GHG pollution and an analysis of GHG emissions reductions.

Comprehensive Climate Action Plan (CCAP): a narrative report that provides an overview of the grantees' significant GHG sources/sinks and sectors, establishes near-term and long-term GHG emission reduction goals, and provides strategies and identifies measures that address the highest priority sectors to help the grantees meet those goals.

Greenhouse gas Inventory (GHGi): a list of emission sources and sinks and the associated emissions quantified using standard methods. The PCAP must include a "simplified" inventory (see Section 2.1). The CCAP must include a comprehensive inventory of emissions and sinks for the following sectors: industry, electricity generation/use, transportation, commercial and residential buildings, agriculture, natural and working lands, and waste and materials management.

Low Income / Disadvantaged Communities (LIDACs): communities with residents that have low incomes, limited access to resources, and disproportionate exposure to environmental or climate burdens. Although the Inflation Reduction Act does not formally define LIDACs, EPA strongly recommends grantees use the Climate and Economic Justice Screening Tool and the Environmental Justice Screening and Mapping Tool to identify LIDACs in their communities. These tools identify LIDACs by assessing indicators for categories of burden: air quality, climate change, energy, environmental hazards, health, housing, legacy pollution, transportation, water and wastewater, and workforce development.

MSA: metropolitan statistical areas as defined by the U.S. Census 2020 MSA population. A list of eligible MSAs can be found in Appendix 15.2 of EPA's CPRG: Formula Grants for Planning, Program Guidance for States, Municipalities, and Air Control Agencies.

State: all 50 U.S. states and the District of Columbia and Puerto Rico. All other Tribes or U.S. territories (the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands) should follow CRPG guidance for Tribes and Territories.

List of Figures

List of Tables

Executive Summary

The Inflation Reduction Act (IRA) of 2022 introduced impactful measures aimed at curbing greenhouse gas (GHG) emissions, notably through initiatives like the Climate Pollution Reduction Grants (CPRG) program. Spearheaded by the U.S. Environmental Protection Agency (EPA), this legislation facilitated the creation and execution of comprehensive climate action plans across various levels of governance, from states and territories to municipalities, air pollution control agencies, tribes, and regional organizations.

The CPRG program has two phases:

Phase One: Planning Phase: 4-year grant period with $250 million provided to eligible entities to develop plans to reduce GHGs. $3 million was available to each state, the District of Columbia (DC), and Puerto Rico. $1 million was available to each of the 67 most populated metropolitan statistical areas (MSA). $25 million was available to tribes and tribal consortia and $2 million to U.S. territories.

Phase Two: Implementation Phase: $4.3 billion in grants available to implement GHG reduction measure developed through the phase one planning grants spanning a 5-year period.

The East Central Florida Regional Planning Council (ECFRPC) was awarded a $1 million planning grant as part of phase one from the EPA to lead the development of the Orlando Sanford Kissimmee MSA climate action plan. Building upon the region's 2019 GHG inventory, which covered emissions from building's energy consumption, transportation, and waste sectors, the plan expanded its scope to include emissions and removals from land use and forestry. Notably, emissions from residential, commercial, and industrial buildings accounted for the largest share at 53.6%, followed by transportation at 39.4%.

Through analysis and forecasting, the East Central Florida region established a science-based target of reducing emissions by 54.3%. Seven key strategy areas were identified to support the path toward the emissions reduction target: decarbonization, reducing vehicle miles traveled, promoting the adoption of electric vehicles (EVs) and alternative fuels, enhancing building energy efficiency, expanding solar photovoltaic (PV) adoption, reduce and divert waste whilst also capturing of emissions generated and encouraging the preservation and integration of natural lands and forests as the region continues to develop.

These emission reduction strategies not only bolster the region's resilience but also deliver tangible benefits to vulnerable communities by mitigating air pollution, alleviating energy burdens, enhancing environmental quality, and fostering economic and energy resilience.

This Priority Climate Action Plan (PCAP) lays a solid foundation for continued GHG emission reduction efforts in the East Central Florida region, fostering resilience and sustainability across its communities.

1 Introduction

1.1 CPRG Overview

The Climate Pollution Reduction Grant (CPRG) program provides $5 billion in grants to states, local governments, tribes, and territories to develop and implement ambitious plans for reducing greenhouse gas emissions and other harmful air pollution. Authorized under Section 60114 of the Inflation Reduction Act, this two-phase program provides $250 million for noncompetitive planning grants, and approximately $4.6 billion for competitive implementation grants.

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The East Central Florida Regional Planning Council, through the collaborative program, has partnered with the East Central Florida Regional Resilience Collaborative (R2C) Greenhouse Gas reduction committee, the Orlando-Kissimmee-Sanford MSA partners, and ICLEI to produce this priority climate action plan (PCAP) supporting investment in policies, practices, and technologies that reduce pollutant emissions, create high-quality jobs, spur economic growth, and enhance the quality of life in the east central Florida region.

The first of three main deliverables in the CPRG program is the PCAP. The primary objective of the PCAP is to identify near-term, high-priority, implementation–ready, high-impact actions and goals (measures) to reduce GHG emissions. The framework drafted under these high impact actions (HIAs) will enable projects to be developed and submitted under the implementation phase of CPRG. The PCAP includes a GHG inventory, quantified GHG reductions, high impact actions and goals (measures), a preliminary low-income and disadvantaged communities benefits analysis, a workforce analysis framework, and a review of authority to implement.

A Comprehensive Climate Action Plan (CCAP) will be completed following the PCAP. The CCAP provides the scope for more detailed modeling, technical analysis, and community engagement. It will also serve as a detailed roadmap for reducing emissions across the east central Florida region.

The third deliverable is a status report at the close of the 4-year period (summer-fall 2027), which will include the implementation status of the reduction measures in the CCAP, relevant updated analysis or projections supporting CCAP implementation and next steps, and future budget/staffing needs to continue implementation of the CCAP.

1.2 PCAP Overview and Definitions

The following sections provide a brief description of each element of the PCAP which aims to provide a tailored guide for the region to continue making informed decisions and identifying the most significant GHG reductions in line with the region's objectives.

1.2.0 GHG Inventory

A greenhouse gas (GHG) inventory lists emissions sources by sector and their associated emissions using standardized methods. Emissions within the inventory are presented as carbon dioxide equivalent" (CO_2e) values within in this PCAP.

1.2.1 GHG Emissions Projections

Emissions projects allow for the visualization of how emissions evolve over time and how they are affected by various policies, programs, and projects over time.

1.2.2 GHG Reductions Measures

Reduction measures, also referred to as high impact actions (HIAs), goals and strategies by the east central Florida region aim to address emissions and make recommendations providing a framework for counties, municipalities and jurisdictions to reduce emissions by developing actions and implementation projects.

1.2.3 Benefits Analysis

Reducing greenhouse gas (GHG) emissions simultaneously decreases co-pollutants, which are examined in a qualitative discussion.

1.2.4 Low Income and Disadvantaged Communities Benefits Analysis

Low income and disadvantaged communities are the most vulnerable areas of our region. This section of the PCAP discusses the impacts of emissions reduction goals and strategies could have on these vulnerable communities, how they were identified and a framework for fostering the importance of communication and inclusion to increase the resiliency of these areas.

1.2.5 Review of Authority to Implement

This section describes how each of the high impact actions, goals and strategies intertwine with the policies, actions and momentum already taking place across the counties, municipalities and jurisdictions across the east central Florida region.

1.2.6 Next Steps

A discussion of what the next steps are in the climate action planning process.

1.3 Scope of the PCAP

1.3.0 East Central Florida Region

The geographic scope of the east central Florida region is illustrated in Figure 1. The region comprises of eight counties: Brevard, Lake, Marion, Orange, Osceola, Seminole, Sumter, and Volusia Counties. The region has a current population of over 4.2 million people with projections to exceed an estimate of 4.6 million to 5.6 million people by 2030, and an estimate of 4.6 million to 7.5 million people by 2050[1].

The East Central Florida Regional Planning Council is a council of governments representing these 8 counties, including 78 cities and towns and 4 MSAs. In addition to this population, as a tourism hotspot, the region also hosts approximately 70 million tourists per year visiting our many theme parks and natural areas. The region also houses the world's busiest cruise port at Port Canaveral with both passenger and cargo vessels. This location is often called the Port for inner and outer space as it is directly intertwined with the space industry and NASA's Kennedy Space Center.

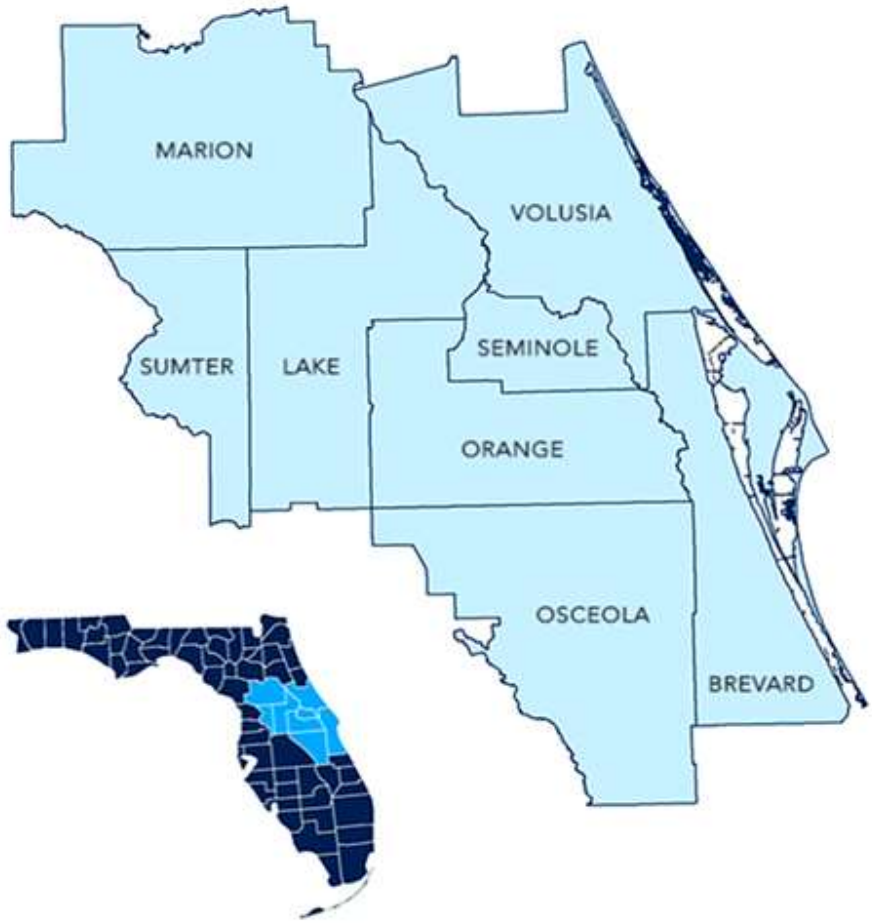


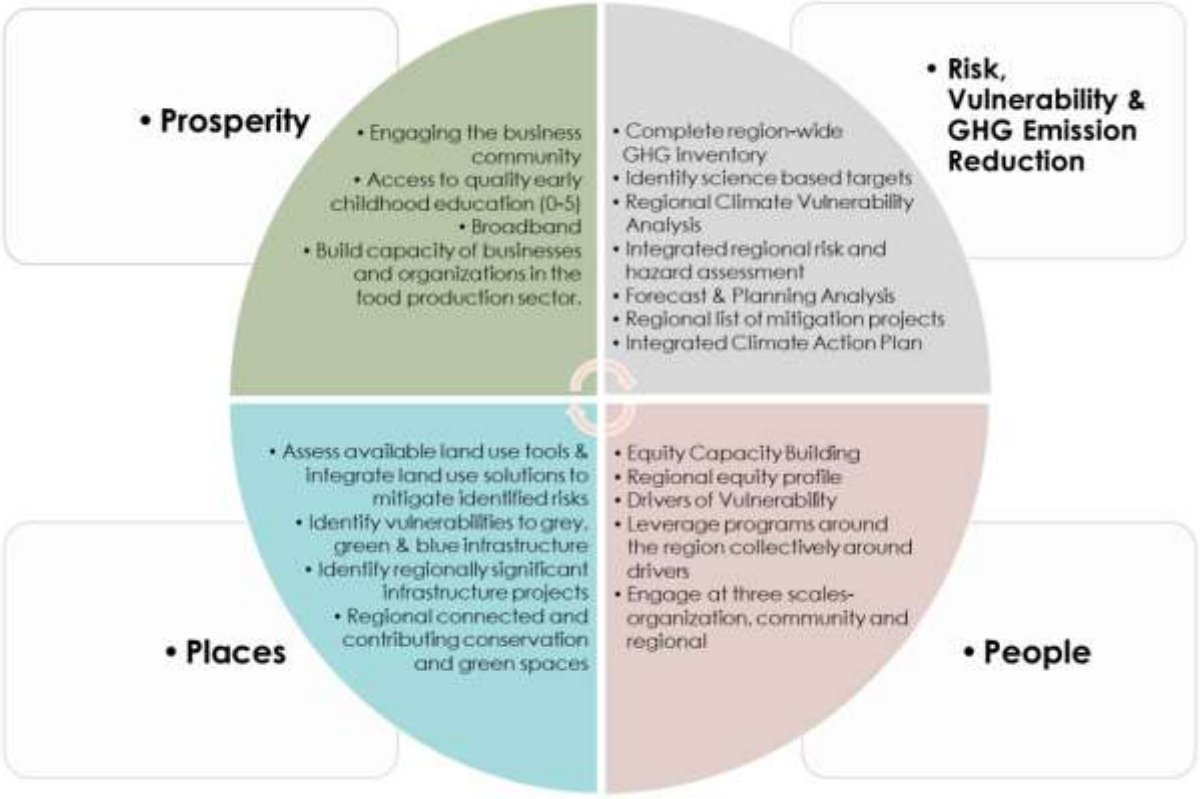
Figure 1: Geographic Region

[1] Bureau of Economic and Business Research Population Projections

1.4 Approach to Developing the PCAP

1.4.0 PCAP Interagency and Intergovernmental Coordination

The funded MSA, City of Orlando, Orange County, City of Kissimmee, Osceola County and Seminole County have formalized partnerships with the East Central Florida Regional Resilience Collaborative through adopted MOUs. The existing R2C committees were utilized where appropriate to include additional stakeholders and agencies in the development and review of the PCAP. Stakeholder review was key throughout the PCAP development process. Such review was integral in the formation of the high impact actions, goals, quantification, benefits and specifically in evaluating the projected benefits to LIDACs. Attendance of committee meetings, generally held bi-monthly, has been strongly encouraged and welcomed for a more informed and aligned outcome. Additional committee meetings have been held with a special focus on the CPRG MSA, for focused discussion on deliverables and engagement coordinated by the ECFRPC.



All committees work towards continuous community education and alignment within the pillars and stated priorities. The ECFR2C acknowledges that continuous education must be included to create meaningful engagement and momentum toward action.

ICLEI's ClearPath tool is the platform R2C partners agreed upon and used to standardize, capture, track and maintain the regional inventory. Data collection and input has been conducted on behalf of and for each County and aggregated to the regional scale. Discussion of the resulting inventory through stakeholder meetings informs the continued review and development of the high impact actions, goals and strategies for reducing emissions.

1.4.1 PCAP Public and Stakeholder Engagement

The East Central Florida Regional Resilience Collaborative will continue to engage partners in the ongoing expansion of the regional GHG inventory. The existing 2019 inventory results, methodology, high impact action analysis and science-based target will remain easily accessible on the ECFRPC website under the Resilience Collaborative tab. As the ECFRPC website is being redesigned, supporting documents and timelines for the CPRG grant will be updated and supplied at the launch of the new site.

The East Central Florida Regional Resilience Collaborative partners continue to discuss and consider a people first approach to ongoing projects and goals. Committees have previously been formed and discussed vulnerabilities within people, places, and economic systems. Input from health and equity groups; green, grey, and blue infrastructure organizations; and the business and the economic development community led to the development of common themes included and defined as the drivers of vulnerability in east central Florida, publicly accessible via an online dashboard[2]. A regional risk assessment was completed (June 2023) incorporating 32 drivers that capture social vulnerability across the communities within the region. It provides a holistic view of the impacts from hazards (including climate hazards) that communities face.

MSA partners were presented with a list of communities with high social vulnerabilities, identified through the CJEST and EJScreen tools. This allows partners to interact with communities in harmony with their current internal planning efforts and past community engagements, leveraging established trust and communication channels.

[2] https://dashboards.mysidewalk.com/ecfrpc-c-dashboard

2 State/MSA Context

The east central Florida region has experienced an increasing number of shocks and stressors to the region including hurricanes, extreme heat and storms that led to the establishment of the East Central Florida Regional Resilience Collaborative (R2C) originated in September 2018 after a unanimous decision by the East Central Florida Regional Planning Council based on common ground in response to shocks and stressors of the inland and coastal communities. Utilizing the Regional Planning Council for structure, the Collaborative is organized under a resilience umbrella with three pillars of (people) Health + Equity, (places) Built Infrastructure + Natural Environment and (prosperity) Economic Resilience. Woven throughout each pillar is an emphasis on the reduction of risks, vulnerabilities and carbon footprint and an increase in sustainability goals.

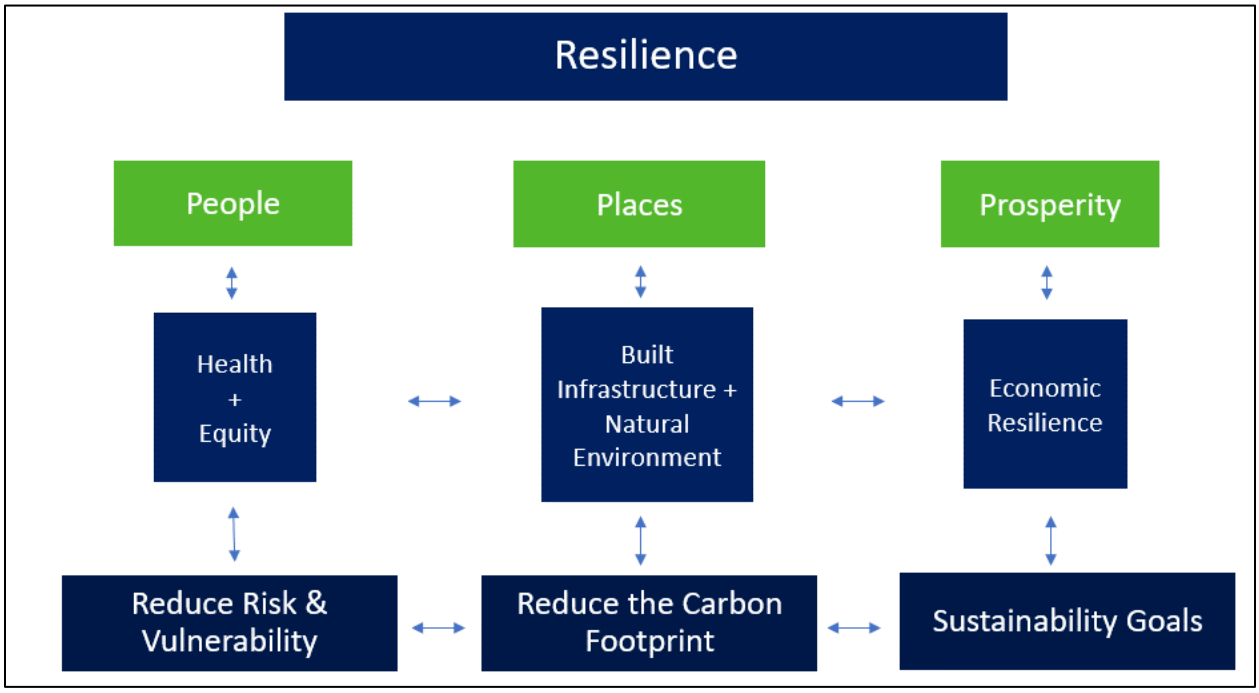


Figure 2: Resilience Pillars

Local governments, transportation agencies, educational entities and others have formalized their partnership with the R2C through board/commission consideration of a memorandum of understanding. To increase capabilities and capacities of our implementing local governments, the collaborative fulfilled a need found across the region and established a Regional Greenhouse Gas Inventory Technical Advisory Committee (RGHGi TAC). This RGHGi TAC guided the development of east central Florida's first regionwide inventory with a baseline year of 2019, building from existing local government GHG inventories, the R2C measured the energy, transportation, and waste sectors.

The region utilizes ICLEI's ClearPath tool and platform to aid in a standardized approach, gathering data for and on behalf of each (8) counties across the region and then aggregating the numbers to the regional scale. In partnership with ICLEI, the R2C then established a 54.3% emissions reduction Science Based Target by 2030, developed a high impact action analysis, joined the Global Covenant of Mayors for Climate and Energy (GCoM) and leveraged the completed work to begin building capacity and support for the first Regional integrated Climate Action Plan in early stages of development. As a part of the GCoM commitment, the R2C is committed to a new inventory every three years- 2022 data requests have been sent to the 22 energy providers, the 9 transit agencies, over 57 wastewater treatment facilities as well as waste across the region.

The R2C is also tasked to host a leadership Summit that brings together the many organizations, businesses, within many sectors to highlight the momentum taking place across the region that not only highlights emissions mitigation activities, but also highlights adaptation efforts underway. The recent 2023 R2C Leadership Summit gathered transportation organizations including the Orlando International Airport, Port Canaveral, Florida's Department of Transportation, NASA's Kennedy Space Center Visitor Complex and others to highlight the steps they are taking toward alternative fuels and other emission reduction measures. Ongoing projects and R2C conversations continue to propel action around the region.

The CPRG funding allows the current momentum and collaboration within the region to continue and accelerates the development of a comprehensive climate action plan.

3 PCAP elements

3.1 Greenhouse Gas (GHG) Inventory

3.1.0 Scope of GHG Inventory

A regional greenhouse gas emissions inventory is a key tool in understanding the region's emissions and their sources. It enables strategies to be developed on a wide range of emissions reduction opportunities. These are critical opportunities that can bring benefits to health, wellbeing, prosperity, and resiliency of the community. It is an optimal approach to forecast emissions, measure community performance, and transition toward an accelerated integrated climate action and base for making informed decisions.

The regionwide GHG inventory includes emissions from all 8 counties in the region (Brevard, Lake, Marion, Orange, Osceola, Seminole, Sumter and Volusia). This work builds community cooperation, and sustainable relationships. It establishes an actionable process for duplication and will be a catalyst for a paradigm shift toward a more resilient future. A consistent approach is key for measurement and tracking.

The PCAP consists of combining and assembling an 'expanded 2019 GHG inventory' for the region. The existing 2019 Region-wide Greenhouse Gas Emissions Inventory methodology was produced in 2020 by the East Central Florida Regional Resilience Collaborative (R2C) with assistance from the R2C Greenhouse Gas Inventory Advisory Committee, and ICLEI – Local Governments for Sustainability US and created within ICLEI's ClearPath tool. ClearPath is a leading online software platform for completing greenhouse gas inventories, forecasts, climate action plans, and monitoring at the community-wide scale.

Utility providers were contacted, via standardized requests, to provide data for the 2019 baseline (where applicable and not already gathered) as well as 2022-year data. The sectors included in the inventory were energy, transportation, solid waste. This was expanded to include land use and forestry during the development of the PCAP.

The R2C reduction committee continues to build consensus around the methodology and data sources needed to include additional sectors in the inventory. At present the water and wastewater, agriculture, and off-road transportation sectors are under development. These have not been included in the PCAP inventory due to time and data availability constraints but will be detailed within the comprehensive climate action plan (CCAP).

The following sections go through each data source used for the GHG inventory in more detail.

3.1.1 Data Review

Due to the unique scale of this regionwide inventory, encompassing eight (8) counties in the east central Florida region, data collection and calculations were sensibly based and considered under regionwide parameters. Data was individually calculated for each county and later aggregated for a full regional scope of emissions.

Data was collected from twenty-two energy sector (electricity and gas) utilities, nine transportation entities (transit and rail) along with additional on-road vehicle research, the Florida Department of Environmental Protection for waste information, and ICLEI LEARN platform respectively. However, due to a lack of cooperation by some energy providers, a combined data source approach was applied to fill the approximate 30% data gap by complementing the inventory with Google's Environmental Insights Explorer (EIE) data.

Table 1: Data Sources by Sector

Sector		Data Source
Energy	*Electricity*	*Utility activity data & EIE estimates*
	Natural Gas	
Transportation	*On-road*	*EIE Data*
	Rail	*Source activity data*
Waste	*Municipal solid waste*	*Source activity data*
Natural and Working Lands	*Land Use and Forestry*	*ICLEI LEARN*

Table 2: Data Sources for additional sectors under development

Sector		Data Source
Water & Wastewater	*Electricity*	*Utility activity data & estimates*
	Natural Gas	
	Process	
Natural and Working Lands	*Agriculture*	*USDA, National greenhouse gas inventory, activity data*

3.1.1.1 About Google's EIE Data

Google's Environmental Insights Explorer (EIE) was designed to make the foundation for effective climate action — the development of greenhouse gas inventories and the subsequent identification of emissions reduction opportunities — simple, straightforward, and actionable. EIE harnesses unique Google data sources and modeling capabilities to produce estimates of activity and emissions, making them freely available. The data underpinning EIE is primarily based on the same underlying information that is made available in Google Maps and is anonymous and highly aggregated. It is combined with other data sources such as aggregated location history data, building outlines and types, and overhead imagery to create useful environmental insights.

EIE's insights are modeled estimates based on actual measurements of transport activity and building infrastructure. Google uses advanced machine learning techniques to infer transport modes and applies scaling factors and efficiency factors to estimate overall emissions for a given year. In generating these estimates, EIE worked with the Global Covenant of Mayors for Climate & Energy to make sure its data can connect to global GHG accounting standards and protocols while acknowledging that jurisdictions may make different methodological choices that generate different results. Google EIE data was utilized to complement energy and transportation data collected and the east central Florida region was one of the pioneering regions to partner with Google to utilize their data sets within an inventory.

3.1.1.2 About ICLEI's LEARN Data

The manner in which GHG inventories are estimated for different types of land use is more complicated than for other sectors. In addition to both emitting and removing GHGs, there are multiple carbon pools that respond differently to management activities and natural disturbances, interannual variability is high, and measurements may not be as precise as it is in other sectors (See the USCP, Appendix J)[3]. Beginning in 2019, a number of updates to protocols and guidance to estimating carbon from the Agriculture, Forestry, and Other Land Use (AFOLU) sector required that communities include the "net flux" of carbon emissions and removals - carbon emitted to the atmosphere from the land and carbon removed from the atmosphere to the land. By combining activity data with removal and emission factors, counties and communities can develop a baseline inventory of carbon stocks and stock changes in forests and trees outside forests.

In 2019, the first inventory accounting methods for the land sector—starting with forests and trees outside forests—were developed and tested in three counties and one city. The accounting for forest land and trees is documented in Appendix J of the USCP[3]. In 2020, the accounting was further tested across 20+ additional communities, and default activity data and removal and emission factors were developed and programmed into the LEARN tool so that any U.S. county or community can quickly generate its own inventory. The tool utilizes the National Land Cover Database (NLCD) produced by the United States Geological Survey (USGS).

[3] USCP Appendix J

3.1.2 GHG Accounting Method

The first step toward achieving tangible greenhouse gas emission reductions requires identifying baseline emission levels, sources, and activities generating emissions in the community. This report presents emissions from eight counties in the east central Florida region as a whole.

This regionwide inventory report includes 2019 baseline year emissions from the following emissions generating activities:

- Use of electricity by the community
- Use of fuel in residential, commercial, and industrial stationary combustion equipment
- On-road passenger and freight motor vehicle travel
- Locomotive travel
- Generation of solid waste by the community
- Fugitive emissions from natural gas leakage

Due to the novelty of emissions accounting in the region at a regionwide scale, the above-stated emitting activities were chosen as a first measurable step and opportunity for emissions reduction within the previously developed 2019 inventory. This has been further advanced by the inclusion of land use and forestry changes and will be further advanced by the ongoing work within water and wastewater, off-road transportation, and agriculture sectors to progress towards our comprehensive inventory and comprehensive climate action plan. Local governments can have significant impact on these sectors by taking proactive actions for the communities they serve.

The PCAP includes a simplified inventory focusing on GHG emissions for the region. Removals have been included for land use and forestry to illustrate the importance of natural systems in the region. However, removals have not been included across all sectors due to the difficult and complex task of comprehensive inventorying of all removal sectors. The comprehensive climate action plans will facilitate the expansion into the complexities of comprehensively inventorying emission removals.

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

Table 3: Global Warming Potential Values (IPCC, 2014)

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

To calculate emissions accordingly using activity data and emission factors, the following equation was used:

Activity Data x Emission Factor = Emissions

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

Known emission factors are used to convert energy usage or other activity data into associated quantities of emissions. Emissions factors are expressed in terms of emissions per unit of activity data (e.g., lbs. CO_2/kWh of electricity). For this inventory, calculations were made using ICLEI's ClearPath tool and presented in "carbon dioxide equivalent" (CO_2e) values.

3.1.2.1 Energy Sector

Initially, data collection included utility activity data requests to each energy service provider identified for the east central Florida region. Since utility activity data is the gold standard approach for emissions calculations and accountability, the ECFR2C, with the understanding of the grand scale of this inventory, worked with service providers to guide and assist with data collection efforts. However, after substantial communication efforts to collect the desired necessary data, the ECFR2C made the informed decision to use a combined data source approach to fill data gaps due to a lack of timely support from some of the contacted energy providers. As a result, this inventory utilizes utility-provided data and Google's Environmental Insights Explorer (EIE) data. This combined approach complements activity data and allows for gap estimates. It is important to note that for EIE data, region-relevant adjustments were made for greater regional relevance and result accuracy.

Data requested from utility providers (for ICLEI's ClearPath record entry) included:

1. By county residential, commercial, industrial, street and highway lights, and public authority annual energy consumption
2. Utility's emission factors (CO_2, CH_4, and NO_2)

3.1.2.1.1 Identified Energy Providers in the Region

Electric Utilities: City of New Smyrna Beach, City of Mount Dora, City of Saint Cloud, City of Winter Park Electric, Duke Energy, Florida Municipal Power Agency (includes: City of Bushnell, City of Leesburg, City of Ocala, and Kissimmee Utility Authority), Florida Power & Light (FPL), Orlando Utilities Commission (OUC), *Reedy Creek improvement District, and *Seminole Electric Cooperative (includes: Central Florida Electric Cooperative, Clay Electric Cooperative, **Peace River Electric Cooperative, Sumter Electric Cooperative **Withlacoochee River Electric Cooperative).

Natural Gas Utilities: *AmeriGas, *City of Leesburg, *Florida City Gas, *Florida Public Utilities, Lake Apopka Natural Gas District, *Reedy Creek Improvement District, and TECO.

*No data provided

**Partial data provided

3.1.2.1.2 Google's Buildings Insights

Using EIE energy activity data calculation as a reference, the ECFR2C was able to estimate and/or acquire square footage for each counties' floor space and assign a building type category to most buildings within the regional county boundaries. In addition, the region applied EIE region-specific energy intensity factors (energy per floor space unit) from the Climate Action for Urban Sustainability (CURB) tool to estimate the total energy consumed. For each jurisdiction, Google assumes a mix of grid-supplied electricity and stationary combustion energy sources based on CURB's energy usage breakdown. However, the region adjusted this breakdown to better represent the fuel and electricity usage within each county.

3.1.2.1.3 EIE Energy Data Adjustments

EIE residential and non-residential (including any non-residential energy) electricity (kWh) and natural gas (Therms) activity data were, first, individually calculated for each county, and later aggregated for a regionwide inventory result. These calculations were done using a combination of EIE derived data and county-specific acquired numbers. Data adjustments were made as county-specific data was provided.

Two approaches were taken to collect county-specific residential and non-residential buildings' square footage/floor space; these included data from each county property appraiser or GIS-based research through the East Central Florida Regional Planning Council. For optimal calculations, priority was given to county-provided data, using GIS-based information to address data gaps.

The ECFR2C was able to obtain county buildings square footage/floor space from four (Lake County, Orange County, Osceola County, and Volusia County) out of the eight counties in the region. For the four remaining counties (Brevard County, Marion County, Seminole County, and Sumter County), GIS square footage data was used. For a higher level of accuracy, these numbers were quality checked by comparing property appraiser and GIS numbers from those counties from which data was collected.

The following equations were used to apply this data to the inventory complementing the utility provided data to create a combined data source approach which addressed data gaps.

Electricity (kWh)= Energy Intensity x Floor Space x Electricity Fraction

Natural gas (Therms)= Energy Intensity x Floor Space x NG Fraction

3.1.2.1.4 Calculation Assumptions

Due to region-specific energy use characteristics, which are greatly influenced by the region's climate, adjustments were made to EIE's estimated electricity and natural gas fraction percentages. In order to calculate emissions with the closest representation of the region's energy fractions, Orange County's fraction percentages were standardized and applied across the region.

	Electricity	Natural Gas
Residential	97.09%	2.91%
Non-residential	46.34%	53.66%

The grid electricity default "FRCC All (FRCC) eGRID 2019" was used for each county and the aggregated regionwide inventory for emissions factors. This default was applied to EIE data and wherever utility associated emissions factors were missing. This approach resulted in a standardized and consistent regional measure with higher quality results. Additionally, EIE regional energy intensity factors estimated by the CURB Tool were also used to calculate residential and non-residential energy usage.

3.1.2.1.5 EIE Use for Electricity Data

About 77% of the electricity activity data was obtained from energy service providers, and 23% was calculated to address the data gap by using EIE estimates. These numbers were used to either substitute missing data by estimating the difference between utility numbers and EIE county total estimates, or to disaggregate whole annual energy consumption numbers provided into residential and commercial (non-residential) activity data by using EIE percent attributable by sector (residential and non-residential).

3.1.2.1.6 EIE Use for Natural Gas Data

The same approach was used to fill data gaps present in the natural gas data. Utility-derived activity data was obtained from 56% of energy service providers and 44% was calculated using Google EIE estimates. Process and Fugitive Emissions

Incidental emissions created from natural gas distribution account for 0.3% of total emissions.

Natural gas processes and fugitive emissions account for leakage in the local natural gas distribution system. The calculation is based on the total quantity of natural gas consumed aggregated for the region and a 0.3% default leakage rate, as provided by ICLEI's ClearPath Tool. This rate percentage is obtained from the Environmental Defense Fund (EDF) User Guide for Natural Gas Leakage Rate Modeling Tool.

3.1.2.1.7 Aggregating Data

Each activity data per county calculated was consequently entered into the ClearPath tool for each county inventory. The resulting emissions "by sector by fuel" were then exported to aggregate and develop a regionwide scope of energy emissions.

3.1.2.2 Transportation Sector

3.1.2.2.1 Google's Transportation Insights

To develop a GHG emissions inventory with dependable quality and consistent methodology, EIE data was also used for calculating emissions in the transportation sector. Several cities around the region performed a comparison between EIE and local transportation organizations' data. After detailed analysis and sharing of observations, it was concluded that EIE data and measures have greater accuracy and methodology quality in addition to capturing a shift in modes, reinforcing the ECFR2C's decision to utilize EIE data for the 2019 regionwide inventory. However, it is important to note that data was successfully collected from all on-road vehicle organizations in the region (transit and para-transit: Lynx, LakeXpress, SCAT, Votran, and SunTran), building communication with a significant portion of the East Central Florida transportation sector. Using Google's proprietary data, the region was able to characterize the trips taken within the regional boundaries and the trips that crossed the regional boundaries. This data is derived from device Location History data in Google Maps that Google applies several privacy filters, aggregation/anonymization techniques, and inference models on. This considers movement over all major road classifications, from interstates to local roads. Similar to the population (and occupancy factor) scaling techniques used by transportation models based on Household Travel Surveys, but with a broader and more comprehensive set of inputs, Google can estimate annual vehicle trips by mode and vehicle distance traveled for the region.

3.1.2.2.2 EIE On-Road Transportation Data

For on-road vehicles (passenger cars, transit and para-transit, trucks, and other on-road vehicles), calculations were performed by obtaining vehicle miles traveled (VMT) and vehicle (e.g., motorcycle, light truck, car, etc.) type percentages see Appendix A. VMT was calculated from EIE in-boundary, inbound, and outbound emitting on-road vehicles data from each county data set.

3.1.2.2.3 Calculation Assumptions

To complete calculations for on-road emissions, percentages for vehicle type by fuel type (diesel or gasoline) data was obtained from ICLEI's "National Default Vehicle Fuel Efficiency and Emission Factors, 2018," where U.S. Energy Information Administration and Environmental Protection Agency's data is aggregated to get emissions factors and miles per gallons. In addition, 2019 US National Defaults (updated 2021) available through the ClearPath Tool were used as transportation factor sets.

3.1.2.2.4 Rail Transportation Data

Rail transportation emissions were calculated from passenger and freight data, based on county-wide train miles traveled, local attribution percentage (when available), and fuel consumption (diesel or electric) information. Data was requested from four (SunRail, Amtrak, CSX, and FCEN) of the identified regional rail service companies; however, data was only directly obtained from two (SunRail and Amtrak). In addition, a secondary source was used to

collect data from CSX, increasing the inventory's rail coverage, no data was obtained from the FCEN rail company.

Data entry into the ClearPath tool was conducted using the "rail transportation" calculator, recording rail type, fuel usage, and local attribution information.

3.1.2.2.5 Aggregating Data

Each on-road and rail data set was entered into the ClearPath tool for each county inventory, which yielded transportation-related emissions data by fuel type. These numbers were later aggregated and populated again for the development of a regionwide scope of transportation emissions.

3.1.2.3 Waste Sector

Municipal Solid Waste (MSW) data was collected directly from the Florida Department of Environmental Protection Agency (FDEP), Division of Waste Management, Waste Registration & Recycling Program. The information was collected per county and included data pertaining to total tons of landfilled waste, composted waste, and incinerated waste and energy generated, when applicable. Data on Florida's MSW material percentages were also collected for factor sets input and emissions calculations into the ClearPath tool. Once each county's MSW data per solid waste record type was completed, these numbers were aggregated and incorporated into the regionwide inventory waste sector for full community emissions scope.

3.1.2.3.1 Waste Data Assumptions

For landfilled waste calculations, it was assumed that the landfill methane collection scenario was "typical," based on the ClearPath Tool's options provided. It was also assumed that the landfill moisture content is "wet due to regional average precipitations." For composted waste, the material was classified as "green waste" (i.e., yard waste) due to compost composition, as directed by FDEP. In terms of the waste that is combusted, (Lake and Sumter county only), it was assumed that the percent of total combusted MSW generated in-boundary was 1%.

3.1.2.4 Natural Lands and Forestry

In coordination with ICLEI USA, the US Community Protocol's Land Emissions and Removals Navigator (LEARN) tool was utilized to estimate the net flux of AFOLU emissions from 2013-2019. This analysis reported six "land use" categories which were defined by data on land cover—forest land, grassland, cropland, wetland, settlement, and other land (barren, snow, ice). The tool utilizes the National Land Cover Database (NCLD), produced by the USGS. The NCLD serves as the definitive Landsat-based, 30-metre resolution land cover database for the United States. Areas of tree canopy and tree canopy loss outside NLCD-defined forests are calculated in the LEARN tool using the NLCD's tree canopy cover products, produced by the United States Forest Service (USFS).

While GHG Inventories are recommended to comprise data from a single year, AFOLU data measures changes over the course of multiple years due to the complexities of measurements for this sector. Therefore, this analysis accounts for an annual average across 2013 to 2019 and is not a measure of emissions and sequestrations specifically for 2019.

This PCAP focuses on a simplified GHG emissions inventory for the region. Removals from this sector have been included, however removals across all sectors have not been included due to the difficult and complex task of comprehensively inventorying removals. The comprehensive climate action plan (CCAP) which will follow and build on this PCAP and will delve further into the complexities of removals.

For reference, it is important to recognize that although annual average GHG emissions have been estimated to be 1,818,95 tCO_2e/yr over the period 2013 to 2019, and GHG removals have been estimated to be -9,033,670 tCO_2e/yr. This equates to a Net GHG balance of -7,215,375 tCO_2e per year for the region for the forest and trees. This underscores that further disturbances to forests not only release emissions but also diminish the region's land capacity to absorb emissions.

3.1.2.4.1 Natural Lands and Forestry Land Use Classification

The LEARN tool compared the two land cover maps and generated a land cover transition map for the selected inventory period (2013-2019). Each 30-m pixel within the inventory boundary is assigned a value corresponding to one of 256 possible transitions (i.e., 16x16 possible NLCD land cover/land cover change combinations). For simplified reporting, areas calculated within the original 256 NLCD transition classes are also aggregated into a 36-category map (corresponding to 6x6 possible land cover/land cover change combinations. The 16 NLCD categories are reclassified into 6 simplified land cover/land use categories. Regardless of the type of land use change, land falls into one of two overarching categories; land that remains in the same use class and land converted into a different use class over the inventory period.

Table 4: Scheme for reclassifying 16 original NLCD categories into 6 simplified land cover/land use categories

NLCD class	IPCC land use class
Deciduous Forest Evergreen Forest Mixed Forest Woody Wetlands	Forest Land
Shrub/Scrub Grassland/Herbaceous Pasture/Hay	Grassland
Cultivated Crops	Cropland
Open Water Emergent Herbaceous Wetlands	Wetland
Developed, Open Space Developed, Low Density Developed, Medium Density Developed, High Density	Settlement
Perennial Ice/Snow Barren Land	Other Land

3.1.2.4.2 Natural Lands and Forestry Estimating Emission Data

Removal and emission factors are calculated by type of activity, forest type and age class for each of the 11 regional variants of the forest and tree GHG protocol. National forest inventory data are used by the LEARN tool to derive factors that are representative of regions[4]. Removal and emission factors for nine classifications of forests and trees outside forests, for each of the 11 regions, are estimated and combined with the relevant activity data[4].

3.1.2.5 Additional Sectors Being Developed for Future Inclusion

In addition to the sectors detailed in previous sections the following are currently under active advancement: water and wastewater, off-road transportation, and agriculture.

Utility data covering 69% of water and wastewater utility providers has been obtained with ongoing efforts to obtain data from the remaining providers. As part of our ongoing efforts, methodology for approaching data gaps and estimates is being developed. Proposals include establishing population covered by data and the population represented by data gaps to utilize within proxy estimates based on the utility data obtained and calculations within ICLEI ClearPath to produce the estimated emissions from the energy and processes associated with the supply of portable water and processing of wastewater. Once this methodology and approach has been refined, finalized and agreed upon via the R2C GHG reduction committee consensus, water and wastewater emissions can be integrated within our comprehensive inventory.

Off-road transportation data is available within the National Emissions Inventory (NEI), which is published every three years. 2017 and 2020 data are currently available. The dataset must be aligned with the east central Florida region's 2019 baseline inventory for inclusion. Concerns on the impact the 2020 pandemic on off-road transportation, particularly within the marine and pleasure craft segments, need to be fully reviewed via comparisons between the 2017 and 2020 datasets available. A thorough review and analysis of the data is critical before incorporating it into east central Florida's inventory. Therefore, to facilitate this essential review process, off-road transportation will be integrated into the comprehensive inventory and comprehensive climate action plan.

The comprehensive inventory and comprehensive climate action plan will also address the agricultural sector, recognizing the data availability challenges specific to this area.

[4] LEARN tool methods and data

3.1.3 GHG Inventory Results

3.1.3.1 Regionwide Emissions Inventory Results

Figure 2 shows the results of the 2019 GHGi carried out previously with the energy sector contributing a combined 55% consisting of energy from residential, commercial, and industrial buildings, and 41% from transportation of towards the region's emissions total.

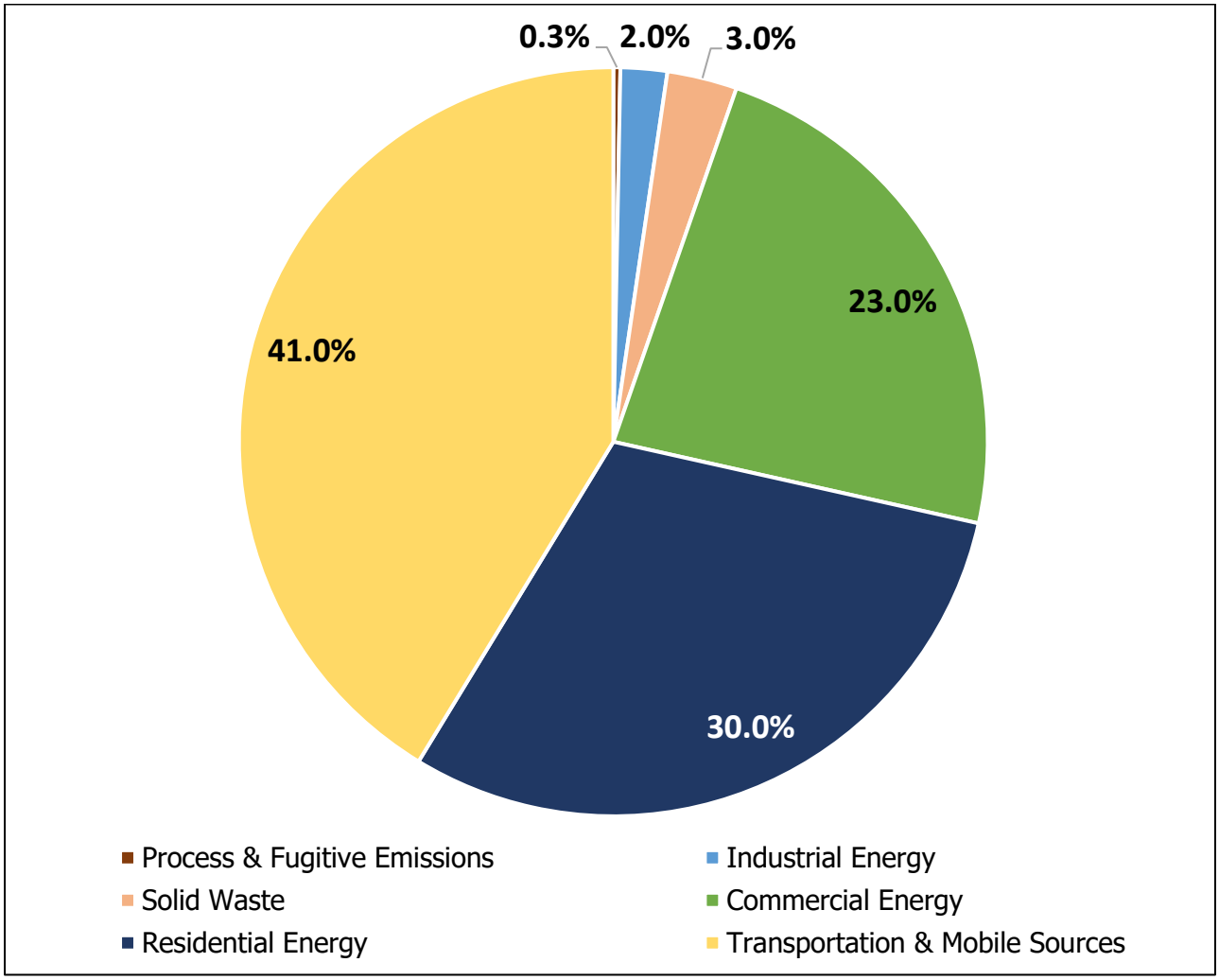


Figure 3 - Existing 2019 Regionwide Emissions by Category

Figure 3 shows the updated inventory and shows the largest contributor is energy consumed by residential, commercial, and industrial buildings contributing a combined 53.6%, followed by transportation contributing 39.4%, respectively towards the region's emissions total.

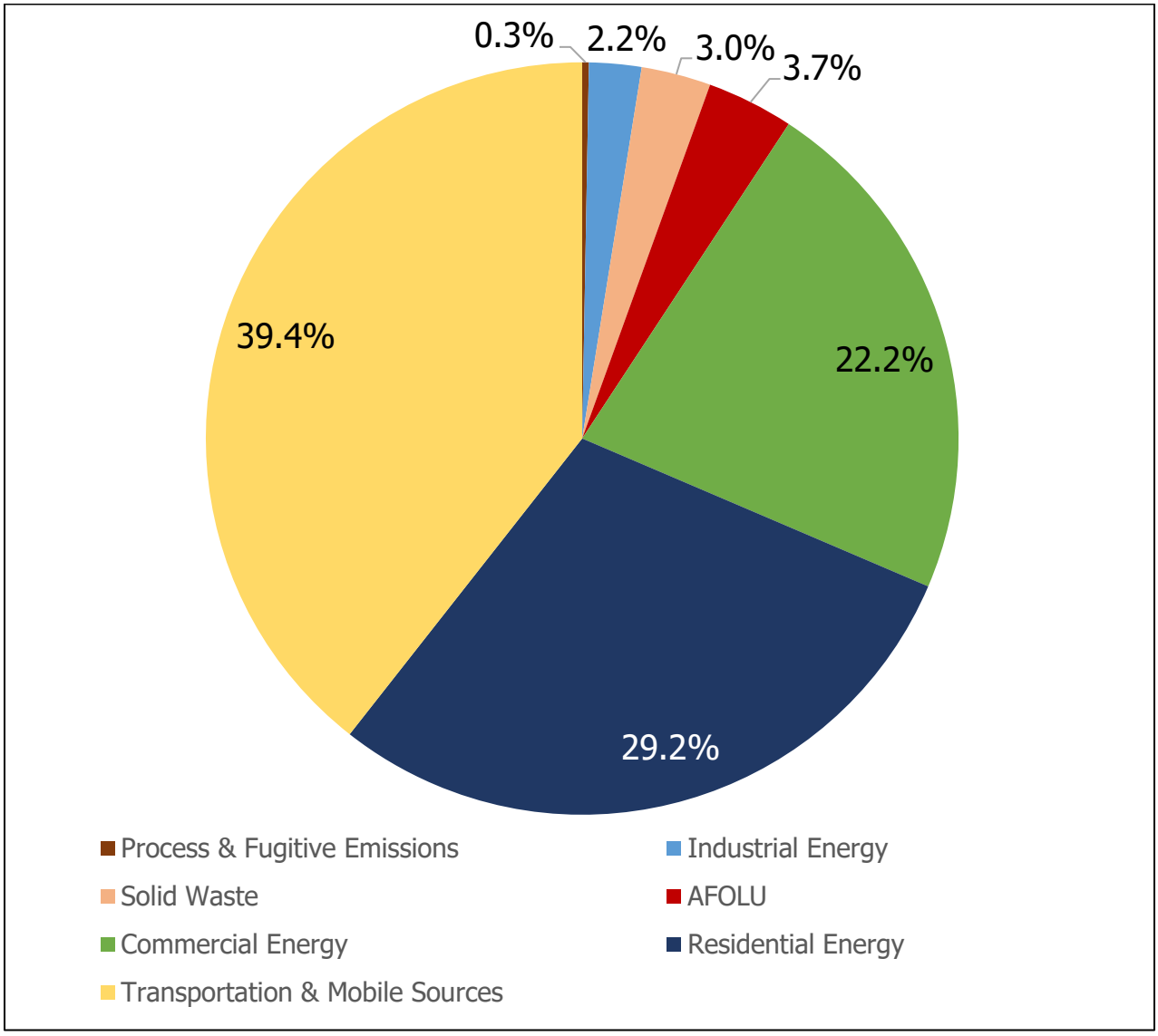


Figure 4: Regionwide 2019 base line inventory emission results including land-use and forestry emissions.

Table 3: Communitywide Regional Emissions Inventory

Sector	Fuel or source	2019 Usage	Usage unit	2019 Emissions ($MTCO_2e$)
Residential energy	Electricity	34,427,810,716	kWh	13,614,601
	Natural Gas	115,659,468	Therms	615,152
	Other			- 1.00
			Residential energy total	14,229,752
Commercial energy	Electricity	18,805,061,817	kWh	7,459,391
	Natural gas	632,445,810	Therms	3,363,758
	Other			- 1.00
			Commercial energy total	10,823,148
Industrial energy	Electricity	1,982,070,536	kWh	803,415
	Natural Gas	55,068,997	Therms	292,276
	Other			- 2.00
			Industrial energy total	1,095,689
On-road transportation (Passenger vehicle and transit)	Gasoline	33,329,031,223	VMT	13,908,992
	Diesel	3,555,686,820	VMT	5,251,678
Rail	Diesel	5,970,447	Gal.	61,503
			Transportation total	19,222,173
Solid Waste	Waste Sent to Landfill	5,504,141	Tons	1,431,041
	Waste Composted	388,778	Tons	27,070
	Waste Incinerated	156,413	Short Tons	542
			Solid waste total	1,458,653
Process & Fugitive Emissions	Fugitive Emissions from Natural Gas Distribution			139,346
			Fugitive total	139,346
Land Use and Forestry Change (AFOLU)				1,818,295
			Land Use and Forestry Change (AFOLU) total	1,818,295
			Total Regionwide emissions	**48,787,056**

3.1.3.1 Net GHG Emissions

3.1.3.2

The total regionwide emissions for the 2019 baseline year was 48,787,056 metric tons of CO_2e.

The total amount of carbon removals from land use change and forestry (non-forest to forest, undisturbed forest, and trees outside of forests) was -9,033,670 metric tons of CO_2e.

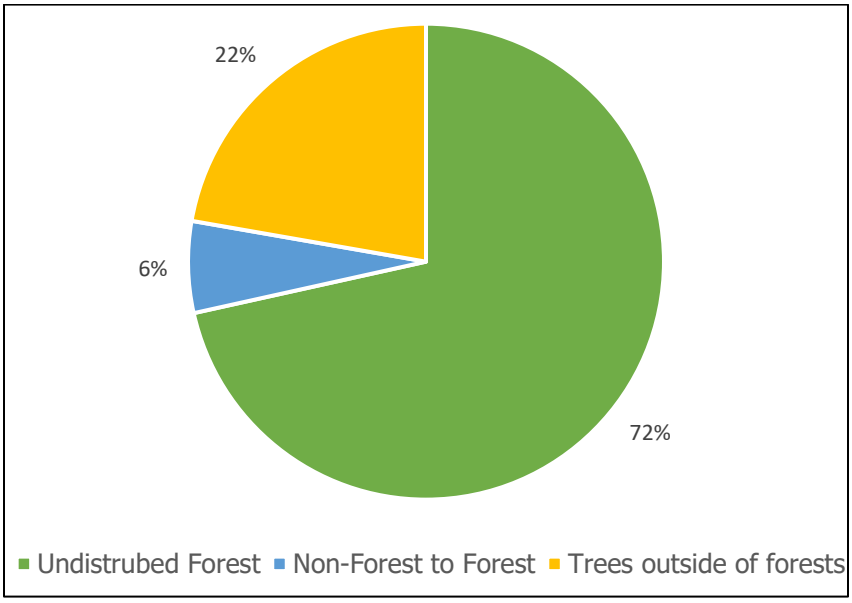


Figure 5: Sources of carbon removals

The total net GHG emissions for the region are 39,753,386 metric tons of CO_2e. Carbon removals equate to 18.5% of the total gross emissions.

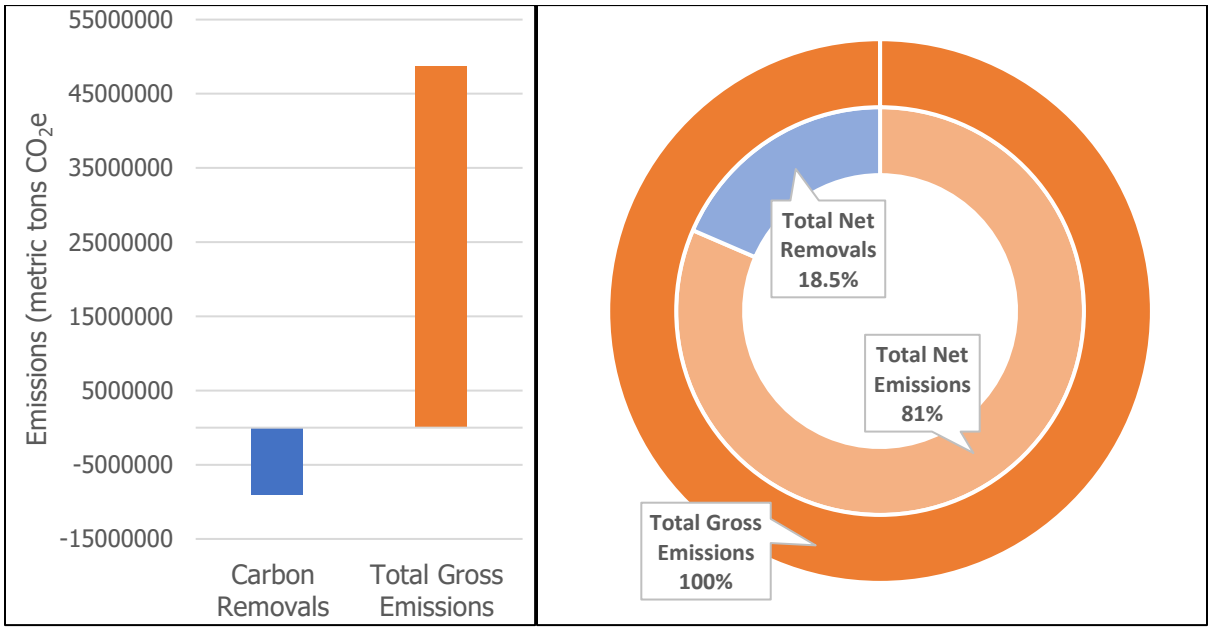


Figure 6: Total gross emissions, total removals and total net emissions.

3.2 GHG Emissions Projections

3.2.0 Emissions Forecast

An emissions forecast begins with the results of a greenhouse gas inventory and creates projections of emissions trends based on anticipated demographic, economic, and policy changes. The forecast is a foundational step for Climate Action Planning.

East Central Florida regional emissions were projected using the following growth-related variables:

- Regional population growth

Population growth is used to project future activity such as residential energy usage. The regional population growth projection was sourced from the Bureau of Economic and Business Research[5]. ICLEI chose this source to keep uniformity with other planning documentation used by the ECFRPC, such as the East Central Florida 2060 Plan[6]. While tourism is not captured in regional population growth, tourism impacts are captured through energy consumption and other activity data within the greenhouse gas inventory.

- Commercial and industrial growth

Commercial and industrial growth is used to project future commercial and industrial energy usage. The ECFRPC used JobsEQ's Industry Snapshot occupation and employment data to bucket job counts into non-residential sectors[7]. To convert the number of projected jobs into non-residential space, the ECFRPC used job/land use multipliers[8] from the City of Orlando's "Growth Projections" report. Because of the lack of data for other counties, the ECFRPC assumed that this multiplier[8] was applicable across the region. These calculations were verified with data from the Orange County Property Appraiser and were found to be relatively accurate. Therefore, the calculation was carried out for the seven other counties.

- On-road transportation fuel efficiency standards[9] (CAFE Standards)

Fuel efficiency standards are used to project the reduction of emissions intensity for each mile driven by on-road vehicles. Fuel efficiency standards decrease emissions due to federally mandated improvements in vehicle fuel economy. ICLEI developed variables from fuel efficiency projections provided by the Center for Climate and Energy Solutions[10] (C2ES).

- Utility grid decarbonization[11]

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[5] Bureau of Economic and Business Research, University of Florida

[6] East Central Florida 2060 Plan

[7] Industries with less than five employees were omitted from the analysis. industries within the agricultural and mining sectors were omitted from these calculations because the multipliers would not be applicable.

[8] The commercial multiplier is 450 sq. ft. per employee and the industrial multiplier is 900 sq. ft. per employee.

[9] Default Fuel Efficiency Standards

[10] Center for Climate and Energy Solutions

[11] Utility decarbonization projections are based on projected energy sources and not emissions factors.

Both Duke Energy[12] and Florida Power and Light[13] (FPL) submit 10-year site plans in which they project their energy sources in 2030. These projections allow us to forecast a change in the grid electricity carbon intensity up until 2030. Utility grid decarbonization decreases emissions over time due to the reduction in emissions output per unit of electricity produced. The Duke and FPL decarbonization was applied to their respective electricity demands.

3.2.1 Forecast Results

East Central Florida's 2019 regional emissions were estimated at 46,968,766 Metric Tons Carbon Dioxide Equivalent (CO_2e). Based on the above growth rates and emissions intensity factors, 2030 emissions are projected to be 52,546,550 Metric Tons CO_2e. The following table displays the primary[14] 2019 baseline and 2030 projected emissions.

Table 5: Baseline and Business-as-Usual emissions comparison

Sector	Source	Baseline Emissions (MT CO_2e)	2030 BAU Emissions (MT CO_2e)	Percent Change (%)
Residential Energy[15]	Electricity	13,614,601	16,215,081	19%
	Natural Gas	615,152	740,480	20%
Commercial Energy[1515]	Electricity	7,459,391	7,685,763	3%
	Natural Gas	3,363,758	3,877,293	15%
Industrial Energy[1515]	Electricity	803,415	796,855	-1%
	Natural Gas	292,276	326,972	12%
Transportation	On-road	19,160,670	20,873,247	9%

[12] Duke Energy 10-year Site Plan

[13] FPL 10-year Site Plan

[14] Primary emissions represent the emissions in which High-Impact Actions address.

[15] Not all energy data was provided by a utility. Please see Table 3 for more details.

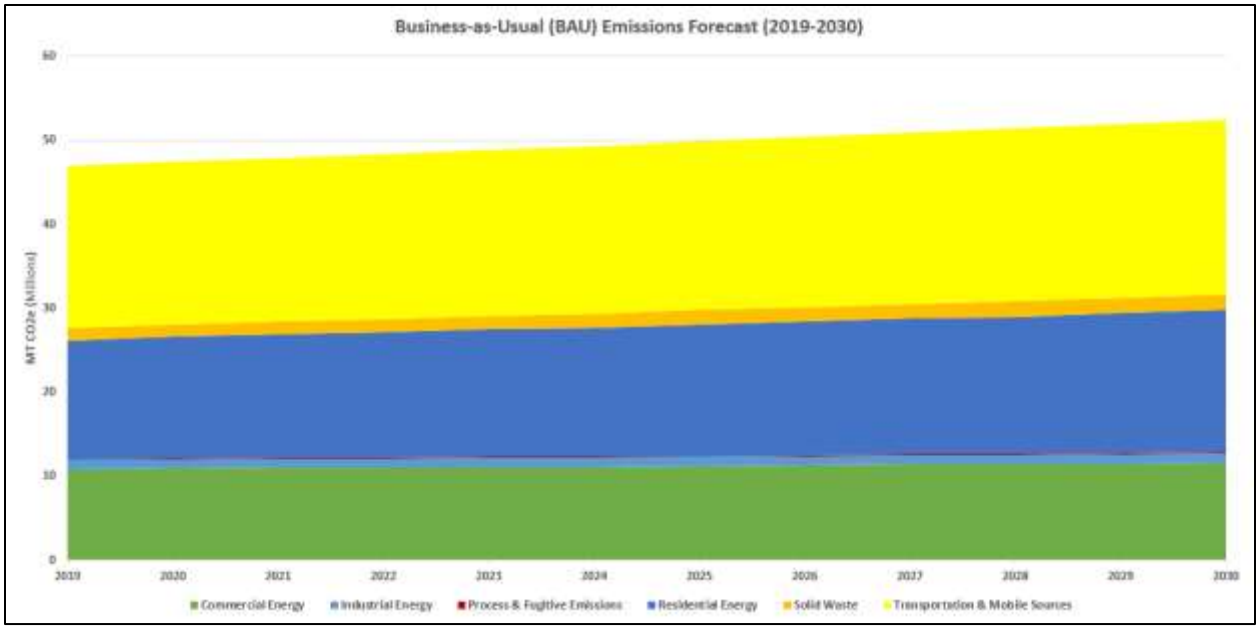


Figure 7: Business as Usual (BAU) Forecast

3.2.2 High-Impact Action Modeling Results

The following chart compares Business-as-usual forecasted emissions to remaining emissions after the various high-impact actions and goals have been applied (see table 6).

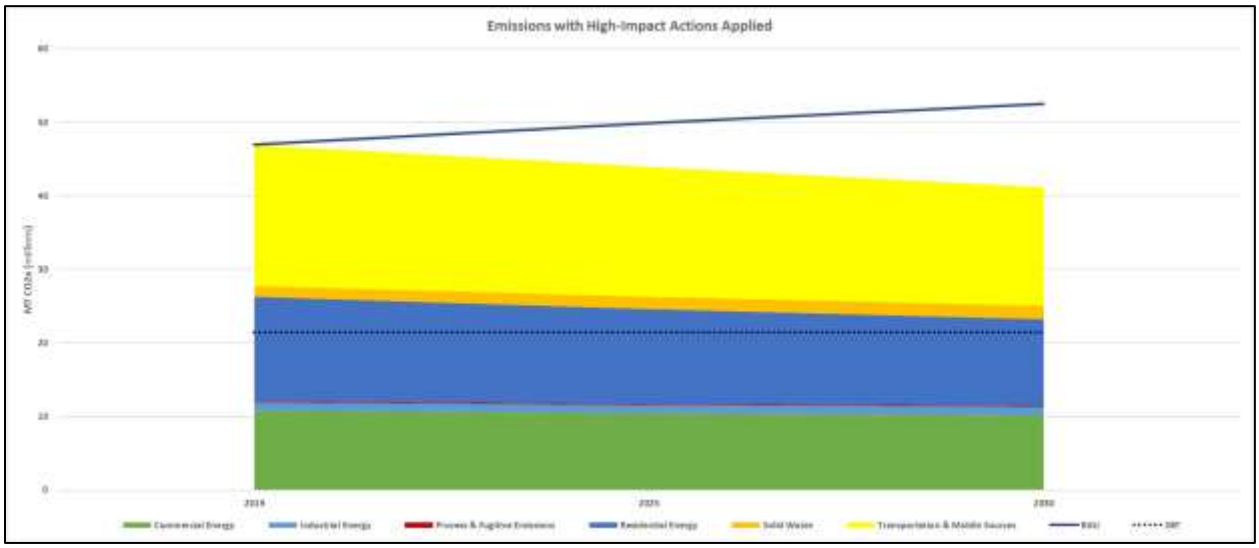


Figure 8: High Impact Actions Results

Planning and implementing strategies to support the High-Impact Actions are essential to mitigate climate change impacts, bolster resilience, improve public health, and reduce energy costs.

By following this trajectory 2030 near term regional emissions are estimated at 41,144,771 Metric Tons CO_2e, equating to a 12.4% reduction. This reduction is far from what's needed to achieve the absolute Science-Based Target of 54.3% and therefore leadership requested the next step to this process should be gaining an understanding of additional and more aggressive pathways toward reductions. We anticipate working with the ECFR2C to make and model adjustments to the current pace of the goals utilized in addition to broadening the scope of the high impact actions.

3.3 GHG Reduction Targets

3.3.0 East Central Florida's Science-Based Targets

The following section presents the previously developed science-based target for East Central Florida.

Target: In support of the United States goal, the East Central Florida region's absolute target is a 54.3% emissions reduction from the 2019 inventory findings.

To support the 2030 United States Greenhouse Gas Emission Reduction target or Nationally Determined Contribution, the east central Florida region has a duty to reduce 2019 emissions by at least 54.3%. Scientists broadly agree that global emissions need to be reduced by 45% by 2030to keep warming below 1.5°C to limit the recognized climate change impacts like sea level rise, flooding, and extreme heat.

Setting the science-based target (SBT) as a regional goal puts East Central Florida in alignment with the ambition necessary to achieve national and global goals, encourages collaboration, drives innovation, improves the region's economic competitiveness, and creates a synergistic outcome toward reductions. The absolute regional SBT is more definitive and considers changing populations including seasonal changes to population and high annual growth of the population within the region.

Absolute Target: The most compatible with local government methodologies, absolute targets consider population growth and offer definitive reduction.

Action: The East Central Florida Region will use the target to define and guide a series of high-impact actions to reduce emissions.

3.4 Regionwide GHG Reduction High Impact Actions and Goals (measures)

The Climate Pollution Reduction Grant (CPRG) enables regions and states to develop and implement plans for reducing GHG emissions and other harmful air pollutants. The 2019 GHG inventory previously developed enabled the identification of high impact actions and goals (priority measures). This identification added momentum to the ongoing resilience and sustainability efforts in the region. The efforts undertaken focused and furthered discussions, stimulating and accelerating activities within these key sectors.

The high impact actions and goals in this section have been identified as "priority measures" prior to the expansion to include additional sectors. This list is not exhaustive of the east central Florida region's (including Orlando-Kissimmee-Sanford MSA) priorities and therefore the high impact action scenarios are anticipated to be broadened to incorporate additional strategies which will modify the goals and allow for additional strategies and focus actions. As no one "measure" can adequately address the concerns of each community, a combination of pathways and collaborative efforts can provide a blueprint and produce transformative action. The upcoming comprehensive climate action plan (CCAP) process will facilitate this process.

The subsequent sections introduce the concept of the high impact actions and goals (priority measures), detailing the carbon reduction potential, key implementation agency or agencies and the momentum, actions, and policies already in progress. These have been captured to encompass the whole east central Florida region to allow collaboration, leverage expertise and accelerate action between local governments, businesses, and organizations.

3.4.0 Identifying Regionwide High Impact Actions and Goals (Priority Measures)

Upon completion and review of the 2019 regionwide GHG emission inventory results, established science-based target, emissions forecast, and high impact actions analysis, the East Central Florida Planning Council accepted and unanimously supported the development of an Integrated Climate Action Plan in March of 2022. In addition, ECFR2C will continue to track key sectors and emissions indicators on an ongoing basis on behalf of the R2C partners. The inventory illustrates that residential and non-residential energy consumption in buildings, in addition to transportation/ land use patterns, offer a significant opportunity for reduction with collective action. The region requires bold commitment and action from entities across east central Florida to drastically reduce fossil fuel-based sources for the generation and consumption of energy and transportation services and significantly increase the use of alternative fuels that directs the region toward carbon-free and low emitting sources in those sectors. Through these efforts and others, the east central Florida region can achieve environmental, economic, and social benefits beyond reducing emissions.

The goals and strategies detailed within the next section have been developed through the R2C, identifying momentum within the region under each over-arching, high impact action. These goals and strategies which fall within each high impact action illustrate the momentum and pathways to implementation. However, these alone will not enable the region to meet the science-based target to reduce emissions by 54.3% and as such they will be progressed and advanced alongside additional focused actions within the comprehensive climate action plan to embolden the region to reach the target.

3.4.1 High-Impact Actions and Goals (Priority Measures)

Table 6: Summary of High Impact Actions and Goals (Priority Measures)

High Impact Action and Goal Summary (Priority Measure)	Potential Near Term Net Reduction (MT CO_2e)	Implementing Agency or Agencies	Geographic Scope
Region-wide Grid Decarbonization Pathway	1,586,127	Local, Regional, Utility Providers	east central Florida region
Vehicle Miles Traveled Reduction (Gasoline - 12%, Diesel - 6%)	1,681,895	Air Pollution Control Agencies, Transportation agencies, Counties, Municipalities	east central Florida region
Electric Vehicle (EV) Adoption (4.5% Annual Growth)	3,160,237	Counties, Municipalities Local, Regional	east central Florida region
Expansion of Residential Solar PV Deployment (15% of region-wide capacity)	2,254,620	Counties, Municipalities Local, Regional	east central Florida region
Commercial Buildings Energy Efficiency	1,360,859	Counties, Municipalities Local, Regional	east central Florida region
Residential Buildings Energy Efficiency	2,944,169	Counties, Municipalities Local, Regional	east central Florida region
Reduce and divert waste and increase emissions capture	Low	Counties, Municipalities Local, Regional, Water and Waste Service Providers	east central Florida region
Protect and enhance biodiversity and natural systems	Medium	Counties, Municipalities Local, Regional	east central Florida region

3.4.1.1 Decarbonization

High Impact Action: Decarbonization

Goal: Reduction of grid carbon emissions related to the generation of electric power - phasing out of fossil fuels in grid power operations by 2030.

As part of HIA Analysis for grid decarbonization, ICLEI was appointed to calculate and apply an emissions reduction planning scenario. This reduced the carbon factor of grid emissions annually by 1% for residential sector, 0.6% for the commercial sector and 0.5% for the industrial sector. These weighted figures were calculated based on the utility mix of the region and considered information within Duke and FPL's electricity demand experiences and 10-year site plans.

2030 Near Term Net Reduction - 1,586,127 MT CO_2e

Potential Funding Sources – Federal, County, City

Tracking Metrics - % of energy from renewable or alternate sources

Schedule and Milestones: This goal will be broadened in scope with additional strategies already developed for 2030. Strategies and actions will be advanced through ongoing discussions at R2C GHG reduction committee meetings to yield additional updates and further goal and strategy forecasting that will be advanced during the comprehensive climate action plan (CCAP) process due summer-fall 2025. A 2022 GHG inventory is currently underway and will act as an assessment of the region's progress and feed into the reduction goal and solidify identified strategies.

The strategies outlined in the following table illustrate how high-impact actions and goals can be translated into actionable strategies and initiatives.

Decarbonization strategies
Establish renewable energy generation commitments.
Increase solar installation and programs.
Expand and augment building weatherization and improvement.
Increase waste to energy conversion.
Support appropriate utility-owned renewables and energy storage and utility relationships.
Establish renewable energy pool purchasing programs.
Establish future land use and planning best practices.
Promote clean energy workforce training.

Promote efficient and reliable grid practices.
Develop and expand distributed generation solutions and grid reliability.
Increase biogas to energy conversion

3.4.1.1.1 Methods and Assumptions

ICLEI and the R2C only had access to high-level utility 10-year site plans, it can be concluded the region needs action to decarbonize by reducing fossil fuel-based electricity generation and commit to significantly more carbon free and renewable energy sources by 2030. Approximately 75% of the region's energy is supplied by natural gas (figure 6). Relying too heavily on a single fuel source is a practice that can introduce volatility into the energy sector. This approach proves unstable in the marketplace and fails to demonstrate adequate redundancy levels necessary to uphold a resilient energy supply for the region.

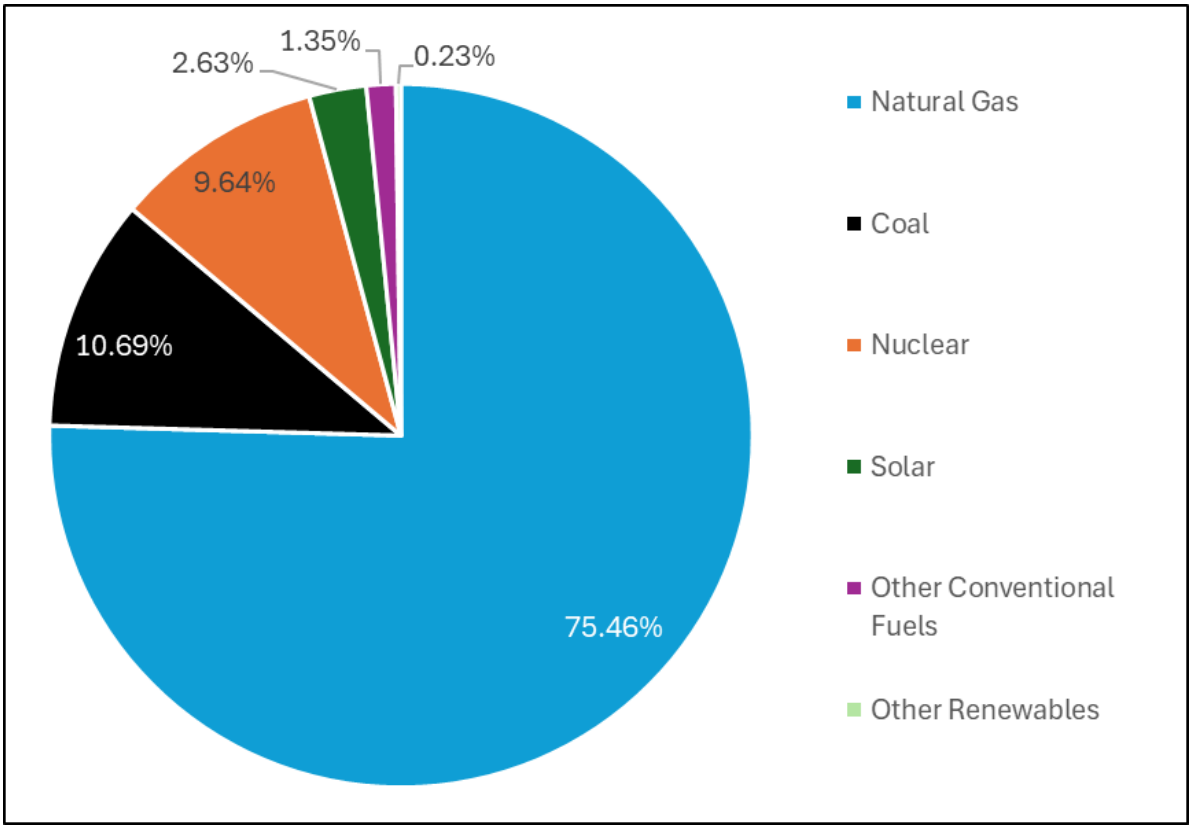


Figure 6: Electricity Grid Fuel Sources

ICLEI ClearPath was utilized to calculate the GHG reduction emissions of grid decarbonization. The forecast used is discussed in Section 3.2 GHG Emissions Projections of this report.

For each energy sector, residential, commercial, and industrial a weighted carbon intensity factor annual compound growth rate was applied to the business-as-usual model to demonstrate carbon emission reductions whereby grid carbon is reduced and projected from

2023 to 2030. Florida Power and Light (FPL) and Duke make up the largest proportions of energy providers in the region. The weighted average carbon intensity factor applied was calculated based on the mix of utility providers who contribute different kWh proportions across each sector: residential, commercial, and industrial.

Residential Sector Energy

Compound rate change in grid energy carbon intensity: -1% per year.

Commercial Sector Energy

Compound rate change in grid energy carbon intensity: -0.6% per year.

Industrial Sector Energy

Compound rate of change in grid energy carbon intensity: -0.5% per year

The tables below illustrate the percentage proportion of grid energy sources in 2019 to 2030.

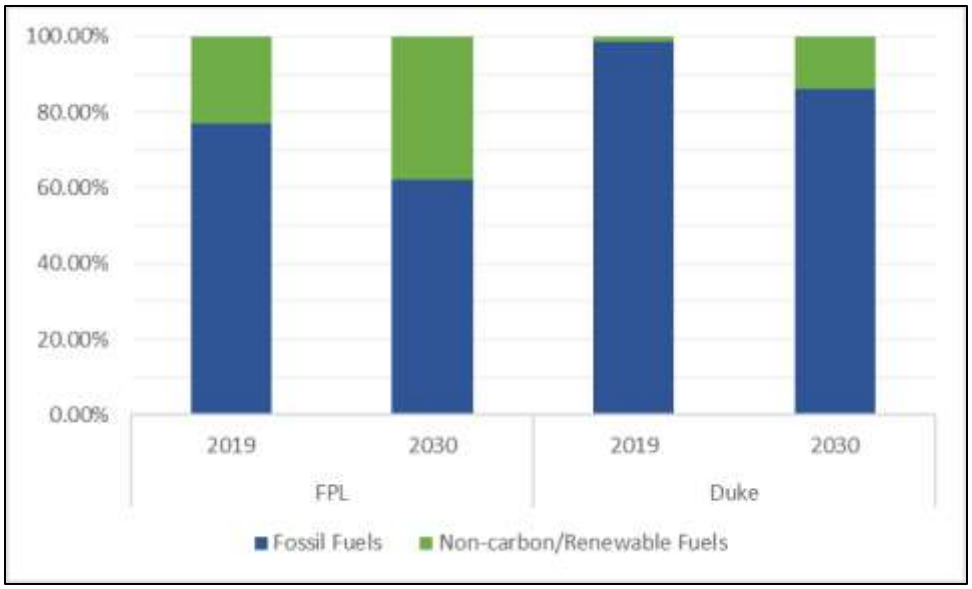


Figure 7: Grid Energy Sources FPL and Duke 2019 and 2030

Table 7: Grid Energy Sources % Duke Energy, 10-year site plan

	Fossil Total	Non-carbon/RE Total
2019	98.466%	1.534%
2030	86.006%	13.994%

Table 8: Grid Energy Sources % Florida Power and Light, 10-year site plan

	Fossil Total	Non-carbon/RE Total
2019	77.00%	23.00%
2030	62.27%	37.73%

3.4.1.2 Vehicle miles traveled (VMT) reduction

High Impact Action: Reduce vehicle miles travelled (VMT)

Goal: Reduction of internal combustion-engine vehicle miles traveled by at least 12% in gasoline vehicles and 6% in diesel vehicles by 2030.

R2C's applied VMT reduction scenario includes a reduction in gasoline vehicle miles travelled of at least 12% and a reduction in diesel vehicle miles of 6% or higher.

2030 Near Term Net Reduction - 1,681,895 MT CO_2e

Potential Funding Sources – Federal, County, City

Tracking Metrics – vehicle miles travelled

Schedule and Milestones This goal will be broadened in scope with additional strategies already developed for 2030. Strategies and actions will be advanced through ongoing discussions at R2C GHG reduction committee meetings to yield additional updates and further goal and strategy forecasting that will be advanced during the comprehensive climate action plan (CCAP) process due summer-fall 2025. A 2022 GHG inventory is currently underway and will act as an assessment of the region's progress and feed into the reduction goal and solidify identified strategies.

The strategies outlined in the following table illustrate how high-impact actions and goals can be translated into actionable strategies and initiatives.

Vehicle miles traveled (VMT) reduction strategies
Increase and improve transit ridership and options, routes, and operating hours.
enhance an interconnected system with alternative forms of transportation and the influence of smart technologies
Integrate multi-modal transit-based development and land use planning to increase densities and intensities around transit stations.
Encourage employee telecommuting and remote work programs.
Reduce reliance/dependance on personal vehicles.
Improve fleet and freight management strategies.
Encourage emerging technologies and innovative practices to reduce emissions

3.4.1.2.1 Methods and Assumptions

ICLEI ClearPath was utilized to calculate the GHG reduction emissions of a reduction in vehicle miles travelled. The forecast used is discussed in Section 3.2 GHG Emissions Projections of this report.

For each fuel type gasoline and diesel, the amount of vehicle miles travelled was reduced by 12% and 6% respectively and projected to 2030. The ICLEI ClearPath tool calculated the emissions reductions the reduced VMT saves.

Gasoline

2019 Gasoline VMT: 33,329,031,223.00

12% Reduction: 3,999,483,746.76

VMT Reductions Per year (8 years (2023-2030)): 499,935,468.3

Diesel

2019 Diesel VMT: 3,555,686,820.00

6% Reduction: 213,341,209.20

VMT Reduction Per Year (8 years (2023-2030)): 26667651.15

On-road transportation fuel efficiency standards[16] (CAFE Standards) developed by ICLEI are used within the GHG emissions reduction modelling. Fuel efficiency standards are used to project the reduction of emissions intensity for each mile driven by on-road vehicles. Fuel efficiency standards decrease emissions due to federally mandated improvements in vehicle fuel economy. ICLEI developed variables from fuel efficiency projections provided by the Center for Climate and Energy Solutions[17] (C2ES).

3.4.1.3 Electric vehicle (EV) and alternative fuel adoption

High Impact Action: Increase electric vehicle (EV) adoption.

Goal: Implementing necessary infrastructure support to promote and increase electric vehicle use to a rate of 4.5% annual growth in EV VMT.

R2C's applied on-road EV adoption emissions reduction scenario includes a minimum of 4.5% annual growth in EV vehicle miles travelled. This measure was selected based on regional consensus on current and project EV adoption numbers in addition to the median of nationwide EV sales projections and California's EV sales projections (extrapolated using a vehicle turn in rate of 9%).

2030 Near Term Net Reduction - 3,160,237 MT CO_2e

Potential Funding Sources – Federal, County, City

[16] Default Fuel Efficiency Standards

[17] Center for Climate and Energy Solutions

Tracking Metrics – EV miles travelled

Schedule and Milestones: This goal will be broadened in scope with additional strategies already developed for 2030. Strategies and actions will be advanced through ongoing discussions at R2C GHG reduction committee meetings to yield additional updates and further goal and strategy forecasting that will be advanced during the comprehensive climate action plan (CCAP) process due summer-fall 2025. A 2022 GHG inventory is currently underway and will act as an assessment of the region's progress and feed into the reduction goal and solidify identified strategies.

The strategies outlined in the following table illustrate how high-impact actions and goals can be translated into actionable strategies and initiatives.

Electric vehicle (EV) and alternative fuel adoption strategies
Expand alternative fuel and EV infrastructure.
Launch alternative fuel and EV workforce development training.
Transition fleets to alternative fuel vehicles.
Streamline procurement through partnerships and programs.
Increase public engagement and education.
Facilitate the public's EV transition.
Explore and encourage innovative fuel technologies.

3.4.1.3.1 Methods and Assumptions

ICLEI ClearPath was utilized to calculate the GHG reduction emissions due to a growth in EV vehicle adoption. The forecast used is discussed in Section 3.2 GHG Emissions Projections of this report.

Following the vehicle miles travelled reduction measure 4.5% of the remaining miles travelled by gasoline vehicles were then modelled as being travelled by electric vehicles and projected to 2023. The ICLEI ClearPath tool calculated the emission reductions resulting from the increase in vehicle miles travelled by electric vehicles opposed to those miles being travelled by gasoline vehicles. Cumulatively the percentage of gasoline vehicles displaced by electric at the end of the program is 45%.

VMT After VMT Scenario Reduction: 29,329,547,476.24

4.5% per year replaced with electric vehicles through 2030.

3.4.1.4 Commercial/Residential Building energy efficiency

High Impact Action: Increase energy efficiency of commercial and residential buildings.

Goal: Improve building efficiency requirements and usage performance related to heating, cooling and lighting to achieve a 36.9% reduction in building energy-use intensity

The R2C applied residential & commercial buildings energy efficiency scenario that estimates for all new building and 1% of existing building square footage (from normal renovations and turnover) to meet IECC 2018 energy codes. In addition, 5% of the existing building stock square footage will experience a 20% reduction in energy use intensity from additional renovations/changes. These changes result in an estimated 36.9% reduction in building energy-use intensity, based on national assumptions extrapolated from the 2012 Energy Information Administration Commercial Building Energy Consumption Survey and Pacific Northwest National Laboratory.

Commercial Buildings 2030 Near Term Net Reduction - 1,360,859 MT CO_2e

Residential Buildings 2030 Near Term Net Reduction - 2,944,169 MT CO_2e

Potential Funding Sources – Federal, State, County, City

Tracking Metrics – % energy reduction

Schedule and Milestones: This goal will be broadened in scope with additional strategies already developed for 2030. Strategies and actions will be advanced through ongoing discussions at R2C GHG reduction committee meetings to yield additional updates and further goal and strategy forecasting that will be advanced during the comprehensive climate action plan (CCAP) process due summer-fall 2025. A 2022 GHG inventory is currently underway and will act as an assessment of the region's progress and feed into the reduction goal and solidify identified strategies.

The strategies outlined in the following table illustrate how high-impact actions and goals can be translated into actionable strategies and initiatives.

Energy Efficiency Strategies
Accelerate energy efficiency retrofits and weatherization with a focus on high performance standards including energy star certification
Encourage stronger energy efficient/high performance building design standards, to include solar ready, as a standard of practice.
Employ energy management tools, standards, policies and programs.
Develop and expand energy efficiency outreach, education, and tools.
Increase outreach to communities to provide energy efficiency tool kits.
Promote energy audits.
Develop and promote green building training and workforce development programs.
Establish/incentivize energy reduction goals

3.4.1.4.1 Methods and Assumptions

This sector of GHG emissions, encompassing the built environment, is dominated by energy use to condition the spaces within our buildings and homes as well heating the water we use. Weatherization improves the reliance of our homes and building against environmental conditions, reducing the energy required and as such improving energy burdens and reducing emissions created by that energy. By creating lean (minimizing energy demand), clean (utilizing the most efficient heat and cooling equipment and sources) and green buildings the region can improve the resilience of buildings and homes.

ICLEI ClearPath was utilized to calculate the GHG reduction emissions due efficiency improvements with residential and commercial buildings via existing building renovations and improvements to meet the IECC 2018 energy codes. The forecast used is discussed in Section 3.2 GHG Emissions Projections of this report.

Detailed below is data and sources utilized within the GHG reduction calculations performed within ICLEI ClearPath.

Residential Buildings – Existing Buildings Renovations

This record represents 5% of all Square Feet (existing) per year is reduced by 20% (energy)

Total reduction to 2030: 3,442,750,073 kWh

Annual kWh reduction: ~312,977,279 kWh

This represents forecast reductions through 2030.

Residential Buildings - Existing Buildings (IECC 2018 Code)

This record represents 2% of existing Square Feet (1% is standard renovations and turnover) will meet IECC 2018 (Nationwide estimate of 36.95% reduction in building EUI)[18].

Total reduction to 2030: 2,289,848,646 kWh

Annual kWh reduction: ~ 228,984,865 kWh

This represents forecast reductions through 2030.

Residential Buildings - New Buildings (IECC 2018 Code)

This record represents All new buildings will meet IECC 2018 (Nation wide estimate of 36.95% reduction in building EUI)[18]. Calculations done on internal HIA Spreadsheets:

Total reduction to 2030: 2,983,940,137 kWh

Annual kWh reduction: ~ 298,394,014 kWh

This represents forecast reductions through 2030.

Commercial Buildings – Existing Buildings Renovations

This record represents 5% of all Square Feet (existing) per year is reduced by 20% (energy)

Total reduction to 2030: 1,880,489,247 kWh

Annual kWh reduction: ~170,953,568 kWh

This represents forecast reductions through 2030.

Commercial Buildings - Existing Buildings (IECC 2018 Code)

This record represents 2% of existing Square Feet (1% is standard renovations and turnover) will meet IECC 2018 (Nation wide estimate of 36.95% reduction in building EUI)[18].

Total reduction to 2030: 1,250,754,677 kWh

Annual kWh reduction: ~ 125,075,468 kWh

This represents forecast reductions through 2030.

Commercial Buildings – New Buildings (IECC 2018 Code)

This record represents All new buildings will meet IECC 2018 (Nationwide estimate of 36.95% reduction in building EUI)[18].

[18] https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-28125.pdf Site EUI is 51.7
https://www.eia.gov/consumption/commercial/data/2012/c&e/pdf/e2.pdf Site EUI is 82.0

Total reduction to 2030: 857,284,316 kWh

Annual kWh reduction: ~ 85,728,432

This record represents forecast reductions through 2030.

3.4.1.5 Increase solar photovoltaic deployment

High Impact Action: Increase residential solar photovoltaic deployment across the region.

Goal: Amplify local jurisdiction initiatives that help increase residential solar PV adoption for a deployment rate of 15% of the total residential solar rooftop capacity.

The committee has discussed and plans to broaden the scope of this goal to include residential, commercial, municipal and large-scale solar PV.

R2C's applied residential rooftop solar PV scenario estimates for a deployment of 15% of the region's total residential rooftop solar PV capacity. This county-wide deployment percentage is based on Google's Environmental Insights Explorer residential rooftop solar PV capacity data.

2030 Near Term Net Reduction - 2,254,620 MT CO_2e

Potential Funding Sources – Federal, County, City

Tracking Metrics – number of solar permits granted, kW capacity of solar PV installations

Schedule and Milestones:

This goal will be broadened in scope with additional strategies already developed for 2030. Strategies and actions will be advanced through ongoing discussions at R2C GHG reduction committee meetings to yield additional updates and further goal and strategy forecasting that will be advanced during the comprehensive climate action plan (CCAP) process due summer-fall 2025. A 2022 GHG inventory is currently underway and will act as an assessment of the region's progress and feed into the reduction goal and solidify identified strategies.

The strategies outlined in the following table illustrate how high-impact actions and goals can be translated into actionable strategies and initiatives.

Solar photovoltaic strategies
Establish a regional solar PV installation goal.
Align solar PV implementation with national best practices.
Protect and encourage consumer focused- incentives and net metering.
Streamline solar permitting.
Build and strengthen solar workforce development programs and training.
Increase and support public education and outreach.
Increase solar co-op participation.
Increase public/private partnership.
Identify and implement solar parking/carport opportunities.
Develop and implement solar readiness code.
Utilize distributed renewable energy for emergency management.
Reduce renewable energy and energy efficiency soft cost.
Reduce barriers within land use and zoning standards that could unnecessarily prohibit solar PV installations

3.4.1.5.1 Methods and Assumptions

ICLEI ClearPath was utilized to calculate the GHG reduction emissions due to a growth in solar PV of 15% of the region's total residential rooftop solar PV capacity. The forecast used is discussed in Section 3.2 GHG Emissions Projections of this report.

The generation potential was calculated in conjunction with Google's EIE data resource. The ICLEI ClearPath tool calculated the emission reductions resulting from the increase in solar PV being adopted in the residential sector with a weighted generation potential across the region of 1520 kWh/kW per system. The projected installed capacity through 2030 was calculated at 613114.2857 kW/year. The ICLEI ClearPath tool was used to calculate the emission reductions from replacing grid supplied electricity with the solar PV generated kWh.

Generation potential weighted average: 1520.49986 kWh/kW

Google EIE Region-wide Total Capacity (MW): 28612 MW

Google EIE Region-wide 15% of total Capacity (MW): 4291.8 MW

Installed Capacity within 7 years (2023-2030): 613114.2857 kW/year

3.4.2 Waste Sector

In the spring of 2023, the ECFRPC and ECFR2C engaged in work within the waste sector. The initial effort centered on examining the vulnerabilities of the region's waste system and physical infrastructure. At the start of the project, vulnerability was defined as the propensity for landfills, material collection sites, recycling facilities, and transfer facilities to face physical challenges caused by storm surge, sea level rise, and flooding.

However, a component of this effort was to convene the region's local government waste professionals in a set of outreach and engagement meetings. Through this series of meetings, waste professionals from every regional county detailed other vulnerabilities felt by the physical infrastructure, as well as the industry's workforce. The list of vulnerabilities was expanded to include factors such as facility capacity, workforce availability, land availability, and others.

Following the evaluation of these vulnerabilities, the waste stakeholder group drafted a list of recommendations to increase waste diversion as the region moved forward.

Waste strategy recommendations
Encourage regional collaboration for sustainable materials management.
Optimize waste reduction.
Identify opportunities for collaboration between public and private sectors.
Promote innovative technologies
Advance and strengthen the regional waste network
Promote consistent messaging about waste diversion
Improve transparency and efficiency in waste management operations.

2030 Near Term Net Reduction – low greenhouse gas emissions reductions. Waste emissions will increase as the regional population increases, therefore strategies to reduce the per capita disposal rates and increase diversion rates will enable the region to limit increasing emissions from this growing sector.

Potential Funding Sources – Federal, State, County, City

Tracking Metrics – % emissions reduction, energy produced (kWh)

Schedule and Milestones:

These strategy recommendations will be broadened in scope and additional strategies will be developed for 2030. Strategies and actions will be advanced through ongoing discussions at waste stakeholder group meetings to yield additional updates. Further goal and strategy forecasting will be advanced during the comprehensive climate action plan (CCAP) process due

summer-fall 2025. A 2022 GHG inventory is currently underway and will act as an assessment of the region's progress and feed into the reduction goal and solidify identified strategies.

3.4.3 Land Use and Forestry Sector

The strategic resilience action plan was developed following the ECFR2C's establishment in 2019 as well as the convening of a grey, green, and blue infrastructure committee which progressed the region towards resiliency. This work included identifying regional green, blue and grey assets and infrastructure systems to strengthen functionality, accommodate growth and future migration, protect biodiversity, ecosystem services, natural floodplains and wetlands, and their economic interdependencies toward a more resilient region. Within Oceola County residents voted to assess themselves to create a fund for land purchase, over 3,300 acres have been purchased through the program. This is also complemented by the Osceola County Urban Forest Management Plan produced in 2022[19]. Vulnerabilities within the region must be addresses holistically including the consideration of biodiversity and natural systems and their role in providing resilience in the region including but not limited to functions such as carbon sequestration and water recharge and capture.

Land use and forestry sector strategy recommendations
Encourage the protection and enhancement of tree canopy and green spaces.
Promote the protection of wildlife management and conservation areas from encroachment.
Promote innovative design that encourages development to complement natural resources and features.
Advance the use of nature-based solutions.
Promote inclusion and protection of native biodiversity, and ecological corridors.
Foster awareness of biodiversity, the value of natural systems and climate risks.
Consider ecosystem services in development approvals.

2030 Near Term Net Reduction – medium greenhouse gas emissions reductions

Carbon emissions from land use and forest disturbances attribute 3.7% of the total gross emissions for the region.

Carbon removals from land use and forestry equate to 18.5% of the total gross emissions for the region.

[19] Urban Forest Management Plan

Potential Funding Sources – Federal, County, City

Tracking Metrics – area of land converted from forest to non-forested land, tree canopy cover

Schedule and Milestones:

These strategy recommendations will be broadened in scope and additional strategies will be developed for 2030. Strategies and actions will be advanced through ongoing discussions at stakeholder group meetings to yield additional updates. Further goal and strategy forecasting will be advanced during the comprehensive climate action plan (CCAP) process due summer-fall 2025. A 2022 GHG inventory is currently underway and will act as an assessment of the region's progress and feed into the reduction goal and solidify identified strategies.

3.4.4 Further Expansion of Actions and Goals

While actions within the energy and transportation sectors can yield higher levels of emission reductions, emissions from solid waste, wastewater, and nature-based solutions should not be overlooked. Although the latter actions yield less reductions, they support and move the region closer to the 2030 Science-Based Target. Therefore, the R2C GHG Reduction CommitteeR2C GHG Reduction Committee will integrate reduction strategies for all sectors of the inventory into the comprehensive climate action plan to provide a more holistic approach to emissions reduction.

3.5 Benefits Analysis

The following section discusses the framework and plans to be advanced and developed throughout the climate action planning process, providing an initial snapshot of regional momentum, co-pollutant benefits, planned analyses, and potential gains from emissions reduction actions. While focusing on emissions reduction, the High Impact Actions (HIAs) actions also yield additional benefits for the east central Florida region.

The ECFR2C GHG Reduction Committee has discussed and drafted a set of benefits for inclusion in the climate action planning process. These benefits include, improved environmental quality, encompassing both air, water, and land , improved health and wellbeing of the population, improved economic resilience, improved energy confidence, and enhanced mobility. Woven throughout these drafted co-benefits is equity. The committee agreed that as these benefits are realized, those communities and areas that feel the effects of the current business-as-usual scenario in greatest intensity, should reap the drafted benefits.

In specific relevance to air quality, the ECFR2C has initiated conversation and collaboration with air quality departments in partner governments. The air quality measurements and metrics throughout Florida have remained in compliance with federal standards, and the monitoring system exceeds federal standards. However, some areas approach the federal limit for certain air pollutants making actions with the co-benefit of environmental quality (and subsequently air quality specifically) important. Improving air quality and holding the region to a standard higher than that nationally mandated is also a benefit hopefully pursued within this plan.

The following benefits are anticipated to be realized for each of the HIAs as detailed below:

Grid Decarbonization: The decarbonization of grid energy is anticipated to create a variety of benefits within the region. In the process of decarbonizing the grid, there is potential for improvements in air quality and water quality. Based on the drafted strategies for the achievement of grid decarbonization, there is also potential to increase energy resiliency, diversifying the source of the region's energy. There is also potential for the reduction in electricity costs in the process of decarbonizing the grid. The HIA of grid decarbonization will potentially realize the co-benefits of improved environmental quality improved energy confidence.

Vehicle Miles Traveled (VMT) reduction: Similar to the anticipated benefits of EV deployment, reducing the number of vehicle miles traveled is anticipated to have marked improvements on air quality and overall health. Improved air quality is also anticipated to have positive effects on the current population diagnosed with asthma and

have the potential to lower asthma rates in the future. A method of reducing VMT lies in improving and expanding upon existing public transport. This is anticipated to benefit the region by allowing those currently blocked from public transport due to availability or proximity to engage with the service in higher frequency and with greater ease. Overall, the co-benefits under this HIA are projected to be improved environmental quality, improved health and wellbeing, and enhanced mobility.

Electric Vehicle (EV) and alternative fuel adoption: By encouraging the deployment of EVs, more internal combustion powered vehicles will be taken off of the road. This will ultimately improve air quality, especially in communities close to major roadways. Improved air quality is also anticipated to have positive effects on the current population diagnosed with asthma and possibly aid in lowering asthma rates in the future. EVs also require different infrastructure than fossil fuel powered cars. Overall, these benefits align with the co-benefits of improved environmental quality and improved health and wellbeing. The construction of alternate infrastructure will create additional jobs throughout the region, bolstering efforts under workforce development and expanding a trade industry. Workforce development and industry expansion is projected to be accompanied by resources and programs lowering the barrier of entry to these future jobs for those at all levels of educational attainment and socioeconomic status.

Commercial/Residential Building Efficiency: Building efficiency improvements will reap many benefits in addition to the reduction of GHG emissions. By retrofitting existing buildings and holding new structures to energy efficiency standards, energy costs will lower, benefitting the residents and businesses of the region. Improving building efficiency will hopefully create the co-benefit of improved economic resilience.

Increase Solar Photovoltaic (PV) Deployment: Installation of solar PV will diversify the production and supply of energy, adding a layer of resilience to the region's energy supplies. Solar PV installation will also potentially lower the cost of energy, similar to those strategies in the building efficiency category. Installing greater amounts of solar PV installations will hopefully create the co-benefits of improved economic resilience and improved energy confidence.

3.6 Low Income Disadvantaged Communities Benefits Analysis

3.6.0 Identify LIDACs and Climate Impacts and Risks

Low Income Disadvantaged Communities (LIDAC) were identified in the counties of Lake, Orange, Osceola, and Seminole counties, all of which are a part of the Orlando-Kissimmee-Sanford MSA.

The process of identification began by using the Climate Economic Justice Screen Tool (CEJST). CEJST evaluates areas by census tracts. Tracts are denoted as "burdened" when the area is identified as "low income" which is defined as "households where income is less than or equal to twice the federal poverty level" ***and*** meets more than one of the burden thresholds in the evaluated indicators.

The evaluated 29 indicators are categorized into the following eight groups: climate change, energy, health, housing, legacy pollution, transportation, water & wastewater, and workforce development. The individual indicators and their respective groups can be found in the graphic from EPA below:

Category	Environmental, climate, or other burdens	Socioeconomic burden
Climate change	1. Expected agriculture loss rate ≥ 90th percentile OR 2. Expected building loss rate ≥ 90th percentile OR 3. Expected population loss rate ≥ 90th percentile OR 4. Projected flood risk ≥ 90th percentile **(NEW)** OR 5. Projected wildfire risk ≥ 90th percentile **(NEW)**	Low income*
Energy	1. Energy cost ≥ 90th percentile OR 2. PM 2.5 in the air ≥ 90th percentile	Low income*
Health	1. Asthma ≥ 90th percentile OR 2. Diabetes ≥ 90th percentile OR 3. Heart disease ≥ 90th percentile OR 4. Low life expectancy ≥ 90th percentile	Low income*
Housing	1. Historic underinvestment = Yes **(NEW)** 2. Housing cost ≥ 90th percentile OR 3. Lack of green space ≥ 90th percentile **(NEW)** OR 4. Lack of indoor plumbing ≥ 90th percentile **(NEW)** OR 5. Lead paint ≥ 90th percentile	Low income*
Legacy pollution	1. Abandoned mine land present = Yes **(NEW)** OR 2. Formerly Used Defense Site (FUDS) present = Yes **(NEW)** OR 3. Proximity to hazardous waste facilities ≥ 90th percentile OR 4. Proximity to Superfund or National Priorities List (NPL) sites ≥ 90th percentile OR 5. Proximity to Risk Management Plan (RMP) sites ≥ 90th percentile	Low income*
Transportation	1. Diesel particulate matter ≥ 90th percentile OR 2. Transportation barriers ≥ 90th percentile **(NEW)** OR 3. Traffic proximity and volume ≥ 90th percentile	Low income*
Water and wastewater	1. Underground storage tanks and releases ≥ 90th percentile **(NEW)** OR 2. Wastewater discharge ≥ 90th percentile	Low income*
Workforce development	1. Linguistic isolation ≥ 90th percentile OR 2. Low median income ≥ 90th percentile OR 3. Poverty ≥ 90th percentile OR 4. Unemployment ≥ 90th percentile	High school education < 10%

Source: CEJST Technical Support Document

To evaluate communities across the region on a finer scale, further areas were identified using the Economic Justice Screening Tool (EJ Screen). EJ Screen measures area on a smaller scale, by census ***block*** rather than by census ***tract.*** Per EPA guidance, the layer of "EPA IRA Disadvantaged Communities" was used. The EPA IRA (Inflation Reduction Act) Disadvantaged Communities layer considers an "EJ (Environmental Justice) Index" when denoting a census block as an EPA IRA Disadvantaged Community. The first component considered for each census block is demographic. The demographic portion considers both the low-income population and the populations of people of color within the selected census block into account. This demographic data is then measured in conjunction with the thirteen supplemental environmental indices noted in the table below:

Variable	Description
1	Particulate Matter 2.5
2	Ozone
3	Diesel Particulate Matter
4	Air Toxics Cancer Risk
5	Air Toxics Respiratory Hazard Index
6.	Toxic Releases to Air
7.	Traffic Proximity
8.	Lead Paint
9.	RMP Facility Proximity
10.	Hazardous Waste Proximity
11.	Superfund Proximity
12.	Underground Storage Tanks
13.	Wastewater Discharge

The data is then displayed through an interactive mapping tool, highlighting the census blocks that exceed the established thresholds, denoting the area as a part of the EPA IRA Disadvantaged Communities. The census blocks that fell into this group were also identified and denoted, in addition to the census tracts already identified in the CEJST inquiry.

Finally, the region was evaluated for additional LIDAC areas against the East Central Florida Drivers of Vulnerability which led to the formulation of the social vulnerability (SoVI) Indicators. The drivers of vulnerability were formulated with the goal of highlighting indicators that would build resilience throughout the region. Building off the ECFR2C structure of people, places, and prosperity, indicators were discussed and selected across stakeholder committees in the areas of infrastructure, economic resilience, and health and equity. At the core of identifying and working around these drivers of vulnerability is to minimize disparity and engage in risk reduction.

The component of vulnerability directly aligns with the effort to identify LIDAC areas for the purposes of this project. Social vulnerability accounts for both population and infrastructure.

The component of social vulnerability (SoVi) includes the measurement of thirty-two indicators. These indicators range from percent of renters in the population to percent of those receiving social security benefits, and percent of those without a vehicle. A complete list of the 31 SoVi indicators can be found below. The indicators of social vulnerability, as well as the many other factors and indicators that comprise the entire risk formula, are measured in quarter-mile, hex shaped grids. This arial measurement allows for an even more granular evaluation of the region and its communities. The SoVi indicators were also decided on by the stakeholder committee. These bottom-up decisions add a region-specific nuance that supplements the evaluation already undertaken in the CJEST and EJScreen tools. By incorporating the SoVi data encapsulated in the risk assessment, this project also includes the years of meaningful engagement with regional stakeholders who have worked with and invested in the communities identified for now further outreach and engagement through this effort.

Variable	Description
1	Percent Civilian Unemployment
2	Percent Employment in Extractive Industries
3	Percent Employment in Service Industry
4	Percent Female Participation in Labor Force
5	Percent Renters
6	Percent Mobile Homes
7	Percent Unoccupied Housing Units
8	Percent Population under 5 years or 65 and over*
9	Percent of Children Living in 2-parent families
10	Median Age
11	Percent Female*
12	Percent Female Headed Households*
13	People per Unit
14	Percent Asian*
15	Percent Black*
16	Percent Hispanic*
17	Percent Native American*
18	Percent Poverty
19	Percent Households Earning over $200,000 annually

Variable	Description
20	Per Capita Income
21	Percent with Less than 12th Grade Education
22	Median Housing Value
23	Median Gross Rent
24	Percent of households spending more than 40% of their income on rent or mortgage
25	Percent Households Receiving Social Security Benefits*
26	Percent Speaking English as a Second Language with Limited English Proficiency
27	Nursing Home Residents Per Capita
28	Percent of population without health insurance
29	Percent of Housing Units with No Car
30	Percent with a Disability
31	Percent Subsidized Housing
32	Percent without Broadband Access

The indicators within SoVi are all measured and complied to give any individual quarter-mile hex-grid a score on a scale of 1 – 5. For the purposes of this effort, all hex grids with a SoVi score of 3 or higher were identified.

A map visually detailing the complete findings of this analysis can be seen below (figure 7). The map depicts the census blocks identified in CJEST, the census tracts identified in EJ Screen, and the quarter-mile ex grids identified in the regional risk assessment.

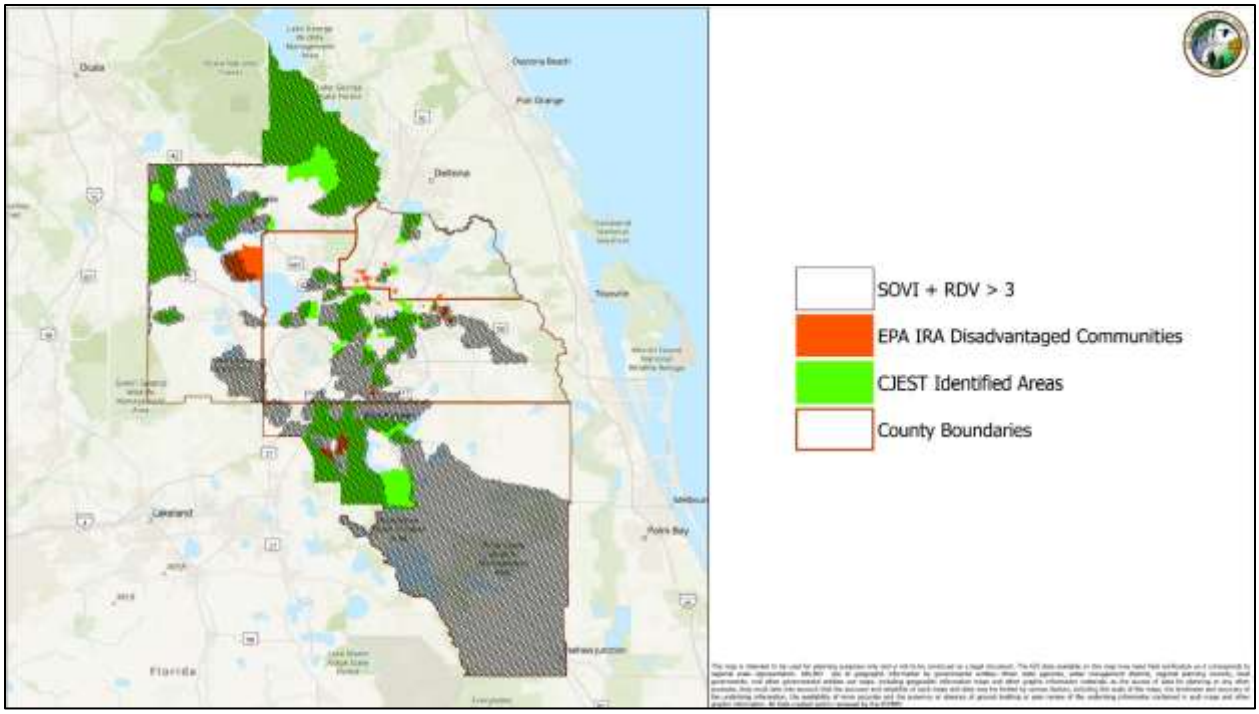


Figure 9: LIDAC Communities Map

These steps of evaluation and identification created a comprehensive and inclusive baseline of LIDAC areas to present to the environmental professionals comprising the CPRG team. The complete list of community names and their accompanying census tracts and blocks can be found in the appendices. The required Excel file detailing these findings has also been attached.

The preliminary research above not only identified LIDAC areas but noted the accompanying indicators with surpassed thresholds related to climate risks, impacts, and vulnerabilities. The complete list of indicators with exceeded thresholds can be found in the appendices. However, for each MSA partner, some climate risks of frequency are detailed below:

Table 9: LIDAC Climate Risks, Impacts and Vulnerabilities

MSA Partner	LIDAC Climate Risks, Impacts, and Vulnerabilities
Orange County	
	Diesel particulate matter exposure
	Proximity to Risk Management Facilities & Superfund Sites
	Energy Cost
City of Orlando	
	Diesel particulate matter exposure
	Proximity to Risk Management Facilities & Superfund Sites
	Energy Cost
	Transportation Barriers
Osceola County	
	Projected wildfire risk
	Diesel particulate matter exposure
	Ozone & Air Toxics risk

MSA Partner	LIDAC Climate Risks, Impacts, and Vulnerabilities
City of Kissimmee	
	Projected wildfire risk
	Diesel particulate matter exposure
	Energy Cost
Seminole County	
	Proximity to Risk Management Facilities & Superfund Sites
	Air Toxics Risk
	Diesel particulate matter exposure
Lake County	
	Projected wildfire risk
	Ozone & Air Toxics Risk
	Transportation barriers

3.6.1 Engage with LIDACs to understand community priorities

Following the identification of regional LIDAC areas, the MSA stakeholder group, comprised of local government professionals, were presented the initial findings which covered the areas identified, the methodology by which they were identified, and the comprehensive list of flagged indicators which are provided in the appendices of this document.

Additionally, the MSA stakeholder group reviewed the map displayed above, made edits to the jurisdictions of certain identified LIDAC areas based on the understanding and experience in the jurisdictions of focus.

Because outreach and engagement within LIDAC areas will be led by the jurisdictions with the ECFR2C serving as a mode to build capacity and connectivity across the MSA, the stakeholders were asked to consider the existing and planned investments and strong community organization connections in each LIDAC area identified and complete a virtual survey

Each MSA partner completed the aforementioned virtual survey. The responses gleaned important notes on existing investments in the identified LIDAC areas, planned projects in these areas, and furthermore where outreach for this effort would not only be effective, but beneficial for residents. Responses also provided contact information of community organizations well-established in the identified LIDAC areas. These community organizations will be instrumental in fostering meaningful connection and feedback directly from LIDAC areas as they have already created a connection with community members built on trust, reputability, and respect. The ECFR2C and MSA partners want to amplify these existing connections, working ***with*** the community, not ***for*** the community. as they have proven to be not only effective but authentic and is the best avenue to glean comprehensive feedback throughout this process.

To kick-start outreach and introduce this effort to the identified LIDAC areas, a community outreach survey was created. The survey is titled "East Central Florida Regional Resilience Collaborative EPA Climate Pollution Reduction Grant Community Survey" and has been initially provided in English and Spanish. The goal of the survey is to gain initial community knowledge on greenhouse gases and their environmental effects, as well as community input on the general challenges they face (e.g. high energy bills, proximity to major roadway, or lack of

access to well-paying jobs) and in the spaces of transportation, housing, and other priorities ranging from available green space to improved health. For each section asking respondents to rank the challenges they face, there is an accompanying section asking what benefits would be realized if these challenges were addressed.

The survey and its questions have been reviewed by the MSA stakeholder committee. The survey will be sent out virtually through MSA stakeholder networks and the community organization contacts received through the initial LIDAC area response form. The ECFR2C will also be housing links to the survey on its website as well.

The ECFR2C plans to begin outreach to the community organizations provided by MSA stakeholders through the "LIDAC area response form" in February 2024. Initial outreach will involve sharing the current "East Central Florida Regional Resilience Collaborative EPA Climate Pollution Reduction Grant Community Survey" survey for immediate distribution throughout networks and to allow feedback to be gathered as soon as possible. Conversations will be held collaboratively to determine when and where the planned in-person workshop should take place. As survey responses are collected, conversation between the ECFR2C, MSA stakeholder, and community organization will be held to determine the identified priorities and challenges of the community, and structure the content of the in-person meeting, aligning the activity to the ultimate deliverable required by the CCAP project. Ample notice will be provided ahead of in-person meetings. Outreach materials for the event will cover not only location, time, date and content, but an effort will be made to provide materials on ease of transport to the event, some type of incentive for attendance, etc.

3.6.2 Estimate potential benefits of GHG emission reduction high impact actions and goals (measures) to LIDACs

Based on initial findings, the climate risks, vulnerabilities, and impacts faced by the region's identified LIDAC areas, the indicators appearing most frequently were exposure to diesel particulate matter, risk of exposure to air toxics & ozone, barriers to transportation, and energy cost.

In terms of GHG reduction, the ECFR2C has established high impact actions (HIAs) to achieve the established 2030 reduction goal. These HIAs and the regionally informed strategies to implement them have the potential to lessen the severity of these conditions for LIDAC areas.

Exposure to diesel particulate matter and other air toxics including ozone was observed in all of the MSA partner jurisdictions. LIDAC areas in close proximity to a major highway will most likely feel more pronounced effects. Initial conversations with the MSA stakeholder group, in conjunction with research through CEJST and EJ Screen, has revealed that these specific LIDAC areas are most affected by poor air quality factors such as these presently. The high impact actions of vehicle miles travelled (VMT) reduction and EV deployment will not only lower greenhouse gas emissions originating from tailpipes but will also lower the amount of other air pollutants in tailpipe emissions. The state has a robust air-quality monitoring program which will allow for the tracking of air quality changes throughout the entirety of the grant length. In conjunction, health-related challenges, such as asthma rates in the identified LIDAC areas, are

hoped to decrease over the long-term, and in the short-term alleviate exacerbated symptoms for those already diagnosed.

The strategies to achieve the HIA of EV deployment includes expanding infrastructure and launching a workforce development program to bolster the EV industry. Expanded infrastructure, especially into LIDAC areas, would make the transition to EVs more feasible for all income levels, with the potential to bring further business into the area. A workforce development program would also provide those in the LIDAC areas with high levels of unemployment, a pathway toward a well-paying career in a growing industry.

One strategy to accomplish the HIA of VMT Reduction is expansion of public transit. This expansion will include both leveraging existing programs aimed at making already allocated dollars more effective and expand public transit, filling the gaps where existing routes and availability are not sufficient or available.

Fulfillment of the overall goal will address the barriers to transportation that many of the identified LIDAC areas face. Planned community engagement will also add needed nuance, specificity, and local relevance to how these strategies are accomplished, ensuring benefits for the communities that need it most.

Finally, throughout preliminary research, energy costs were prevalent in the LIDAC areas within Orange County, The City of Orlando, and the City of Kissimmee. The HIAs of building efficiency and grid decarbonization, along with the strategies formulated to implement them, will not only lower energy usage, but ensure that energy is supplied from low-carbon sources. The HIA of building efficiency contains strategies that build off of existing programs, amplifying success and bringing resources to those in LIDAC areas who need them. The HIA also contains strategies for energy efficiency retrofitting on previous construction and adhering to high performance standards for new buildings to lower energy usage into the future.

3.7 Review of Authority to Implement

A review of authority to implement has been conducted as part of this PCAP. Stakeholders from counties across the region were involved in a CPRG Planning group which meet once a month and were asked to provide details of existing policies and actions being carried out or planned across each of the high impact actions and goals (priority measures) identified. This builds upon the existing efforts previously conducted as part of the 2019 GHG inventory development and plan, whereby, a policy tracking document was established to record and track any policies and actions carried out or proposed by the counties.

Alongside this work the R2C GHG Reduction Committee has met to review strategy maps for each of the high impact actions and goals (priority measures). These meetings were dictated to the development and discussion of consensus on approaches and methodologies for recording, measuring, and reviewing the high impact actions, along with benefits across the community.

This section will address each of the five high impact actions contained within the review of authority, detailing regional synergies in action, the political and statutory mechanisms that create the authority to implement such efforts, creating momentum toward the previously mentioned goals for each high impact action. This review is important not only for the purposes of the EPA CPRG program, but to inform the implementations of the climate planning process as the ECFRPC does not have the statutory authority to implement action directly. It informs the climate planning process, addressing the five high-impact actions, detailing regional synergies, and specific actions taken or planned across various sectors to address climate change mitigation goals.

The following review provides a snapshot of the momentum underway in the region. Through this the region is developing its understanding of the policies and actions already being put in place across the region enabling the continuation of drafting best practice policies and actions across each sector and identifying areas that need additional research to accelerate emissions reduction activities and implementations.

3.7.0 Decarbonization

At the regional scale, the goal of grid decarbonization is to "reduce grid carbon emissions related to the generation of electric power" ultimately "phasing out fossil fuel use in grid power operations by 2030". This goal, discussed and drafted by the R2C GHG Reduction Committee, sets the region moving on a path forward. While this goal's adoption was motivated in part by the forecasting and measurement described previously in the PCAP, motivation also stemmed from existing and planned regional action already underway in this area.

Current and planned actions were gathered from all R2C partner counties and various municipalities within them. Actions were also gathered from utility providers, which is relevant to the high impact action of decarbonization.

Six regional partners contributed actions or projects that align with the goal of decarbonization. Orange County, The City of Orlando, The City of Cape Canaveral, The City of Winter Park, Volusia County and Osceola County all have some form of renewable energy commitments in place within their own jurisdiction-specific plans. These plans were adopted by each made through individual local government. This is the mechanism by which these regional partners have the authority to implement actions such as these in their respective jurisdictions.

Some renewable energy generation commitments center directly on ensuring the utility-generated power and usage is derived in part or entirely by renewable sources. Other commitments involve city buildings, with counties and municipalities aiming to offset building operations, equip their buildings with renewable battery backups, and hold new public buildings to energy efficiency standards.

The variation in these commitments and how they will be realized in the long term may reflect the feasibility of certain actions across the diverse east central Florida region. The potential outcomes because of these variations is an important factor for consideration as the region moves forward in the climate planning process.

More commonly, partners have narrowed in on solar installation to aid in the journey to decarbonization. The City of Cape Canaveral, the City of Maitland, the City of Orlando, and Orange County all aim to install solar on public buildings or on public grounds to begin and further the decarbonization of grid -provided energy. The City of PalmBay, the City of Cape Canaveral, the City of Maitland, and Orange County also plan to conduct further feasibility analyses to explore opportunities for grid decarbonization.

Another specific method of decarbonizing the grid being employed and explored by Orange County, Marion County and Seminole County throughout the region is landfill gas-to-energy conversion. Lake County has also engaged in the practice of waste-to-energy conversion by opening a waste-to-energy facility through partnership with the private sector.

These individual actions, and the mechanisms by which each jurisdiction has the authority to implement, moves each jurisdiction toward grid decarbonization in some form. However, when examined in conjunction with one another, a synthesis is built across jurisdictional boundaries. This synthesis not only builds regional momentum and strengthens the partnerships within the R2C, but opens avenues of collaboration and commitment to one another in the effort to tackle joint projects in the space of grid decarbonization, playing to the strengths of each jurisdiction's authority to implement. By combining the already aligned histories of each jurisdiction, a path forward is defined with all entities at the table to create a program that works in close coordination, not mere basic alignment.

3.7.1 Vehicle Miles Traveled (VMT) Reduction

At the regional scale, the goal of VMT reduction is to "Reduce internal combustion-engine vehicle miles traveled by at least 12% in gasoline vehicles and 6% in diesel vehicles by 2030." This goal was also discussed and drafted by the R2C GHG Reduction Committee and sets the region moving on a path forward. While this goal's adoption was motivated in part by the forecasting and measurement described previously, based on the largest emitting sectors in the 2019 GHG inventory, motivation also stemmed from existing and planned regional action already underway in this area.

With respect to VMT reduction, the R2C's partnered transportation planning organizations (TPOs) have been instrumental in lending context, experience, and perspective including their in-depth knowledge of current and planned programs and policies.

Space Coast, Ocala-Marion, and Volusia County TPOs all address the expansion of public transit as a key action integral in achieving VMT reduction. The actions range from ensuring expanded

hours of operation to providing a higher number of fixed bus routes, stops, and reduced headways. There is also an emphasis on the interconnectivity of all transit resources, making each rider's journey from one location to the next as seamless as possible in a car-dependent landscape. The City of Orlando, the City of Deltona, and the City of Winter Park also noted aligning strategies with those outlined by the TPOs. The existing momentum and strong alignment across jurisdictional boundaries paints the region as an area ripe for projects and efforts that will not only work to achieve organization-specific actions and policies but move toward a regional vision. The commitments and actions described here are made possible to implement through the plans created by and authority granted to transportation planning (TPOs) and their ability to draft and pass master plans.

Current and planned actions were gathered from all R2C partner counties and various municipalities within them. These actions made clear that while expansion of public transit is necessary to reduce VMT in a region with such extensive urban sprawl, considering land use as a tool to reduce VMT carries high importance. The City of Cape Canaveral, the City of Groveland, the City of Orlando, Orange County, and Osceola County consider either "complete streets", roadway configurations, and roadway safety as factors when creating new or revitalizing existing roadways to promote heavier use by pedestrians, bicyclists, and others using alternate forms of mobility.

The City of Melbourne, the City of Cocoa, Ocala-Marion TPO, and Osceola County are also engaged in increasing the number of pedestrians and bicyclists by prioritizing programs to provide facilities, safe and accessible sidewalks and bikeways, and walkable pedestrian and cycling environments between connected neighborhoods. Building on this idea of alternative mobility, the City of Orlando has also adopted a bike and electric scooter-share program, creating a robust micro-mobility program.

Seminole County, Volusia County, and Lake-Sumter TPO have all noted policies and programs that cater to more compact land-uses, encouraging less automotive dependency, ease of service by public transport services, and closer proximity between work and home.

Local governments have the authority to implement commitments and actions like these through their comprehensive plan process.

Partners across the region are engaged in aligning efforts, building the case for the necessity of further collaboration across jurisdictional boundaries to accomplish not only organization-specific goals, but, as a whole, gaining insight and regional perspectives, working toward an integrated, multi-faceted, regionally motivated path towards VMT reduction.

3.7.2 Electric Vehicle (EV) Deployment

At the regional scale, the goal for the high impact action of Elective Vehicle (EV) Deployment is to "implement necessary infrastructure support to promote and increase electric vehicle use to a rate of 4.5% annual growth in EV VMT". This goal was also discussed and drafted by the R2C GHG Reduction Committee and sets the region moving on a path forward. While this goal's adoption was motivated in part by the forecasting and measurement described previously in the PCAP, based on the largest emitting sectors in the 2019 GHG inventory, motivation also stemmed from existing and planned regional action already underway in this area.

The mechanisms which allow partners the authority to implement actions in the VMT reduction section are similar to those in this section.

Just as with VMT reduction, discussion and involvement of the region's TPOs have been integral to the discussion surrounding this aspect of transportation. Current and planned actions were gathered from all R2C partner counties and various municipalities within them. These actions, policies and programs related to expanding the infrastructure reinforced the need to make the adoption and use of EV's as accessible and realistic to the average resident and consumer as possible.

The City of Clermont, the City of Maitland, Osceola County, Ocala- Marion TPO, and the Central Florida Regional Expressway Authority, have all taken on projects that involve installing and expanding charging infrastructure at the organization buildings for use by employees and visitors. The City of Cape Canaveral and Winter Park have taken this idea a step forward, examining their public-facing charging infrastructure, beginning and maintaining programs that will upgrade existing public charging stations. The abundance of existing action surrounding the topic of expanding EV infrastructure creates a consensus on where regional partners are on the journey to increasing EV adoption, illustrating a baseline when considering the path forward.

With so much activity surrounding the expansion of charging infrastructure, the City of Orlando plans to establish a streamlined EV permitting process, creating more ease surrounding these new installations and improvements to current infrastructure. Volusia County TPO also plans to create a virtual tool detailing all public charging stations. The combination of these two actions would encourage expansion of infrastructure by lowering the barriers to installation and then further provide a resource so the public is aware of its availability. Isolated but complementary programs like these within the review of authority exemplify the need to build programs across jurisdictions, working together regionally to implement.

Finally, many local governments have recognized that they themselves can contribute to the number of EVs on the road. The City of Cape Canaveral, the City of Maitland, the City of Orlando, Orange County, Volusia County, and Lynx all have policies and programs in place to increase the proportion of vehicles in their fleet running on electricity. The fleet may encompass passenger vehicles used by organization employees or can refer to the fleet of public transport vehicles as is the case for Lynx. Incorporated within these policies and programs are an emphasis on public-private partnership to streamline the procurement of electric vehicles.

The redundancies in policy and programing builds momentum surrounding the ideas of expanding EV infrastructure, transitioning available fleet, and streamlining procurement as supported and regionally aligned actions to further the deployment of electric vehicles. The review of authority also illustrates gaps in implemented programs across the region, and how those programs could be connected to amplify and accelerate action.

3.7.3 Residential and Commercial Building Efficiency

The largest component of the regional GHG inventory stems from energy consumption across the residential, commercial, and industrial sectors. The goal for the high impact action directed at increasing residential and commercial building efficiency is to "improve building's energy requirements and usage performance related to heating, cooling, and lighting to reduce GHG

emissions and achieve a 36.9% reduction in building energy use intensity." This goal was also discussed and drafted by the R2C GHG Reduction Committee and sets the region moving on a path forward. While this goal's adoption was motivated in part by the forecasting and measurement described previously in the PCAP, based on the largest emitting sectors in the 2019 GHG inventory, motivation also stemmed from existing and planned regional action already underway in this area.

Overall, the City of Cape Canaveral, the City of Orlando, the City of Satellite Beach, and Brevard County have instilled standards surrounding the LEED certification of new and existing organization owned buildings. The same entities have also enrolled in other nationally recognized programs such as the Property Assessed Clean Energy Program (PACE), and Solar Energy Loan Fund (SELF) to aid making efficiency improvements to existing buildings, and in some instances particularly buildings in underserved areas.

Many R2C partners have varied programs in place to make retrofits to existing buildings with the aim of improving energy efficiency. The City of Palm Bay, the City of Ocala, Orange County, Osceola County, Volusia County, and Seminole County all noted of programs directed at existing buildings. These programs center on objectives from retrofitting buildings with products like LED lightbulbs to creating an efficiency report of all municipal facilities to determine where action in this area will begin.

Plans for new buildings are also being held up to energy efficiency standards. In the City of Cape Canaveral, the City of Orlando, the City of Winter Park, Osceola County, and Volusia County have all implemented programs where all new buildings must use a renewable source of energy, promoting energy conservation strategies in new buildings through audits and rebates, or building to LEED or ENERGY STAR standards. These commitments were made through individual local government-adopted plans. This is the mechanism by which these regional partners have the authority to implement actions such as these in their respective jurisdictions.

3.7.4 Solar Photovoltaic (PV) Installation

Solar opportunities are popular in the Sunshine State as a method of procuring renewable energy. The goal currently drafted to accelerate the effort under solar photovoltaic (PV) adoption aims to "amplify local jurisdiction initiatives that help increase residential solar PV adoption for a deployment rate of 15% the total residential solar rooftop capacity". This goal was also discussed and drafted by the R2C GHG Reduction Committee and sets the region moving on a path forward. While this goal's adoption was motivated in part by the forecasting and measurement described previously in the PCAP, based on the largest emitting sectors in the 2019 GHG inventory, motivation also stemmed from existing and planned regional action already underway in this area.

In the east central Florida region, Orange County, the City or Orlando, the City of Satellite Beach, the City of Winter Park, and the City of Maitland, have earned their SolSmart designation. The SolSmart program allows local governments to streamline their solar permitting process and install solar energy systems at an affordable rate. The items required by SolSmart for designation have all been identified by the R2C GHG Reduction Committee as important actions that should be undertaken across as many R2C partners as possible, to build

consensus and standardization through the program for a unified approach to solar PV installation.

In the jurisdiction of Orange County as well as at the regional organization level in the case of Solar United Neighbors, and Florida Power and Light (FPL) meter aggregation and solar co-ops are being explored as a method for residents to become engaged with solar, lowering many of the financial and property ownership barriers that exist for installation-only centered projects.

Such a unified front on solar PV installation lays a strong foundation for further implementation within the region.

4 Workforce Planning Analysis Organizing Framework

The purpose of the Regional Workforce Planning Analysis is to provide a framework to understand the region's green economy by focusing on the industries and occupations that would most probably benefit from the implementation of the PCAP report and any associated investments in green infrastructure/activities. The analysis is comprised of three main parts. First, the ECFRPC will develop an economic profile that discusses the characteristics of green industries and occupations within the region. This part of the report will also examine the current demographics of these green occupations. This would help to identify how underserved populations could benefit from the new green investments. For the second part of the analysis, the team will reach out to key workforce development and economic organizations to gain their insights on the green economy. This effort will help supplement the findings of the economic profile. Finally, the data gathered from these efforts will be used to estimate the economic impact of any proposed green investments using Greenlink's Green Jobs Calculator.

4.1.0 Economic Profile of Green Industries

The first step of this process is to develop a profile of green industries within the east central Florida region. For this first part of the process, the ECFRPC relied mostly on the framework developed by the Brookings Institute in the Advancing Inclusion through Clean Energy Jobs (2019) publication. This was one of the first documents to examine the prospective effects of the clean-energy transition on the national workforce and labor market opportunities. The study identified 80 industries key for the development of a green economy. The authors aggregated these industries into three main clean tech sectors (and five subsectors), which are described in more detail below:

- Clean Energy Production: This sector is comprised of industries directly involved in power generation (utilities), the manufacture of clean energy components (wind turbines, transformers, storage batteries), and the construction, operation, and maintenance of the electric grid (heavy and civil engineering construction).
- Energy Efficiency: This sector is comprised of industries involved in the manufacturing of energy-efficient products (home appliances, motor vehicles, etc..), and the development of green buildings.
- Environmental Management: This sector is comprised of industries involved in waste management, environmental remediation, and regulation.

Besides these three sectors, the ECFRPC also included the Engineering Services industry (NAICS 541330) in the first iteration of this analysis. This is because there might be several cutting-edge clean technology businesses that might not be currently included within the NAICS codes selected by Brookings. It is also important to note that not all of the chosen industries have presence in the region. Being the tourism capital of the world, East Central Florida has a very high concentration of jobs in the leisure and hospitality industry, as well as its supporting industries such as retail, transportation, and real estate development. While the ECFRPC has previously identified several regional industry clusters within the manufacturing/high technology sectors, few of them have establishments that could be considered "green". For example, the region is known worldwide for its high concentration establishment working in the development of turbine technologies. Both Siemens and Mitsubishi Power Systems have headquarters located within the region. However, it seems that these companies are more geared towards the development of gas turbine generators and aviation.

The first step of this analysis was to assess the state of the region's "green" economy using the Brookings framework. To complete this industry analysis, the ECFRPC used the Jobs EQ database which provides employment numbers by industry. The data is based on Quarterly Employment Compensation and Wages data produced by the US Department of Labor. The ECFRPC downloaded the information for its eight counties and aggregated it for the different sectors. The preliminary results are summarized in the table below. A complete list of the six-digit NAICS industries used to develop each subcategory is provided on Appendix 1.

Table 10: Employment by Industry Sector

Industry Sector	Subsector	Regional Employment	Percent Total
Clean Energy Generation, Manufacturing and Construction	Generation Utilities	2,517	1.8
	Grid Component Manufacturing and Construction	3,847	2.8
Energy Efficiency	Construction of Energy Efficient Buildings	86,340	62.3
	Manufacturing of Energy-Efficient Products	14,755	10.6
Environmental Management, Conservation and Regulation	Environmental Management, Conservation and Regulation	11,487	8.3
Other	Engineering Services	19,658	14.2
Grand Total		138,604	

Sources: Jobs EQ 2023, ECFRPC Calculations

According to Jobs EQ, these sectors currently employ over 130,000 people across there region. The Construction of Energy Efficiency Buildings subsector currently comprises over 60% of all the positions. Engineering Services is the second largest subcategory by employment (14.2 percent). Finally, the Manufacturing of Energy Efficient products comprises another 10.6 percent of the jobs within the region.

While this is a good snapshot of the regional economy, these job numbers are inflated. This is because not all of these positions cater to the "green" market. For example, the large concentration of jobs within the construction industry is mostly due to the demand generated by the increasing number of individuals moving to the region. While some of the firms within this industry may specialize in developing green buildings, the vast majority are not. This required the ECFRPC to develop a methodology to develop more realistic estimate of green jobs within the region.

To develop a more realistic estimate, the ECFRPC will use a list of green occupations created by Jobs EQ based on a study published by O*NET titled "Greening of the World of Work: Revisiting Occupational Consequences". The purpose of the original report and its follow up was to ascertain the effect of green economy activities on general occupational and skill requirements.

Similar to industry codes, labor economists use a six-digit taxonomy to disaggregate occupations based on the type of tasks performed at the job. Because several of these "green" occupations are new or emerging, they were classified with an 8-digit code. For example, SOC 11-3051 is the code for Industrial Production Managers. These are the individuals tasked with planning, directing, and coordinating all activities and resources necessary for manufacturing any type of product. O*NET defined several new green occupations under this category including Biofuels Production Managers (SOC 11-3051.03) and Methane/Landfill Gas Collection System Operators (11-3051.05). For the purpose of creating its "green" jobs list" JobsEQ cross walked the 8-Digit SOCs to 2018 Hybrid 6-Digit SOCs using its national job ads database. If at least 20 percent of the advertised positions followed the 8-digit code description, then the whole occupation was classified as green jobs. A complete list of green occupations found in East Central Florida will be included as Appendix 2 in the report.

The ECFRPC downloaded the employment numbers for all the identified green occupations for the three largest Metropolitan areas within the region (Orlando-Kissimmee, Sanford-Lake Mary, and Deltona-Palm Bay). To develop better employment estimates, the team will use the JobsEQ Industry/Occupation Matrix tool to ascertain the distribution of occupations within the green industries described previously. For example, while there are over 34,000 people working in Customer Service Representative positions, only five percent of them work on the green industries identified by Brookings.

Once this matrix analysis is completed, the ECFRPC will then have a final number of people working on green occupations and a table summarizing occupation can be generated. This will be a regional snapshot of East Central Florida's green economy. To supplement this information, the team will also identify a list of green establishments located within the region. This business inventory will be geocoded to depict the distribution of these businesses across the region. As part of this exercise, the team will also gather/estimate sales data for these businesses. This information might be useful for the modeling phase of the project.

As expressed in the EPA webinar, one of the plan's goals is to connect these "green jobs" with underserved populations. As part of the analysis process, the ECFRPC will use JobsEQ to determine demographic characteristics of several of these green occupations. These include age, race, gender, and ethnicity. Because of time and resource constraints, this analysis will only be performed for the largest occupations. The information gathered here will be used as base data in order to develop some career pathways that could connect underrepresented populations to growing green occupations.

4.1.1 Regional Organizations Outreach

After completing the green economy profile, the team will proceed to meet with several regional organizations to help validate and supplement the previous analysis' findings. These will include workforce development agencies, economic development organizations, and job training partners. The following organizations are of particular interest to this project (Table 8).

However, the team recognizes that time constraints will certainly limit the ability to contact all of them within the timeframe of this study.

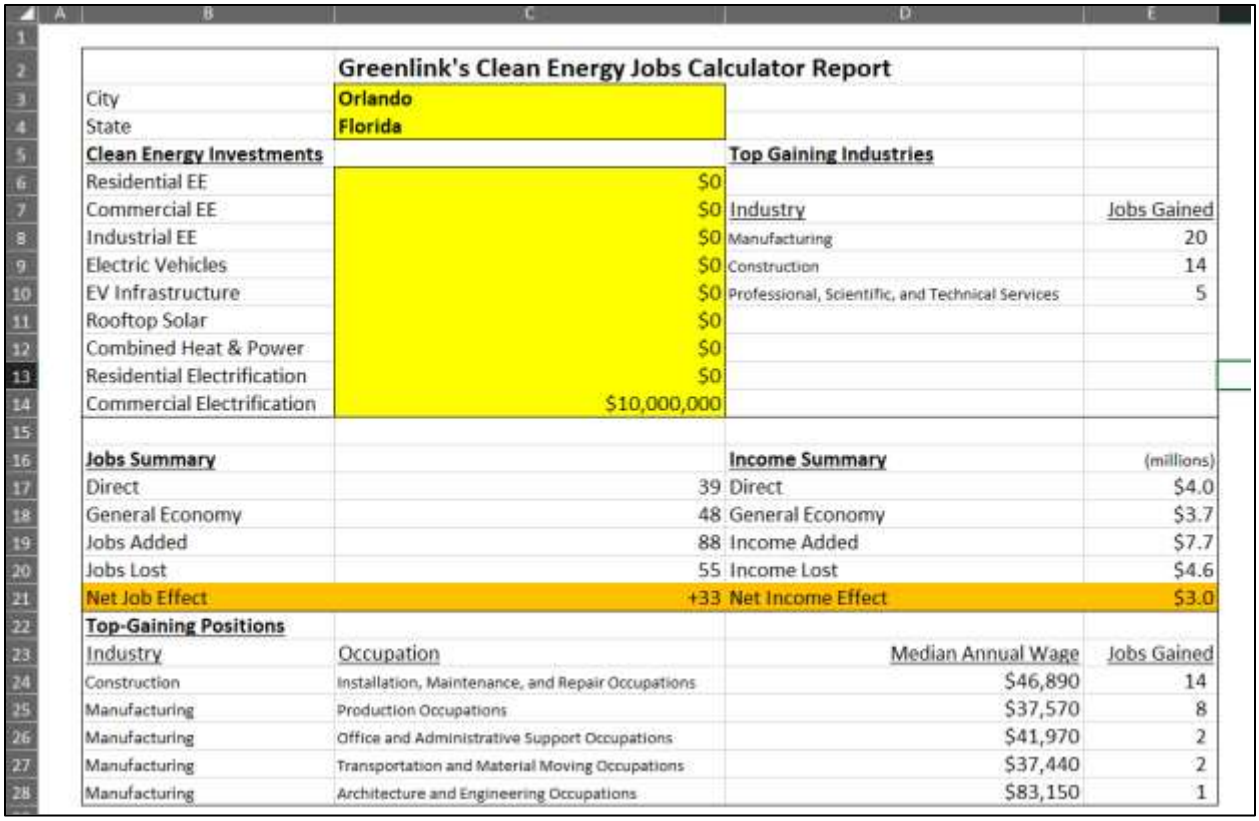
Table 11: Outreach Organizations

Name	Geography	Type	Role
Career Source Central Florida	Metro Orlando	Workforce Development	Assist with occupational growth forecast
Career Source Brevard	Brevard County	Workforce Development	Assist with occupational growth forecast
Career Source Volusia/Flagler	Volusia County	Workforce Development	Assist with occupational growth forecast
Florida Solar Energy Center	Regional	Technology Research	Verify occupational data
Jobs Partnership Florida	Metro Orlando	Job Training Partner	Career Pathways information
Sustainable Workplace Alliance	Metro Orlando	Job Training Partner	Career Pathways information
Florida High Tech Corridor	Regional	Economic Development	Energy and Environmental Sciences Cluster

The findings of this outreach and the "green" economy profile will assist with determining the technologies and activities that are most ripe for investment. This information will then be used to model the economic impact of "green" funding to our region.

4.1.2 Modeling the Links Between "Green" Investments and Jobs Creation

The ECFRPC will be teaming with *Greenlink Analytics* to estimate the economic impact that the new investments in green infrastructure and programs would have in the east central Florida region. The industry/occupational data will be adapted to follow the calculator's format, as depicted in Figure xx. Notice that clean energy investments are divided into nine categories: Residential Energy Efficiency, Commercial Energy Efficiency, Industrial Energy Efficiency, Electric Vehicles, EV Infrastructure, Rooftop Solar, Combined Heat and Power, Residential Electrification, and Commercial Electrification. Based on the region's economic characteristics, the ECFRPC foresees that not all of these areas will benefit from new investments.



Greenlink's Clean Energy Jobs Calculator Report				
City	Orlando			
State	Florida			
Clean Energy Investments			**Top Gaining Industries**	
Residential EE	$0			
Commercial EE	$0		Industry	Jobs Gained
Industrial EE	$0		Manufacturing	20
Electric Vehicles	$0		Construction	14
EV Infrastructure	$0		Professional, Scientific, and Technical Services	5
Rooftop Solar	$0			
Combined Heat & Power	$0			
Residential Electrification	$0			
Commercial Electrification	$10,000,000			
Jobs Summary			**Income Summary**	(millions)
Direct	39		Direct	$4.0
General Economy	48		General Economy	$3.7
Jobs Added	88		Income Added	$7.7
Jobs Lost	55		Income Lost	$4.6
Net Job Effect	+33		Net Income Effect	$3.0
Top-Gaining Positions				
Industry	Occupation		Median Annual Wage	Jobs Gained
Construction	Installation, Maintenance, and Repair Occupations		$46,890	14
Manufacturing	Production Occupations		$37,570	8
Manufacturing	Office and Administrative Support Occupations		$41,970	2
Manufacturing	Transportation and Material Moving Occupations		$37,440	2
Manufacturing	Architecture and Engineering Occupations		$83,150	1

Figure 10: Jobs Calculator

Source: Greenlink

The organization's *Clean Energy Jobs Calculator* uses multipliers to estimate the industries and occupations that would benefit the most from the new funding. These results will be separated by direct and indirect/induced effects and include indicators such as jobs, income, and value-added gains the regional economy. While the calculator's results are highly aggregated, the ECFRPC hopes to use the profile findings to provide more detailed information about these impacts.

4.1.3 Final Report

The final part of this analysis will be to use these new employment numbers to generate a simple career pathways program. The ECFRPC will identify the educational and training centers offering the degrees and certifications needed to attain these new green jobs. Based on these findings, the team will provide a short set of recommendations that will be incorporated into the final CCAP plan.

5 Next Steps

The PCAP document has identified and presented areas and measures where action is required in order to achieve a resilient region. Through the collaboration of our municipal partners and organizations we have been able to set the scene of what progress the region has made, what can be learned from and what advancements are required. This plan does not represent the entirety of the east central Florida region's needs and aims to embolden the many ongoing efforts across the region mitigating pollution. The sectors, high impact actions and goals (measures) addressed in this plan are designed to identify the activities that can offer the most significant reductions in the near term.

Due to the constraints of the PCAP, there are aspects which will be expanded on through future work including expansion of the existing greenhouse gas inventory, continuation of community engagement, workforce planning and development analysis, further development, re-forecasting, and modeling of high impact actions and goals (measures) and expansion into carbon sequestration.

CPRG planning strives across a four-year grant framework and will conclude in August 2027. The next step following the PCAP is development of the comprehensive climate action plan (CCAP).

Building upon the PCAP which focuses on the near term, the CCAP will enable the region to re-address the near-term targets and set longer-term goals, strategies, and measures. Some of the workstreams are already underway including the further expansion of the region's GHG inventory.

The GHG inventory presented in this report will be expanded and advanced to include refined, improved and methodologies addressing all sectors. The off-road sector will be expanded from locomotive data across all off-road activities. The agriculture sector will also be assessed for inclusion as well as separately detailing energy used and process emissions for and associated with the supply of portable water and treatment of wastewater. These expansion areas are already underway and will form part of the comprehensive climate action plan over the next year.

Through continued committee meetings the high impact actions, goals and strategies will be continuously advanced, developed and expanded as we move through the climate action planning process. Exch strategy map will be continuously reviewed and discussed to further and embolden emission reduction actions.

Coordination with our municipal partners, stakeholders and organizations will continue to be a key component in the development of the CCAP and foster the meaningful development of these climate action plans enabling and enhancing the collective resilience of east central Florida.

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6 Appendix A: Methodology Details

6.1 Energy

The following table shows each activity related to energy consumption, data source, and notes on data gaps.

Table 12: Energy Data Sources

Activity	Data Source	Data Gaps/Assumptions
Regionwide		
Residential, commercial, and industrial electricity consumption	Utility provided activity data	• 77% of electricity activity data was provided by utilities
	Utility activity data & EIE estimates	• 23% of the electricity data was estimated using EIE by calculating the difference between utility provided activity data and EIE totals
	Google EIE adjusted data	• Orange County energy fractions were standardized across the region • FRCC All (FRCC) eGRID 2019 emission factors were used across the region
Residential, commercial, and industrial natural gas consumption	Utility provided activity data & EIE estimates	• Data gaps were estimated by calculating the difference between utility provided activity data and EIE totals
	Google EIE adjusted data	• Orange County energy fractions were standardized across the region • FRCC All (FRCC) eGRID 2019 emission factors were used across the region

Table 13: Energy Data Sources

Year	CO_2 (lbs./MWh)	CH_4 (lbs./GWh)	N_2O (lbs./GWh)
FRCC All (FRCC) eGRID 2019	861.028	55	7
Duke 2019	1007	40	10
FPL 2019/eGRID2019	664.89	55	7
FMPA 2019	963	55	7
City of Winter Park 2019	768.41	75	10

6.2 Transportation

Table 14: Transportation Data Sources

Activity	Data Source	Data Gaps/Assumptions
Region-wide		
Vehicle miles travelled	Google EIE data	For vehicle type percentage by fuel type (diesel or gasoline) data was obtained from ICLEI's "National Default Vehicle Fuel Efficiency and Emission Factors, 2018," where U.S. Energy Information Administration and Environmental Protection Agency's data is aggregated to get emissions factors and miles per gallons. Emissions factors and vehicle type percentages were sourced from ICLEI. ICLEI sourced the data from EPA, EIA, and the Bureau of Transportation Statistics.
Rail fuel consumption	Provider data	Missing data from 1 out of the 4 identified rail service provides in the region

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

Table 15: MPG and Emissions Factors by Vehicle Type

Fuel	Vehicle type	MPG	CH_4 g/mile	N_2O g/mile
Gasoline	Passenger car	24.1	0.0183	0.0083
Gasoline	Light truck	17.6	0.0193	0.0148
Gasoline	Heavy truck	5.371652	0.0785	0.0633
Gasoline	Motorcycle	24.1	0.0183	0.0083
Gasoline	Transit Bus	17.6	0.0193	0.0148
Gasoline	Para-transit Bus	17.6	0.0193	0.0148
Gasoline	Motorcycle	24.1	0.0183	0.0083
Diesel	Passenger car	24.1	0.0005	0.001
Diesel	Light truck	17.6	0.001	0.0015
Diesel	Heavy truck	6.392468	0.0051	0.0048
Diesel	Transit Bus	17.6	0.001	0.0015
Diesel	Para-transit Bus	17.6	0.001	0.0015
Diesel	Motorcycle	24.1	0.0005	0.001

6.3 Solid Waste

Table 16: Solid Waste Data Sources

Activity	Data Source	Data Gaps/Assumptions
Region-wide		
Landfilled waste	FDEP Division of Waste Management, Waste Registration & Recycling Program.	• Landfill methane collection scenario was assumed "typical" • Landfill moisture content was assumed "wet" due to regional average precipitation
Composted waste	FDEP Division of Waste Management, Waste Registration & Recycling Program.	• Composted waste type was classified as "green waste" (i.e., yard trash) due to the majority of composition, as guided by the FDEP
Combusted waste	FDEP Division of Waste Management, Waste Registration & Recycling Program.	• Percent of total combusted MSW generated in-boundary was assumed 1%

6.4 Fugitive Emissions

Table 17: Fugitive Emissions Data Sources

Activity	Data Source	Data Gaps/Assumptions
Region-wide		
Natural gas usage	EDF User Guide for Natural Gas Leakage Rate Modeling Tool	0.3% default was used

6.5 Forestry and Land Use

Table 18: Land Use and Forestry Data Sources

Activity	Data Source	Data Gaps/Assumptions
Region-wide		
Land use and forestry	ICLEI LEARN tool	Tool creates and annual average from changes across the period 2013 to 2019

6.6 Inventory Calculations

The 2019 inventory was calculated following the US Community Protocol and ICLEI's ClearPath software. As discussed in Inventory Methodology, the IPCC 5th Assessment was used for global warming potential (GWP) values to convert methane and nitrous oxide to CO_2 equivalent units. ClearPath's inventory calculators allow for input of the sector activity (i.e., kWh or VMT) and emission factor to calculate the final CO_2e emissions.

7 Appendix B: LIDAC Identification & Analysis Detail

The City of Orlando

- Parramore

Census Tracts: 12095018900, 12095010500

  - Proximity to Risk Management Plan facility
  - Low income
  - Diesel Particulate Matter exposure
  - Traffic proximity and volume
  - Underground storage tanks and releases
  - Energy Cost
  - Asthma
  - Diabetes
  - Heart Disease
  - Low life expectancy
  - Housing Cost
  - Low median income
  - Poverty
  - Unemployment
  - High School education

- Thorton Park/Milk District

Census tracts: 12095018400, 12095011000,

  - Formerly used defense sites
  - Proximity to risk management plan facilities
  - Low income
  - Underground storage tanks and releases
  - Linguistic isolation
  - High school education
  - Diesel particulate matter exposure
  - Traffic proximity and volume

- South of 408/North of Michigan b/w I4 and Semoran

Census Tracts: 12095018500, 12095013702, 12095013701, 12095013300, 12095013603

  - Energy Cost
  - Low income
  - Housing cost
  - Lack of indoor plumbing
  - Proximity to risk management plan facilities

- Diesel particulate matter exposure
- Traffic proximity and volume
- Underground storage tanks and releases
- Linguistic isolation
- High school education

Kissimmee

- Osceola Medical Center
    - Census tract/block #s: 12097041600, 12097041800, 12097042900
        - Projected wildfire risk
        - Low income
        - Diabetes
        - Housing cost
        - Lack of indoor plumbing
        - Diesel particulate matter exposure
        - Linguistic isolation
        - Low median income
        - Poverty
        - Highschool education
- Kissimmee Gateway Airport
    - Census tract/block #s: 12097041700, 12097040901, 12097042000, 12097042100
        - Low income
        - Diesel particulate matter exposure
        - Underground storage tanks and releases
        - Projected wildfire risk
        - Energy cost
        - Linguistic isolation
        - High school education
        - Transportation barriers

Orange County

- Orlo Vista

Census tracts: 12095014805, 12095014701, 12095014702, 12095018300, 12095014601, 12095011701, 12095011702, 12095014605, 12095014608, 12095014609, 12095014606

  - Traffic proximity and volume
  - Diesel particulate matter exposure
  - Underground storage tanks and releases
  - Low income
  - Housing cost
  - Energy Cost
  - Asthma
  - Transportation barriers
  - Poverty
  - Unemployment
  - Diabetes
  - Projected flood risk
  - Proximity to risk management plan facilities
  - Heart disease
  - Low median income
  - High school education

- Pine Hills; N. Orange Blossom Trail

Census Tract #s: 12095012401, 12095012402, 12095012403, 12095012307, 12095018700, 12095012000, 12095012100

  - Transportation barriers
  - Above average energy cost
  - Low income
  - Housing cost (share of households making less than 80% of the area median and spending more than 30% of income on housing)
  - Proximity to superfund sites
  - Diesel Particulate Matter exposure
  - Underground storage tanks and releases
  - Low median income
  - Poverty
  - Unemployment
  - High school education (% of people ages 25 years or older who did not graduate high school)

  - Asthma
  - Diabetes
  - Heart Disease

- Meadow Woods

Census blocks: 120950168093, 120950168092

  - Particulate matter
  - Ozone
  - Diesel particulate
  - All air toxic categories
  - Traffic proximity
  - Superfund site proximity

- Union Park/ UCF Area

Census tracts: 12095016510, 120950167441, 120950165132, 120950165111, 120950165041, 120950165033, 12095016724, 12095016713

  - Low median income
  - Poverty
  - High school education
  - Diesel particulate
  - Toxic releases to air
  - Air toxics cancer risk
  - Traffic proximity

- Waterford/Waterford Chase

Census tracts: 120950167442, 120950167421, 120950165131,

  - Low income
  - Projected wildfire risk
  - Housing cost
  - Wastewater discharge
  - Linguistic isolation
  - High school education

- Between Semoran and 417 & between 408 and Hoffner Ave

Census tracts: 12095013403, 12095013402, 12095016715, 12095013406, 12095013405, 12095013503, 12095013505, 12095016709, 12095013511, 12095013512

  - Housing cost
  - Low income
  - Traffic proximity and volume
  - Diesel particulate matter exposure
  - Linguistic isolation
  - High school education
  - Energy Cost
  - Lack of indoor plumbing
  - Poverty
  - Formerly Used Defense Sites
  - Underground storage tanks and releases
  - Projected wildfire risk
  - Diabetes
  - Heart disease

- Goldenrod and Azalea Park

Census tracts: 12095016712, 12095013202, 12095013201, 12095016402, 12095016407, 12095016410, 12095016302

  - Low income
  - Underground storage tanks and releases
  - Housing cost
  - Diesel particulate matter exposure
  - Linguistic isolation
  - Traffic proximity and volume
  - High school education
  - Proximity to Superfund sites
  - Poverty
  - Proximity to Risk Management Plan facilities

- Edgewood, Pine Castle & Taft

Census Tracts: 12095016804, 12095013606, 12095014200, 12095014302, 12095014301

  - Expected agriculture loss
  - Housing Cost
  - Low income
  - Linguistic Isolation
  - High school education
  - Proximity to risk management plan facilities
  - Diesel Particulate matter exposure
  - Underground storage tanks and releases
  - Lack of indoor plumbing

  - Poverty
  - Traffic proximity and volume
  - Asthma
  - Low median income
  - Energy cost
  - Unemployment

- Dr. Philips

Census tracts: 12095014812

  - Housing cost
  - Low income
  - Proximity to risk management plan facilities
  - Diesel Particulate matter exposure
  - Traffic proximity and volume

- Winter Garden / Ocoee

Census Tracts: 12095017300, 12095018100, 12095015001, 12095015003, 12095015002

  - Proximity to risk management plan facilities
  - Low income
  - Expected agriculture loss
  - Transportation barriers
  - Linguistic isolation
  - Poverty
  - High school education
  - Lack of indoor plumbing

- Apopka

Census tracts: 12095015105, 12095015105, 12095017503, 12095017600, 12095017703

  - Proximity to risk management plan facilities
  - Energy cost
  - Low income
  - Asthma
  - Low life expectancy
  - Proximity to risk management plan facilities
  - Underground storage tanks and releases
  - Linguistic isolation
  - High school education

- Winter Park

Census block: 120950159011

  - Disel matter
  - Air toxic releases
  - Air toxic respiratory
  - Superfund proximity
  - Underground storage tanks
  - Wastewater discharge

- Eatonville

Census Tract #s: 12095018000, 12095015202, 12095015201, 12095015104

  - Low life expectancy
  - Low income
  - Proximity to Risk Management Plan facility
  - Diesel Particulate Matter exposure
  - Underground storage tanks and releases

<u>Osceola County</u>

- St. Cloud
  - Census tracts/blocks: 12097043203, 12097043400, 12097043500
    - Projected wildfire risk
    - Low income
    - Heart Disease
    - Underground storage tanks and releases
    - Projected wildfire risk
    - Low income
    - Heart Disease
    - Underground storage tanks and releases
- Poinciana
  - Census tracts/blocks: 12097041100, 12097041300, 12097041500, 12097043206, 12097040804, 120970410043
    - Projected wildfire risk
    - Low income

        - Transportation barriers
        - Expected agriculture loss rate
        - Expected building loss rate
        - Linguistic isolation
        - Energy cost
- Campbell
    - Census tracts/blocks: 120970410051, 120970410053, 120970410062
        - Ozone
        - Diesel Particulate
        - Air toxics Cancer causing
        - Air toxics respiratory
        - Toxic releases to air
        - Proximity to regional risk management facility

<u>Seminole County</u>

- Sanford
    - Census tracts/blocks: 12117020807, 12117020807, 12117020901, 12117020302, 12117020401, 12117020500, 12117020101, 12117020201
        - Projected wildfire risk
        - Low income
        - Diabetes
        - Heart disease
        - Proximity to superfund sites
        - Underground storage tanks and releases
        - Housing cost
        - Asthma
        - Low life expectancy
        - Low median income
        - Poverty
        - High school education
        - Lack of indoor plumbing

        - Unemployment
        - Proximity to risk management plan facilities
- Casselberry
    - Census tracts/blocks: 12117022001
        - Diabetes
        - Low income
        - Proximity to Risk management plan facilities
        - Underground storage tanks and releases
        - Poverty
        - Unemployment
        - High school education
- Lake Howell
    - Census tracts/blocks: 121170222064
        - Diesel particulate emissions
        - Air toxics – cancer
        - Air toxics – respiratory
        - Air toxic releases
        - Traffic proximity
        - Superfund site
        - Wastewater discharge

8 Appendix C: Green Sector Industries

Green Sector	Green subsector	Industry
Clean Energy Generation, Manufacturing and Construction	Generation Utilities	Solar Electric Power Generation
		Wind Electric Power Generation
		Other Electric Power Generation
		Electric Bulk Power Transmission and Control
		Electric Power Distribution
		Steam and Air-Conditioning Supply
	Grid Component Manufacturing and Construction	Power and Communication Line and Related Structures Construction
		Other Heavy and Civil Engineering Construction
		Power, Distribution, and Specialty Transformer Manufacturing
		Battery Manufacturing
Energy Efficiency	Construction of energy efficient buildings	New Single-Family Housing Construction (except For-Sale Builders)
		New Multifamily Housing Construction (except For-Sale Builders)
		New Housing For-Sale Builders
		Residential Remodelers
		Industrial Building Construction
		Commercial and Institutional Building Construction
		Land Subdivision

		Residential roofing contractors
		Nonresidential roofing contractors
		Residential plumbing and HVAC contractors
		Nonresidential plumbing and HVAC contractors
		Residential finish carpentry contractors
		All other residential trade contractors
		All other nonresidential trade contractors
	Manufacturing of energy-efficient products	Mineral Wool Manufacturing
		Metal Window and Door Manufacturing
		Sheet Metal Work Manufacturing
		Semiconductor Machinery Manufacturing
		Industrial and Commercial Fan and Blower and Air Purification Equipment Manufacturing
		Heating Equipment (except Warm Air Furnaces) Manufacturing
		Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing
		Semiconductor and Related Device Manufacturing
		Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use
		Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables
		Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals
		Residential Electric Lighting Fixture Manufacturing

		Commercial, Industrial, and Institutional Electric Lighting Fixture Manufacturing
		Electric Lamp Bulb and Other Lighting Equipment Manufacturing
		Small Electrical Appliance Manufacturing
		Major Household Appliance Manufacturing
		All Other Miscellaneous Electrical Equipment and Component Manufacturing
		Automobile and Light Duty Motor Vehicle Manufacturing
		Heavy Duty Truck Manufacturing
		Motor Vehicle Body Manufacturing
		Motor Vehicle Gasoline Engine and Engine Parts Manufacturing
		Motor Vehicle Electrical and Electronic Equipment Manufacturing
		Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing
		Motor Vehicle Brake System Manufacturing
		Motor Vehicle Transmission and Power Train Parts Manufacturing
		Motor Vehicle Seating and Interior Trim Manufacturing
		Motor Vehicle Metal Stamping
		Other Motor Vehicle Parts Manufacturing
		Architectural Services
		Landscape Architectural Services
		Drafting Services
		Building Inspection Services

Environmental Management, Conservation and Regulation	Environmental Management, Conservation and Regulation	Environmental Consulting Services
		Solid Waste Collection
		Hazardous Waste Collection
		Other Waste Collection
		Hazardous Waste Treatment and Disposal
		Solid Waste Landfill
		Solid Waste Combustors and Incinerators
		Other Nonhazardous Waste Treatment and Disposal
		Remediation Services
		Materials Recovery Facilities
		All Other Miscellaneous Waste Management Services
		Environment, Conservation and Wildlife Organizations
		Administration of Air and Water Resource and Solid Waste Management Programs
		Administration of Conservation Programs
		Administration of Urban Planning and Community and Rural Development
		Regulation and Administration of Transportation Programs
		Regulation and Administration of Communications, Electric, Gas, and Other Utilities

- Source: Brookings Institute, 2019