East Central Florida Region (ECFR$_2$C)

High Impact Action Analysis

Table of Contents

East Central Florida's Science-Based Targets

2030 absolute Science-Based Target: 54.3%

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 50% global emissions reductions by 2030 are needed to keep warming below 1.5°C to limit the recognized climate change impacts like sea level rise, flooding, and extreme heat. We also acknowledge that the emission reduction provides tremendous public health and economic benefits.

Setting the science-based target (SBT) as a regional goal puts East Central Florida in alignment with the ambition necessary to achieve national goals, encourages collaboration, reduces uncertainty, drives innovation, improves the region's economic competitiveness, and creates a synergistic outcome toward reductions. The methodology, based on the One Planet City Challenge, is most compatible with local government processes and simplifies integration of reduction strategies. The absolute regional SBT is more definitive and considers changing populations including seasonal and high growth.

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 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[1]. ICLEI chose this source to keep uniformity with other planning documentation used by the ECFRPC, such as the East Central Florida 2060 Plan[2]. 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.[3] To convert the number of projected jobs into non-residential space, the ECFRPC used job/land use multipliers[4] from the City of Orlando's "Growth Projections'' report. Because of the lack of data for other counties, the ECFRPC assumed that this multiplier 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.

---

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

[2] East Central Florida 2060 Plan

[3] 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

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

- *On-road transportation fuel efficiency standards[5] (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[6] (C2ES).

- *Utility grid decarbonization[7]*

Both Duke Energy[8] and Florida Power and Light[9] (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 the reduction in emissions output per unit of electricity produced. The Duke and FPL decarbonization was applied to their respective electricity demands.

Forecast Results

East Central Florida's 2019 regional emissions were estimated at 46,968,766 Metric Tons Carbon Dioxide Equivalent (CO2e). Based on the above growth rates and emissions intensity factors, 2030 emissions are projected to be 52,546,550 Metric Tons CO2e. The following table displays the primary[10] 2019 baseline and 2030 projected emissions.

Table 1. Baseline and Business-as-Usual emissions comparison

Sector	Source	Baseline Emissions (MT CO2e)	2030 BAU Emissions (MT CO2e)	Percent Change (%)
Residential Energy[11]	Electricity	13,614,601	16,215,081	19%
	Natural Gas	615,152	740,480	20%
Commercial Energy[11]	Electricity	7,459,391	7,685,763	3%
	Natural Gas	3,363,758	3,877,293	15%
Industrial Energy[11]	Electricity	803,415	796,855	-1%
	Natural Gas	292,276	326,972	12%
Transportation	On-road	19,160,670	20,873,247	9%

---

[5] Default Fuel Efficiency Standards
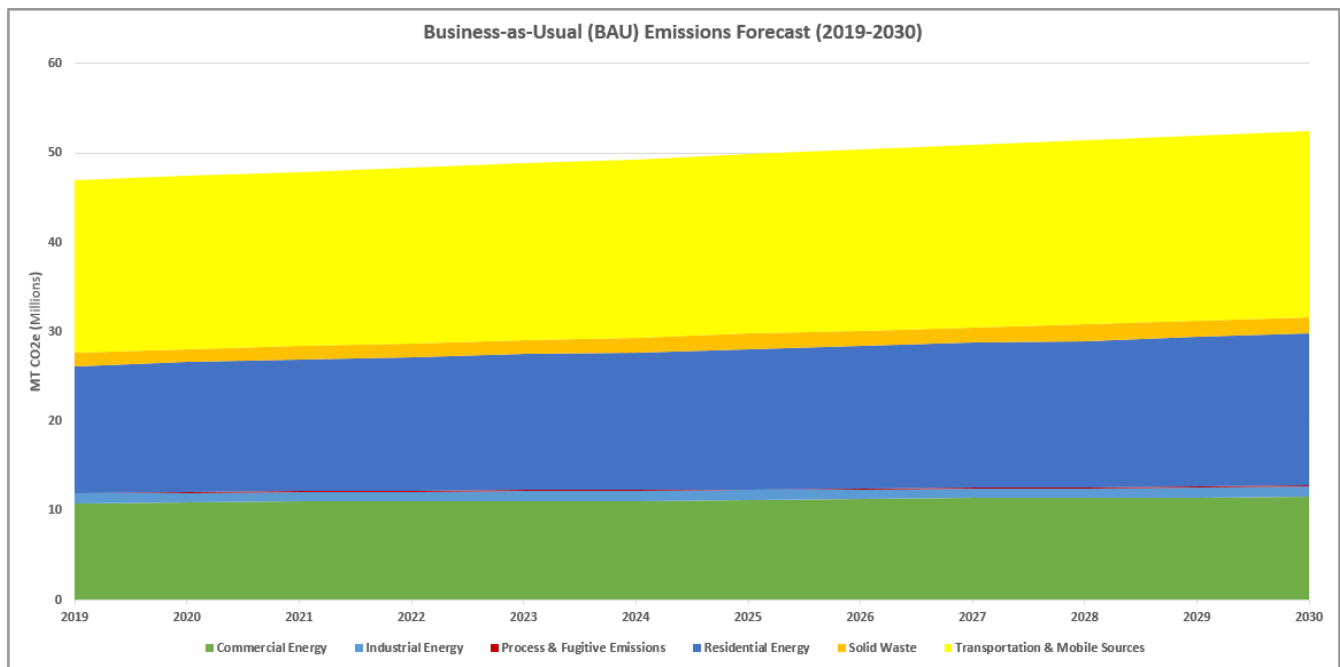
[6] Center for Climate and Energy Solutions

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

[8] Duke Energy 10-year Site Plan

[9] FPL 10-year Site Plan

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

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

Business-as-Usual (BAU) Emissions Forecast (2019-2030)

Legend: Commercial Energy, Industrial Energy, Process & Fugitive Emissions, Residential Energy, Solid Waste, Transportation & Mobile Sources

High-Impact Actions

Climate Action Planning is the process by which the region can assess the many options that are available to reduce greenhouse gas emissions. Climate Action Planning is a forward-looking exercise and as such, the calculations made are projections and require a number of assumptions about external drivers. Often, Climate Action Planning starts with high-level approaches which use High-Impact Actions. High-Impact Actions are high-level strategies that are projected to yield significant emissions reductions.

ICLEI analyzed East Central Florida's Regional greenhouse gas inventory, the measurement of the sources and amounts of regional emissions, regional growth, and grid decarbonization potential to develop a list of high-level actions the East Central Florida Region can take and/or advocate for to support their 2030 Science-Based Targets. The following conditions will get the region closer to its science-based target:

- **Grid Decarbonization Scenario:** Duke and FPL electricity demand experiences projected emissions intensity reduction from forecasted decarbonization. All other demand experiences FPL's projected emissions intensity reduction.
- **Vehicle Miles Traveled Reduction Scenario:** Reducing gasoline vehicle miles traveled by 12% and diesel Vehicle miles by 6%
- **Electric Vehicle (EV) Adoption Scenario:** 4.5% Annual Growth in EV Vehicle Miles Traveled[12]
- **Residential Rooftop Solar PV Scenario:** Deployment of 15% of the region's total residential rooftop solar PV capacity[13]
- **Commercial/Residential Energy Efficiency Scenarios**: All new buildings and 1% of existing building square footage, from normal renovations and turnover, will meet the IECC 2018 energy codes[14]. 5% of existing building stock square footage will experience 20% reduction in energy use intensity from additional renovations/changes.

---

[12] This scenario is the median of nationwide EV sales projections and California's EV sales projections. This value was extrapolated using a vehicle turn in rate of 9%.

[13] County-wide residential rooftop solar PV capacity source from Google's Environmental Insights Explorer.

[14] This change results in an estimated average of 36.9% reduction in building energy-use intensity. These are national assumptions and estimates extrapolated from 2012 EIA CBECS and PNNL

This list of actions is not exhaustive. Other combinations of conditions will also support East Central Florida's Science-Based Targets.

High-Impact Action Modeling Results

The following chart compares Business-as-usual forecasted emissions to remaining emissions after the various High-Impact Actions have been applied.
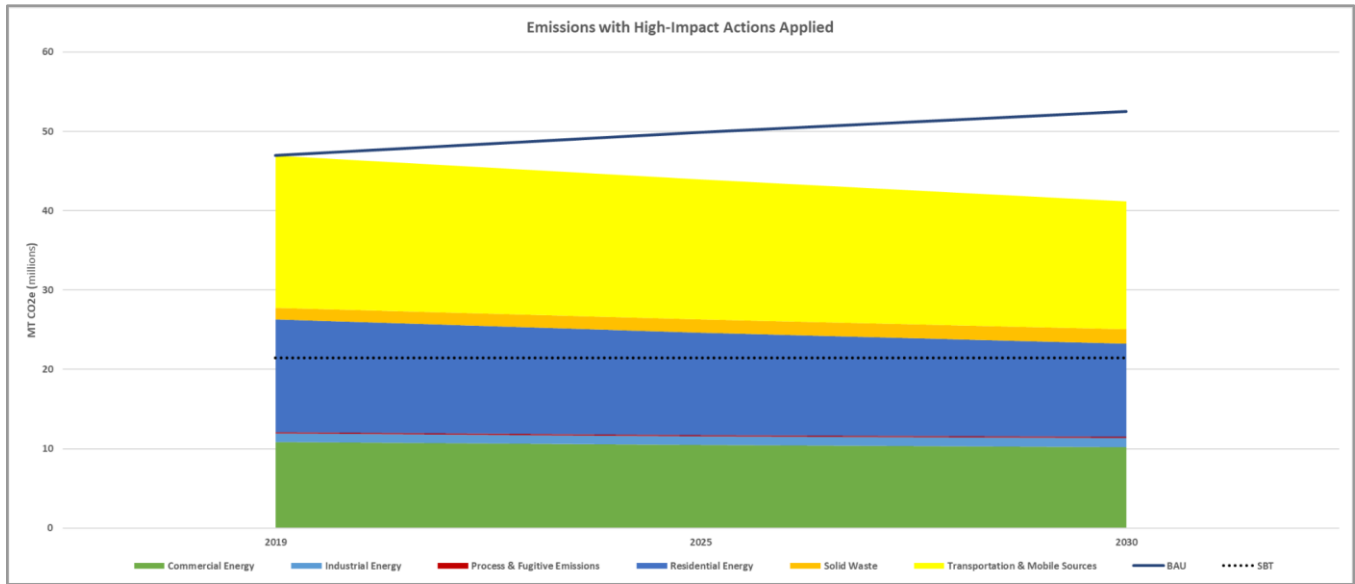
The following table displays net reduction per action during 2030.

Table 2. 2030 net reduction by action

Type	2030 Net Reduction (MT CO$_2$e)
Region-wide FPL Decarbonization Pathway	1,586,127
Vehicle Miles Traveled Reduction (Gasoline - 12%, Diesel - 6%)	1,681,895
Electric Vehicle (EV) Adoption (4.5% Annual Growth)	3,160,237
Residential Rooftop Solar PV (15% of region-wide capacity)	2,254,620
Commercial Buildings Energy Efficiency	1,360,859
Residential Buildings Energy Efficiency	2,944,169

Call to Action

Planning and implementing strategies to support the High-Impact Actions are essential not only to mitigate climate change impacts, but also to bolster resilience, improve public health, reduce costs of energy and more.

By following this trajectory[15] 2030 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%.

While the majority of energy data (combined electricity and natural gas) was provided by utilities, a portion is still estimated. Because of this, the region would greatly benefit from additional utility engagement as activity data is the gold standard.

Table 3. Proportion of utility-provided data vs estimated data

Sector	Type	Residential	Commercial (Public Authority & Street Lights included)	Industrial	Total
Electricity	Duke	30.2%	42.2%	45.0%	34.8%
	FPL	18.5%	25.7%	18.7%	21.0%
	Other Utility	16.3%	29.4%	36.2%	21.5%
	Estimated	35%	2.6%	0%	22.7%
Natural Gas	Utility	18.7%	58.8%	100%	55.8%
	Estimated	81.3%	41.2%	0%	44.2%

The region requires bold utility action. While ICLEI and the ECF Regional Resilience Collaborative only had access to high-level utility 10-year site plans, it can be concluded that there is a need for utilities across the region to commit to drastically reducing fossil fuel-based electricity generation and commit to significantly more carbon-free energy sources by 2030. Local governments can take and generate bold action to increase demand for carbon-free energy sources. The Cities of Cape Canaveral and Orlando, Volusia and Orange Counties have declared varying degrees of emissions reduction commitments. In conjunction, local governments are leading by example increasing solar deployment on their municipal buildings and streamlining residential solar permitting processes. Mobile solar generators for energy redundancy as well as state of the art floating solar PV systems are two additional innovative applications already in the region.

The region would also benefit from various transportation strategies relating to improving EV adoption and public transit accessibility and frequency. Because of the current and projected reliance on electricity and transportation, these actions are imperative to achieving the region's 2030 Science-Based Target and a healthy, resilient future. The Electric Vehicle Infrastructure Master Plan by the Florida Department of Transportation identifies electric vehicle supply equipment (EVSE or charging station) locations, barriers, funding impacts and implementation strategies. The State anticipates EV market adoption rates to more than double from 2030 to 2035, then double again from 2035 to 2040. While this is encouraging, the

---

[15] Grid decarbonization is considered within the forecast

continued focus on level of service and outdated standards of operation continue to hinder progressive action. EV readiness within land development codes and comprehensive plan policies, micro mobility expansion, multimodal networks and bus rapid transit expansion are necessary to transition people out of their personal vehicles and move the region one step closer toward emission reduction.

While energy and transportation sector reduction actions yield high levels of emission reductions, emissions from solid waste, wastewater and nature-based solutions, for example, should not be neglected. Even though the aforementioned actions yield less reductions, they support and move the region closer to the 2030 Science-Based Target. These actions relate to solid waste diversion (composting and recycling), improved landfill gas collection, improved wastewater processes, nature-based solutions, such as conserving and restoring natural ecosystems (e.g., mangroves, wetlands, etc.), soil quality, low-impact development, and various other carbon reduction approaches should be a part of a climate action plan for the region.

Jurisdictions are acting, but can only go so far in isolation. It is due to this; the East Central Florida Regional Resilience Collaborative was formed to encourage dialogue to shift conventional practices and create multi-and cross sector collective action and data-sharing to accelerate and increase collective impact toward these measures. The ECFR2C must continue to build capacity, capability and develop a Climate Action Plan to further guide emission mitigation strategies and support local, state and national policies toward these ends.