



**SEAP**

STRATEGIC ENERGY ACTION PLAN  
CITY of CHARLOTTE



2023 Annual Report

# Strategic Energy Action Plan



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In 2023, the culmination of the fifth year of implementing the City of Charlotte’s Strategic Energy Action Plan marks a significant milestone for the city. Over this period, considerable progress has been made toward achieving sustainability objectives outlined in the 2030 and 2050 goals. Work has been propelled forward by Charlotte’s commitment to strive to source 100% of its energy use in its building and fleet from zero carbon sources by 2030 and its vision to become a low-carbon city by 2050, measured by 2 tonnes of carbon dioxide equivalent per capita.

The past year stands out with notable successes, showcasing collective dedication to sustainability. The city is delighted to receive another “A-” rating in emissions reporting by CDP, an international nonprofit dedicated to helping entities disclose their environmental impact. The selection of Charlotte as a Bloomberg American Sustainable City and the improvements in the city’s ACEEE evaluation scores highlights the commitment to sustainability. Additionally, in line with City Council’s emphasis on equity and racial wealth building, several impactful projects have been initiated.

Despite the environmental challenges posed by the resurgence of travel and energy consumption that followed the easing of COVID-19 restrictions, these changes are opportunities for reflection and recalibration, policy refinement, and targeted interventions.

As Charlotte endeavors to maintain its position as a global sustainability leader, the collective efforts of every resident are indispensable. Whether living, working or playing in Charlotte, everyone has a vital role in advancing shared goals.

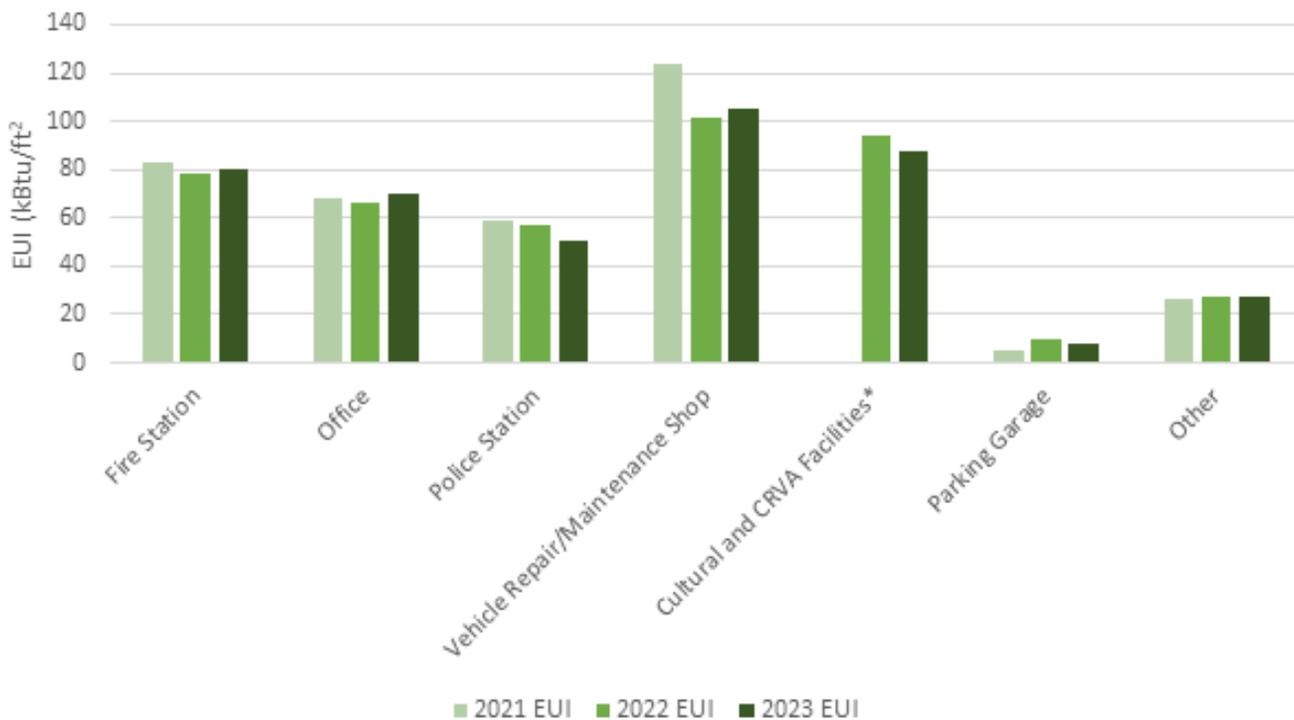
This year’s report is presented in a novel format, reflective of the city’s commitment to transparency and accessibility. With the launch of the SEAP Dashboard in November 2023, the aim is to provide residents with ready access to updated metrics, while this annual report serves to offer a snapshot of progress and emerging trends.

Sincere gratitude to all who have contributed to Charlotte’s journey toward sustainability and shaping a future where environmental stewardship and community prosperity intersect.

# Buildings

## Energy Use Intensity by Building Type

Energy Use Intensity (EUI) demonstrates how efficiently a building is using energy. The lower the EUI, the more energy efficient the building.



**55.3%**

of benchmarked buildings reduced EUI since 2022.



**8.2%**

reduction in EUI across the city's building portfolio compared to 2022.

## Key Building Benchmarking Takeaways



Four buildings were added, bringing total square footage of benchmarked properties to 6,825,836 ft².

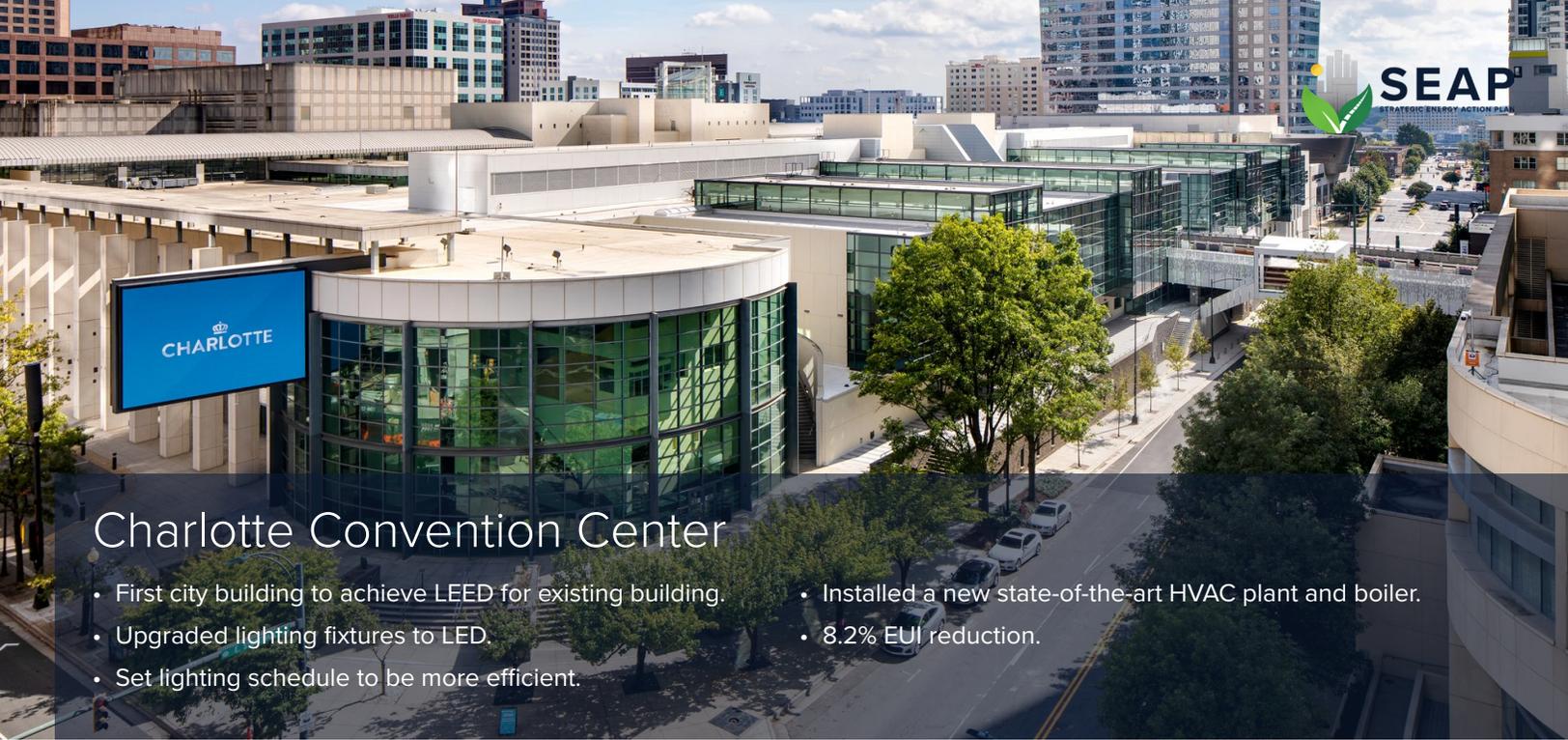
(Total square footage indicates the extent that we are benchmarking our facilities.)



The main areas of reduction were Cultural and CRVA Facilities, Police, and Parking Decks.



The 6.5% EUI increase in Offices presents an opportunity for improvement.



## Charlotte Convention Center

- First city building to achieve LEED for existing building.
- Upgraded lighting fixtures to LED.
- Set lighting schedule to be more efficient.
- Installed a new state-of-the-art HVAC plant and boiler.
- 8.2% EUI reduction.



## Green Building certification

Green building certification includes buildings that are certified by a third party to have been built and/or operated more sustainably in a variety of ways that may include building materials, renewable energy, and energy efficiency to lower carbon emissions. Included are buildings receiving Leadership in Energy and Environmental Design (LEED), Energy Star, and Green Globes certifications.

A total of **23 city buildings** have received green building certification.

### Community-wide numbers:

- **LEED-certified** – 16 buildings certified or recertified in 2023.
- **EnergyStar-certified** – 86 buildings certified or recertified in 2023.
- **Green Globes-certified** – four buildings certified in 2023.
- **A total of 876 projects** community-wide have received green building certification.

### Two city buildings became LEED-certified in 2023:

- **LEED Silver** - Charlotte Water Zone 4.
- **LEED Gold** - for existing buildings – Charlotte Convention Center.



## Power Down the Crown

- Power Down the Crown is the city's voluntary benchmarking program for municipal buildings and buildings reported on by our community partners.
- Eight partners benchmarked their baseline year for 24 properties for a total of 4,357,412 ft<sup>2</sup>

# Energy Generation

## Solar Photovoltaic (PV)

Solar photovoltaic systems convert the sun's energy into clean, renewable electricity.

Solar capacity includes the maximum output or generation anticipated for a solar PV system.

### CITYWIDE

19

Solar PV systems in operation

14

Solar PV systems under design or construction

1,595 kW

of solar PV capacity in operation



### COMMUNITYWIDE

3,900

Residential solar PV systems

114

Commercial Solar PV systems

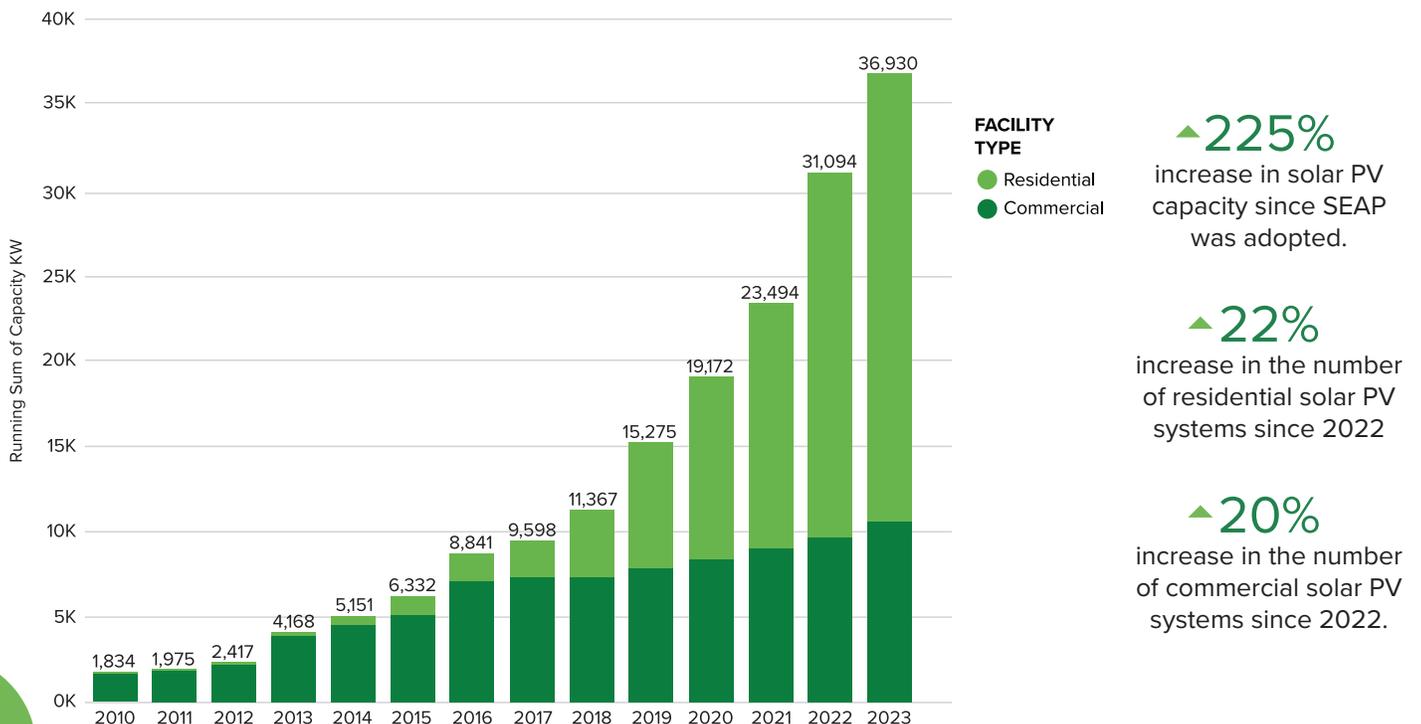
~37 MW

of solar PV capacity

**90%** increase in the number of citywide solar PV systems in operation since 2022.

**59%** increase in citywide solar PV capacity in operation since 2022.

Residential and Commercial Solar Photovoltaic Capacity by Year Communitywide.





# Streetlights

LED lights are currently the most energy-efficient lighting, they reduce the energy used for similar light, last longer, and are more durable than standard lighting.

**32%** of street lighting fixtures are LED.

7%

increase in LED  
street lighting fixtures  
since 2022.

# Transportation

## Fleet and Charging Metrics

**CO<sub>2</sub> AVOIDED: 1,551 METRIC TONS**

\*1 metric ton of CO<sub>2</sub> = 2,564 miles driven by an average gasoline-powered passenger vehicle.

Charlotte's fleet avoided **43%** more carbon than last year.

\* based on refined methodology.

	Light Duty	% of total Light Duty	Medium Duty	% of total Medium Duty	Heavy Duty	% of Total Heavy Duty	Total # of Vehicles	% of Each Fuel Type
<b>Electric</b>	77	2.6%	0	0.0%	35	3.7%	112	2.5%
<b>Hybrid</b>	66	2.2%	0	0%	65	6.9%	131	3%
<b>Alternative Fuel (CNG)</b>	1	0.0%	0	0%	39	4.1%	40	0.9%
<b>Propane Bi-fuel</b>	124	4.1%	8	2%	0	0.0%	132	3.0%
<b>Diesel</b>	58	2%	176	38%	781	83%	1015	23.1%
<b>Gasoline</b>	2662	89.1%	277	60%	24	2.5%	2963	67.4%
<b>TOTAL VEHICLES</b>	<b>2988</b>		<b>461</b>		<b>944</b>		<b>4393</b>	

### Charlotte fleet demographics:

EVs are electric vehicles. Alternative fuel refers to hybrid vehicles and vehicles that use a fuel source that is not gasoline or diesel.



**24%**

increase in number of EVs since 2022



**9%**

of bus fleet are Battery Electric Buses (BEBs)



**3%**

of total city fleet are EVs



**10%**

are alternative fuel



**76,938**

metric tons of total fleet carbon

Our fleet increased by **33** vehicles in 2023.



## Communitywide EV's and Infrastructure



1,118

Registered EVs in Mecklenburg County



1,923

Registered Hybrids in Mecklenburg County



775

Registered Plug-In Hybrids In Mecklenburg County

250

Municipally-funded charging ports

2,876

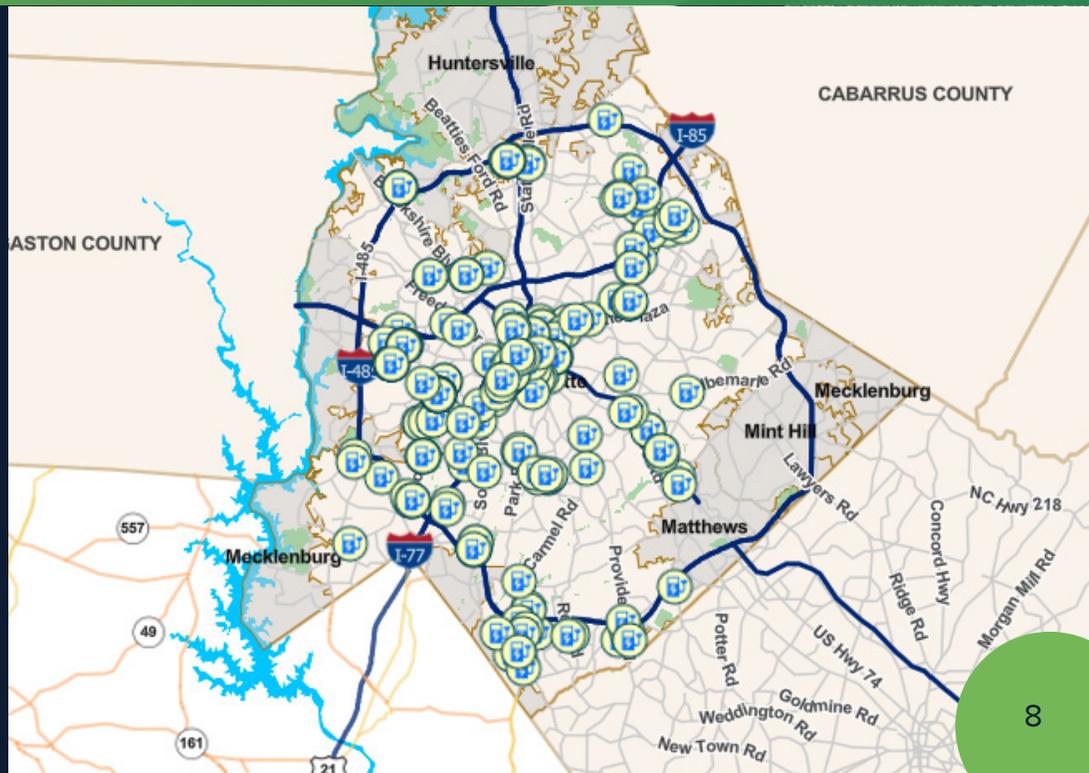
unique drivers charged at City sites

22%

increase in number of municipal ports since 2022

858

Communitywide charging ports





SEAP 2023 SNAPSHOT

# Workforce Development



## Battery Electric Bus (BEB) training

- 100% of new hires trained
- 529 staff and contractors trained
- 14 existing staff received refresher training
- 114 existing staff formally recertified



## Renewable Energy and Efficiency Workforce Training Program – RENEW

- 144 enrolled participants over the course of the program
- 124 graduates as of December 2023
- 63% employment rate

### Participants include:

- 27% female
- 79% minority

# Highlights in Community Action



## E-BIKE Program

Wells Fargo Championship and the City of Charlotte Corridors of Opportunity team announced an Electric Bike Pilot Program launching at the McNeel apartments in the N. Graham/N. Tryon Corridor.

- **\$300,000** donation from Wells Fargo Championship
- In partnership with DreamKey partners, new homeowners in the area will receive an e-bike when they purchase a home.
- Residents of McNeel apartments will have access to a dock of e-bikes for free use.
- This program supports the mode shift goals of the Charlotte Strategic Mobility Plan and the SEAP goal for sustainable modes of transportation.



## PoleVolt Pilot

Partnership with the University of North Carolina at Charlotte, Duke Energy, Centralina Regional Council, and the City of Charlotte.

- Installed a new pilot electric vehicle (EV) utility pole-mounted charger on Seigle Avenue, just down from the intersection with Otts Street.



## High Energy Use Assistance Program

Partnership with Duke Energy and the City of Charlotte launched in the Fall of 2023.

- Energy Efficiency retrofits and needed home rehabilitation projects to be provided at no cost to approximately **500** income-qualified, high-energy use households in Charlotte.

Program launched in the last quarter of 2023:

- **11 homes** have received energy efficiency upgrades in 2023.
- **2,247 kWh** are estimated to be saved per home each year, for an annual total savings of **24,716 kWh**.

# Awards, Reports, Recognition, Grants



## CDP

- Charlotte received “A-“ for the second year in a row
  - “... Has demonstrated best practice standards across adaptation and mitigation, has set ambitious goals and has made progress toward achieving those goals.”
- US National average for cities is a “B”
- Global average for cities is a “C”
- Rated by CDP formerly known as the Carbon Disclosure Project



## American Council for an Energy-Efficient Economy (ACEEE) 2024 City Clean Energy Scorecard

- Measures progress of city policies and programs that save energy, encourage renewable energy, improve equity, and reduce greenhouse gas emissions
- Charlotte has moved up in ranking to 25, an improvement of 17 positions from the previous ranking
- The city ranked 14th in local government operations, underscoring Council’s sustainability investments in the SEAP 2030 goals, specifically city facilities



## Bloomberg American Sustainable Cities

- Charlotte has been selected as one of 25 US cities to join Bloomberg American Sustainable Cities
- 3-year initiative designed to implement transformative local solutions to build low-carbon, resilient, and economically thriving communities.
- Focused on pursuing solutions in the buildings and transportation sectors to confront climate change and racial wealth inequity.



## Cities for Smart Surfaces

- Charlotte is one of 10 cities selected for the Cities for Smart Surfaces program, supported by the National League of Cities and the Smart Surfaces Coalition.

The program offers:

- Data,
- Educational materials,
- Cost-Benefit analysis tools,
- Funding guidance,
- Policy frameworks, and
- Community engagement support
- Focus is placed on urban heat mitigation solutions such as cool roofs, green roofs, solar energy, porous pavements, reflective pavements, rain gardens, and tree canopy.



## Green Fleet Award

- Charlotte is ranked 31st in the NAFA Fleet management Association’s Green Fleet Awards.
- This is an improvement from our rank of 40th in 2021.



## ULI Net Zero Imperative Report

- Urban Land Institute held a Roadmap to Net Zero for New Commercial Buildings Technical Assistance Panel May 30-31, 2023
- The outcome of the panel was a report that includes community resources and programs, recommended financial and regulatory incentives, and the business case and recommendations for developers and the city to help support net-zero building in Charlotte.

# Progress in the Last 5 Years

“The Strategic Energy Action Plan (SEAP) has established 11 Action Areas, with a total of 124 associated tasks. The first six (6) Action Areas are dedicated to actions internal to city policy and operations. The remaining five (5) Action Areas are dedicated to community action, started either in the communities themselves or in partnership with the city.

As shown below, 14% of all tasks in the original SEAP have been completed to date. Additionally, 44% of all SEAP tasks are categorized as “Ongoing,” meaning that while the original task was completed, staff has continued to iterate the step over time, e.g. communication with the public, revising policy, etc. There is another 22% of tasks that are “In Progress.” Lastly, 21% of SEAP established tasks are labeled as “Evaluating.” Some tasks as written have

run into barriers at the federal, state, local, or community level(s) causing staff to re-evaluate the effectiveness of this task; otherwise, there may be newer technologies, programming, or funding options available to achieve the same intent with a different strategy.

These items will be further reviewed and information from this review will be rolled into work on the upcoming SEAP Update.

## City Policy Actions

### Action Area 1

Structural Change



### Action Area 2

Initiate a Citywide Communication Campaign Towards a Low Carbon Future



### Action Area 3

Develop Smart Data Approaches



### Action Area 4

Develop and Implement Resilient Innovation Districts (RIDs)



### Action Area 5

Strive Toward 100% Zero Carbon Municipal Buildings by 2030



### Action Area 6

Strive Toward 100% Zero Carbon City Fleet by 2030



## Community Actions

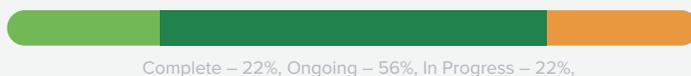
### Action Area 7

Near Zero Carbon Non-Municipal Buildings by 2030



### Action Area 8:

Facilitate Rapid Uptake of Sustainable Modes of Transportation



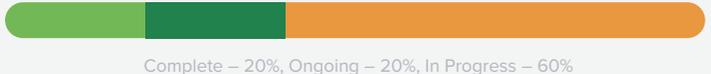
### Action Area 9

Develop and Implement Strategy for Deploying Low Carbon Infrastructure Generation



### Action Area 10

Develop Green Workforce Pipeline in Support of Energy Transition



### Action Area 11

Establish Public-Private-Plus Partnerships to Accelerate Transition to Low Carbon Future



# Greenhouse Gas Inventory

The graphic below shows the 2015 and 2019 Greenhouse Gas Inventories shared in the past in a new way to better communicate our progress toward becoming a low carbon city by 2050. Emissions reduced from 12.4 tCO<sub>2</sub>e per capita, tonnes carbon equivalent emissions per person, to 11.6 tCO<sub>2</sub>e between 2015 and 2019, a 5.8% reduction in emissions per person. The use of tCO<sub>2</sub>e helps quantify emissions holistically, not only including carbon dioxide, but the carbon dioxide equivalent for global warming potential. The largest emitting sector is Road & Rail, followed by the Commercial and Residential sectors. An inventory for 2023 is anticipated to commence in 2024, to evaluate communitywide progress.



For more information on Charlotte's Greenhouse Gas Inventory, and the other relevant data, please visit the SEAP Dashboard.

## Community-wide Greenhouse Gas (GHG) Emissions in Charlotte

The GHG emissions inventory is calculated and reported in accordance with the Global Protocol for Cities (GPC) and the Global Covenant of Mayors for Climate and Energy, a global cooperative effort among mayors and city officials to reduce GHG emissions. The community wide GHG emissions inventory is compliant with the GPC BASIC level of reporting.



Aviation



Commercial



Government



Industry



Residential

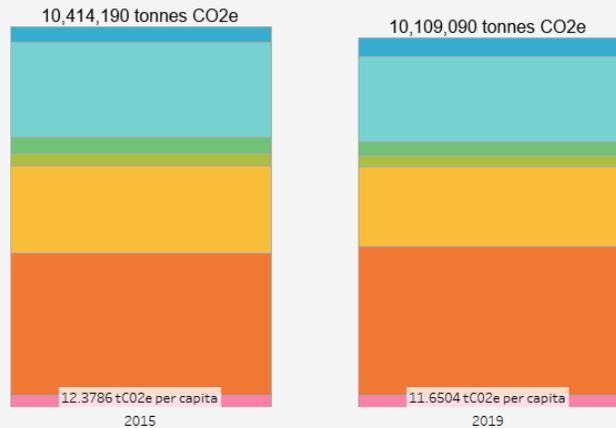


Road & Rail



Waste

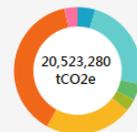
### Emissions by Sector and Year



### % Change from Previous Year

▼ -5.82%  
Change from Previous Year (2015)

### Emissions by Sector



### Emissions by Sector and Energy Type

Facility Type	Energy Type	GHG	%
Aviation	Gasoline	924,550	
	Electricity	4,134,510	20%
Commercial	Natural Gas	774,510	4%
	Electricity	807,720	4%
Government	Natural Gas	50,230	0%
	Electricity	251,080	1%
Industry	Natural Gas	392,260	2%
	Electricity	3,307,070	16%
Residential	Natural Gas	1,260,980	6%
	Diesel	2,158,380	11%
Road & Rail	Gaseous	9,850	0%
	Gasoline	5,768,140	28%
Waste	Gasoline	684,000	3%
	Gaseous		

# Conclusion

In reflection of the accomplishments and advancements made throughout the past year, this annual report shares a sense of pride and optimism for the future of sustainability in Charlotte. Achievements in sustainability metrics underscore the dedication and collaborative spirit of the community and serve as a testament to the city's commitment to progress.

Moving forward, the focus remains fixed on the realization of Charlotte's greenhouse gas reduction goals, as well as the overarching mission: **Charlotte will lead as a global city by continuously improving, protecting, and preserving the environment, its community, and economy while ensuring equity and resilience for today's and future generations.**

As Charlotte marks the completion of five years of SEAP implementation, it is time to acknowledge the importance of reassessment, adaptation and continued momentum. Climate change affects everyone, but not equally. Through the process of the SEAP update, Charlotte will align not only the latest science but add an embedded focus on climate equity. Against the backdrop of historic federal investments in sustainability, there is a unique opportunity to leverage resources and implement innovative projects that will further propel Charlotte's sustainability goals.

Together, Charlotte will work to realize the vision of a Sustainable City.



# SEAP

STRATEGIC ENERGY ACTION PLAN

 CITY *of* CHARLOTTE