



CITY OF WILMINGTON

**FY22 Greenhouse Gas Emissions
Update**

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BACKGROUND

Wilmington has been a longtime leader in addressing the challenge of climate change. In **2006**, Wilmington passed a **Resolution endorsing the US Conference of Mayors Climate Protection Agreement**. In **2009**, Wilmington performed its **first Greenhouse Gas (GHG) emission inventory** which established a GHG emission baseline. The inventory was followed by City Council passing a resolution in October **2009** setting ambitious **GHG emissions reduction goals for municipal operations**.

Wilmington has maintained the commitment to curbing climate change through resolutions supporting GHG emission reductions, including:

- 2017 - Resolution addressing climate change
- 2020 – Resolution establishing the Ad Hoc Clean Energy Policy Task Force
- 2021 – Resolution adopting 2035 and 2050 Clean Energy Goals
- 2021 – Resolution supporting the Mayors for 100% Clean Renewable Energy Pledge
- 2021 – Resolution establishing the Clean Energy Advisory Committee
- 2022 - Resolution to sign Public Comment Letter to NCUC concerning Duke Energy’s Carbon Plan

What is the Goal?



Reduce GHG emissions from **municipal operations** by **58% by 2050** from a 2007 baseline of 9,704 metric ton of CO₂e.

What are Greenhouse Gas emissions?

GHG’s such as carbon dioxide and methane trap heat in the atmosphere, warming the planet and causing cascading impacts on environmental systems. The largest source of GHG emissions from human activity in the US is from burning fossil fuels for electricity, heat, and transportation.

CO₂e, or “carbon dioxide equivalent,” is the standard unit for measuring GHG emissions. The emissions include three categories:

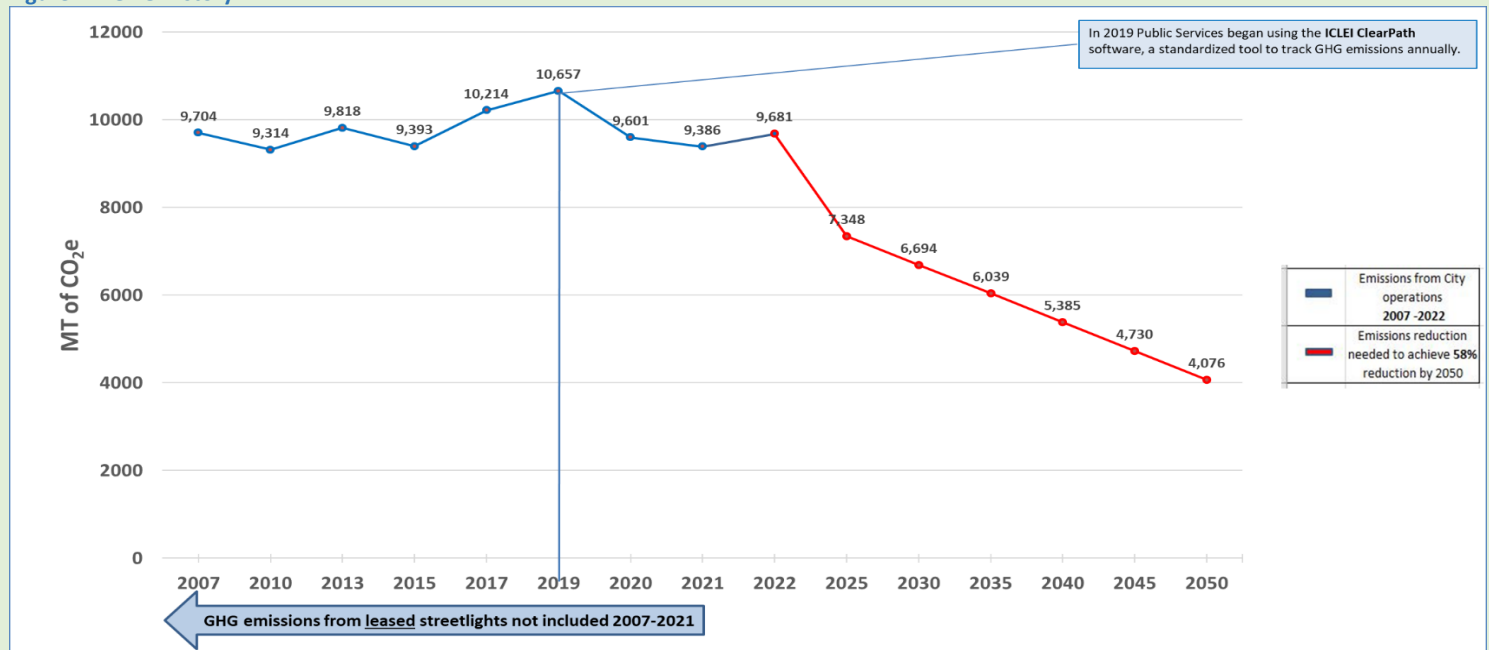
- **Scope 1** – direct emissions from activities under City control including fuel combustion on-site from gas boilers, back-up generators, and fuel usage in fleet vehicles & equipment.
- **Scope 2** – indirect emissions from electricity purchased and used by the City from Duke Energy.
- **Scope 3** – indirect emissions from City activities outside of City control such as off-site fuel purchases.

GHG emissions from the City of Wilmington include emissions from City buildings, fleet & equipment fuel use, streetlights, area lights, and traffic signals.

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What's Wilmington's GHG Emissions History?

Figure 1 – GHG History



Key Points:

- In 2022 GHG emissions were **9,681 MT CO₂e** as shown in Figure 1 above.
- As of 2022, total GHG emissions from City Operations have **decreased 0.2%** from the 2007 baseline.
- The 2022 GHG emissions includes new information by Duke Energy of *estimated* electricity usage of *leased* streetlights on City bills.
 - Note: the electricity usage of the *leased* streetlights, which are non-metered, was not available or reported in previous years.
 - In 2022, the *leased* streetlights contributed **524 MT CO₂e** to the total City's GHG emissions of **9,681 MT CO₂e**. Streetlights represent **6% of total emissions** in 2022.
 - For comparison to the 2007 baseline, if the leased streetlight emissions had been included at that time, it is estimated the GHG emissions from streetlights would have been **1,554 MT CO₂e** of an estimated total **10,667 MT CO₂e**. Streetlights represented and estimated **15% of total baseline emissions** in 2007.
- To meet the GHG reduction goal of 58% by 2050 (or 4,076 MT CO₂e) emissions will need to decrease by an average of **200 MT CO₂e per year** between 2022 and 2050.

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GHG Emissions by Sector

Figure 2 – Emissions by Sector

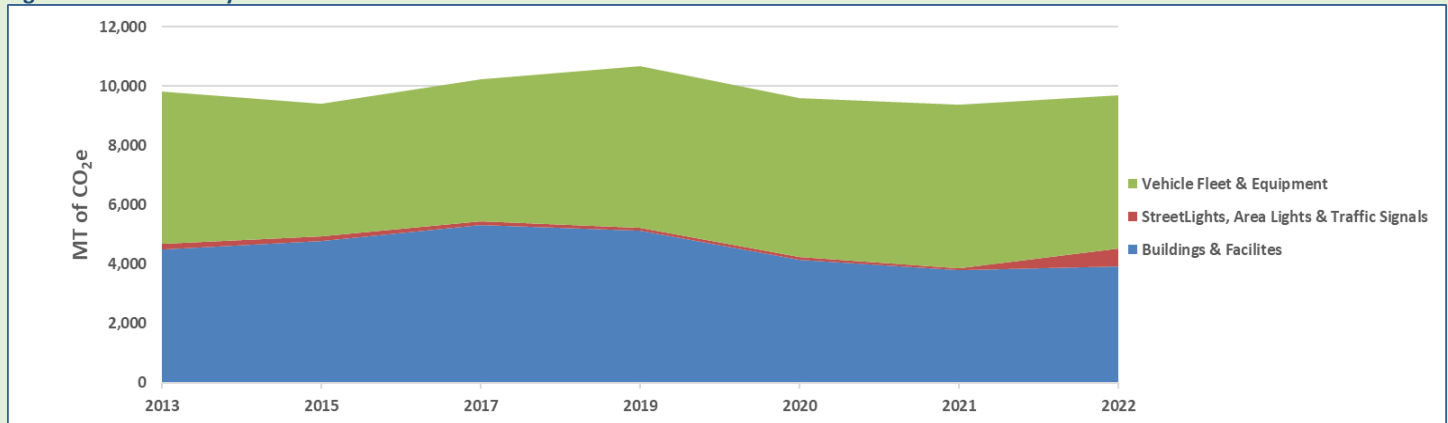


Table 1 – Historical Emissions by Sector

	MT CO ₂ e						
	2013	2015	2017	2019	2020	2021	2022
Vehicle Fleet & Equipment	5,133	4,460	4,768	5,440	5,367	5,534	5,167
Streetlights, Area Lights & Traffic Signals	182	157	133	95	74	69	589
Buildings & Facilities	4,503	4,776	5,312	5,121	4,160	3,782	3,926
Total GHG Emissions	9,818	9,393	10,213	10,656	9,601	9,385	9,682

Key Points:

- Vehicles & Equipment:** In FY22, the emissions from the fuel usage in vehicles & equipment, **5,167 MT CO₂e** (see Table 1), composed the largest sector of the City’s GHG emissions at **53%** as illustrated in Figure 2 above.
 - Good news in this sector** is the **5%** emissions reduction since 2019 from the continued purchase of hybrid vehicles and replacement of aged vehicles with newer, more fuel-efficient models.
 - As the City transitions towards zero-emission vehicles (ZEV’s) the emissions from this sector are expected to decrease.
- Buildings & Facilities:** In FY22, the emissions from Buildings & Facilities, **3,926 MT CO₂e** (see Table 1), represented **41%** of the City’s GHG emissions as illustrated in Figure 2 above.
 - Good news in this sector** is the **26%** emissions reduction since 2017. Building & Facilities emissions have been on a downward trend as energy efficiency initiatives are implemented, aged building mechanical equipment is replaced with new, efficient equipment, and new facilities are designed with energy efficiency as a priority.

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- **Streetlights, Area Lights & Traffic Signals:** In FY22, the emissions from this sector, **589 MT CO₂e**, represented **6%** of the City's GHG emissions. This sector consists of several types of lighting (Table 2).

Table 2 – City Lighting

Description	Meter Info	Count	# Converted to LED	% LED
Streetlights - Leased from Duke Energy Progress	non-metered	8,155	8,008	98%
Streetlights - City Owned	metered	858	858	100%
Area Lights - City Owned	metered	511	303	59%

- **Good news in this sector** is the conversion of high-pressure sodium vapor (HPSV) lighting to LED has led to a **62%** reduction from 2013 – 2021 in City-owned streetlights and area lights. A similar percentage energy reduction was likely achieved from the conversion of the *leased* streetlights. Over the last several years the City has worked with Duke Energy Progress to convert both *leased* streetlights and City-owned streetlights to energy efficient LED. To date **98%** of the leased streetlights and **100%** of the City-owned streetlights have been converted as noted in Table 2. There remain 208 City-owned *area* lights that have yet to be converted to LED.
- However, as noted previously, beginning in October 2021 Duke Energy Progress updated their data software system and began reporting the *estimated* energy usage of the 8,155 leased streetlights. This new estimated energy usage is now being included in the City's annual GHG reporting, which helps to explain the 2022 increase in GHG emissions from this sector (589 MT CO₂e) in Table 1 above.
- This estimate highlights that emissions of the streetlight sector have been reduced **58%** (from 15% to 6% of total emissions) by converting high pressure sodium vapor (HPSV) lights to LED.
- The City-owned lighting (streetlights and area lights) are metered and their energy usage has always been included in annual GHG reporting.
- **eGrid Factor:** The Emissions & Generation Resource Integrated Database (eGRID) is an EPA data source that is used to calculate GHG emissions. Each state or region has a different eGRID factor that is determined by how the electricity provider generates electricity (e.g primarily from coal, natural gas, nuclear, hydro, or renewables).
 - **Good news in this sector** - In Wilmington's region, the electricity provided by Duke Energy Progress has increasingly been generated from cleaner sources. This change has resulted in the eGRID factor decreasing over time (**37%** since 2014) as noted in Table 3, and is a **significant factor in lowering Wilmington's GHG emissions.**

Table 3- eGRID Historical Data

	VIRGINIA/CAROLINAS eGRID EMISSION RATES		
	CO ₂ (lb/MWh)	CH ₄ (lb/MWh)	N ₂ O (lb/MWh)
eGrid 2014	856.6	0.096	0.138
eGrid 2016	805.3	0.067	0.011
eGrid 2018	743.3	0.067	0.009
eGrid 2020	623.1	0.050	0.007

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What Can Wilmington Do Next?

Policy & Legislation



- Support clean energy policy implementation at the federal and state level, such as North Carolina HB 951 to reduce carbon emissions by 70% by 2030
- Support the North Carolina Utilities Commission and Duke Energy's efforts to generate electricity from clean and renewable sources
- Continued support of recommendations from the Clean Energy Advisory Committee

Buildings & Facilities



- Prioritize sustainable design, energy efficiency, and renewable energy systems for all new construction
- Consider a resolution implementing a Sustainable Building Policy for all new City facilities
- Continue to implement energy efficiency projects of existing buildings & facilities
- Purchase energy efficient computers, laptops, and appliances rated by ENERGY STAR and/or EPEAT
- Provide funding or pursue grant opportunities to install solar PV systems on suitable city-owned facilities
- Convert the remaining city-owned area lights to LED
- Continue investments in urban forests

Fleet & Equipment



- Consider funding for a Fleet EV Transition Study
- Phase in the replacement of ICE vehicles with ZEV or hybrid vehicles
- Phase out use of gas mowers, landscaping equipment, and golf carts with electric models
- Identify and pursue federal / state grant opportunities to install EV charging infrastructure at City facilities
- Support the growth and use of alternative transportation



THANK YOU

for more information contact

City of Wilmington

Public Services Department – Sustainability Office

www.wilmingtonnc.gov/sustainability