Strategic Energy Plan:

Pathways to 100% Renewable Energy

DRAFT

Presented by:
Shree Dorestant, DM
Vicki Foust, PhD

Presented to: City Council

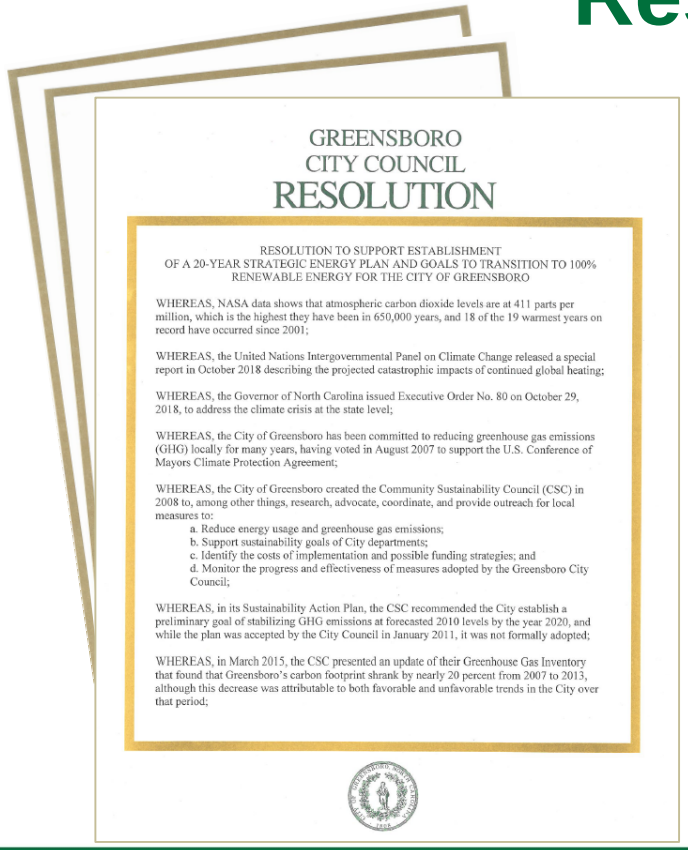
Date: September 29, 2022

GREENSBORO

“Keeping the Green in Greensboro”

- Community Sustainability Council – 2008
- Greenhouse Gas Inventory – 2008—
- Sustainability Action Plan – 2010
- CDP Cities – 2017
- Mayor’s National Climate Action Agenda – 2017
- LEED for Cities and Communities – Silver – 2020
- GSO2040 Comprehensive Plan – 2020
- Solar Energy Central – SolSmart Bronze – 2022

Resolution 19-0770



GREENSBORO
CITY COUNCIL
RESOLUTION

RESOLUTION TO SUPPORT ESTABLISHMENT
OF A 20-YEAR STRATEGIC ENERGY PLAN AND GOALS TO TRANSITION TO 100%
RENEWABLE ENERGY FOR THE CITY OF GREENSBORO

WHEREAS, NASA data shows that atmospheric carbon dioxide levels are at 411 parts per million, which is the highest they have been in 650,000 years, and 18 of the 19 warmest years on record have occurred since 2001;

WHEREAS, the United Nations Intergovernmental Panel on Climate Change released a special report in October 2018 describing the projected catastrophic impacts of continued global heating;

WHEREAS, the Governor of North Carolina issued Executive Order No. 80 on October 29, 2018, to address the climate crisis at the state level;

WHEREAS, the City of Greensboro has been committed to reducing greenhouse gas emissions (GHG) locally for many years, having voted in August 2007 to support the U.S. Conference of Mayors Climate Protection Agreement;

WHEREAS, the City of Greensboro created the Community Sustainability Council (CSC) in 2008 to, among other things, research, advocate, coordinate, and provide outreach for local measures to:

a. Reduce energy usage and greenhouse gas emissions;
b. Support sustainability goals of City departments;
c. Identify the costs of implementation and possible funding strategies; and
d. Monitor the progress and effectiveness of measures adopted by the Greensboro City Council;

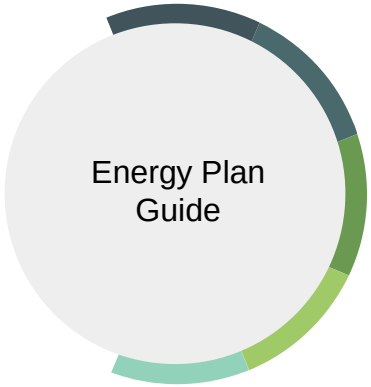
WHEREAS, in its Sustainability Action Plan, the CSC recommended the City establish a preliminary goal of stabilizing GHG emissions at forecasted 2010 levels by the year 2020, and while the plan was accepted by the City Council in January 2011, it was not formally adopted;

WHEREAS, in March 2015, the CSC presented an update of their Greenhouse Gas Inventory that found that Greensboro's carbon footprint shrank by nearly 20 percent from 2007 to 2013, although this decrease was attributable to both favorable and unfavorable trends in the City over that period;

1. Adopted, December 3, 2019
2. Directed the initiation to prepare a 20-year Strategic Energy Plan with the main goals of:
   a. reducing greenhouse gas (GHGs) emissions from City operations by $\geq$ 40% by 2025
   b. reducing overall energy consumption per square foot in all City-owned buildings by $\geq$ 40% by 2025
   c. transitioning to 100% renewable energy in City operations by 2040 from any combination of onsite and offsite renewable sources

Strategic Energy Plan Organization

DRAFT



- Form leadership team
- Identify and engage stakeholders

- Develop an energy vision
- Assess the current energy profile

- Develop energy goals and strategies
- Identify and prioritize actions

- Put together a financing strategy
- Develop a blueprint for implementation

- Develop an evaluation plan
- Adopt plan and publicize

Community Partnership

SEP Leadership Team

- City Departments

Community Partnership

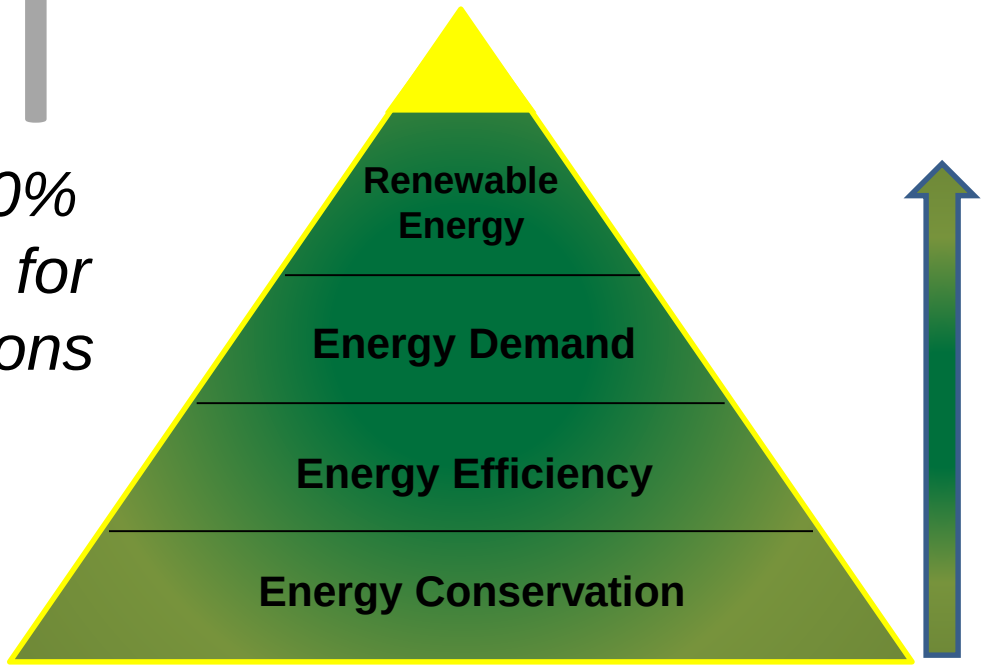
- Academia
- Advocacy Groups
- Businesses
- Civic Groups
- Religious Organizations

Energy Vision

DRAFT

Establish a pathway to 100% renewable energy by 2040 for City of Greensboro operations

"Prioritizing Sustainability"



The Strategic Energy Plan (SEP) Scope:

Reduce Scope 1 & Scope 2 GHGs

40% Operations Emissions Reduction by 2025

Application of achievable goals

ROI Toolkit sustainable energy projects

Funding strategies for green energy projects

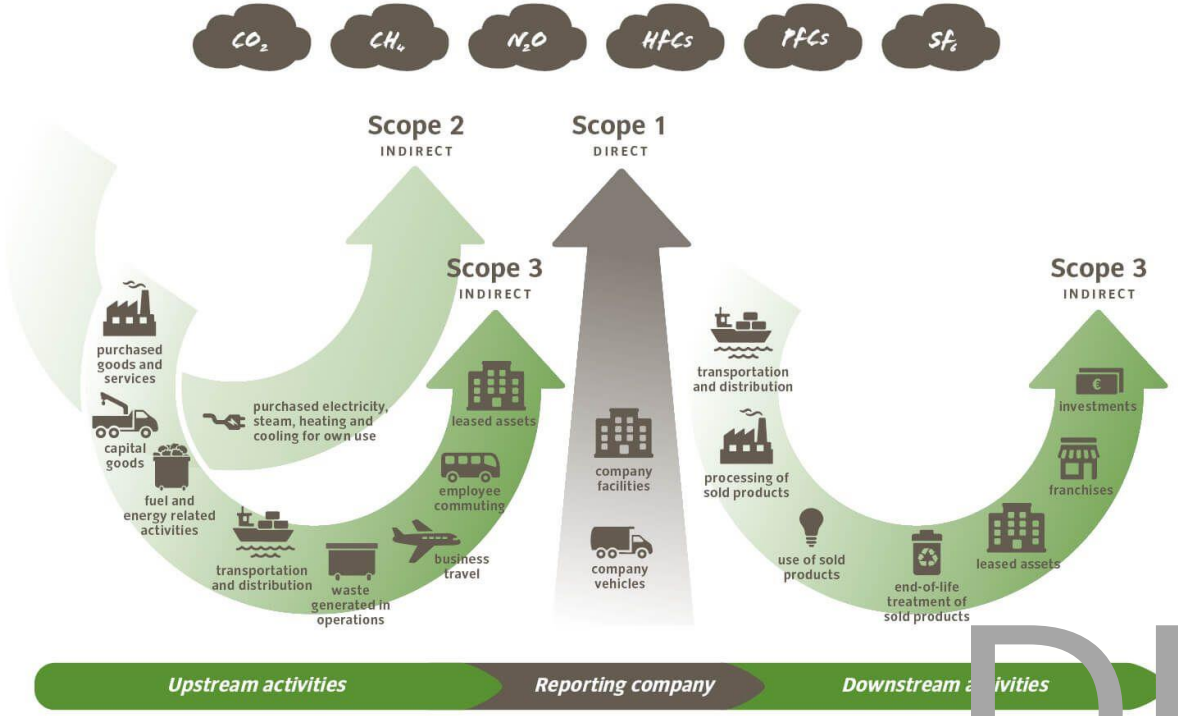
Incentivize all of GSO to mirror sustainable energies

Public Education Outreach Program

GHG Inventory every 2 years

Annual Progress Report

Greenhouse Gas Inventory

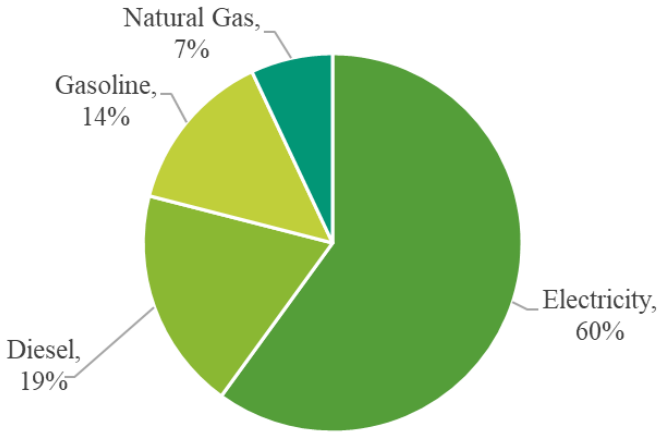


Common Name	GHG	GWP
Carbon Dioxide	CO2	1
Methane	CH3	28
Nitrous Oxide	N2O	265
Fluorinated Gases	CFC	4,500 – 14,000

Summary of GHG Emissions for 2007 and 2019

	2007 Emissions		2019 Emissions		Change in Emissions	
Emission Source	**Emissions (MT CO_{2e})**	**% of Emissions**	**Emissions (MT CO_{2e})**	**% of Emissions**	**Emissions (MT CO_{2e})**	**Change from 2007**
Electricity	93,232	79%	47,254	60%	- 45,978	- 49%
Diesel	12,822	11%	15,022	19%	+ 2,200	+ 17%
Gasoline	7,186	6%	10,552	14%	+ 3,366	+ 47%
Natural Gas	4,468	4%	5,320	7%	+ 852	+ 19%
Total	**117,708**	**100%**	**78,148**	**100%**	**- 39,560**	**- 34%**

Energy Goals, Strategies and Actions



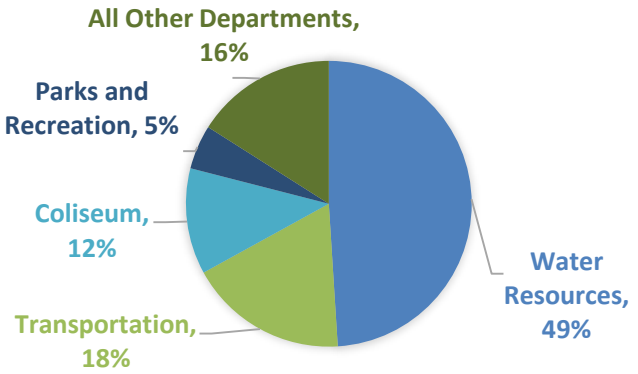
Breakdown of 2019 emissions from energy usage by source

Reducing total electricity use and increasing the use of renewable sources is a priority:

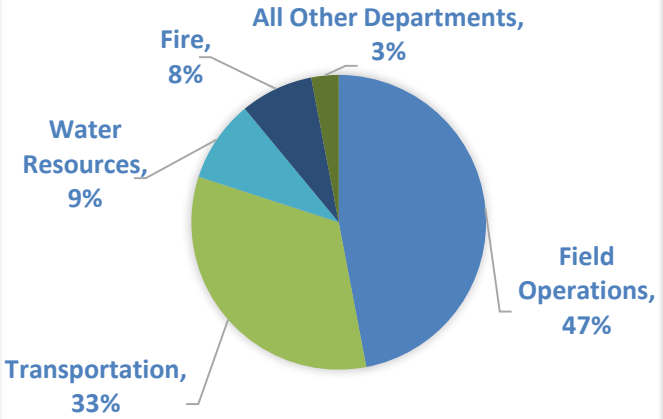
- Energy efficiency measures
- Energy education integration
- Adoption of renewable energy for electricity needs

Energy Goals, Strategies and Actions

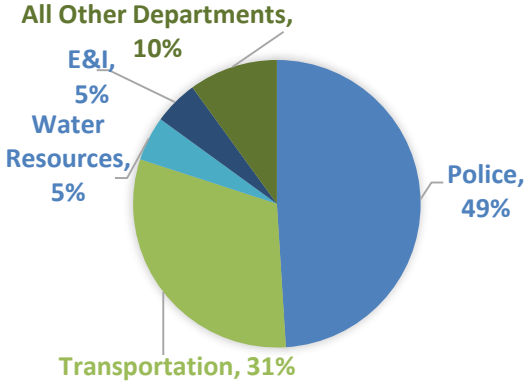
80% Electricity Consumption



80% Diesel Consumption



80% Gasoline Consumption



**Natural Gas accounts for 7% of emissions.*

Pathways to 100% Renewable Energy

Electricity

- Reduce the consumption in buildings and equipment through energy efficiency measures.
- Integrate on-site renewable energy.

Diesel

- Reduce diesel consumption through integration of hybrid and electric vehicles into both fleet vehicle replacement and equipment replacement as comparable vehicles and equipment become available.

Gasoline

- Reduce gasoline consumption through integration of hybrid and electric vehicles into the fleet.

Prioritizing Actions

SEP Implementation Timeline (2022 – 2040)

Years 1-5

- Finalize and adopt SEP
- Execute funding streams
- Perform energy audits and other energy conservation measures
- Create programs and optimize project management
- Conduct various audits, analyses and feasibility studies

Years 6-10

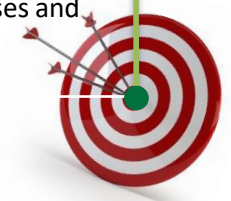
- Execute performance contract(s)
- Continue energy audits; acquire renewable [illegible] audits [illegible] and/or offs[illegible]s
- Continue to [illegible]dentify [illegible]nd [illegible]dop projects (e.[illegible], sola[illegible] and implement various policies and programming (e.g., Fleet purchases)
- Conduct various audits, analyses and feasibility studies.

Years 11-15

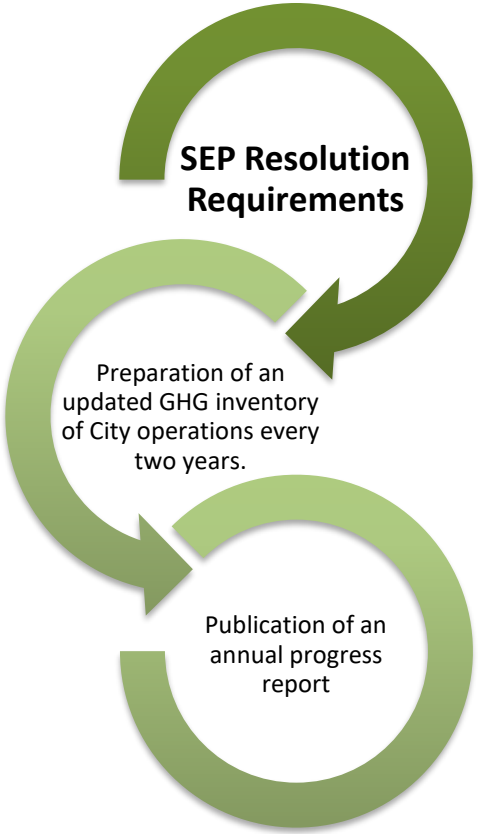
- Budget for additional projects (e.g., solar) and various programming
- A[illegible]uire RE[illegible] and/or [illegible]
- Cor[illegible]nue a[illegible]sessment o[illegible] the con[illegible]rsion of gasoline/diesel equip[illegible]en[illegible]o electric
- Continue to expand EV-charging infrastructure
- Conduct various analyses and feasibility studies

Years 16-20

- Budget planning for additional projects (e.g., rooftop solar)
- Continue assessment of the conversion of gasoline/diesel equipment to electric
- Continue to expand EV-charging infrastructure
- Purchase RECs to meet remaining emissions reduction goal
- Conduct various analyses and feasibility studies



Evaluation Plan



Number	Recommendation	Status
1	The City should establish a Sustainability Office.	✓ **Completed**
2	Clean energy audits/installation/maintenance contracts will give priority to Historically Underutilized Businesses (HUBs) and Minority and Women Business Enterprise (MWBE).	
3	nsure ergy de s are m de in a way th promotes a just transition rens able en gy f all and prioritizes vuln able communities.	
4	l City wned will m et Green Buil g standards (New and ubstan lly enovated ity-O wned).	
5	The City fleet will be composed of zero-carbon sources by 2040.	
6	Establish a policy to achieve no net loss of the tree canopy throughout the city for improved air quality, reduced heat island effect, and ongoing carbon sequestration.	
7	Develop an Energy and Water Education Program for all City staff.	
8	Review current vehicle and equipment purchase/lease process for potential efficiency improvements.	

Q&A

For more information, visit:
www.greensboro-nc.gov/sustainability

If you have any general questions, please contact the Office of Sustainability at:
LiveGreen@Greensboro-nc.gov