

Local Government Clean Energy Report

Winston-Salem, North Carolina

Created: February 2021



NC SUSTAINABLE
ENERGY ASSOCIATION



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Authors:

Daniel Parker
Jerry Carey
Daniel Pate
Laura Langham

Design:

Samantha Radford

About North Carolina Sustainable Energy Association

North Carolina Sustainable Energy Association (NCSEA) is the leading 501(c)(3) non-profit organization that drives public policy and market development for clean energy. Our mission is to drive policy and market development to create clean energy jobs, economic opportunities, and affordable energy that benefits all of North Carolina. NCSEA's work enables clean energy jobs, economic opportunities, and affordable energy options for North Carolinians. Learn more at www.energync.org.



Introduction

Where does this data come from?

Before electricity-generating systems can be interconnected, they must register with paperwork that is filed to the North Carolina Utilities Commission (NCUC). This paperwork includes Reports of Proposed Construction (ROPCs) and Certificates of Public Convenience and Necessity (CPCNs), depending on their generating capacity. NCSEA tracks these ROPC and CPCN filings and compiles them into the Renewable Energy Database (REDB), which is the source of information for this report. The REDB is the most comprehensive source of data on clean energy systems in the state, and includes information on system technology type, size, and location.

What does the REDB contain?



- Application Information
 - NCUC Docket Number
 - Docket Description
 - Application Date, Quarter, and Year
- Facility Type
 - Residential, Commercial, etc.
- Project Name
- Account Holder Company
- Project Location
 - Address, City, County, NCSEA Region, State, Zip Code, Lat/Long
- General System Type
 - Biomass, Solar, Wind, etc.
- Specific System Type
 - Biogas, PV, Thermal, Waste to Heat, etc.
- System Notes
 - Poultry Waste, Swine Waste, Rooftop, Ground-mount, etc.
- System Capacity
- System Total Cost and Cost per Watt
- To whom the electricity and RECs are sold
- Installer Company
- Whether the system has been installed
- System Operation Date, Year, and Quarter
- How the system information was verified
- Political Districts in which system is located
 - NC House and Senate
 - US Senate

Figure 1. Information contained in NCSEA's Renewable Energy Database (REDB)



How Does NCSEA Define Renewable Energy Categories?

While there is no industry standard for defining renewable energy system categories, based on research and internal discussion, NCSEA groups them into three general categories which depend on their location, size, and/or use:

1. **Residential** - a renewable energy system of any generating capacity that is installed on or near a home/residence and produces electricity for use in that home/residence.
2. **Commercial/Industrial** - a renewable energy system with a generating capacity under 2 MW (AC) that is installed on or near a non-residential building that produces electricity for use in that non-residential building.
3. **Utility-Scale** - a renewable energy system with a generating capacity of 2 MW (AC) or greater that generates electricity for sale to an electricity utility.

Background Information

North Carolina is a leader in renewable energy, and specifically in solar photovoltaic (PV) systems. As of Q2 2020, North Carolina has the second most installed solar PV capacity in the United States, with over 6,451 MW.¹

While most of that capacity comes from utility-scale solar PV systems, there are many residential and commercial/industrial systems across the state too. Solar PV, however, is not the only type of renewable energy technology that contributes electricity to our grid. In fact, there are many hydroelectric, bioenergy, and wind systems in North Carolina, but this report primarily focuses on solar PV and wind technology, as applicable.



Current Renewable Energy Systems in Winston-Salem

Winston-Salem has almost three megawatts (MW) of renewable energy systems installed in the city, all of which is from solar PV. Most systems (88%) are residential, although the majority of generating capacity (59%) is from the city's commercial systems.

CATEGORY	# OF SYSTEMS	CAPACITY (MW)
COMMERCIAL	27	1.67
RESIDENTIAL	197	1.18
TOTAL	224	2.85

Table 1. Renewable energy systems in Winston-Salem by category

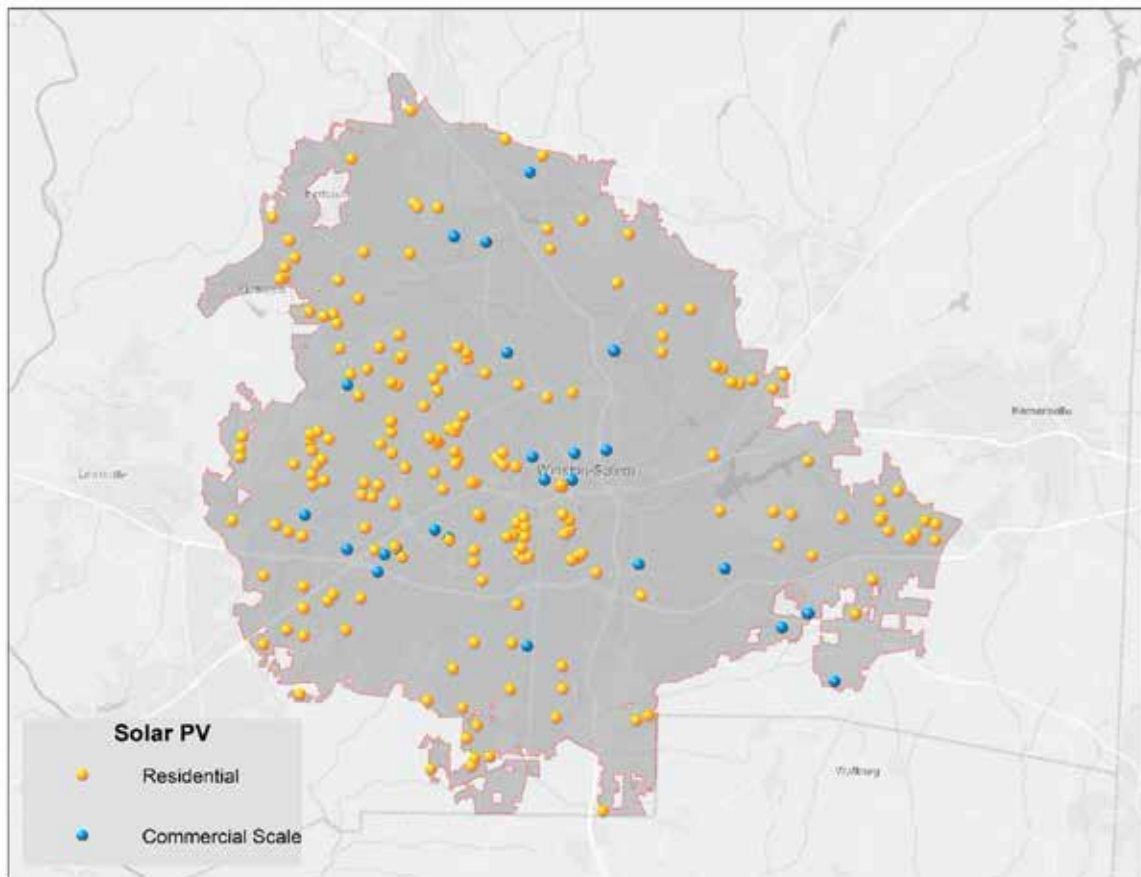


Figure 2. Renewable energy systems installed in Winston-Salem by category from 2010-2019



Commercial System Subcategories

Commercial solar PV systems in Winston-Salem serve a variety of businesses and other uses, including apartments, a brewery, and a car dealership.

CATEGORY	# OF SYSTEMS	CAPACITY (MW)
APARTMENTS/CONDOS	2	0.10
AUTOMOTIVE	1	0.11
BREWERY	1	0.03
EDUCATION	3	0.02
HEALTHCARE	3	0.03
HOUSING	1	0.02
OFFICE	8	0.34
RELIGIOUS FACILITY	1	0.03
RESTAURANT	2	0.01
RETAIL	3	0.87
WAREHOUSE	2	0.10
TOTAL	27	1.67

Table 2. Commercial renewable energy systems in Winston-Salem by sub-type

While growth in the number of renewable energy systems in Winston-Salem was modest until around 2015, the number of total systems has more than doubled since then. This growth, once again, is dominated by residential solar PV systems.



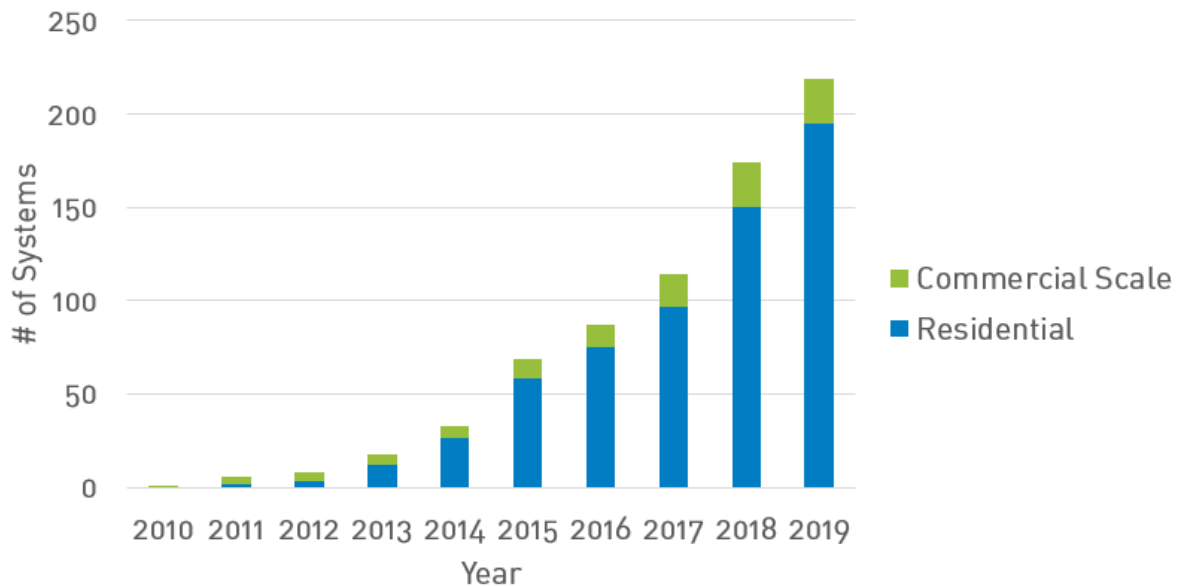


Figure 3. Renewable energy systems in Winston-Salem from 2010-2019

Like the growth in the number of renewable energy generating systems, the generating capacity of these systems in Winston-Salem has almost doubled since 2015. Once again, most of this growth is from residential systems.

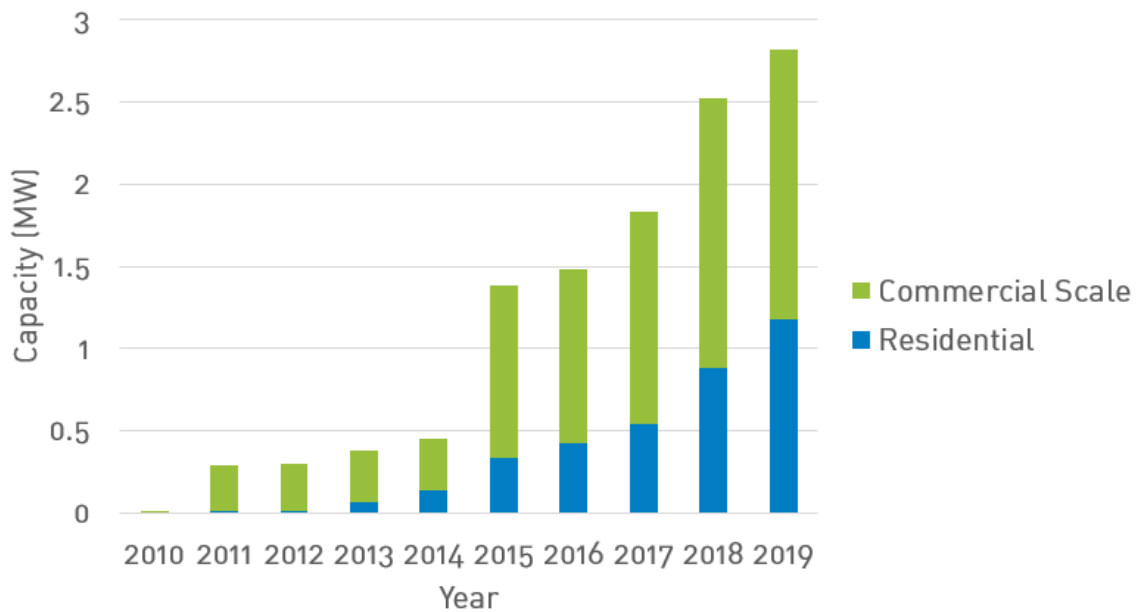


Figure 4. Renewable energy generating capacity in Winston-Salem from 2010-2019



Comparing Winston-Salem to Other Cities

In addition to providing metrics for Winston-Salem’s current amount of renewable energy systems and capacity, this report provides points of comparison from other cities in North Carolina of similar population sizes and/or in counties of similar economic tier.^{2,3} For Winston-Salem, these cities are Durham and Greensboro.

Number of Systems

When compared to these other cities in terms of both number of systems and generating capacity, Winston-Salem is third in both categories. Durham has more residential systems than Greensboro and Winston-Salem do combined. Additionally, Winston-Salem is behind both Durham and Greensboro in the number of commercial systems too.

CATEGORY	DURHAM	GREENSBORO	WINSTON-SALEM
RESIDENTIAL	622	205	197
COMMERCIAL	34	34	27
UTILITY-SCALE	0	1	0
TOTAL	656	240	224

Table 3. Number of renewable energy systems by category

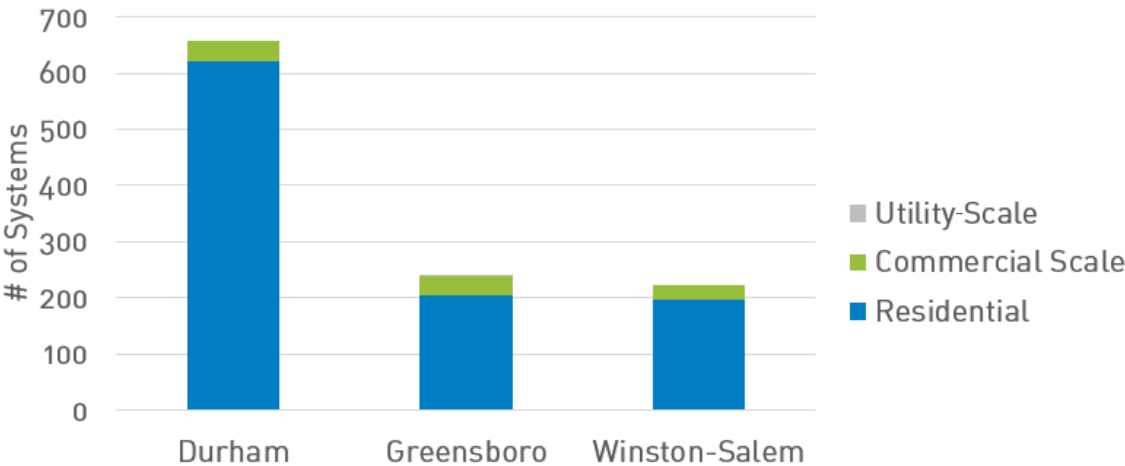


Figure 5. Number of renewable energy systems in Durham, Greensboro, and Winston-Salem



The gap between Durham and the other two cities has increased significantly since 2017, while Greensboro and Winston-Salem remain relatively similar.

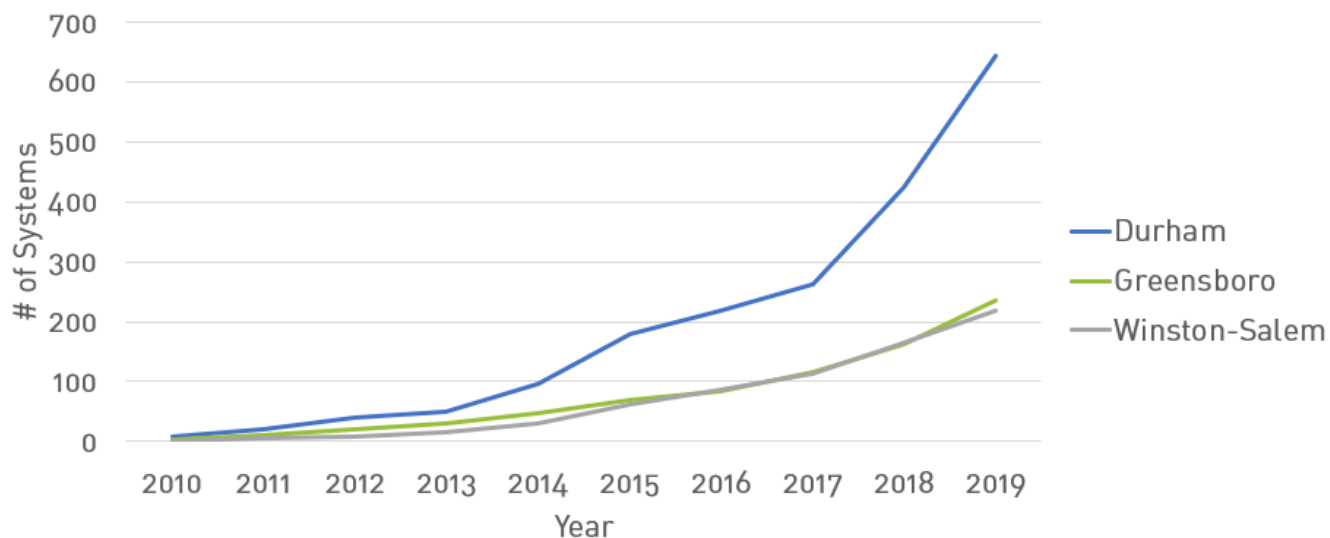


Figure 6. Number of renewable energy systems in Durham, Greensboro, and Winston-Salem from 2010-2019

Generating Capacity

In terms of capacity, Greensboro is well ahead of Durham and Winston-Salem. In fact, Greensboro, due to its utility-scale system as well as its higher commercial scale capacity, has more generating capacity than Durham and Winston-Salem combined.

CATEGORY	DURHAM	GREENSBORO	WINSTON-SALEM
RESIDENTIAL	3.68	1.30	1.18
COMMERCIAL	1.77	4.75	1.67
UTILITY-SCALE	0	3.40	0
TOTAL	5.45	9.45	2.85

Table 4. Renewable energy generating capacity by category



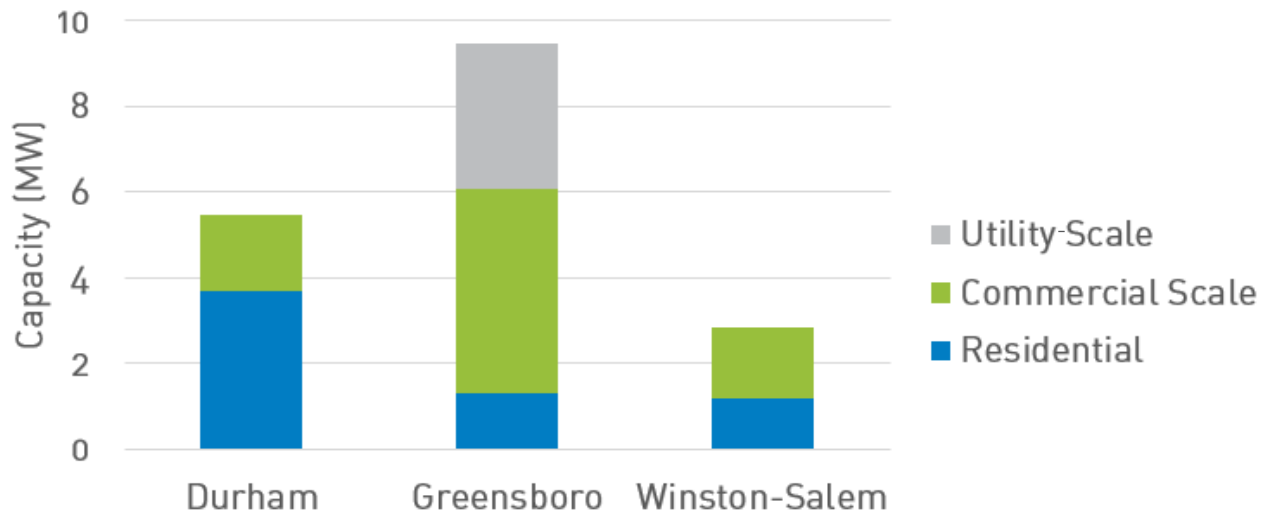


Figure 7. Generating capacity of renewable energy systems in Durham, Greensboro, and Winston-Salem

Unlike the number of systems, Greensboro has stayed well ahead of Winston-Salem in terms of generating capacity. Durham has also remained above Winston-Salem in generating capacity since passing it in 2011.

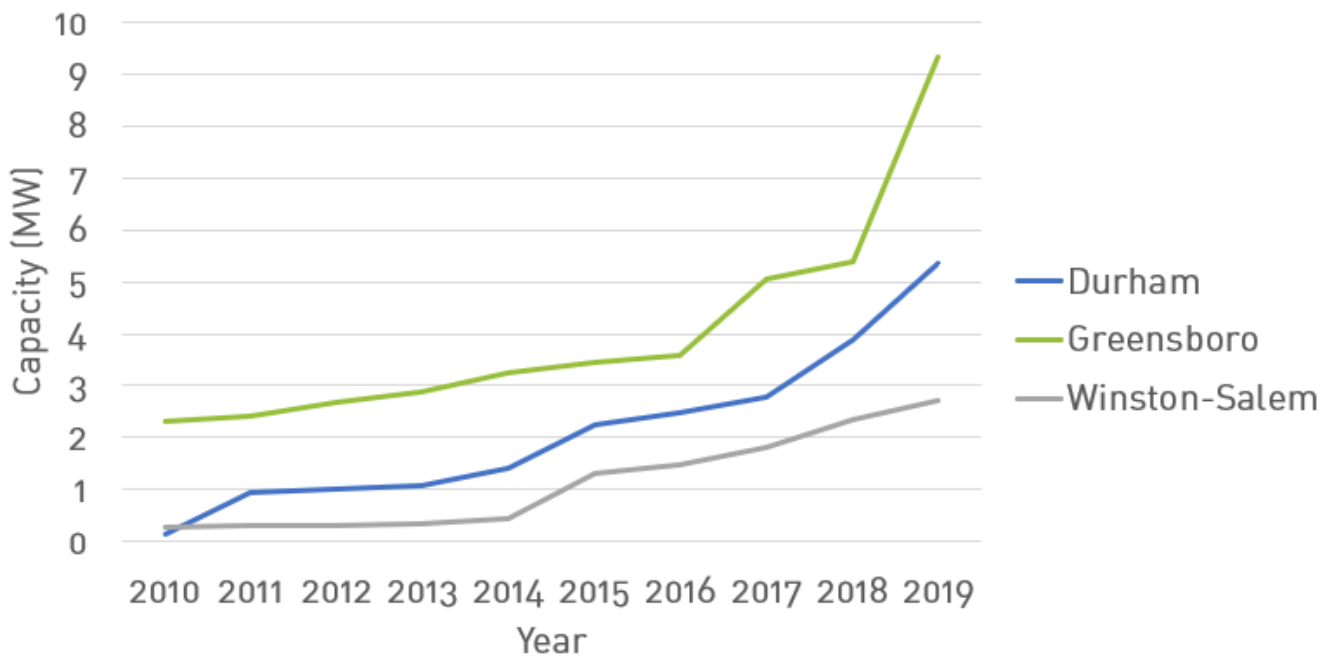


Figure 8. Generating capacity of renewable energy systems in Durham, Greensboro, and Winston-Salem from 2010-2019



Energy Efficient Buildings

Greensboro also leads both Durham and Winston-Salem in the number of energy efficient buildings, which are those that are either ENERGY STAR® or LEED® certified. Winston-Salem is a distant third in this category.

CATEGORY	DURHAM	GREENSBORO	WINSTON-SALEM
ENERGY STAR CERTIFIED	54	45	31
LEED CERTIFIED	104	200	37
TOTAL	158	245	68

Table 5. Energy efficient buildings in Durham, Greensboro, and Winston-Salem by type

CATEGORY	DURHAM (FT ²)	GREENSBORO (FT ²)	WINSTON-SALEM (FT ²)
ENERGY STAR CERTIFIED	4,306,477	3,666,055	3,608,397
LEED CERTIFIED	43,079,340	3,988,758	5,870,868
TOTAL	47,385,817	7,654,813	9,479,265

Table 6. Square footage of energy efficient certified buildings in Durham, Greensboro, and Winston-Salem

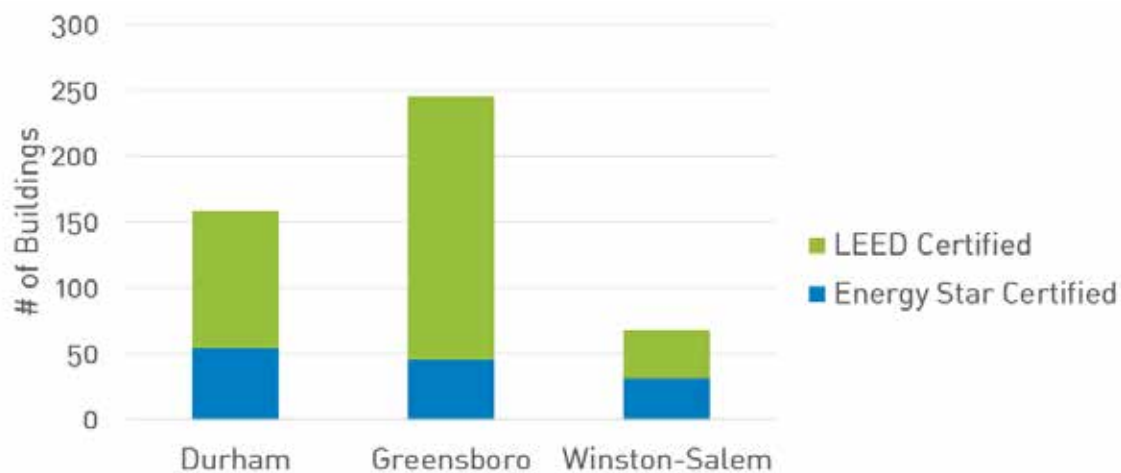


Figure 9. Energy efficient buildings in Durham, Greensboro, and Winston-Salem by type



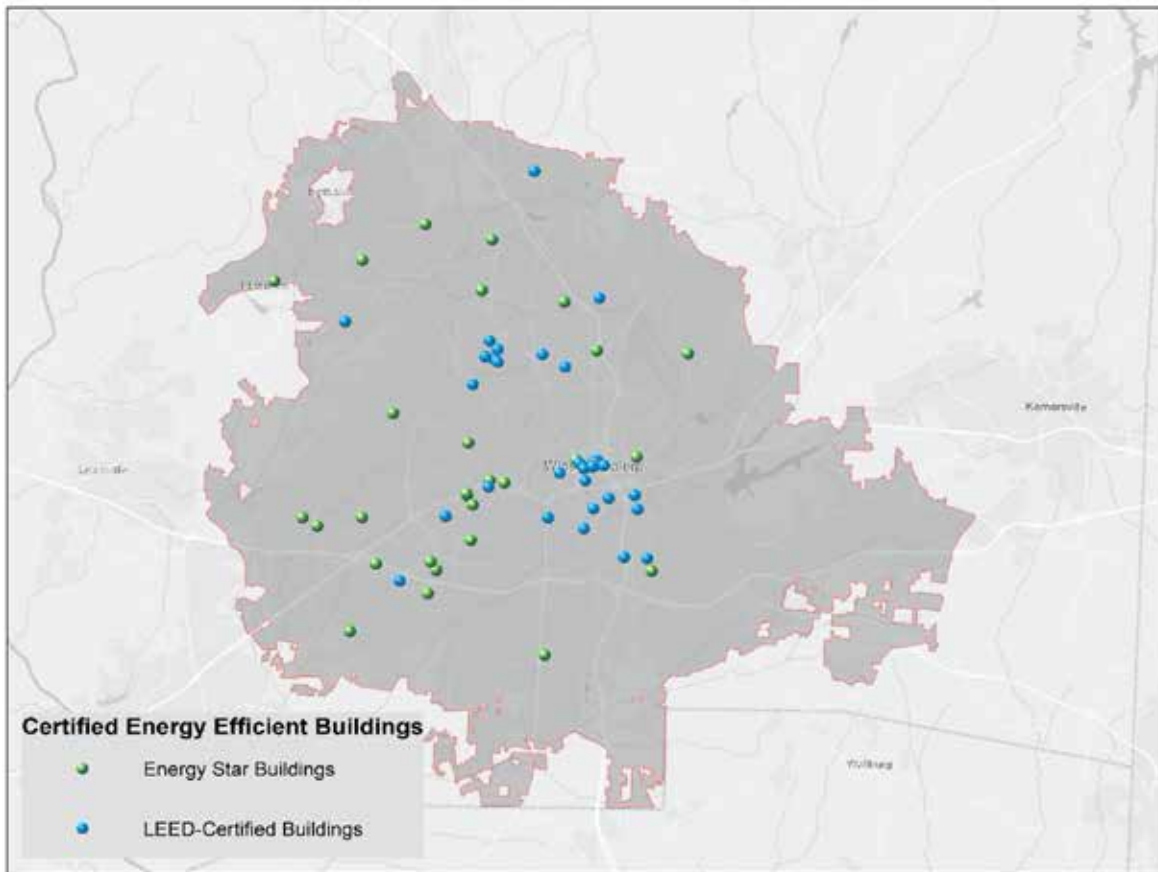


Figure 10. Energy efficient certified buildings in Winston-Salem

Electric Vehicles

In terms of electric vehicles (EV) and hybrid vehicles, Durham County, leads, while Forsyth County is not far behind in second. Durham County, in fact, leads Guilford and Forsyth Counties in all three categories of vehicles.

TYPE	DURHAM	GUILFORD	FORSYTH
ELECTRIC	832	132	301
PLUG-IN HYBRID	517	108	242
HYBRID	7,169	1,846	4,803
TOTAL	8,518	2,086	5,346

Table 7. Electric and hybrid vehicles Durham, Guilford, and Forsyth Counties by type



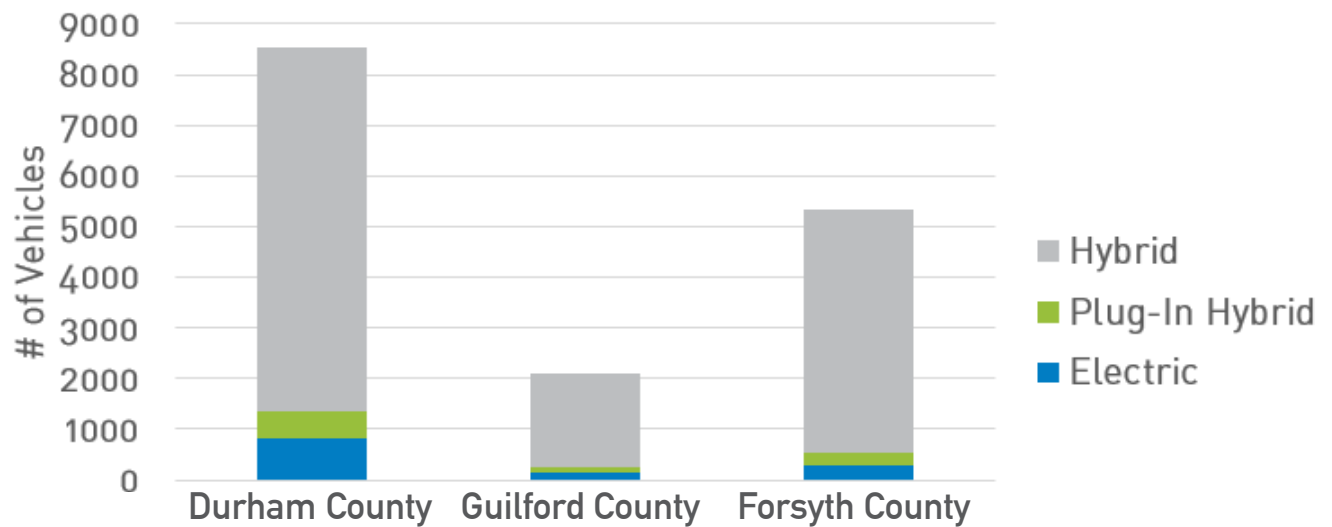


Figure 11. Electric and hybrid vehicles Durham, Guilford, and Forsyth Counties by type

Electric Vehicle Charging Stations

Durham also leads the cities in the number of electric vehicle charging stations. Winston-Salem is third, with almost half as many stations as Greensboro.

TYPE	DURHAM	GREENSBORO	WINSTON-SALEM
LOCAL/MUNICIPAL GOVERNMENT	3	0	0
PRIVATE	38	21	12
STATE GOVERNMENT	1	0	0
UTILITY	1	0	0
TOTAL	43	21	12

Table 8. EV charging stations in Durham, Greensboro, and Winston-Salem by type



Almost all the EV charging stations in these three cities are privately owned.

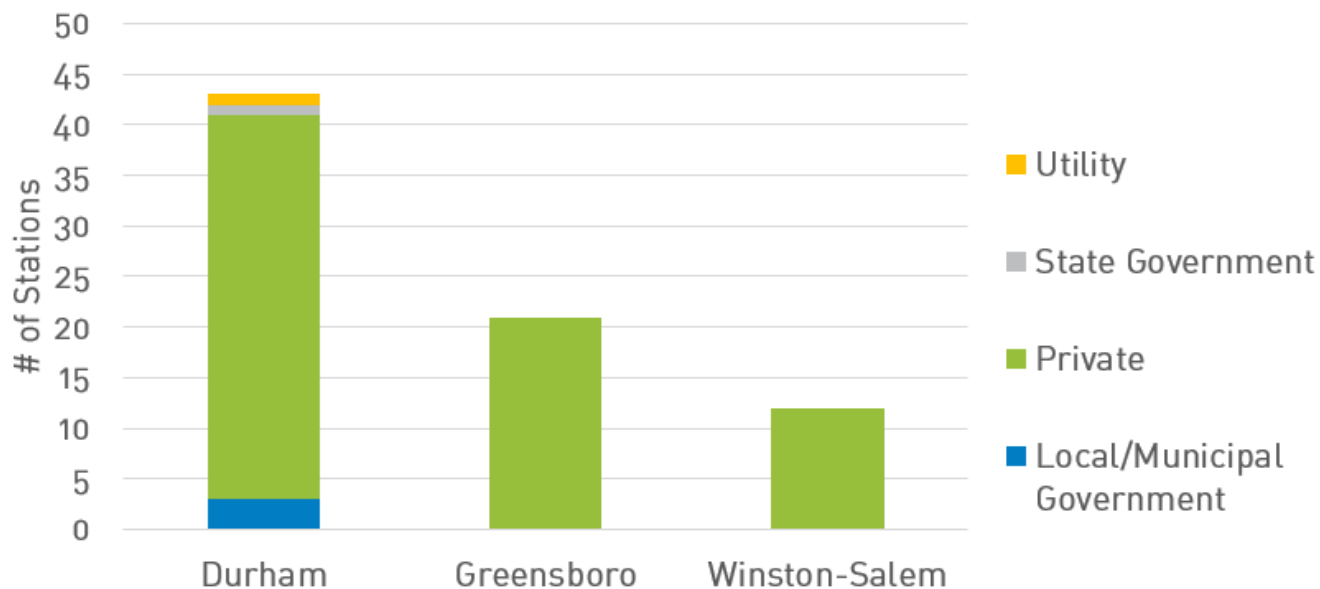


Figure 12. EV charging stations in Durham, Greensboro, and Winston-Salem by owner type

EV Charging Station Outlets

At any one EV charging station, there may be multiple outlets that can be used. In terms of the actual number of outlets at charging stations, Durham leads both Greensboro and Winston-Salem.

CATEGORY	DURHAM	GREENSBORO	WINSTON-SALEM
LEVEL 1	1	4	0
LEVEL 2	131	49	23
DC FAST CHARGE	4	18	1
TOTAL	136	71	24

Table 9. EV charging outlets in Durham, Greensboro, and Winston-Salem by type



Most of the outlets in Durham (96%), Greensboro (69%), and Winston-Salem (96%) are Level 2, and most of the rest are DC fast charging outlets.

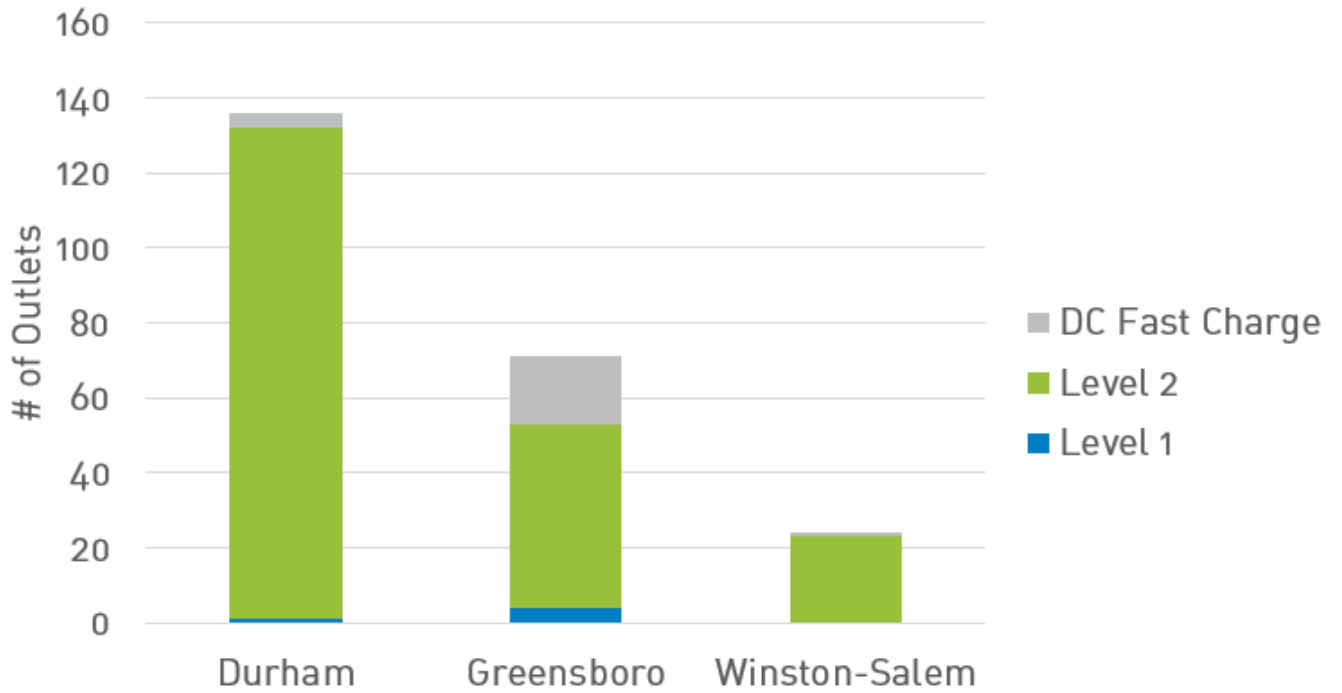


Figure 13. EV charging outlets in Durham, Greensboro, and Winston-Salem by type



Endnotes

1. Solar Energy Industry Association (SEIA). "North Carolina Solar." <https://www.seia.org/state-solar-policy/north-carolina-solar>
2. United States Census Bureau. "QuickFacts: Durham city, North Carolina; Greensboro city, North Carolina; Winston-Salem city, North Carolina." <https://www.census.gov/quickfacts/fact/table/durhamcitynorthcarolina,greensborocitynorthcarolina,winstonsalemcitynorthcarolina/PST045219>
3. North Carolina Department of Commerce. "County Distress Rankings (Tiers)." <https://www.nccommerce.com/grants-incentives/county-distress-rankings-tiers>

