Local Government Clean Energy Report

Cary, North Carolina

Created: March 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.

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 focuses on solar PV, since those are the only renewable energy systems in Cary.

The data in this report is current as of 2/26/2021.

Current Renewable Energy Systems in Cary

All Systems

Cary has over 9 MW of renewable energy generating capacity, all from solar PV systems. While most of this capacity (57%) comes from commercial systems, most of the systems in Cary are residential (93%).

CATEGORY	# OF SYSTEMS	CAPACITY (MW)
RESIDENTIAL	419	2.8
COMMERCIAL	29	5.4
UTILITY-SCALE	1	1.2
TOTAL	449	9.4

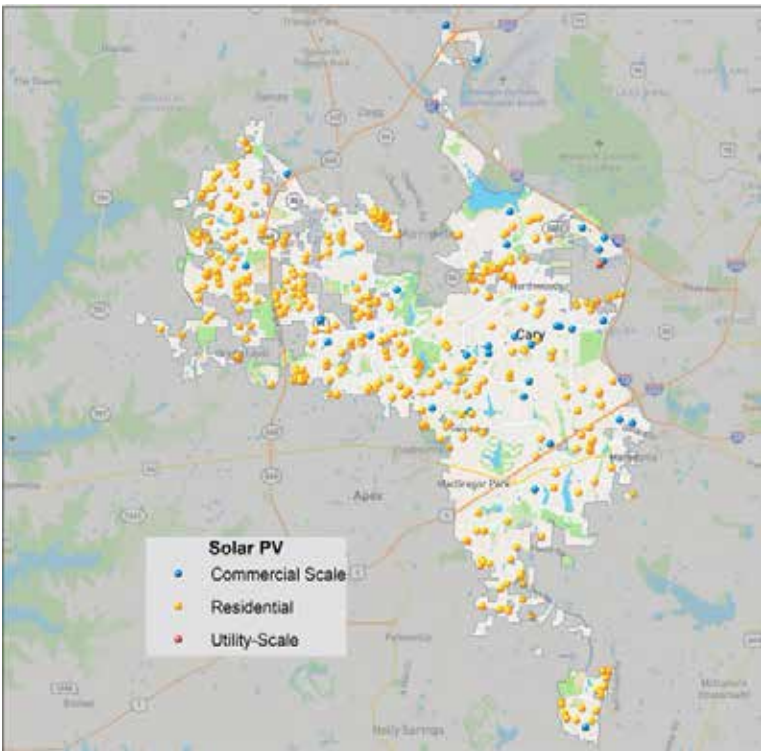Table 1. Renewable energy systems and capacity in Cary

Figure 2. Location of renewable energy systems in Cary

From 2010 to 2019

There are almost 50 times as many solar PV systems in Cary in 2019 compared to 2010. Even since 2015, the number of systems has increased by over 270%, and most of this growth is in the residential category.
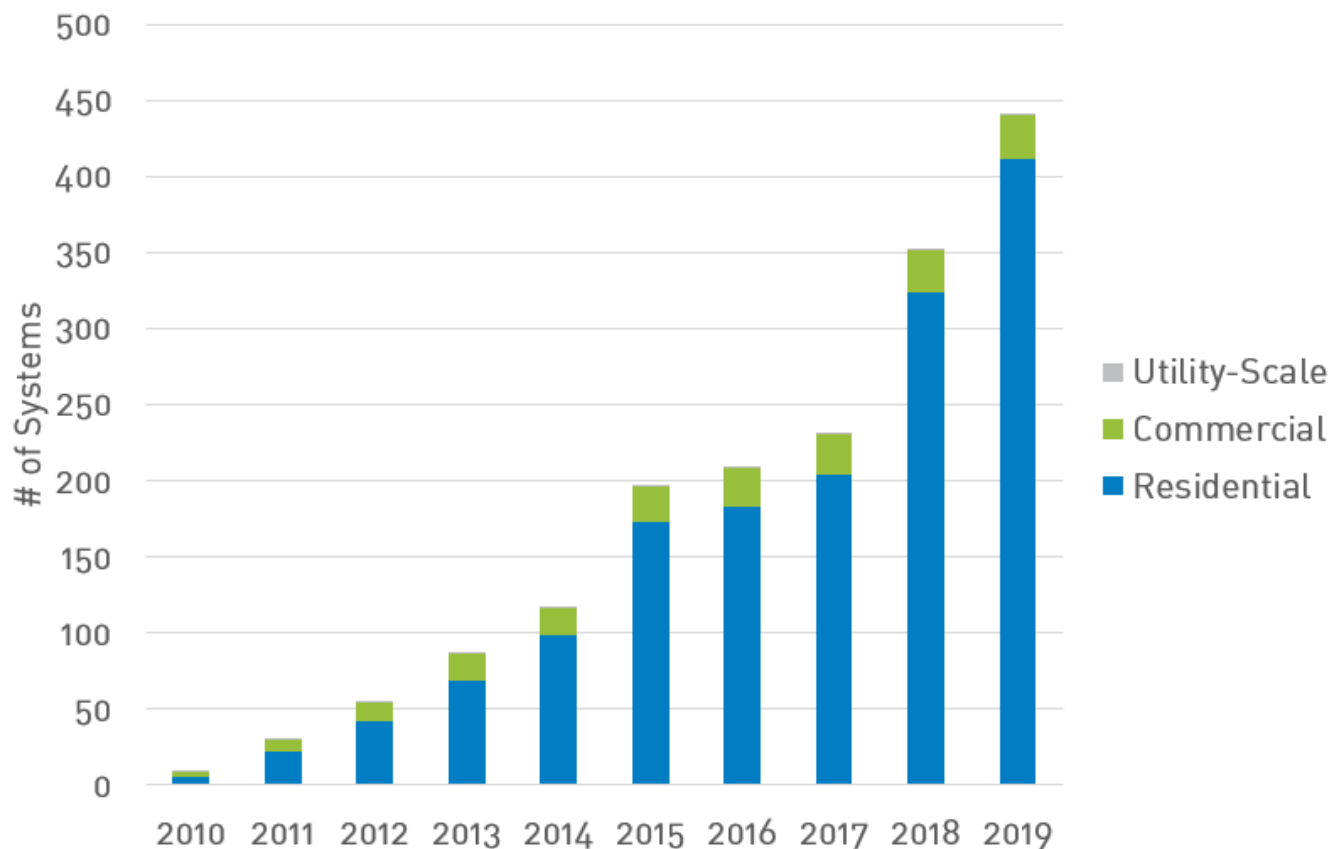

Figure 3. New renewable energy systems in Cary from 2010-2019

Capacity in 2019 is almost 5 times that in 2010, but most of that number is from commercial systems and those have stayed relatively constant since 2015.
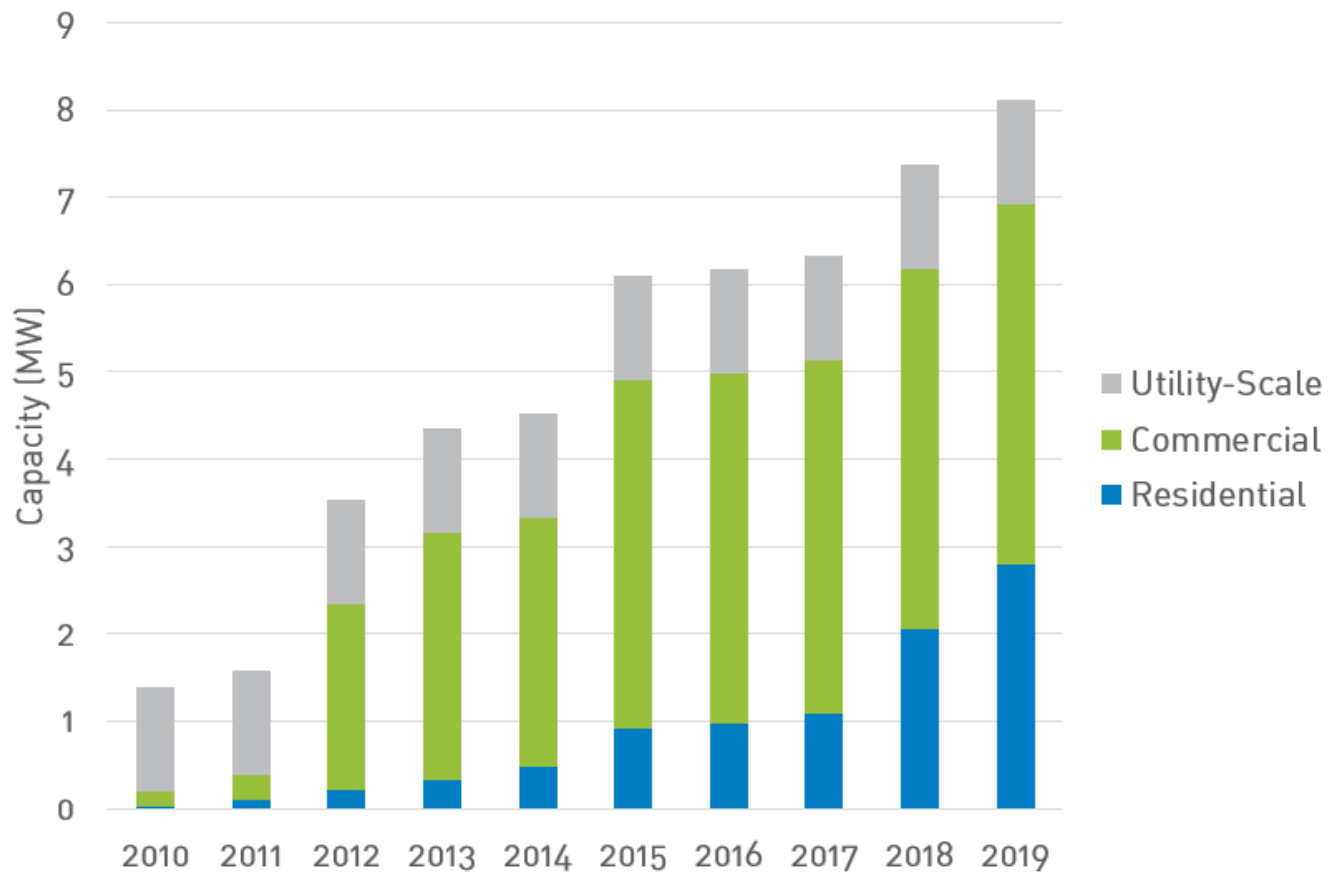
Figure 4. New capacity of renewable energy systems in Cary from 2010-2019

Commercial System Subcategories

Solar PV systems serve a variety of commercial customers in Cary, ranging from a car wash to a hotel, as well as offices and retail locations.

CATEGORY	# OF SYSTEMS	CAPACITY (MW)
AUTOMOTIVE	1	0.02
BEVERAGE	1	0.32
CAR WASH	1	0.00
EMERGENCY RESPONSE	1	0.02
GOVERNMENT	1	1.50
HEALTHCARE	1	0.01
HOTEL	1	0.04
OFFICE	12	2.20
RELIGIOUS FACILITY	1	0.01
RESTAURANT	1	0.04
RETAIL	8	1.20

Table 2. Commercial renewable energy systems in Cary by subcategory

Comparing Cary to Fayetteville and Wilmington

In addition to providing metrics for Cary'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 Cary, these points of comparison are Fayetteville and Wilmington.

Number of Systems

Cary leads both Fayetteville and Wilmington in the number of renewable energy systems. In fact, Cary has more systems than Fayetteville and Wilmington do combined.

CITY	RESIDENTIAL	COMMERCIAL	UTILITY-SCALE	TOTAL
CARY	419	29	1	449
FAYETTEVILLE	30	7	1	38
WILMINGTON	118	10	0	128

Table 3. Total renewable energy systems in Cary, Fayetteville, and Wilmington

Most of the systems in each city are residential, but Cary has the most, by far, of either residential or commercial systems. Cary has led Fayetteville and Wilmington since 2010, with significant growth to that lead since 2017.
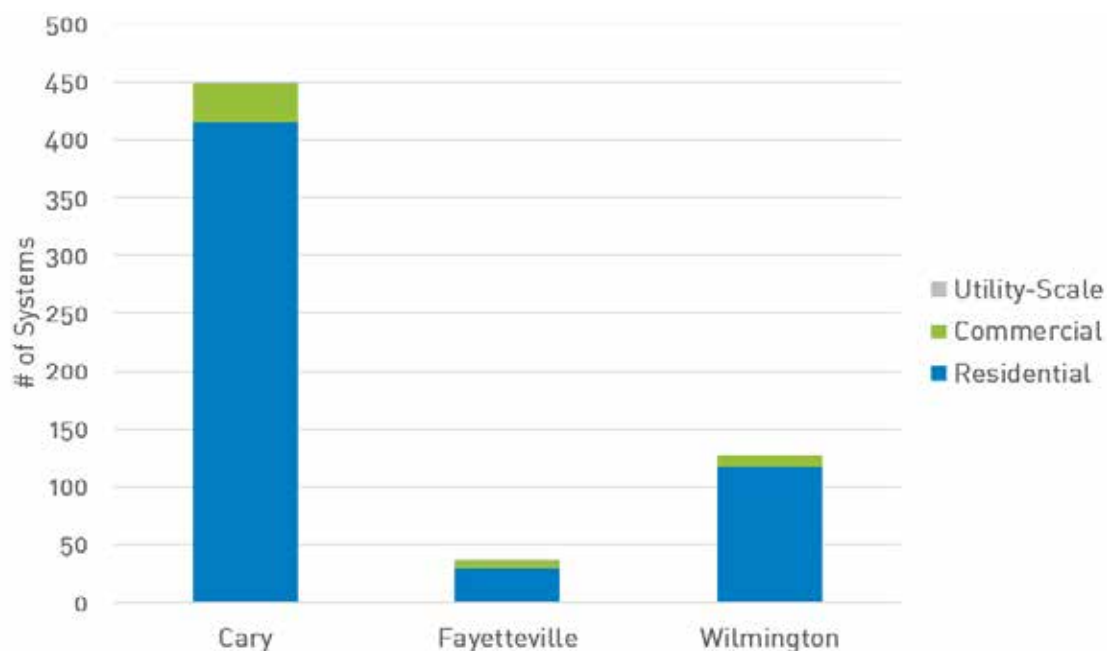

Figure 5. Total renewable energy systems in Cary, Fayetteville, and Wilmington
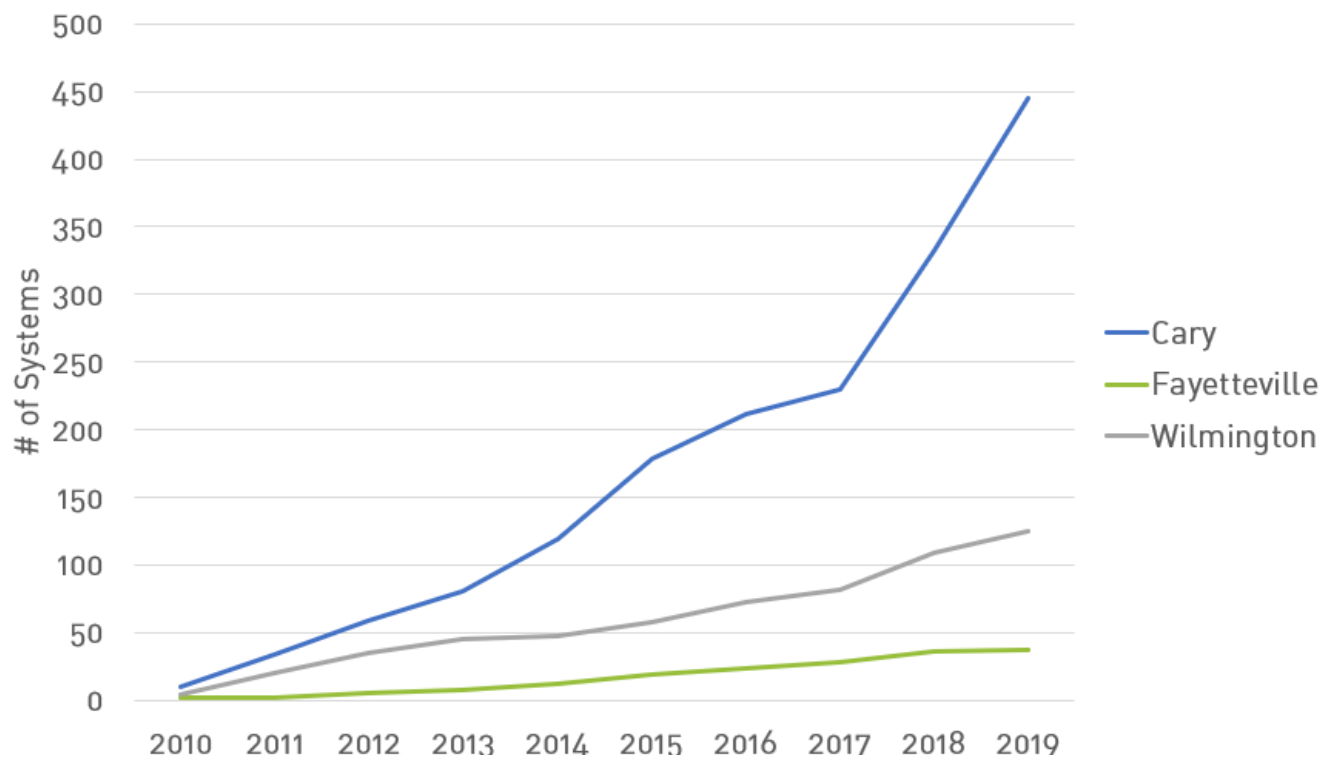
Figure 6. Number of new renewable energy systems in Cary, Fayetteville, and Wilmington from 2010-2019

Generating Capacity

Cary also leads Fayetteville and Wilmington in terms of generating capacity and, once again, has more total capacity than the other cities combined.

CITY	RESIDENTIAL (MW)	COMMERCIAL (MW)	UTILITY-SCALE (MW)	TOTAL (MW)
CARY	2.83	5.36	1.20	9.39
FAYETTEVILLE	0.18	0.35	5.00	5.53
WILMINGTON	0.80	0.66	0.00	1.46

Table 4. Renewable energy generating capacity in Cary, Fayetteville, and Wilmington

While the majority of capacity in Cary and Wilmington comes from commercial and residential systems, most of Fayetteville's capacity comes from its one utility-scale system.
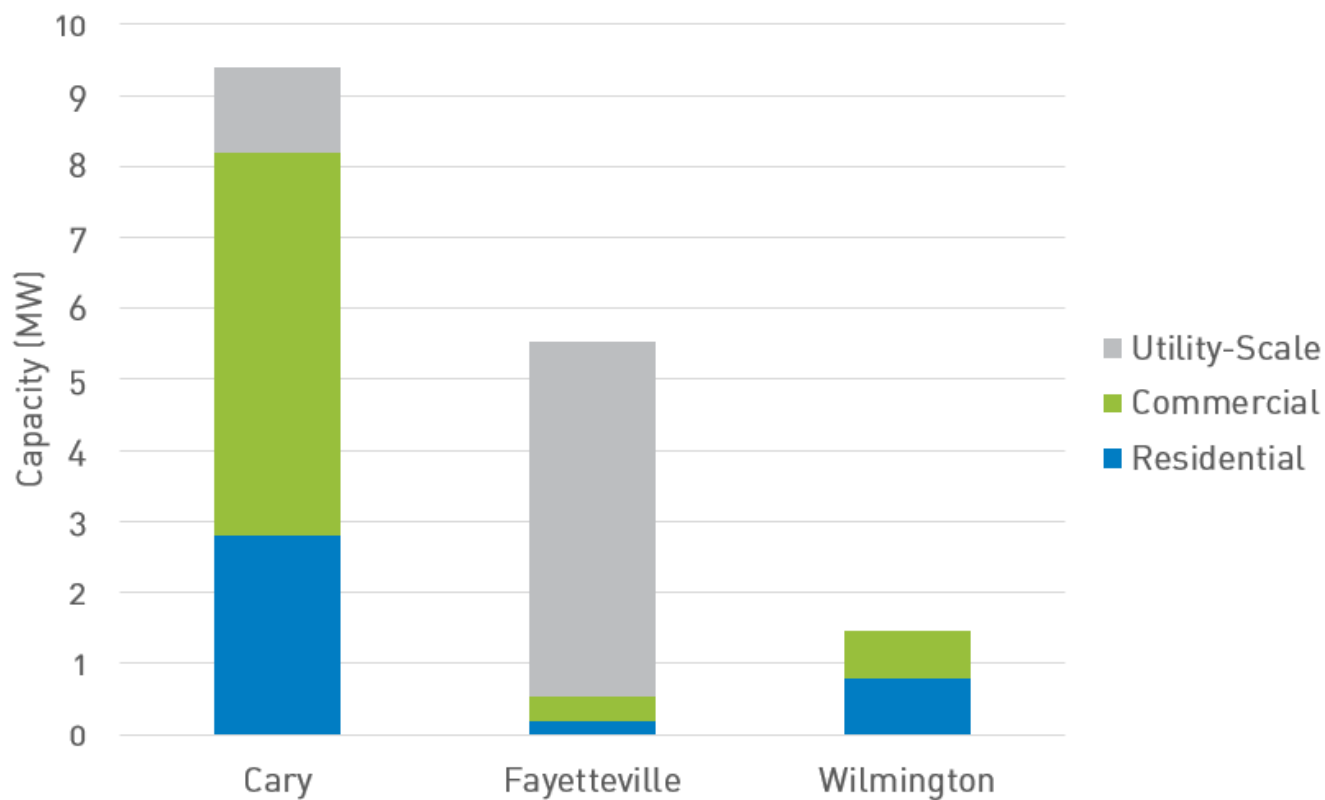

Figure 7. Renewable energy generating capacity in Cary, Fayetteville, and Wilmington

Since 2010, Cary has had a significant lead over the other cities despite the installation of a utility-scale system in Fayetteville in 2016.
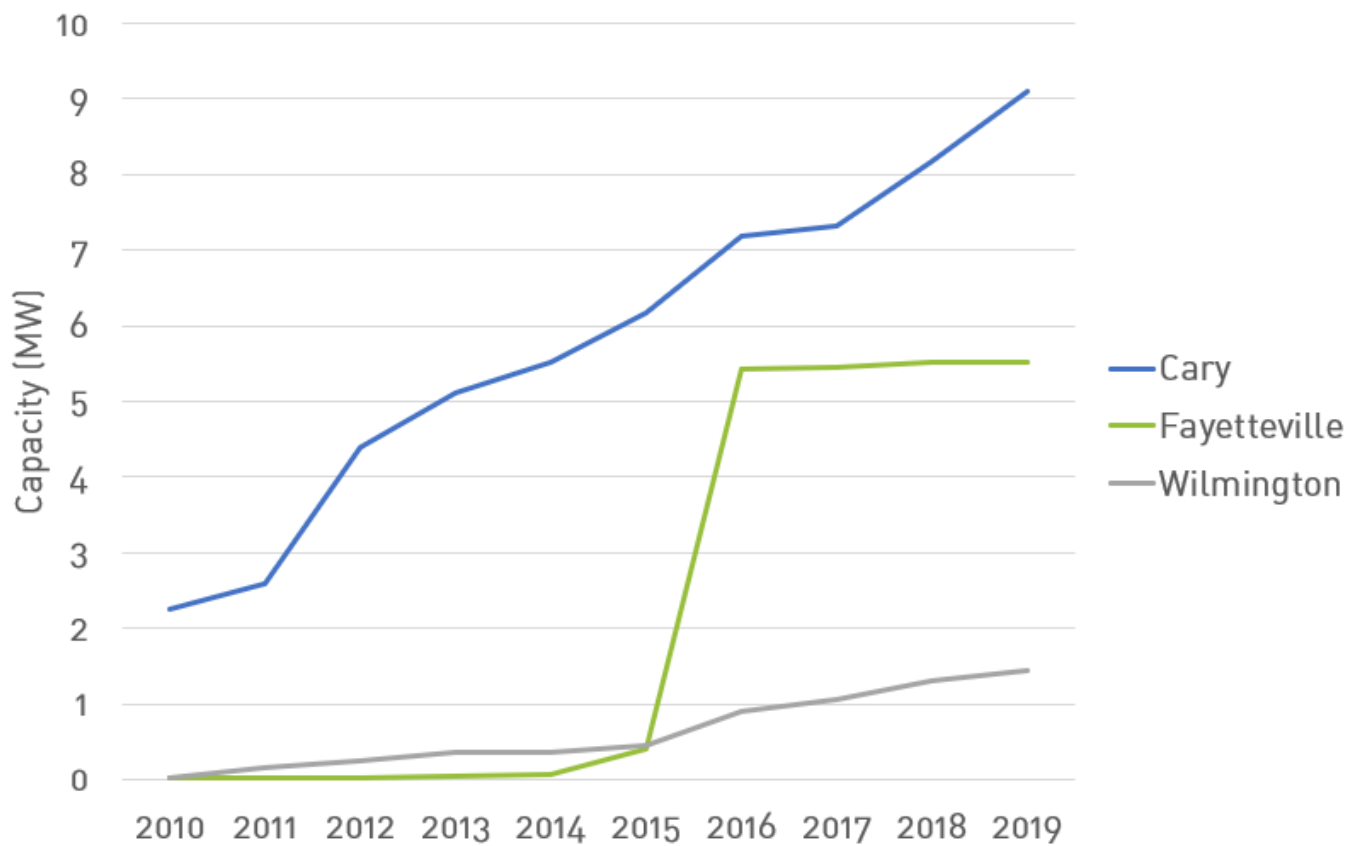
Figure 8. New renewable energy generating capacity in Cary, Fayetteville, and Wilmington

Energy Efficient Buildings

Types of Certification: ENERGY STAR® and LEED®

Two of the most popular certifications for buildings to demonstrate their energy efficiency are ENERGY STAR and LEED. For commercial buildings, the US Environmental Protection Agency's ENERGY STAR program helps building owners benchmark their energy usage and assigns each building a score according to its efficiency.[4] The median score of these buildings is 50, and those with scores of 75 or more are eligible for ENERGY STAR certification.[5]

Leadership in Energy and Environmental Design (LEED) is a program run by the US Green Building Council that focuses on whole building sustainability, including water use reduction and improved indoor air quality, in addition to building energy efficiency.[6] There are a variety of certifications that can be achieved depending on the use of the building and its stage of development.[7]

Certified Energy Efficient Buildings in Cary, Fayetteville, and Wilmington

Cary also leads Fayetteville and Wilmington in the number of energy efficient certified buildings.

CITY	ENERGY STAR	LEED	TOTAL
CARY	40	24	64
FAYETTEVILLE	23	24	47
WILMINGTON	23	16	39

Table 5. Certified energy efficient buildings in Cary, Fayetteville, and Wilmington

While Cary has almost twice as many ENERGY STAR certified buildings than LEED certified ones, those numbers are much closer in the other cities.
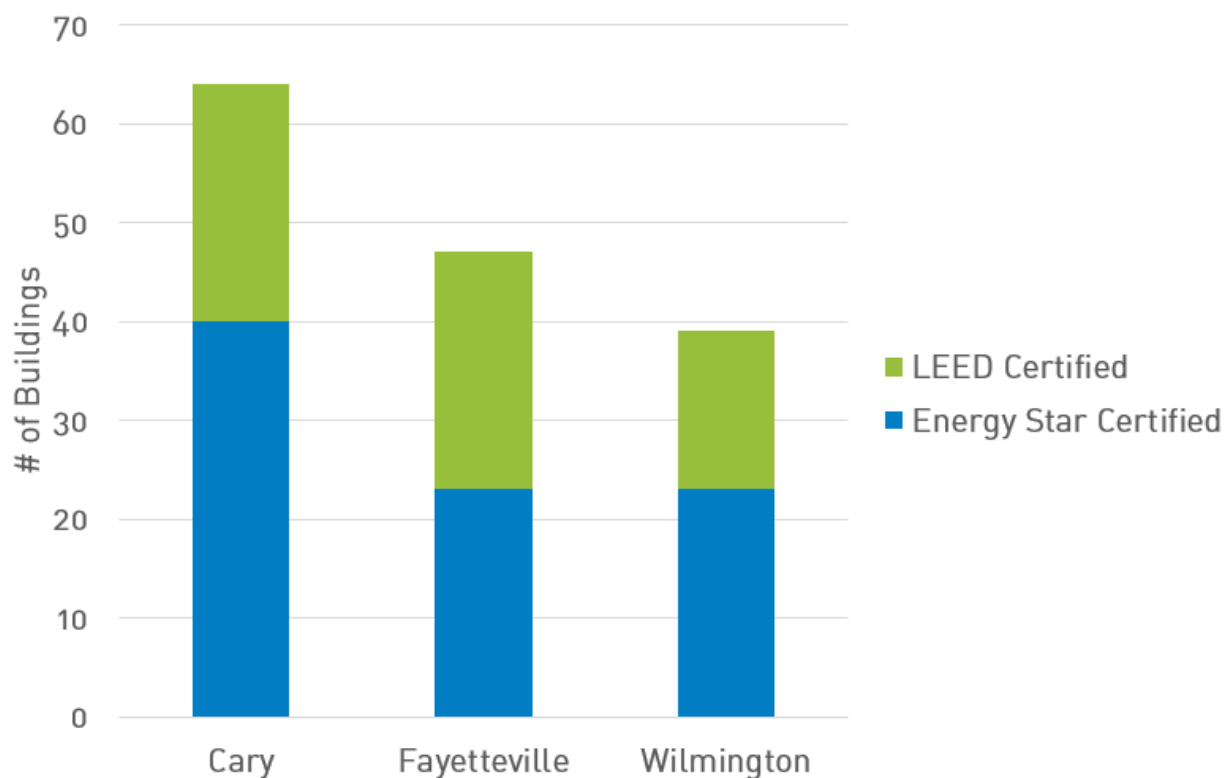

Figure 9. Certified energy efficient buildings in Cary, Fayetteville, and Wilmington
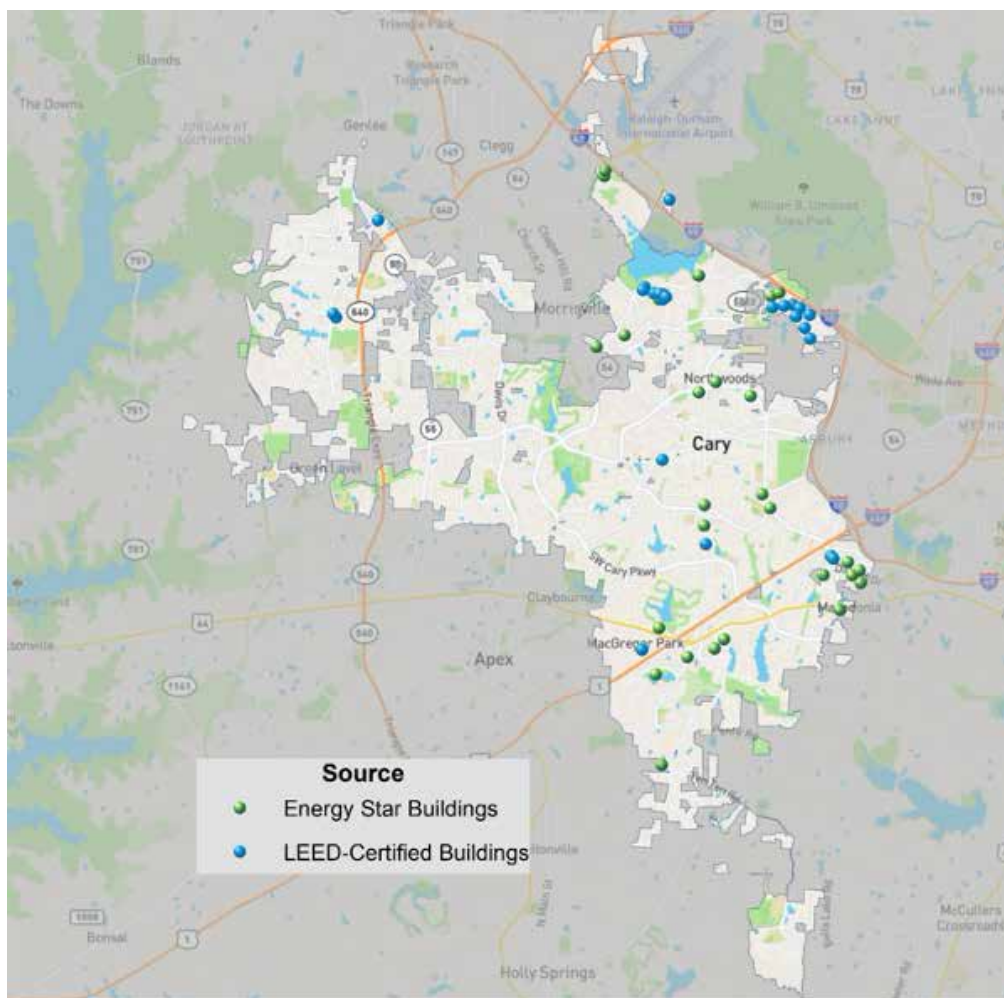
Figure 10. Location of certified energy efficient buildings in Cary

Cary also leads the other cities in the amount of square footage in these certified buildings.

CITY	ENERGY STAR (FT²)	LEED (FT²)	TOTAL (FT²)
CARY	4,457,529	4,216,438	8,673,967
FAYETTEVILLE	3,961,564	1,513,628	5,475,192
WILMINGTON	2,116,918	1,526,331	3,643,249

Table 6. Building area in certified energy efficient buildings in Cary, Fayetteville, and Wilmington

Electric Vehicles

Electric vehicle (EV) information is only available by county, and Wake County leads both Cumberland and New Hanover.

COUNTY	HYBRID	PLUG-IN HYBRID	ELECTRIC	TOTAL
CUMBERLAND	2,708	176	181	3,065
NEW HANOVER	3,286	195	380	3,861
WAKE	22,570	1,839	4,337	28,746

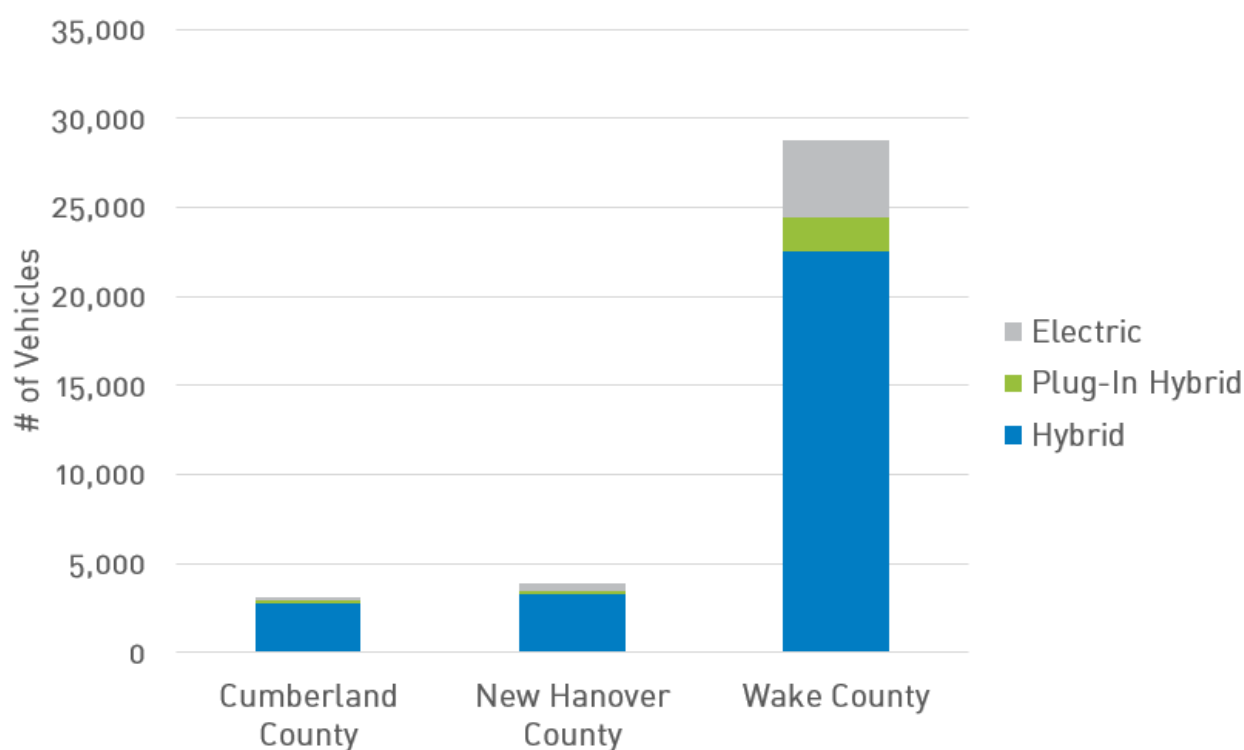Table 7. Electric and hybrid vehicles in Cumberland, New Hanover, and Wake Counties

Figure 11. Electric and hybrid vehicles in Cumberland, New Hanover, and Wake Counties

Wake County also has significantly higher populations than either of the other counties, with at least 770,000 more people than each.[8] Even in terms of EVs per capita, however, Wake County still leads both.

COUNTY	TOTAL EVS	POPULATION	EVS PER 1,000 PEOPLE
CUMBERLAND	3,065	335,509	3,065
NEW HANOVER	3,861	234,473	3,861
WAKE	28,746	1,111,761	28,746

Table 8. Electric and hybrid vehicles per capita in Cumberland, New Hanover, and Wake Counties

Electric Vehicle Charging Stations

Cary also leads Fayetteville and Wilmington in terms of EV charging stations and, once again, has more than the other cities do together.

CITY	PRIVATE	UTILITY	LOCAL GOVERNMENT	FEDERAL GOVERNMENT	TOTAL
CARY	46	4	1	0	51
FAYETTEVILLE	18	0	0	1	19
WILMINGTON	15	4	0	0	19

Table 9. Electric vehicle charging stations in Cary, Fayetteville, and Wilmington

Most of the stations are privately owned (89%), but there are also ones owned by the local and federal government as well as the local utility.
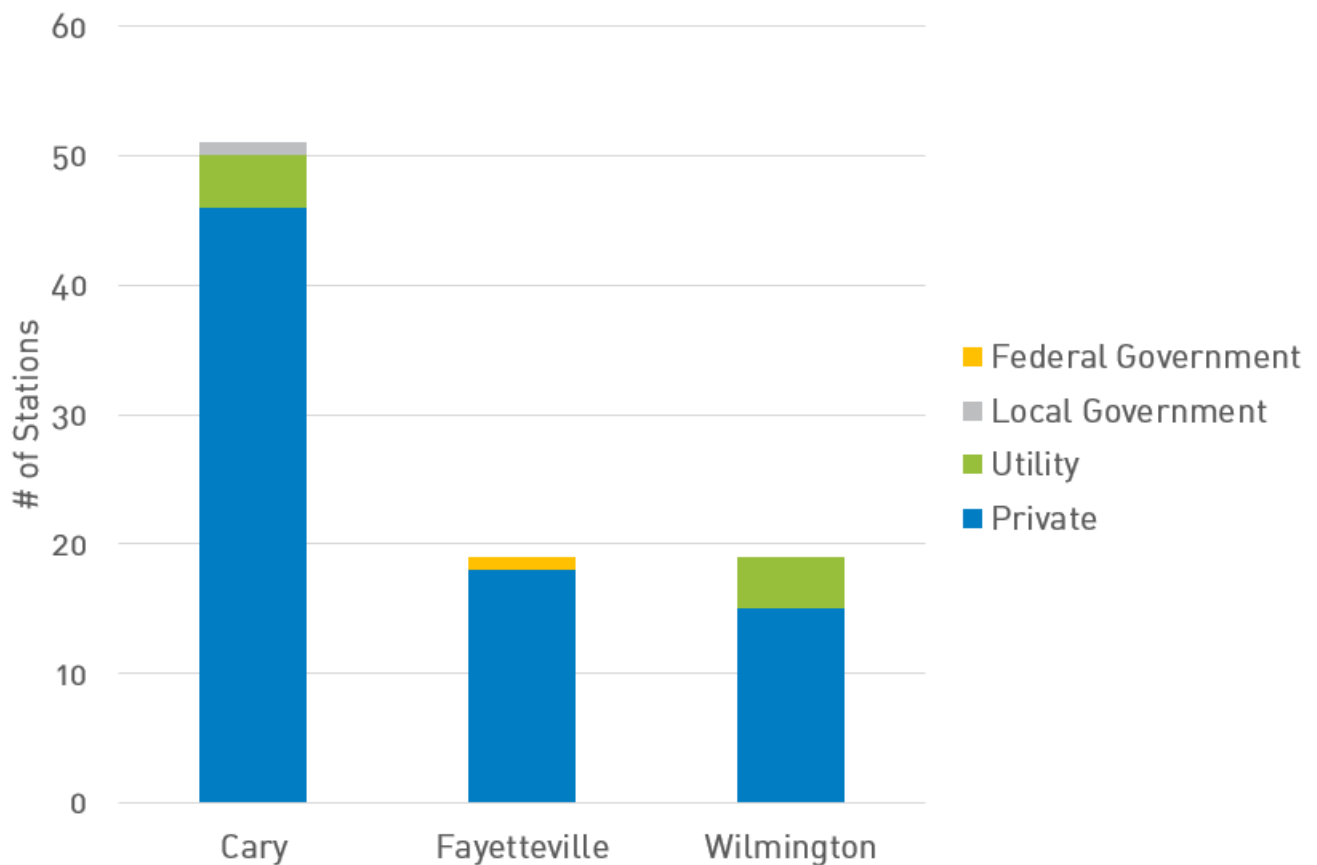
Figure 12. EV charging stations in Cary, Fayetteville, and Wilmington

EV Charging Station Outlets

A single EV charging station may have more than one outlet that can be used to charge a vehicle. Cary leads the other cities in the number of charging stations and number of total outlets at their stations.

CITY	LEVEL 1	LEVEL 2	DC FAST	TOTAL
CARY	0	177	18	195
FAYETTEVILLE	4	27	18	49
WILMINGTON	0	30	10	40

Table 10. EV charging station outlets in Cary, Fayetteville, and Wilmington

Most of the outlets at each of these are level 2 (82%), and the rest are mostly DC fast charging outlets (16%).
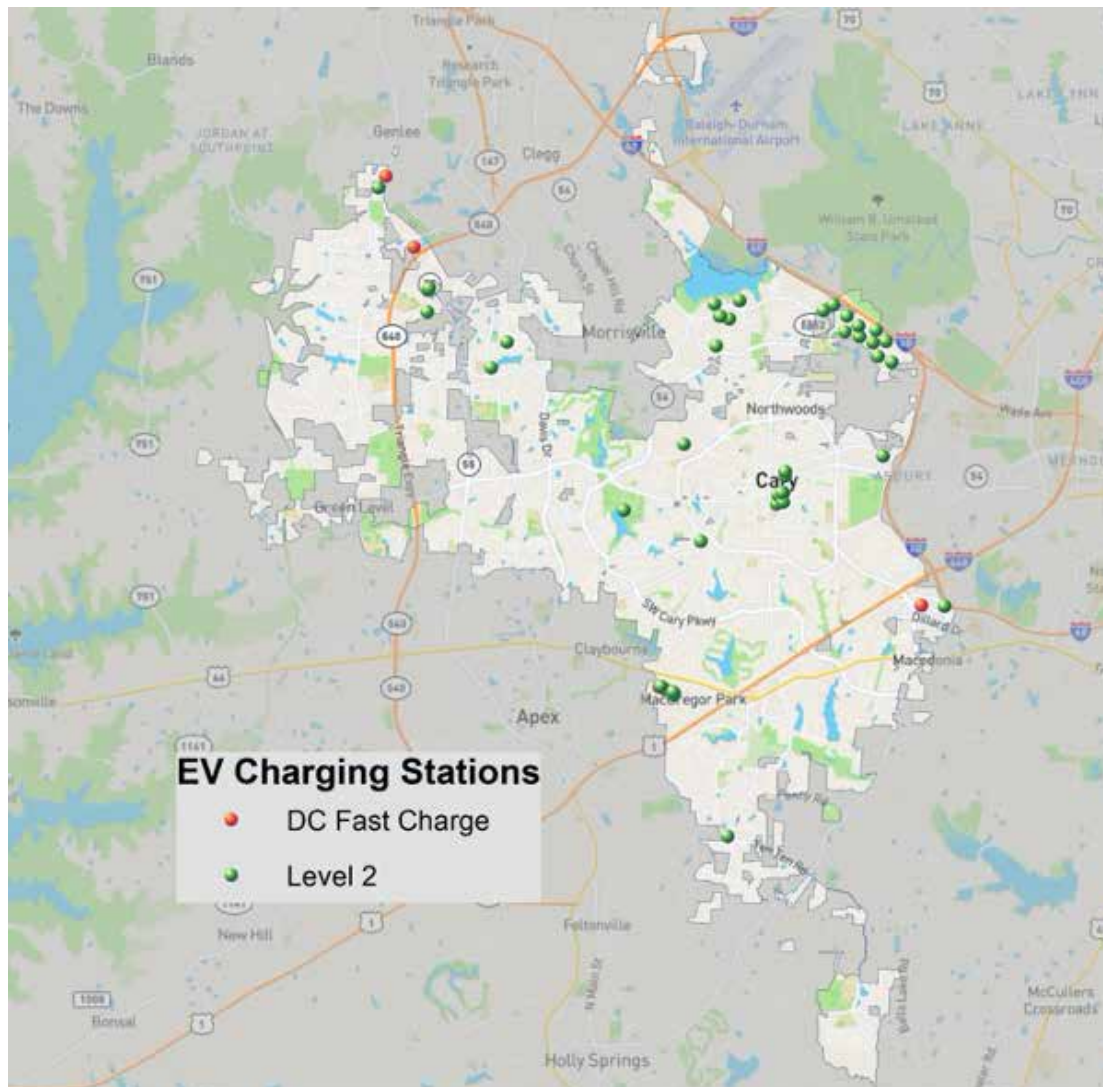

Figure 13. Level 2 and DC fast charging outlets at EV charging stations in Cary
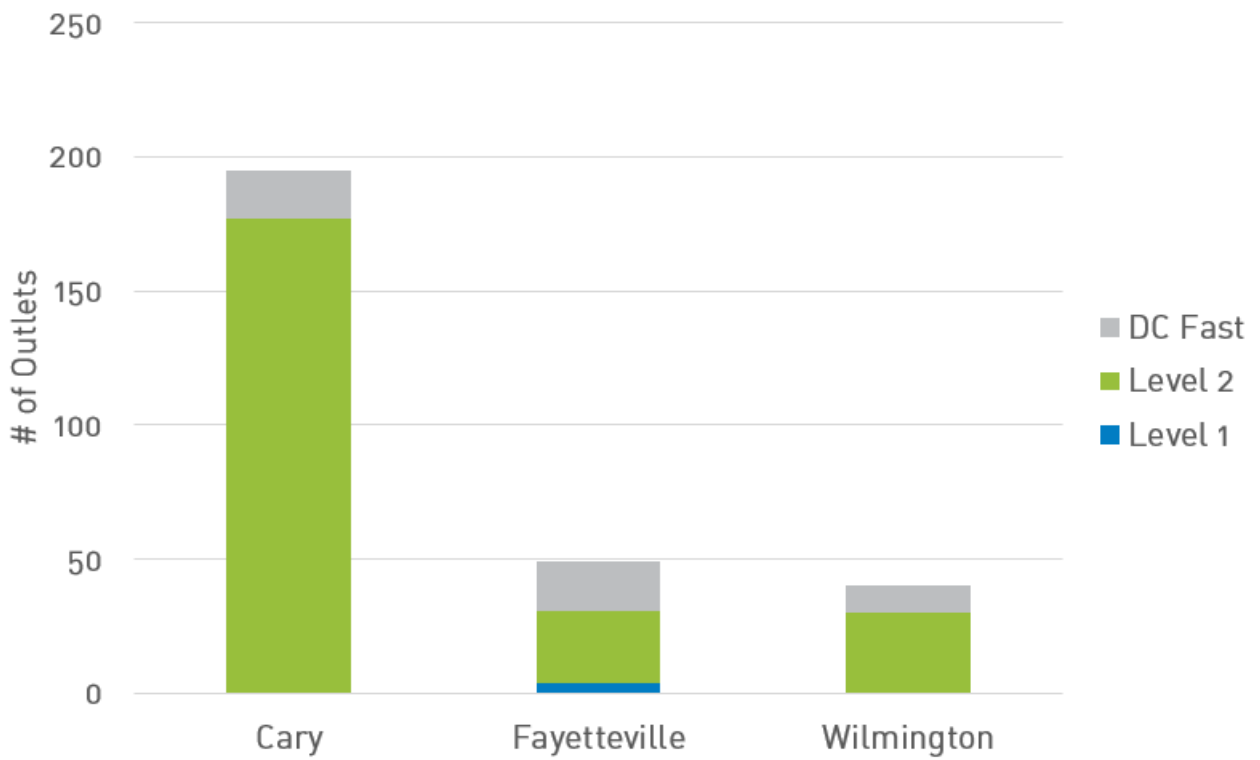
Figure 14. Number of outlets at EV charging stations in Cary, Fayetteville, and Wilmington

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: Fayetteville city, North Carolina; Wilmington city, North Carolina; Cary town, North Carolina." https://www.census.gov/quickfacts/fact/table/fayettevillecitynorthcarolina,wilmingtoncitynorthcarolina,carytownnorthcarolina/PST045219

3. North Carolina Department of Commerce. "County Distress Rankings (Tiers)." https://www.nccommerce.com/grants-incentives/county-distress-rankings-tiers

4. ENERGY STAR. "About ENERGY STAR for Commercial Buildings." https://www.energystar.gov/about/origins_mission/energy_star_overview/about_energy_star_commercial_buildings

5. ENERGY STAR. "What your 1-100 ENERGY STAR score means." https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager/interpret-your-results/what

6. U.S. Green Building Council. "About: Brand." https://www.usgbc.org/about/brand

7. U.S. Green Building Council. "LEED Rating System." https://www.usgbc.org/leed

8. United States Census Bureau. "Quickfacts: New Hanover County, North Carolina; Wake County, North Carolina; Cumberland County, North Carolina." https://www.census.gov/quickfacts/fact/table/newhanovercountynorthcarolina,wakecountynorthcarolina,cumberlandcountynorthcarolina/PST045219