

# Local Government Clean Energy Report

Apex, North Carolina

Created: September 2021



NC SUSTAINABLE  
ENERGY ASSOCIATION



# Local Government Clean Energy Report

## Apex, North Carolina

---

Created: September 2021

### 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](http://www.energync.org).



# Introduction

## Where does this data come from?

### Solar Photovoltaic (Solar PV)

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 Q1 2021, North Carolina has the third most installed solar PV capacity in the United States, with over 7,132 MW.<sup>1</sup>

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 Apex.

This data is current as of 7/3/2021.



# Current Renewable Energy Systems in Apex

## All Systems

Apex has 47 total installed renewable energy systems, all of which are solar PV and most of which are residential (87%).

CATEGORY	# OF SYSTEMS	CAPACITY (MW)
RESIDENTIAL	41	0.29
COMMERCIAL	6	0.67
TOTAL	47	0.96

Table 1. Renewable energy systems in Apex

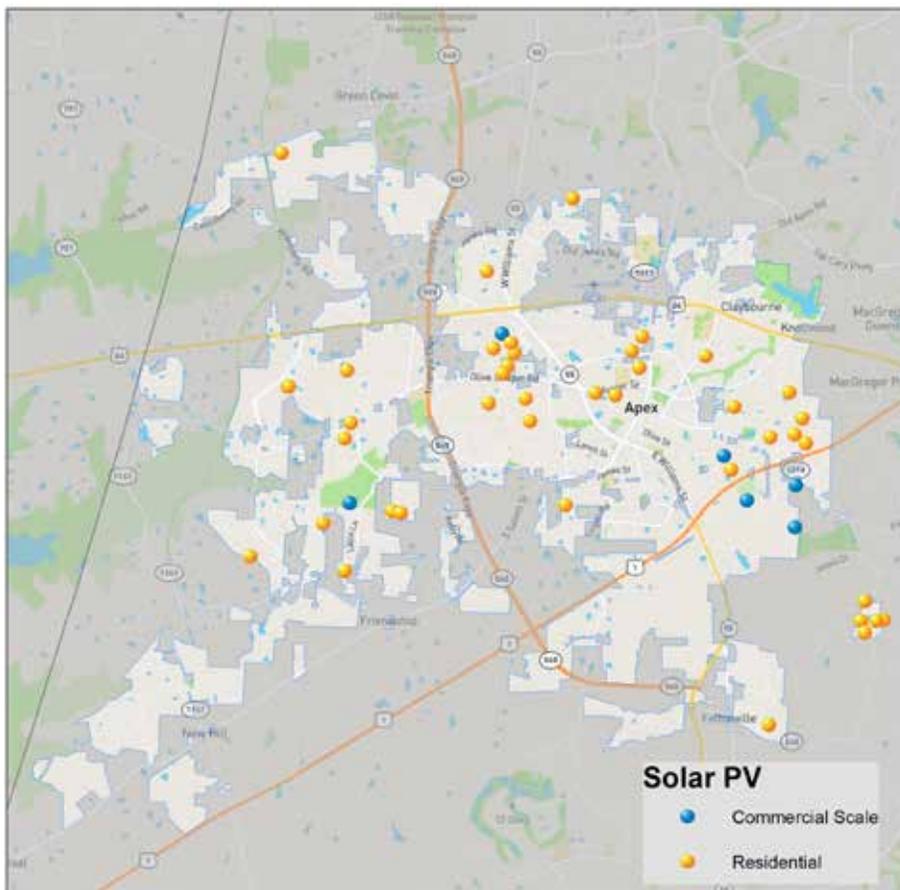


Figure 2. Solar PV systems in Charlotte



## Commercial System Subcategories

Solar PV systems serve a variety of commercial facilities in Apex, including a park and a Target store.

SUBCATEGORY	# OF SYSTEMS	CAPACITY (MW)
GOVERNMENT	1	0.01
OFFICE	2	0.16
RECREATION	1	0.04
RETAIL	1	0.36
WAREHOUSE	1	0.10

Table 2. Commercial renewable energy systems in Apex by subcategory

## Renewable Energy Systems since 2011

Since 2011, most of the renewable energy systems installed in Apex have been residential. Over the last three years in particular, residential systems have grown by 200%, compared to no commercial growth.

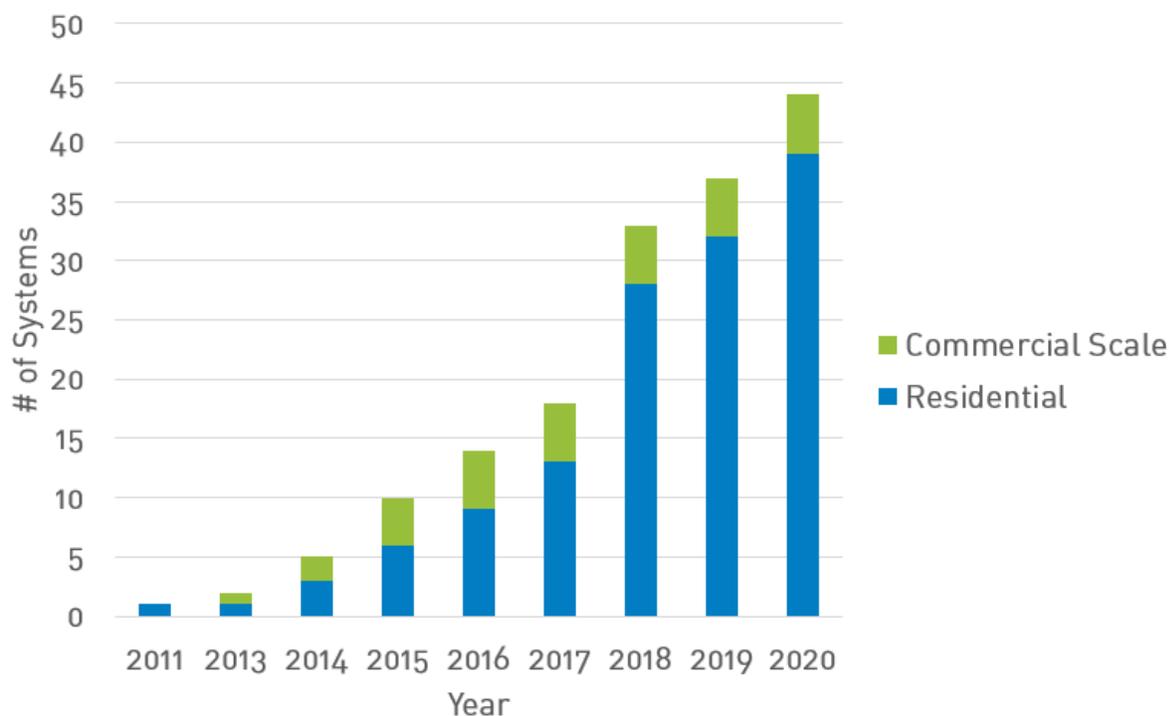


Figure 3. Cumulative renewable energy systems installed in Apex, 2011-2020



While most of the growth in the number of systems has come from residential systems, most of the renewable generating capacity is from commercial systems. In fact, commercial capacity has represented at least 70% of Apex’s total renewable generating capacity in every year from 2013-2020.

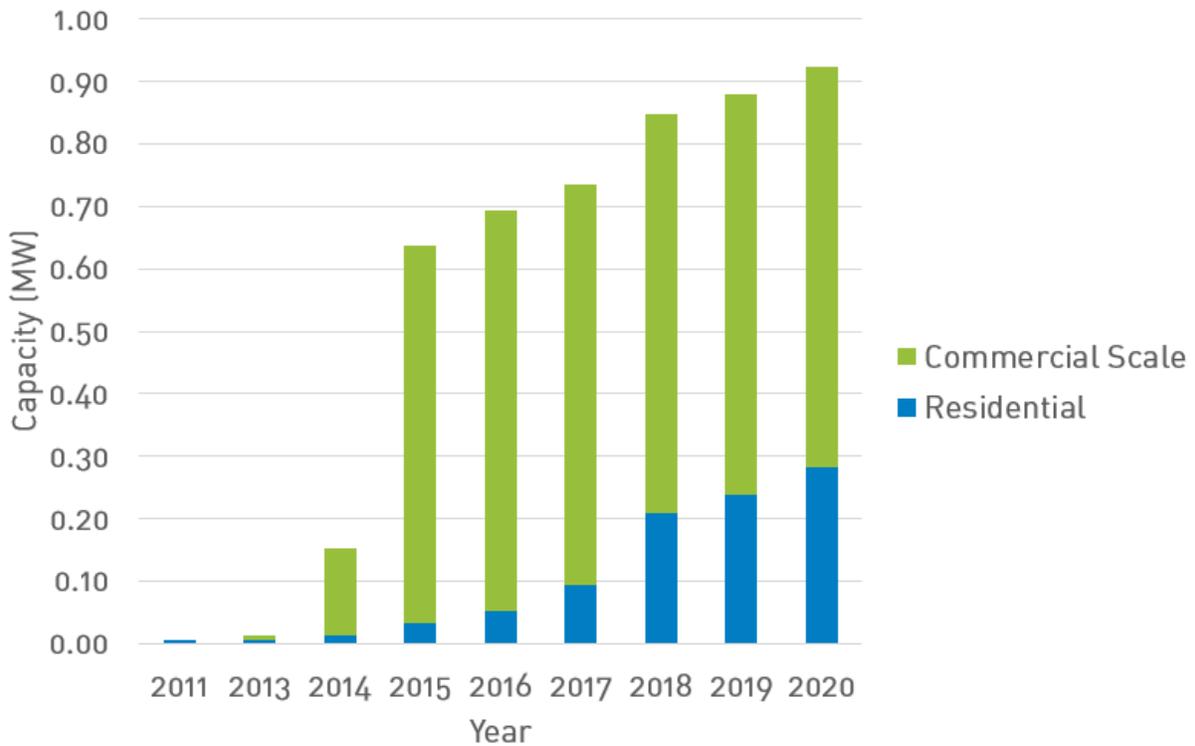


Figure 4. Cumulative renewable energy capacity in Apex, 2011-2020



# Comparing Apex to Cary and Holly Springs

This report provides information about renewable energy systems in Apex, but it also provides data from other cities nearby which can serve as points of comparison. In this case, Apex’s points of comparisons are Cary and Holly Springs.

## Number of Systems

When compared to Cary and Holly Springs, Apex falls behind both in terms of the raw number of renewable energy systems. In all three cities, over 87% of the systems are residential.

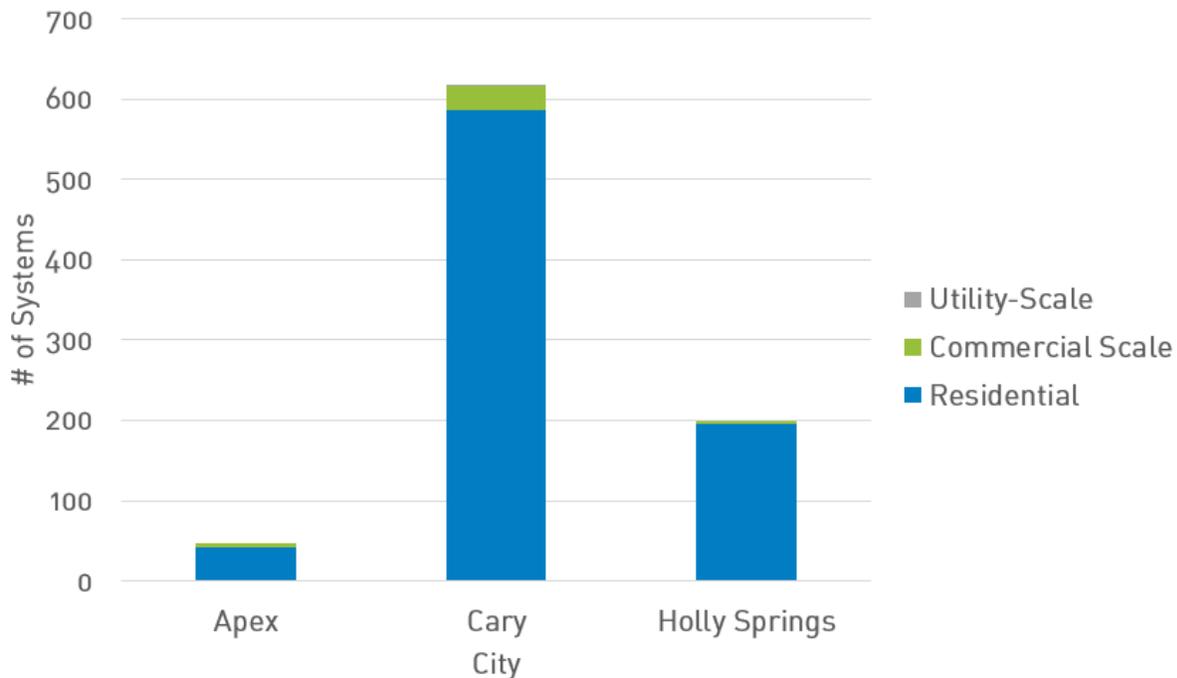


Figure 5. Total number of renewable energy systems in Apex, Cary, and Holly Springs

Even when accounting for differences in population between the three cities, Apex has the least number of residential solar PV systems per 1,000 people between itself, Cary, and Holly Springs.<sup>2</sup>

CITY	# OF RESIDENTIAL SOLAR PV SYSTEMS	POPULATION	RESIDENTIAL SOLAR PV SYSTEMS PER 1,000 PEOPLE
APEX	41	59,300	0.69
CARY	587	170,282	3.45
HOLLY SPRINGS	195	37,812	5.16

Table 3. Residential solar PV systems per 1,000 people in Apex, Cary, and Holly Springs



Since 2011, Cary has led both Apex and Holly Springs in the number of renewable energy systems. Especially since 2017, both Cary and Holly Springs have increased their lead over Apex.

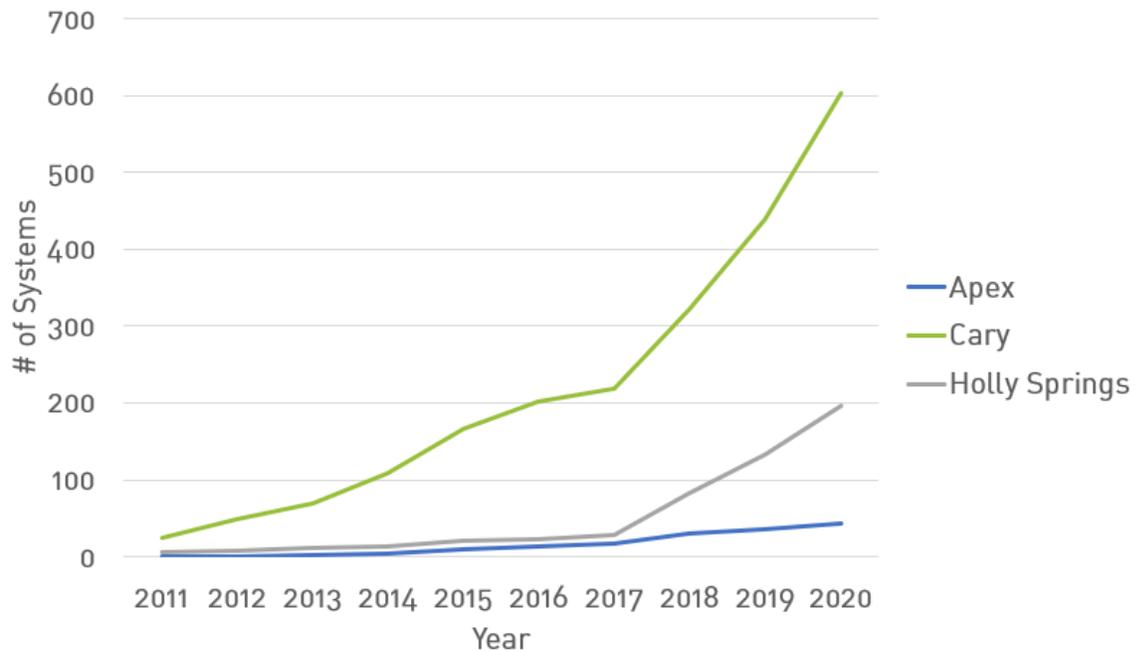


Figure 6. Cumulative number of renewable energy systems in Apex, Cary, and Holly Springs, 2011-2020

### Generating Capacity

Much like in the number of renewable energy systems, Cary and Holly Springs lead Apex. In fact, Cary has almost 3 times as much capacity as Apex and Holly Springs do combined.



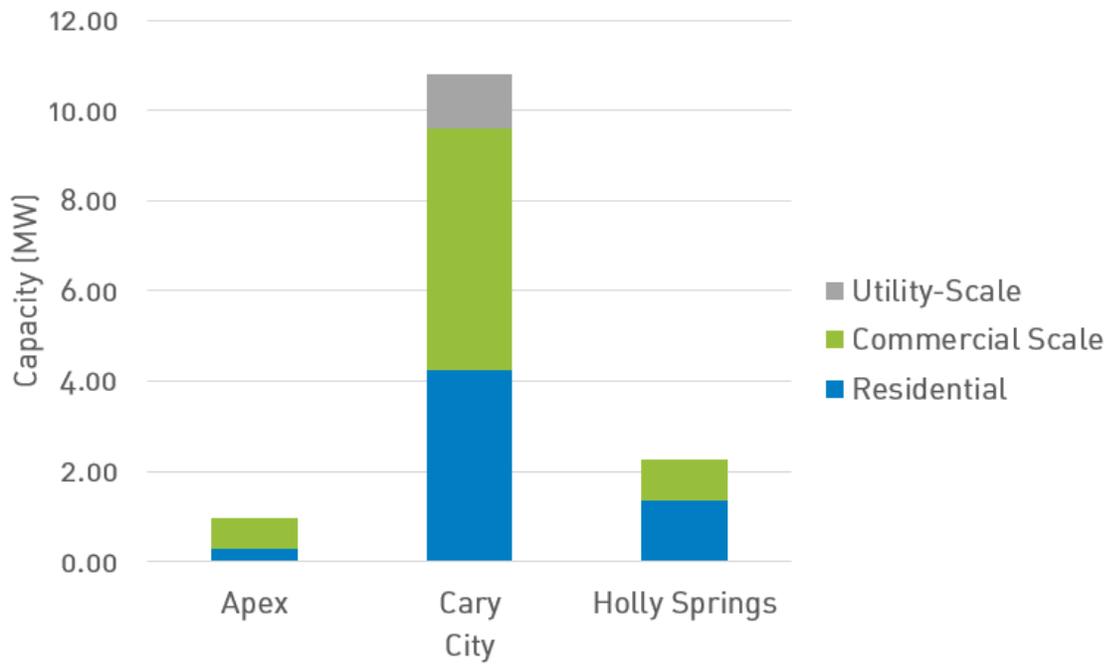


Figure 7. Renewable energy generating capacity in Apex, Cary, and Holly Springs

Cary has led Apex and Holly Springs in renewable generating capacity since 2011. From 2015-2017, Apex led Holly Springs, but Holly Springs passed Apex since then.

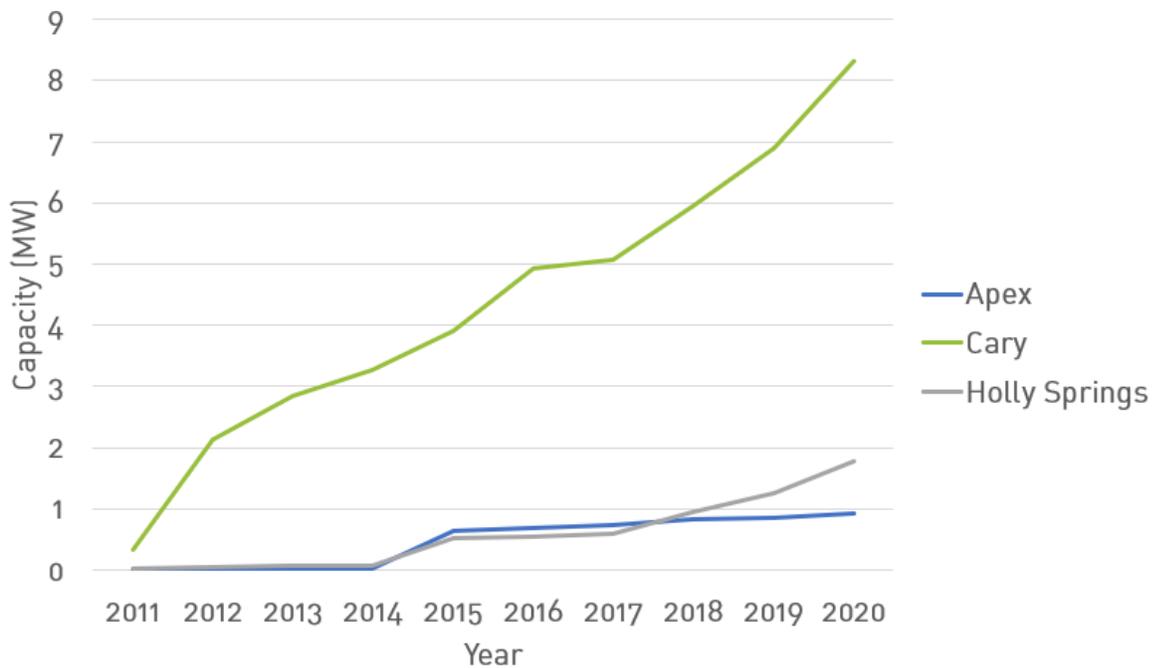


Figure 8. Cumulative renewable energy generating capacity in Apex, Cary, and Holly Springs, 2011-2020



## Energy Efficient Buildings

### Types of Certifications: 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.<sup>3</sup> The median score of these buildings is 50, and those with scores of 75 or more are eligible for ENERGY STAR certification.<sup>4</sup>

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.<sup>5</sup> There are a variety of certifications that can be achieved depending on the use of the building and its stage of development.<sup>6</sup>

Both ENERGY STAR and LEED maintain datasets of the buildings that currently meet their certification standards.<sup>7,8</sup>

### Number of Certified Energy Efficient Buildings

Cary also leads Apex and Holly Springs in the number of certified energy efficient buildings. Cary has over six times as many certified energy efficient buildings as Apex and Holly Springs combined.

CITY	ENERGY STAR CERTIFIED	LEED CERTIFIED	TOTAL
APEX	5	1	6
CARY	40	24	64
HOLLY SPRINGS	3	1	4

**Table 4. Certified energy efficient buildings in Apex, Cary, and Holly Springs**

Most of the certified energy efficient buildings in Apex, Cary, and Holly Springs are ENERGY STAR certified, with 83%, 63%, and 75% respectively.



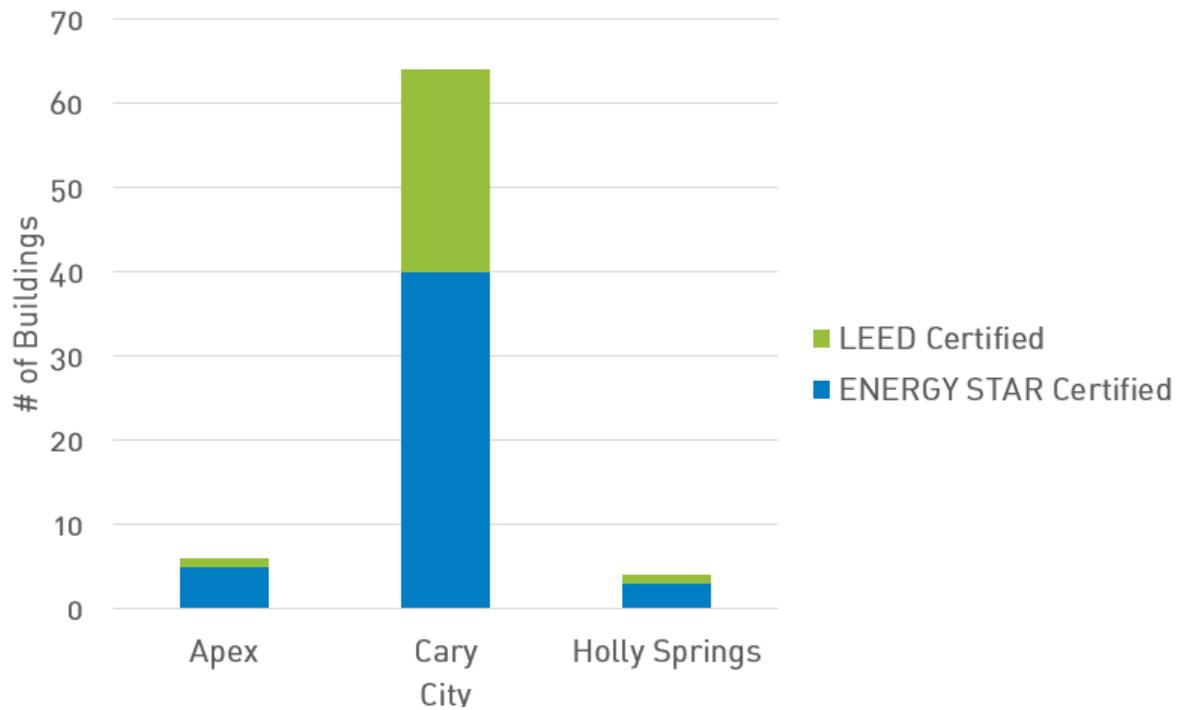


Figure 9. Certified energy efficient buildings in Apex, Cary, and Holly Springs

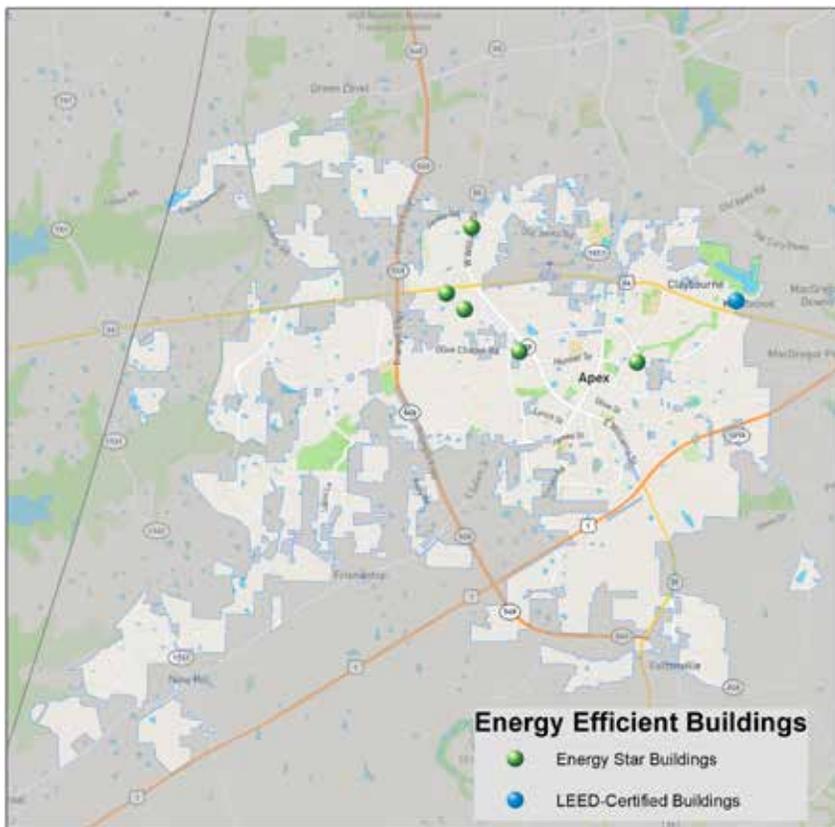


Figure 10. Certified energy efficient buildings in Apex



Since Cary has so many more certified energy efficient buildings than Apex and Holly Springs, it also has significantly more area in certified energy efficient buildings. In fact, Cary has almost 13 times as much building area in Energy Star and LEED certified buildings than Apex and Holly Springs combined.

CITY	ENERGY STAR (FT <sup>2</sup> )	LEED (FT <sup>2</sup> )	TOTAL (FT <sup>2</sup> )
APEX	395,762	4,261	400,023
CARY	4,457,529	4,216,438	8,673,967
HOLLY SPRINGS	223,016	48,951	271,967

**Table 5. Building area in certified energy efficient buildings in Apex, Cary, and Holly Springs**

## Area in Certified Energy Efficient Buildings

### Electric Vehicles

As part of NC Department of Transportation’s (DOT) Zero-Emissions Vehicle (ZEV) Plan, DOT began releasing North Carolina vehicle registration information online. This information includes the number of electric and plug-in hybrid electric vehicles by county.<sup>9,10</sup>

Because Apex, Cary, and Holly Springs are all located in Wake County and EV registration data is only available at the county level, this report compares Wake County to Mecklenburg County. When compared, Wake County has over 2,500 more registered EVs than Mecklenburg County.

COUNTY	ELECTRIC VEHICLES	PLUG-IN HYBRID ELECTRIC VEHICLES	TOTAL
MECKLENBURG	2,913	1,206	4,119
WAKE	4,860	1,925	6,785

**Table 6. Electric vehicles in Mecklenburg and Wake Counties**

Most of the registered EVs in both Wake and Mecklenburg Counties are fully electric vehicles, with 72% and 71%, respectively.



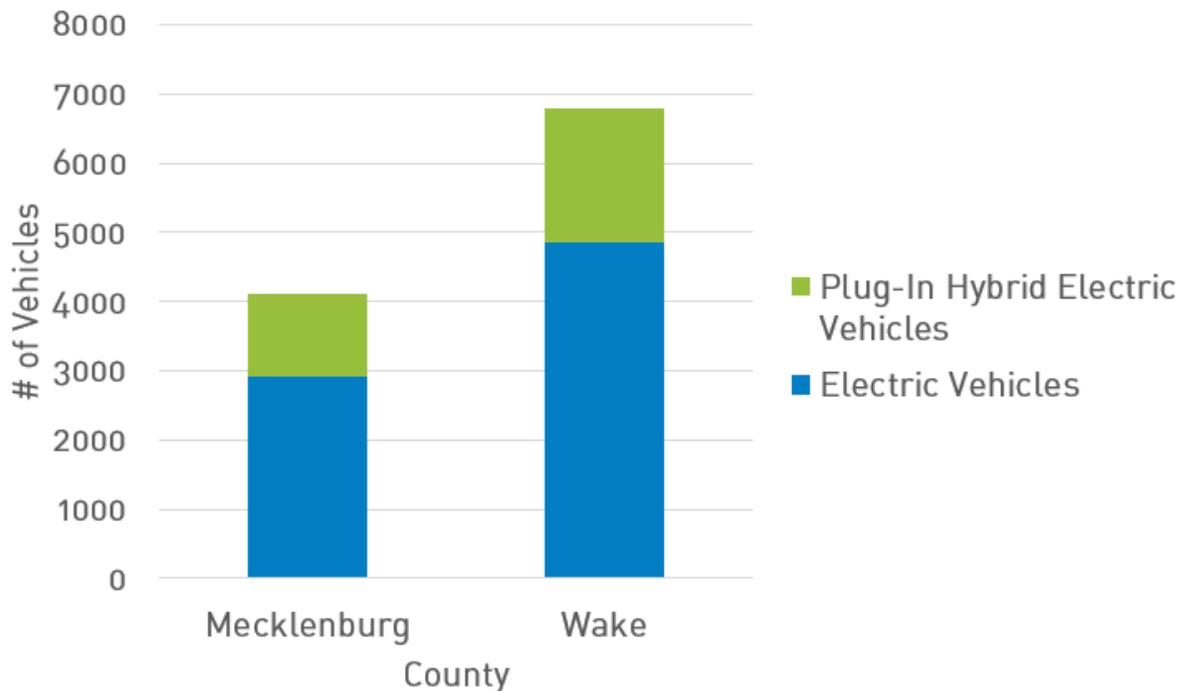


Figure 11. EVs and plug-in hybrid electric vehicles registered in Mecklenburg and Wake Counties

### EV Charging Stations and Outlets

There are many sources for EV charging stations and outlets, ranging from federal government sources to private networks. Each source varies in how the stations and outlets are verified, so some listed in one source may not be in another. For these reports, NCSEA uses the US Department of Energy’s Alternative Fuels Data Center database.<sup>11</sup>

### Electric Vehicle Charging Stations

Cary has 13 times more EV charging stations than Apex and Holly Springs combined.

CITY	LOCAL GOVERNMENT	PRIVATE	UTILITY	TOTAL
APEX	46	1	0	51
CARY	18	0	1	19
HOLLY SPRINGS	15	0	0	19

Table 7. Electric vehicle charging stations in Apex, Cary, and Holly Springs by ownership type

Most EV charging stations in Cary and Holly Springs are privately owned, but stations are owned by the local government and utilities too.



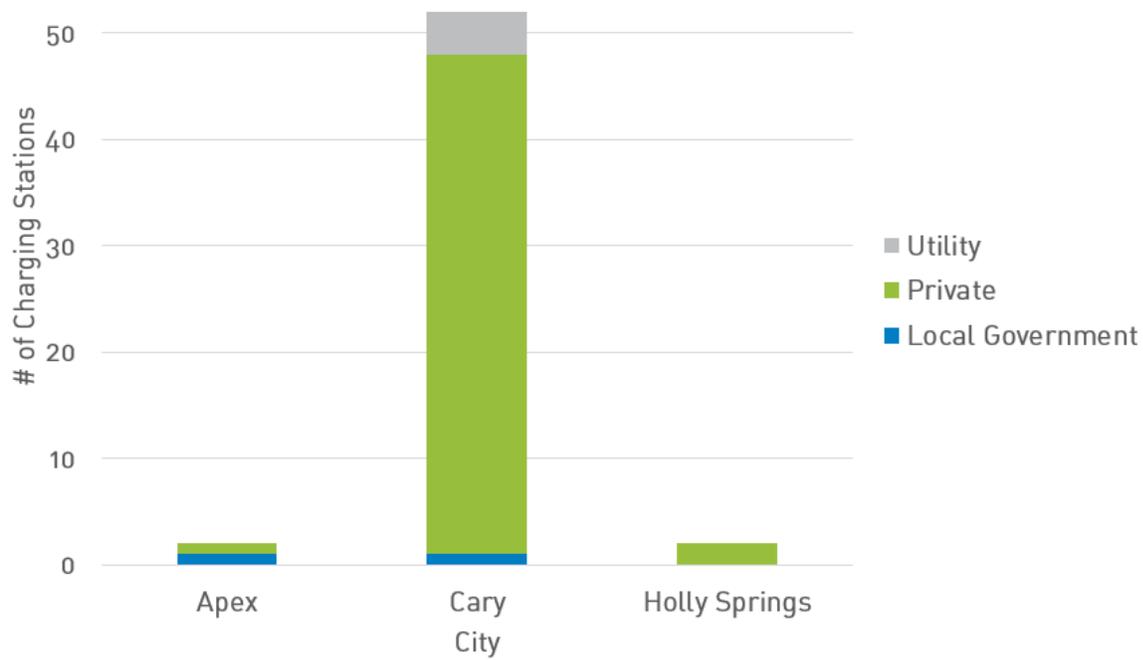


Figure 12. EV charging stations in Apex, Cary, and Holly Springs

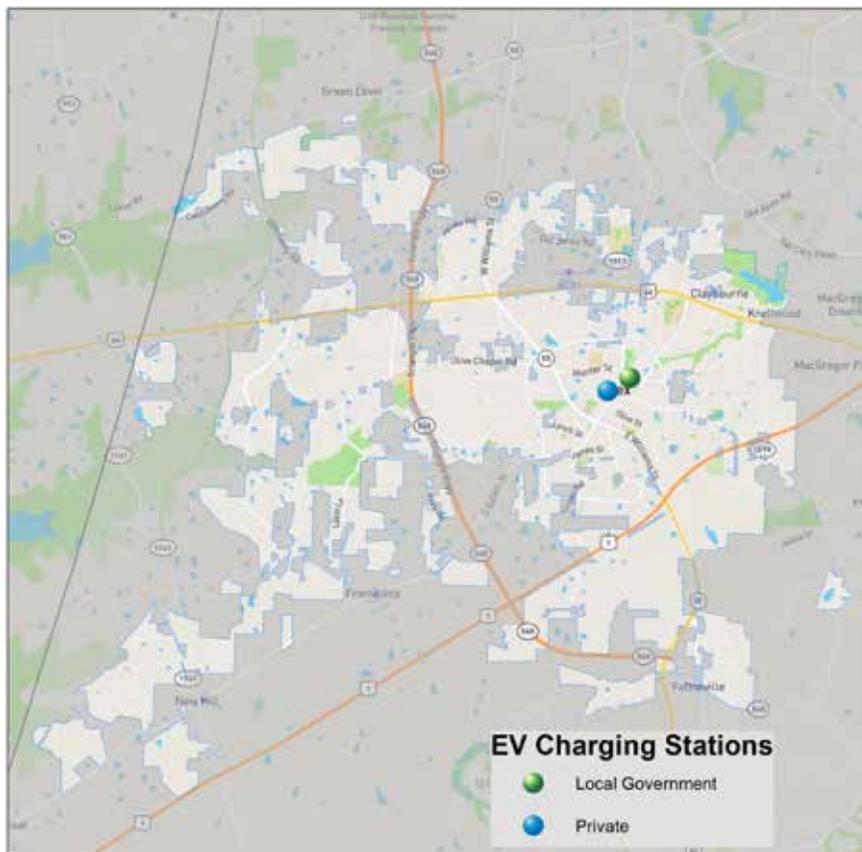


Figure 13. EV charging stations installed in Apex



### EV Charging Station Outlets

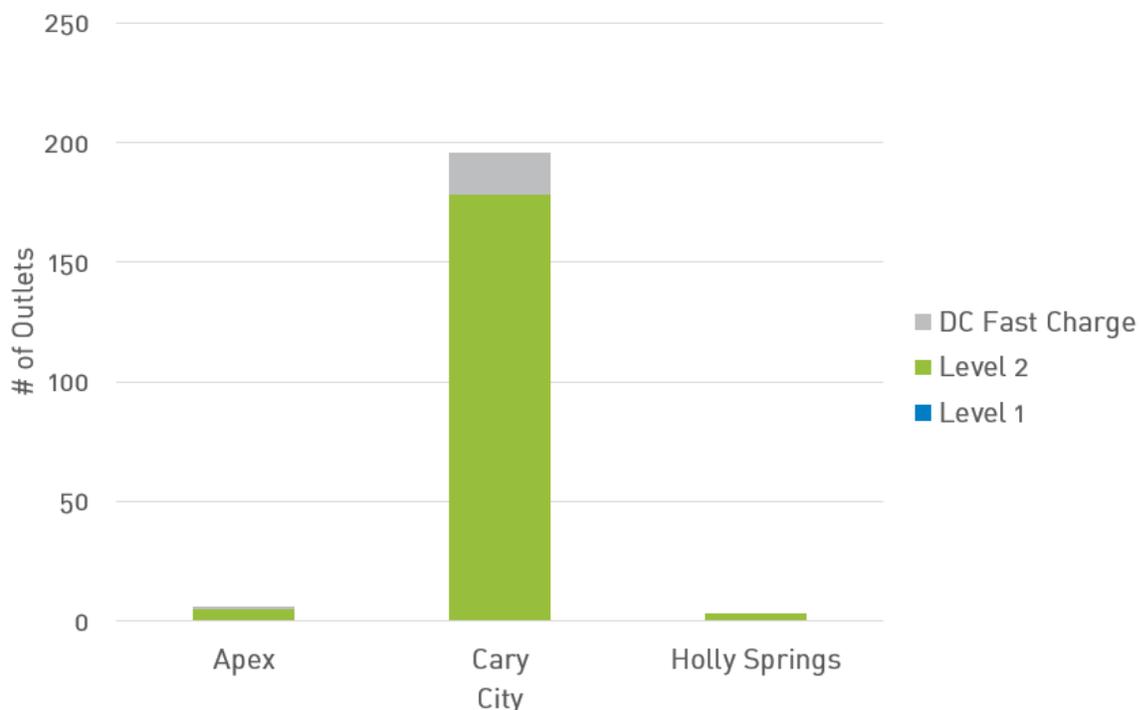
A single EV charging station might have one or more charging outlets. Different levels of outlets operate at different voltages, which lead to different charging times. For example, charging an electric vehicle at a Level 1 station that has an outlet like one found in a home (110 volts, 12-16 amps) will take longer than at a DC Fast Charge outlet, which can deliver power starting at 480 volts at 100 amps.<sup>12</sup>

Since Cary has significantly more EV charging stations than Apex and Holly Springs, it also has more charging outlets than Apex and Holly Springs too. In fact, Cary has almost 22 times as many charging outlets as Apex and Holly Springs.

CITY	LEVEL 1	LEVEL 2	DC FAST	TOTAL
APEX	0	5	1	6
CARY	0	178	18	196
HOLLY SPRINGS	0	3	0	3

**Table 8. EV charging outlets in Apex, Cary, and Holly Springs by charging level**

Most of the charging outlets in each of the cities are Level 2, but there are a few DC fast charge outlets in Apex and Cary too.



**Figure 14. EV charging station outlets in Apex, Cary, and Holly Springs**



# 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: Apex town, North Carolina; Cary town, North Carolina; Holly Springs town, North Carolina." <https://www.census.gov/quickfacts/fact/table/apextownnorthcarolina,carytownnorthcarolina,hollyspringstownnorthcarolina/PST045219>
3. ENERGY STAR. "About ENERGY STAR for Commercial Buildings." [https://www.energystar.gov/about/origins\\_mission/energy\\_star\\_overview/about\\_energy\\_star\\_commercial\\_buildings](https://www.energystar.gov/about/origins_mission/energy_star_overview/about_energy_star_commercial_buildings)
4. 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>
5. U.S. Green Building Council. "About: Brand." <https://www.usgbc.org/about/brand>
6. U.S. Green Building Council. "LEED Rating System." <https://www.usgbc.org/leed>
7. ENERGY STAR. "ENERGY STAR Certified Building and Plant Locator." <https://www.energystar.gov/buildings/reference/find-energy-star-certified-buildings-and-plants/registry-energy-star-certified-buildings>
8. U.S. Green Building Council. "Projects." <https://www.usgbc.org/projects?Country=%5B%22United+States%22%5D&State=%5B%22North+Carolina%22%5D>
9. North Carolina Department of Transportation. "North Carolina ZEV Plan: A Strategic Plan for Accelerating Electric Vehicle Adoption in North Carolina." <https://www.ncdot.gov/initiatives-policies/environmental/climate-change/Documents/nc-zev-plan.pdf>
10. North Carolina Department of Transportation. "ZEV Registration Data." <https://www.ncdot.gov/initiatives-policies/environmental/climate-change/Pages/zev-registration-data.aspx>
11. U.S. Department of Energy: Energy Efficiency & Renewable Energy. "Alternative Fuels Data Center: Electric Vehicle Charging Station Locations." [https://afdc.energy.gov/fuels/electricity\\_locations.html#/analyze?region=US-NC&fuel=ELEC&ev\\_levels=1&ev\\_levels=2&ev\\_levels=dc\\_fast&access=public&access=private&country=US](https://afdc.energy.gov/fuels/electricity_locations.html#/analyze?region=US-NC&fuel=ELEC&ev_levels=1&ev_levels=2&ev_levels=dc_fast&access=public&access=private&country=US)
12. California Electric Vehicle Infrastructure Project. "Electric Vehicle Charging 101." <https://calevip.org/electric-vehicle-charging-101>

