

Local Government Clean Energy Report

Hillsborough, North Carolina

Created: October 2021



NC SUSTAINABLE
ENERGY ASSOCIATION

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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?

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.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 Hillsborough.

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



Current Renewable Energy Systems in Hillsborough

All Systems

There are 49 total renewable energy systems installed in Hillsborough, all of which are solar PV systems. Most of the systems in Hillsborough are residential (90%).

CATEGORY	# OF SYSTEMS	CAPACITY (MW)
RESIDENTIAL	44	0.27
COMMERCIAL	5	0.07
TOTAL	49	0.34

Table 1. Renewable energy systems and capacity in Hillsborough

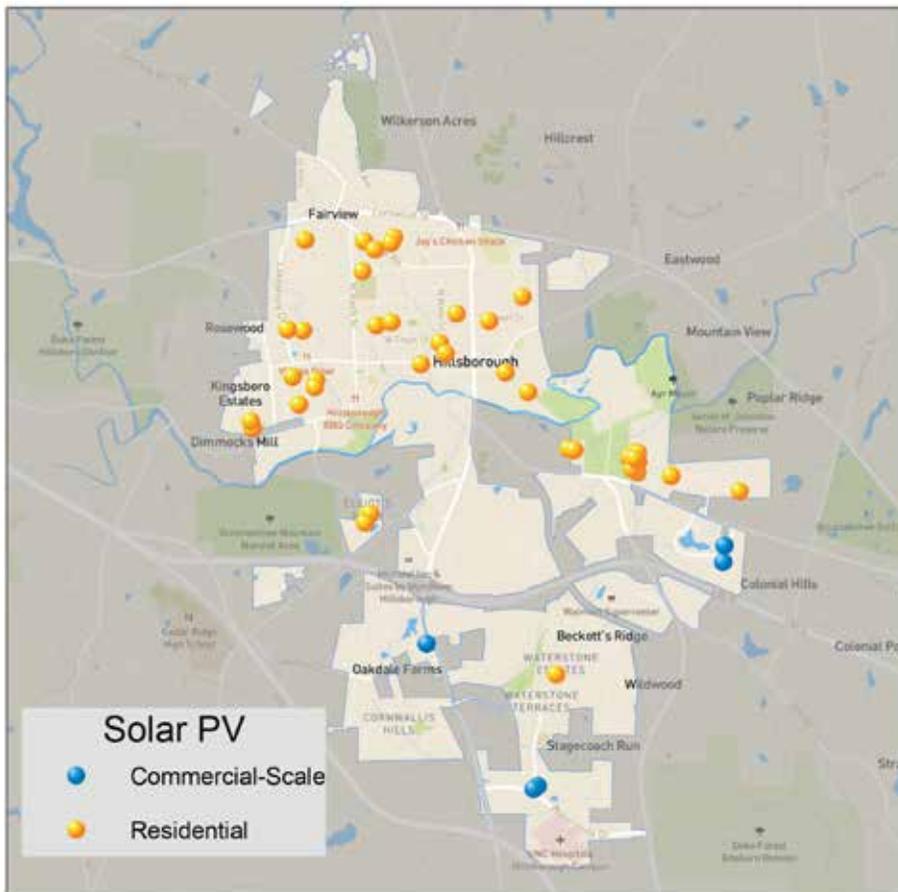


Figure 2. Solar PV systems installed in Hillsborough



Commercial System Subcategories

While most of the solar PV systems in Hillsborough are residential, there are some commercial ones which include a coffee bean roastery and a community college.

SUBCATEGORY	# OF SYSTEMS	CAPACITY (MW)
EDUCATION	2	0.01
FOOD SERVICE	1	0.02
HEALTHCARE	1	0.02
WAREHOUSE	1	0.02

Table 2. Commercial renewable energy systems and capacity in Hillsborough by subcategory

New Renewable Energy Systems and Capacity since 2014

Since 2014, renewable energy systems in Hillsborough have grown over 1,300%, and most of this growth is from residential systems.

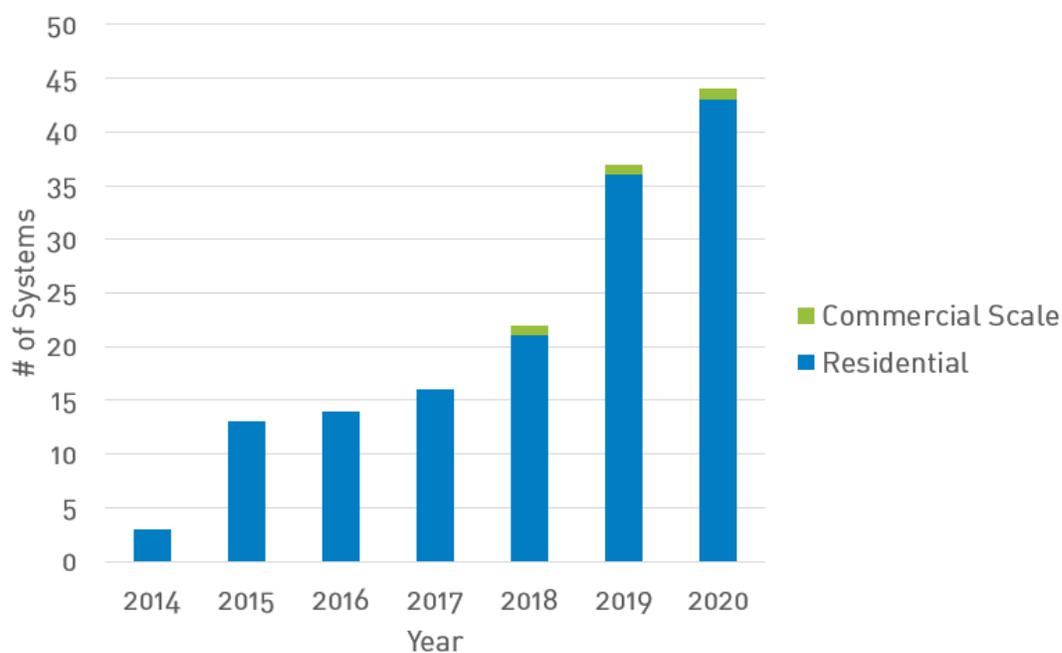


Figure 3. Cumulative renewable energy systems installed in Hillsborough by category, 2014-2020



Like the number of renewable energy systems, most of the renewable energy capacity in Hillsborough is from residential systems too. Since 2014, renewable energy capacity has increased by over 2500%.

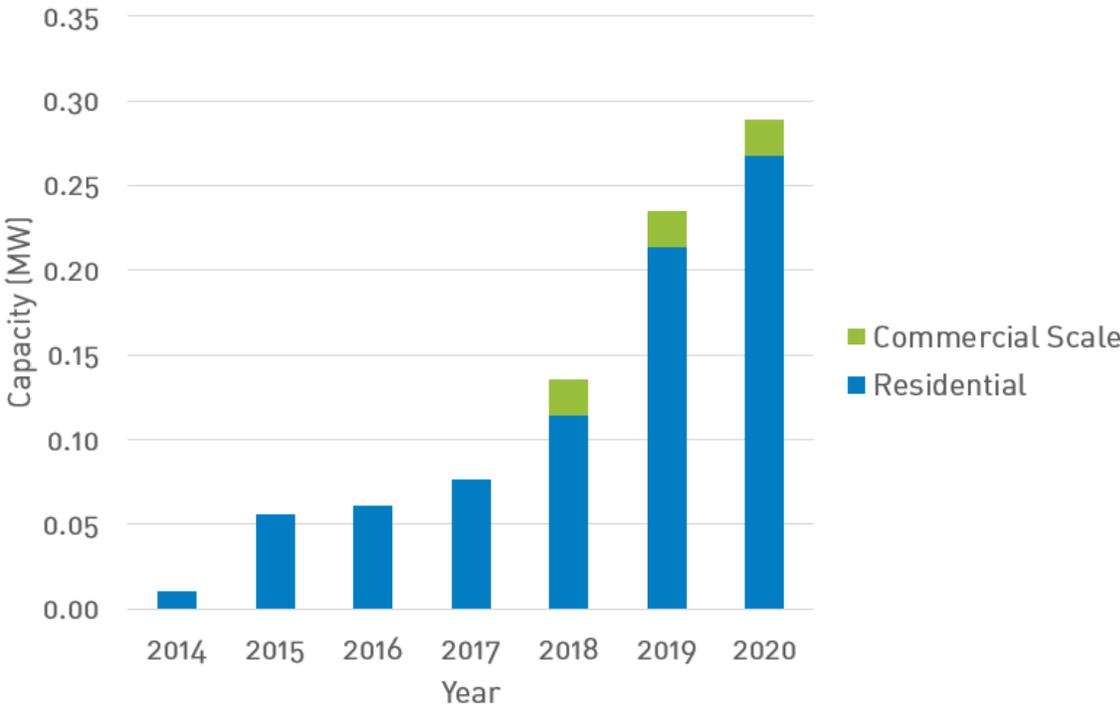


Figure 4. Cumulative renewable energy generating capacity in Hillsborough by category, 2014-2020



Current Renewable Energy Systems in Hillsborough

This report provides information about renewables installed in Hillsborough, but also provides points of comparison from other cities nearby and of similar size. For Hillsborough, these cities are Butner and Mebane.

Number of Systems

Hillsborough leads both Butner and Mebane in the total number of renewable energy systems and leads in the individual categories except for utility-scale.

CITY	RESIDENTIAL	COMMERCIAL SCALE	UTILITY-SCALE	TOTAL
BUTNER	4	1	0	5
HILLSBOROUGH	44	5	0	49
MEBANE	43	2	1	46

Table 3. Renewable energy systems installed in Butner, Hillsborough, and Mebane

Most of the systems in Butner, Hillsborough, and Mebane are residential, with 80%, 90%, and 93%, respectively.

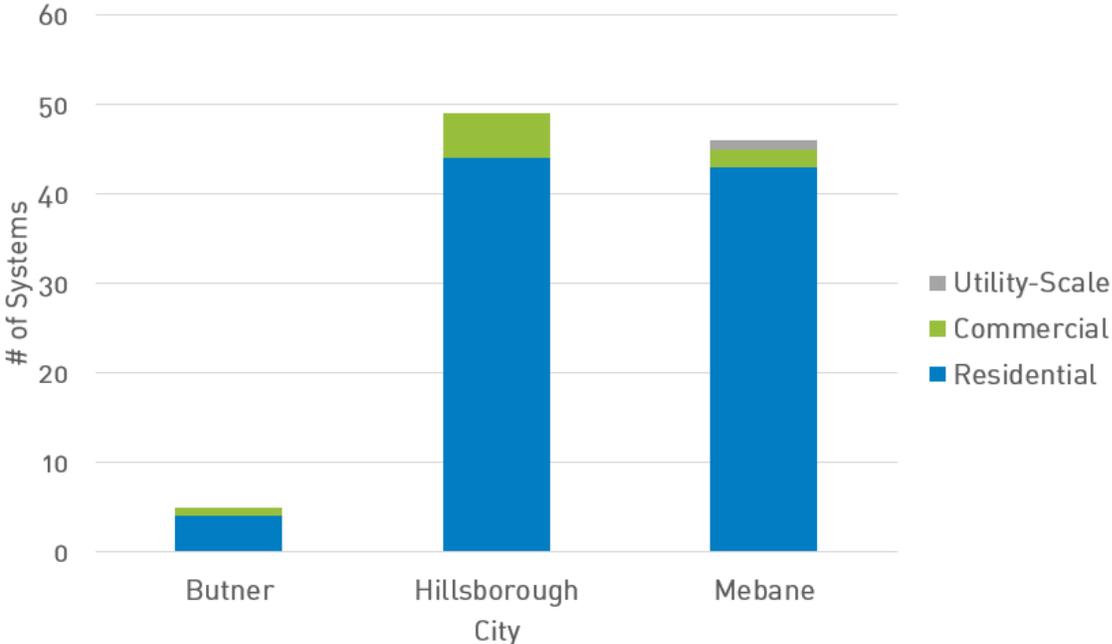


Figure 5. Total number of renewable energy systems in Butner, Hillsborough, and Mebane



Hillsborough has led both Butner and Mebane in number of renewable energy systems since 2015.

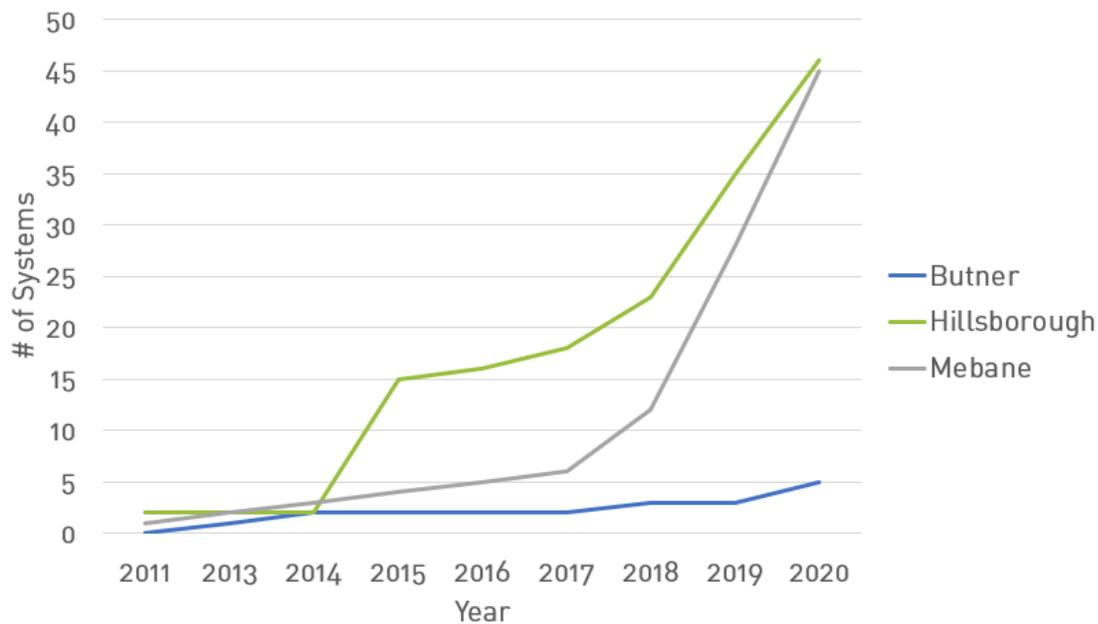


Figure 6. Cumulative renewable energy systems installed in Butner, Hillsborough, and Mebane, 2011-2020

Generating Capacity

While Hillsborough leads Butner and Mebane in the number of renewable energy systems, Mebane leads the other cities in renewable energy generating capacity. Even without its utility-scale system, Mebane would still lead Butner and Hillsborough.

CITY	RESIDENTIAL (MW)	COMMERCIAL SCALE (MW)	UTILITY-SCALE (MW)	TOTAL (MW)
BUTNER	0.02	0.30	0.00	0.32
HILLSBOROUGH	0.27	0.07	0.00	0.34
MEBANE	0.25	0.20	3.00	3.45

Table 4. Renewable energy generating capacity in Butner, Hillsborough, and Mebane

Most of the renewable energy generating capacity in Mebane comes from its 3-megawatt utility-scale system (87%), while commercial systems make up the most capacity in Butner (92%) and residential systems make up the most capacity in Hillsborough (81%).



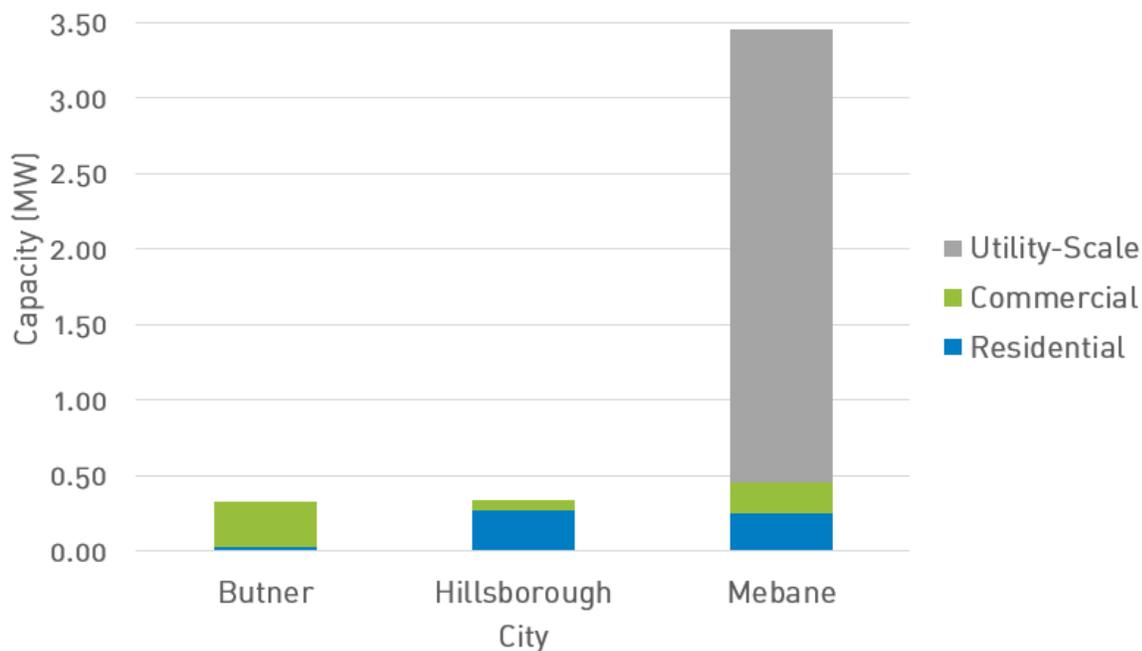


Figure 7. Total renewable energy generating capacity installed in Butner, Hillsborough, and Mebane

Due to its utility-scale solar PV system, Mebane has a sizeable lead in renewable energy generation capacity since it was installed in 2014. Otherwise, Butner and Hillsborough have stayed relatively close to each other in their renewable energy generating capacities.

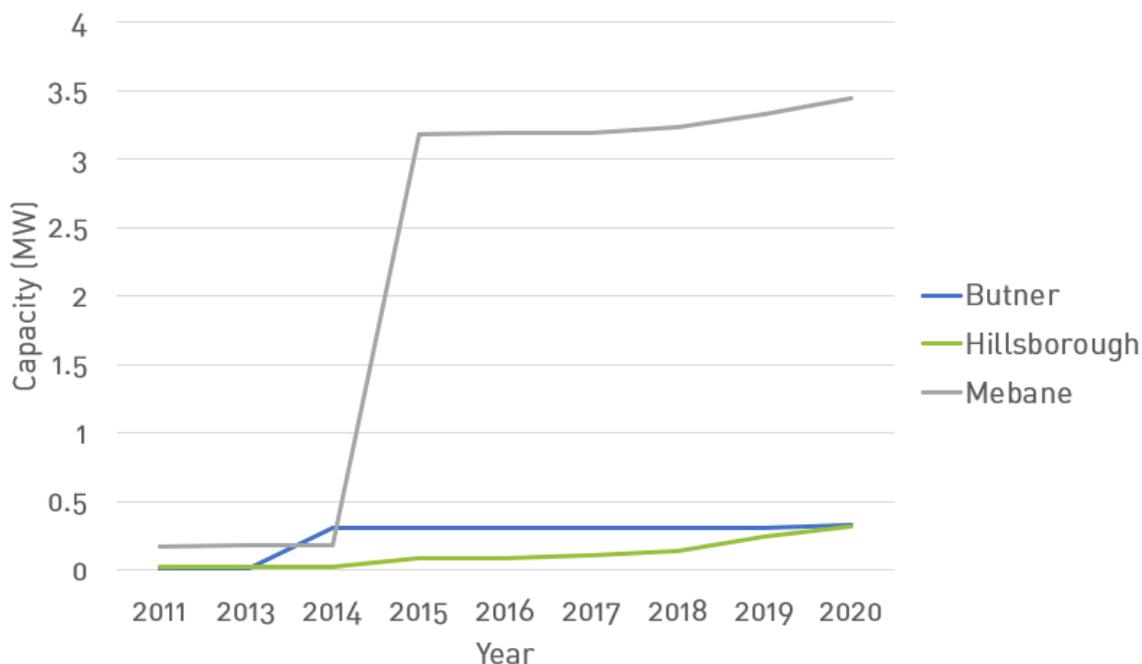


Figure 8. Cumulative renewable energy capacity installed in Butner, Hillsborough, and Mebane



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.² The median score of these buildings is 50, and those with scores of 75 or more are eligible for ENERGY STAR certification.³

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.⁴ There are a variety of certifications that can be achieved depending on the use of the building and its stage of development.⁵

Both ENERGY STAR and LEED maintain datasets of the buildings that currently meet their certification standards.^{6,7}

Number of Certified Energy Efficient Buildings

Mebane leads Butner and Hillsborough in the number of certified energy efficient buildings, with over twice as many as the other cities put together.

CITY	ENERGY STAR CERTIFIED	LEED CERTIFIED	TOTAL
BUTNER	1	0	1
HILLSBOROUGH	2	0	2
MEBANE	4	3	7

Table 5. Certified energy efficient buildings in Butner, Hillsborough, and Mebane



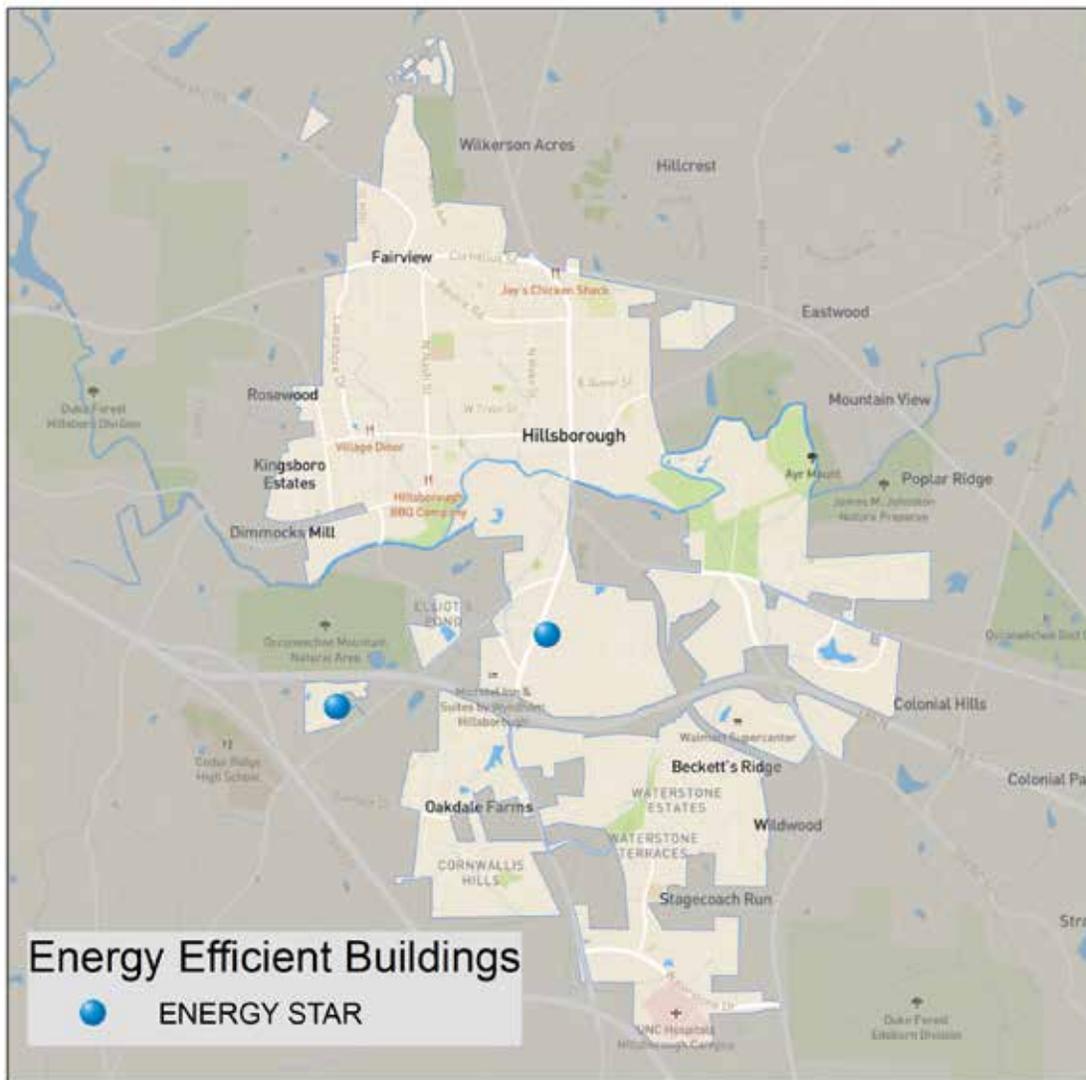


Figure 9. Certified energy efficient buildings in Hillsborough

In Butner and Hillsborough, all the certified energy efficient buildings are ENERGY STAR certified while in Mebane, while most of the certified energy efficient buildings are ENERGY STAR certified, there are a few LEED certified buildings too.



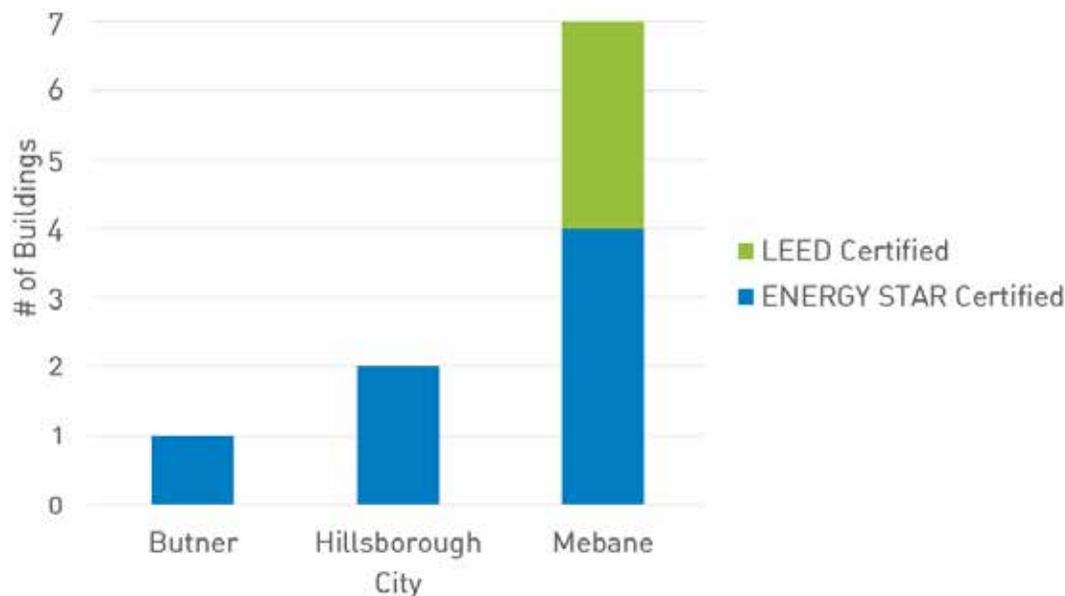


Figure 10. Certified energy efficient buildings in Butner, Hillsborough, and Mebane

Area in Certified Energy Efficient Buildings

Since Mebane leads Butner and Hillsborough in the number of certified energy efficient buildings, it also leads them in the amount of building area in those certified buildings too. In fact, Mebane has almost twice as much building area in certified energy efficient buildings than the other cities combined.

CITY	ENERGY STAR (FT ²)	LEED (FT ²)	TOTAL (FT ²)
BUTNER	33,912	0	33,912
HILLSBOROUGH	315,791	0	315,791
MEBANE	519,427	179,484	698,911

Table 6. Building area in certified energy efficient buildings in Butner, Hillsborough, and Mebane



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 and is available by county.^{8,9}

For context, Butner is located in Granville County, Hillsborough is in Orange County, and Mebane is in Alamance County. Orange County leads Alamance and Granville Counties in the number of electric and plug-in electric vehicles with over three and a half times the number of registered vehicles.

COUNTY	ELECTRIC VEHICLES	PLUG-IN HYBRID ELECTRIC VEHICLES	TOTAL
ALAMANCE	169	120	289
GRANVILLE	45	35	80
ORANGE	871	431	1,302

Table 7. EVs and plug-in hybrid EVs registered in Alamance, Granville, and Orange Counties

In all three counties, most of the electric and plug-in hybrid electric vehicles are totally electric, with over 56% in each county.

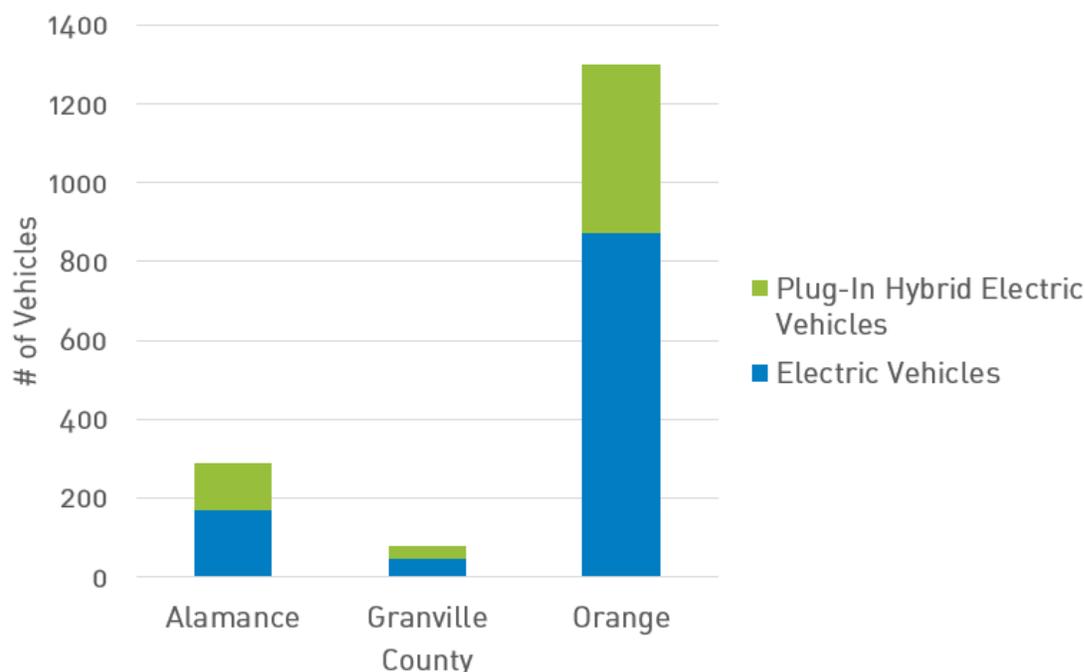


Figure 11. EVs and plug-in EVs registered in Alamance, Granville, and Orange Counties



Even when taking each county's population into account, Orange County leads Alamance and Granville in the number of registered electric and plug-in hybrid electric vehicles.

COUNTY	POPULATION	EVS PER 1,000 PEOPLE
ALAMANCE	169,509	1.70
GRANVILLE	60,443	1.32
ORANGE	148,476	8.77

Table 8. EVs per 1,000 people in Alamance, Granville, and Orange 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.¹⁰

Electric Vehicle Charging Stations

There are not many electric vehicle charging stations in any of these cities, but Mebane has more than Butner and Hillsborough.

CITY	LOCAL GOVERNMENT	PRIVATE	TOTAL
BUTNER	0	0	0
HILLSBOROUGH	2	1	3
MEBANE	0	6	6

Table 9. EV charging stations in Butner, Hillsborough, and Mebane by ownership type



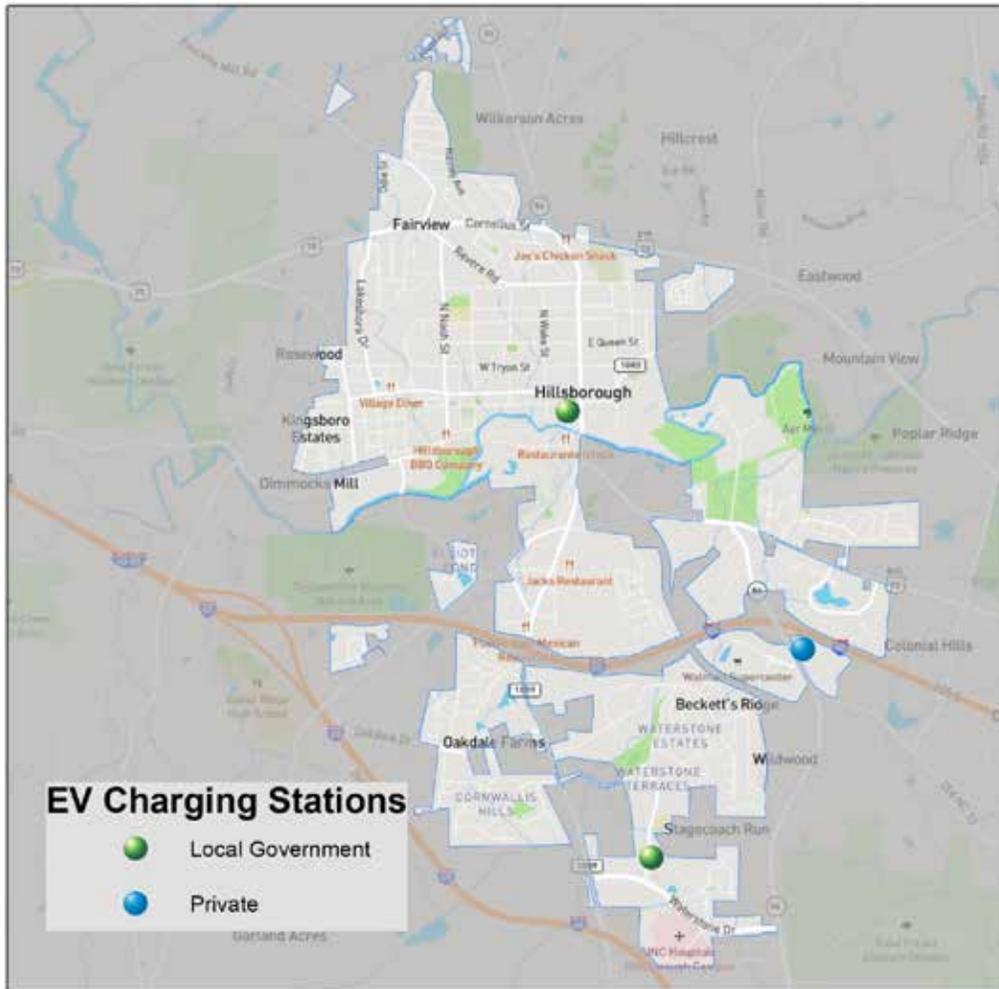


Figure 12. EV charging stations installed in Hillsborough

Electric vehicle charging stations in Mebane are privately owned, there are no charging stations in Butner, and the stations in Hillsborough are owned privately and by the local government.



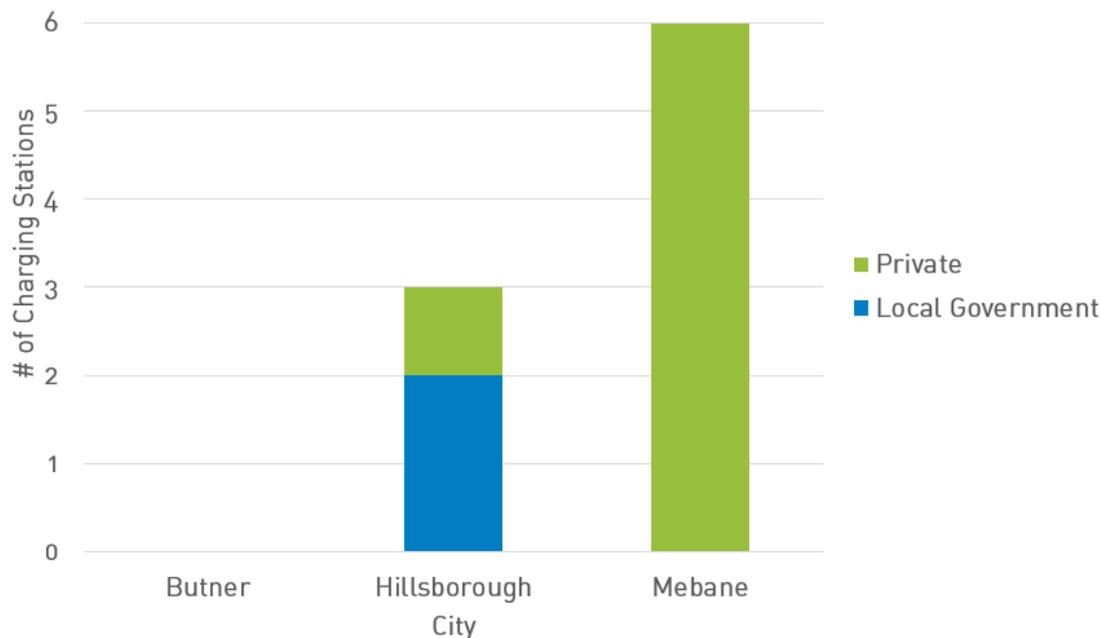


Figure 13. EV charging stations in Butner, Hillsborough, and Mebane by ownership type

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.¹¹

Mebane also leads Hillsborough in the number of electric vehicle charging outlets.

CITY	LEVEL 1	LEVEL 2	DC FAST CHARGE	TOTAL
BUTNER	0	0	0	0
HILLSBOROUGH	0	8	4	12
MEBANE	0	10	8	18

Table 10. EV charging outlets in Butner, Hillsborough, and Mebane by charging level

Most of the electric vehicle charging outlets in Hillsborough and Mebane are level 2, with at least 67% in each city.



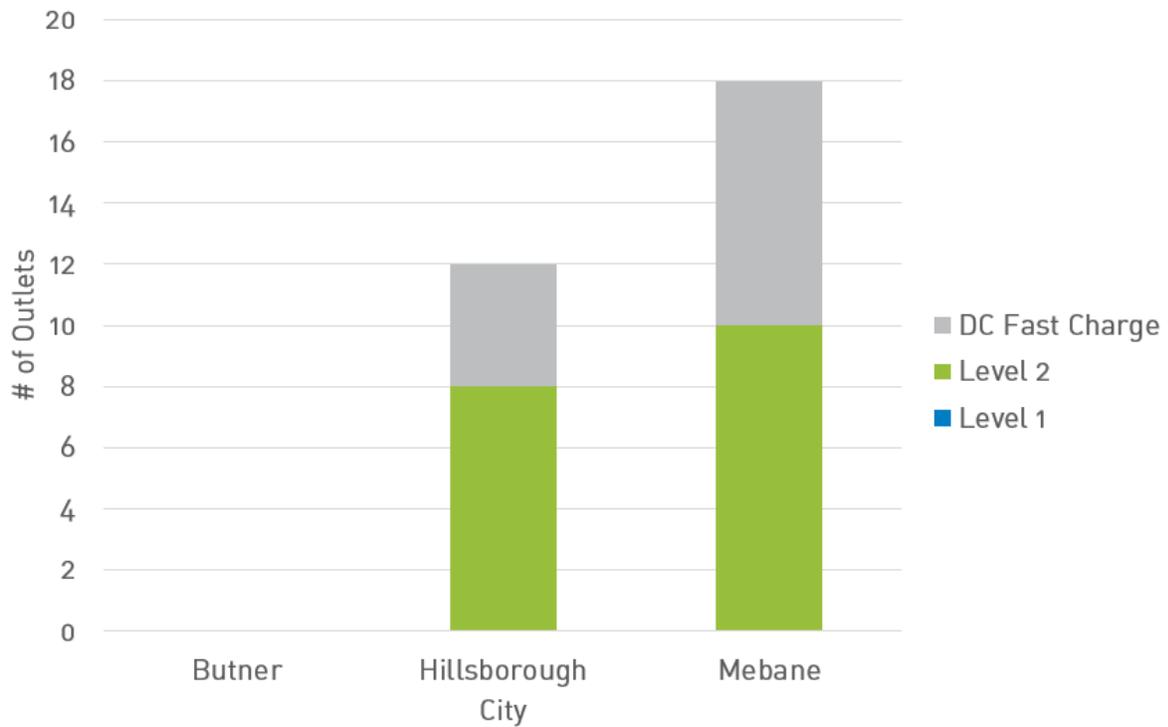


Figure 14. EV charging station outlets in Butner, Hillsborough, and Mebane by charging level



Endnotes

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