

CLEAN JOBS NORTH CAROLINA¹

POWERING NORTH CAROLINA'S ECONOMY WITH CLEAN ENERGY

2020

Clean energy jobs are more critical than ever to North Carolina's economy, after the state's workforce grew to nearly 113,000 at the end of 2019. A Southeast leader in clean energy jobs, North Carolina not only ranked among the top 10 states in the country across a variety of clean energy workforce categories—including solar energy, energy efficiency, and grid modernization—but remained home to the ninth largest total number of clean energy jobs among all 50 states.

The state's clean energy sector experienced a fifth straight year of job growth since E2 (Environmental Entrepreneurs) began tracking U.S. clean energy employment growing to account for 52% of all energy

sector employment in North Carolina. And, since North Carolina Sustainable Energy Association (NCSEA) began tracking clean energy jobs in 2007, annual clean energy jobs have grown over 690%.

E2 and NCSEA's Clean Jobs North Carolina 2020 details the sheer size of this important employment sector, and how focusing on clean energy can help us build back our economy better and faster after COVID-19.

KEY FINDINGS

Q4 2019

#9

NORTH CAROLINA WAS HOME TO 3.4% OF THE NATION'S CLEAN ENERGY JOBS, 9TH AMONG ALL 50 STATES

5.2%

JOB GROWTH SINCE 2017, 40% FASTER THAN OVERALL STATEWIDE EMPLOYMENT

10X

CLEAN ENERGY EMPLOYED 10 TIMES MORE WORKERS THAN FOSSIL FUELS IN 2019

SINCE COVID-19

21k

NORTH CAROLINA CLEAN ENERGY WORKERS REMAIN UNEMPLOYED

4.2%

OF ALL CLEAN ENERGY WORKERS FILING FOR UNEMPLOYMENT WERE IN NORTH CAROLINA

18.8%

OF THE STATE'S CLEAN ENERGY WORKFORCE HAS FILED FOR UNEMPLOYMENT SINCE MARCH

PRESENTED BY:



AUGUST 2020
E2FS: 20-07-A



NC SUSTAINABLE
ENERGY ASSOCIATION

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For questions regarding this report, visit E2's report FAQ at
<https://www.e2.org/reports/clean-jobs-america-faq>.

A Clean Energy-Driven Recovery

As North Carolina leaders continue to assess policy options for economic recovery in the wake of COVID-19, this report makes clear the need to ensure state lawmakers and agencies prioritize clean energy's continued expansion across the state. From expanding utility-scale solar to increasing renewable energy portfolio standards to addressing carbon reduction in the electric power sector through market-based programs and systemic changes in the utility business model, North Carolina can determine its energy and economic future now.

Every county in North Carolina was home to clean energy workers in 2019, while more than four of five clean energy workers were employed by a small business (fewer than 20 employees). In fact, over 25% of the state's clean energy workers (29,000) were based in rural areas—by far the most in the country.

Perhaps more than at any other time before, North Carolina's clean energy sector is integral to bringing the state back from the throes of the economic recession brought on by COVID-19. As with most other sectors, the clean energy sector suffered setbacks. Unlike many sectors, though, clean energy offers North Carolinians not just an opportunity to replace the jobs that have been lost due to COVID-19, but to create thousands of new jobs as well. Ramping up clean energy development during this time of crisis is exactly what North Carolina needs to get its economy back in shape. Clean energy was resilient throughout the 2008 recession and was one of the only sectors to grow GDP and job numbers during that time. The strong economic impact of clean energy development on North Carolina can be seen in NCSEA and RTI International's 2019 Economic Impact Analysis of Clean Energy Development in North Carolina.

According to that report, \$14.8 billion was directly spent on clean energy project development in North Carolina between 2007-2018, and in that same period clean energy development supported almost 170,000 FTE's (full-time equivalents).²

Now is not the time to give up on clean energy. Now is the time to dive in and count on clean energy to do what we know it can do: create jobs, economic opportunities, and affordable energy for all North Carolinians.

State lawmakers should continue the clean energy vision laid out in the North Carolina Clean Energy Plan to 1) maintain the state's place as a national and regional leader and 2) ensure North Carolina businesses and workers share in the economic rewards that will come from building on, and advancing, the clean energy paradigm shift that will have a broad and lasting impact on the economy for years to come.

Methodology

The analysis expands on data from the 2020 U.S. Energy and Employment Report (USEER) produced by the Energy Futures Initiative (EFI) in partnership with the National Association of State Energy Officials (NASEO), using data collected and analyzed by the BW Research Partnership. The USEER analyzes data from the U.S. Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages (QCEW) to track employment across many energy production, transmission, and distribution subsectors. In addition, the 2020 USEER relies on a unique supplemental survey of 30,000 business representatives across the United States. Created and conducted by BW Research and approved by the Office of Management and Budget and U.S. Department of Energy (DOE), this survey is used to identify energy-related employment within key subsectors of the broader industries as classified by the BLS and to assign them into their component energy and energy efficiency sectors.

E2 is a partner on the USEER, which was first released by the Department of Energy in 2016. The 2020 USEER was released on March 23, 2020 and is available at www.usenergyjobs.org.

A FAQ is also [available here](#) to answer any questions.

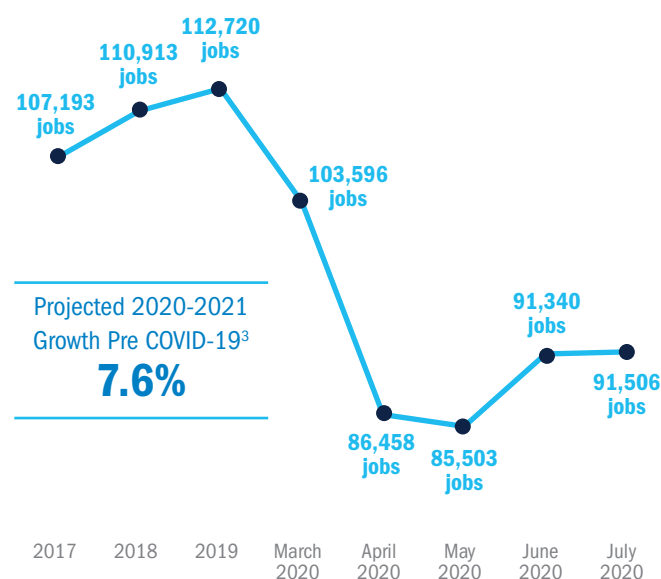
CLEAN JOBS NORTH CAROLINA 2020 THE CURRENT SITUATION

Entering 2020, North Carolina's clean energy workforce had grown to make up 2.5% of overall statewide employment, increasing 5.2% since 2017.

Like much of the economy, the clean energy sector also suffered from the economic downturn and COVID-19. There have been job losses in this sector across the country, and North Carolina is no exception. Many energy efficiency workers lost their jobs after being shut out of homes and buildings to prevent the spread of the COVID-19. Solar and wind turbine companies furloughed workers after they couldn't get panels and parts stranded in shut-down factories. Factory workers were let go as assembly lines for Energy Star appliances and electric and hybrid vehicle auto parts went dark.

Impact On Clean Jobs

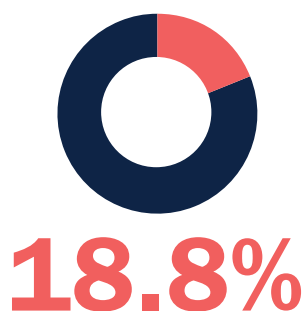
While June and July saw some jobs recovery in clean energy (109,500 added), more than half-a-million (511,000) clean energy workers across all 50 states plus the District of Columbia remain out of work since March. In North Carolina, 6,000 clean energy employees returned to work in June and July, according to E2's latest analysis of unemployment data since March 2020, leaving 21,200 North Carolinian clean energy workers still unemployed in the aftermath of the COVID-19 outbreak and subsequent economic downturn—or nearly 19% of the state's clean energy workforce.



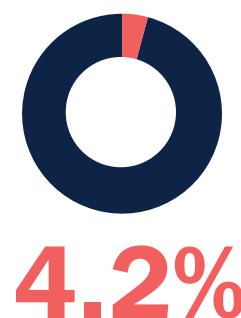
States Hardest Hit

State	Total Losses	Share of Clean Energy Workforce
US TOTAL	511,075	15.20%
California	89,158	16.60%
Georgia	27,316	32.60%
Florida	26,521	16.00%
Texas	24,659	10.20%
Michigan	24,525	19.60%
North Carolina	21,214	18.80%
Pennsylvania	18,866	20.10%
Washington	18,444	21.70%
New York	17,239	10.80%
Ohio	16,494	14.40%

Percentage of Statewide Clean Energy Jobs Lost Post-COVID-19



Percentage of Nationwide Clean Energy Job Losses Post-COVID-19



Reasons for Optimism

But we have reason to be optimistic. As history shows, with the right policies, clean energy can produce jobs quickly in the aftermath of economic downturn.

Through the prolonged economic downturn of the Great Recession and tight credit markets, employment in North Carolina's renewable energy and energy efficiency industries increased 6% from 2008-2009. This signals the resiliency of the renewable energy and energy efficiency industries, especially when considering more than 200,000 jobs—or roughly 5%—of North Carolina jobs were lost between July 2008 to July 2009.

Additionally, no part of the 2009 American Recovery and Reinvestment Act (ARRA) was more successful than the \$90 billion in federal investments in clean energy. In the years following ARRA, nearly 1 million clean energy jobs were created. Hundreds of new made-in-America businesses—game-changing companies such as Tesla which employed 45,000 workers before the crisis—got their start with ARRA-era Department of Energy loans that were repaid in full. More than 100,000 wind, solar, and other clean energy projects were started, bringing new investments and markets to states like North Carolina, which quickly took advantage and became a national leader in solar energy over the following decade.

Most importantly at this time, Clean Jobs North Carolina shows why it's imperative for state lawmakers to not take this burgeoning industry for granted. They must ensure the state's clean energy marketplace is supported through smart initiatives and other policies aimed at restarting our economy and getting this big part of the state's workforce back on the job building a cleaner, more resilient economy for the future.

UNEMPLOYMENT CLAIMS BY INDUSTRY MARCH-JULY 2020

Renewable Energy	2,373 jobs lost (-19.2% of sector's workforce)
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Energy Efficiency	16,506 jobs lost (-18.8%)
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Clean Vehicles	1,251 jobs lost (-17.6%)
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Storage & Grid	757 jobs lost (-20.3%)
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Clean Fuels	327 jobs lost (-21.3%)
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NORTH CAROLINA LOCALITIES HIT THE HARDEST

Metros

Charlotte-Gastonia-Concord	4,860 jobs lost (-21.8% of county's clean energy workforce)
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Raleigh-Cary	3,003 jobs lost (-18.6%)
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Counties

Mecklenburg County	2,707 jobs lost (-13.4%)
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Wake County	2,157 jobs lost (-12.3%)
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Guilford County	849 jobs lost (-13.4%)
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Forsyth County	368 jobs lost (-11.3%)
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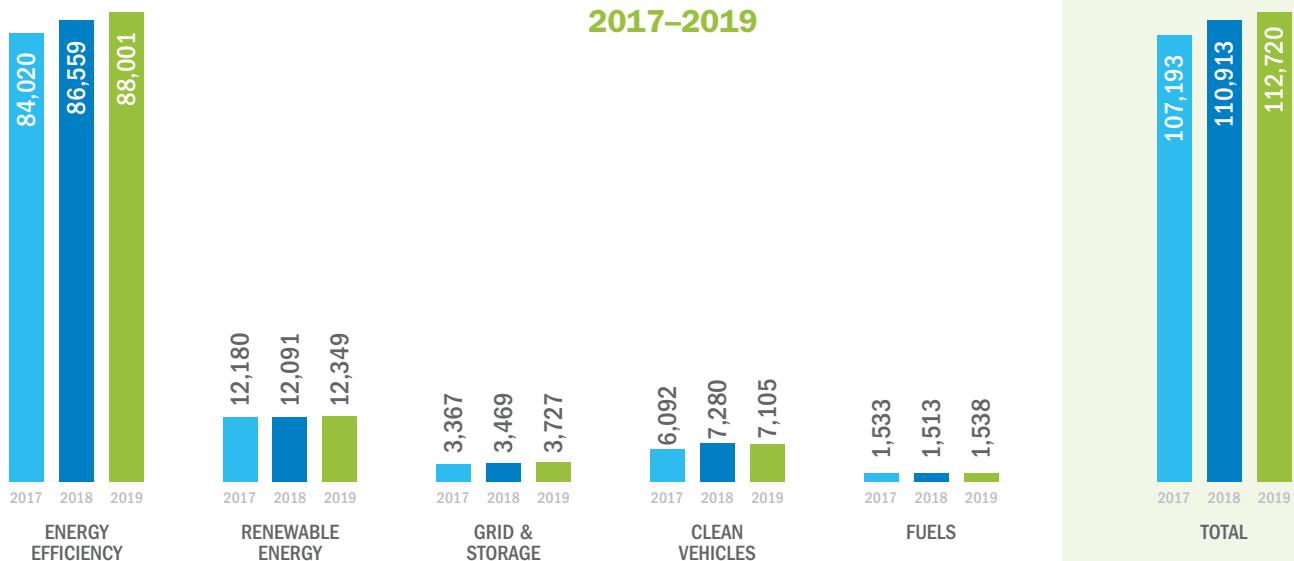
CLEAN JOBS NORTH CAROLINA 2020 YEAR-IN-REVIEW

North Carolina's clean energy economy added over 1,800 jobs in 2019, driven primarily by growth in grid modernization and energy storage (7.5%) and renewable energy generation (2.1%).

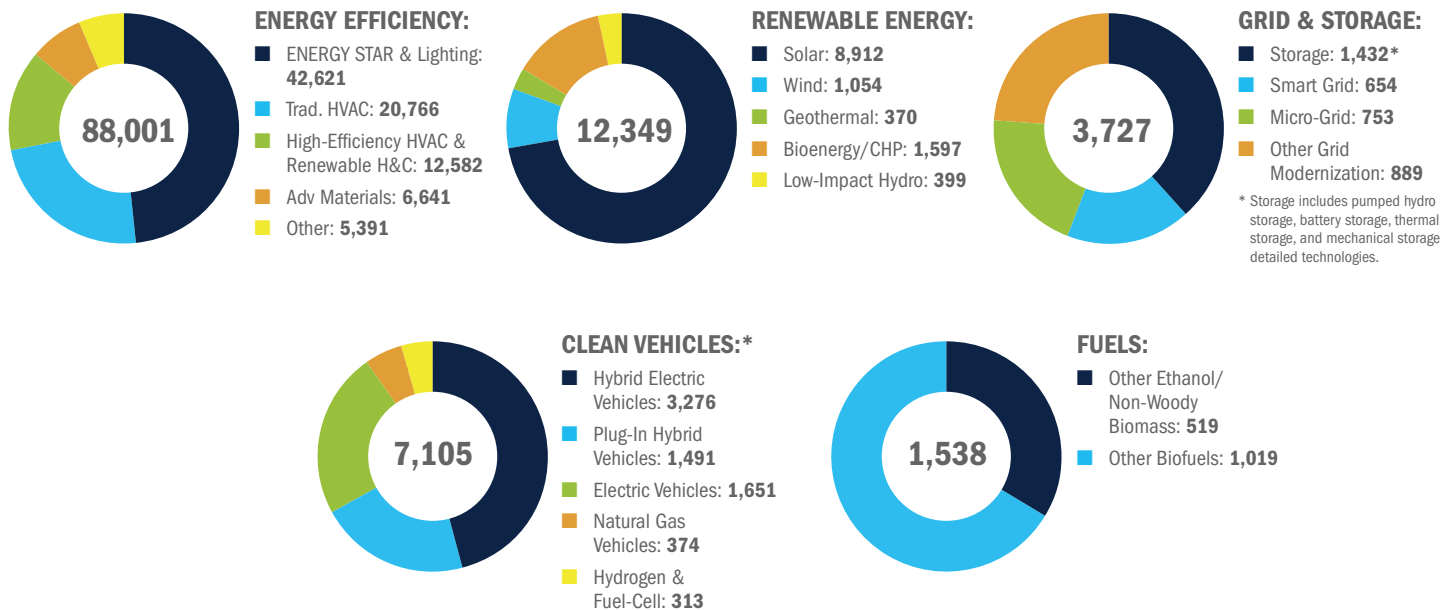
The state saw growth in 18 of 21 subsectors. Clean Vehicles was the only sector to see an overall decline in employment (175 jobs) after growing 20% in 2018 (part of a nationwide trend), and the decline in jobs was limited to the plug-in hybrids and electric vehicles subsectors. Hybrid electric vehicles (3.4%), natural gas vehicles (4.0%), and hydrogen fuel-cell vehicles (11.2%) all saw above average growth.

Swelling to nearly 113,000 workers statewide, North Carolina's clean energy workforce at the end of 2019 was employed primarily by small businesses ranging from agriculture to manufacturing.

STATEWIDE CLEAN ENERGY EMPLOYMENT 2017-2019



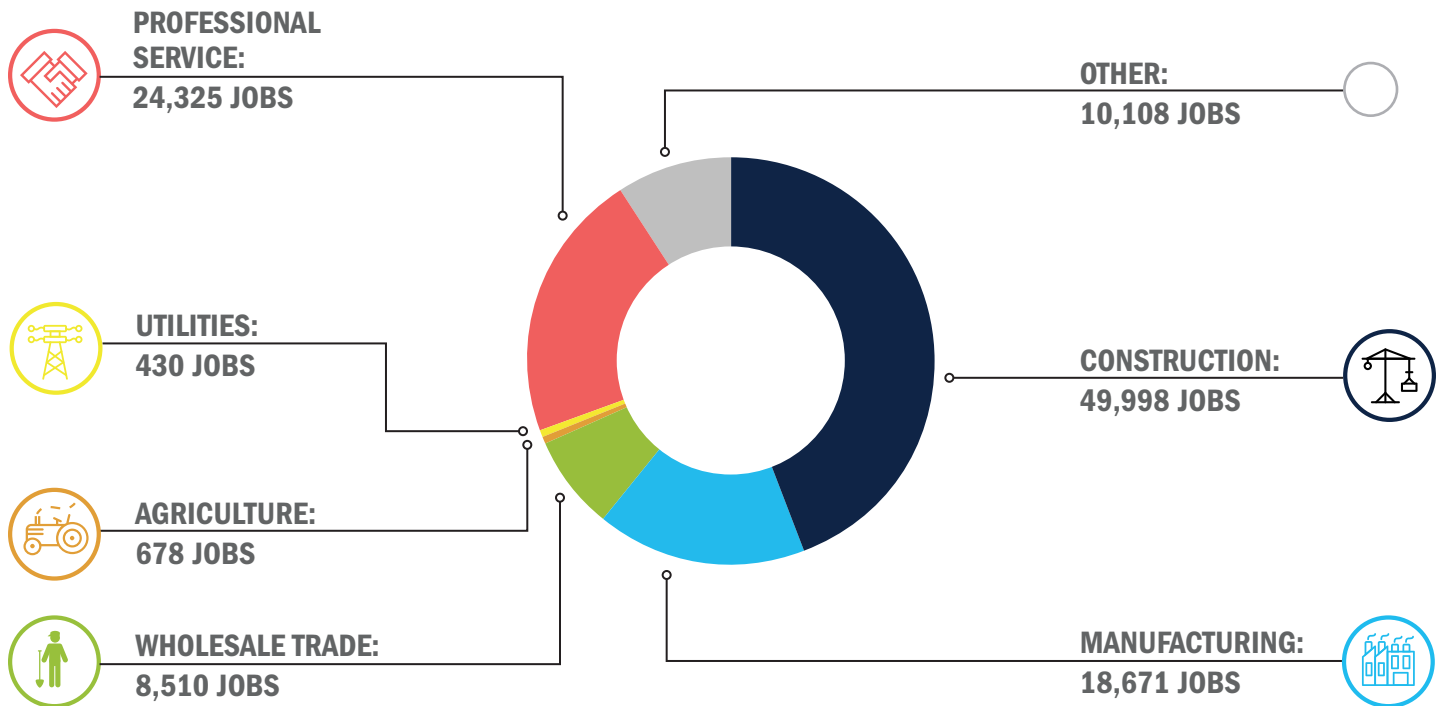
INDUSTRY BREAKDOWN Q4 2019



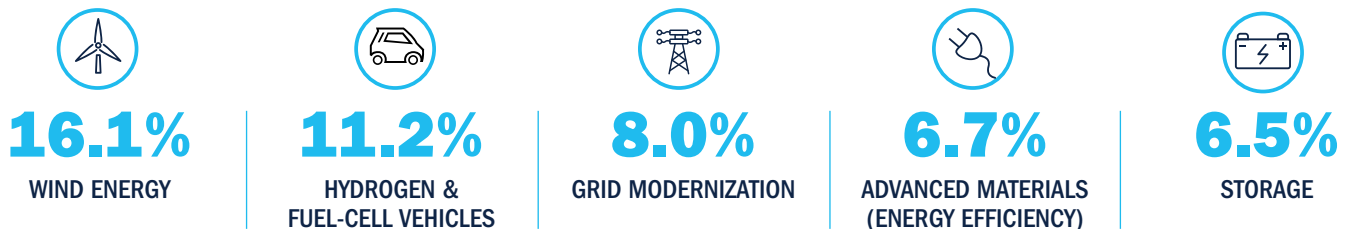
* Storage includes pumped hydro storage, battery storage, thermal storage, and mechanical storage detailed technologies.

* Not included are 14,527 additional employees who work making gas-powered vehicles more fuel-efficient.

CLEAN JOBS BY VALUE CHAIN Q4 2019



FASTEST-GROWING TECHNOLOGIES 2018-2019



CLEAN JOBS BY BUSINESS SIZE Q4 2019



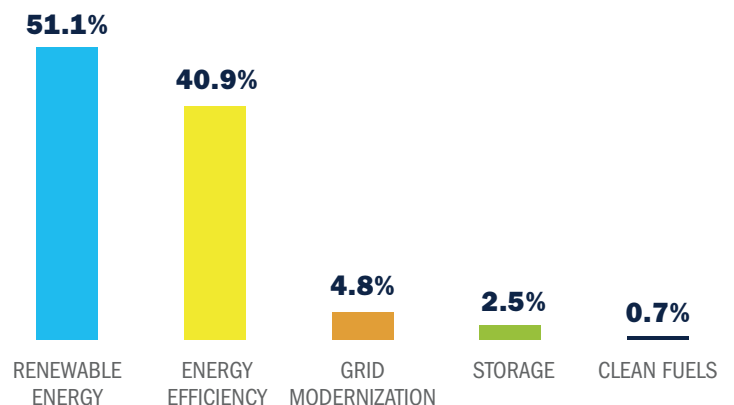
3 OUT OF EVERY 5

CLEAN ENERGY WORKERS IN NORTH CAROLINA ARE EMPLOYED BY BUSINESSES WITH FEWER THAN 5 EMPLOYEES

CLEAN ENERGY WORKERS BY BUSINESS SIZE:

- 1-4 EMPLOYEES: **63.0%**
- 5-19 EMPLOYEES: **19.2%**
- 20-99 EMPLOYEES: **5.8%**
- 100-499 EMPLOYEES: **5.8%**
- 500+ EMPLOYEES: **0.2%**

SECTOR SHARE OF JOB GROWTH 2018-2019



FACES BEHIND THE NUMBERS SOLOMON MARYLAND, ENERGY EFFICIENCY



POSITION: **Founder and Owner**

COMPANY: **Soloman Maryland Heating and Air**

INDUSTRY: **Energy Efficiency**

LOCATION: **Rocky Mount, North Carolina**

TIME IN POSITION: **12 Years**

How did you get into energy efficiency?

About five years ago, Roanoke Electric Cooperative approached my company and wanted to try to lower their rate of buying power through energy efficiency. They started a tariff on-bill program called “Upgrade to \$ave,” which provides energy efficiency upgrades to customers at no cost, and they pay back the upgrades through the savings on their energy bill.

What has been your experience with Roanoke’s “Upgrade to \$ave” program?

At first, I was reluctant. Until I saw the results. Every home I go into, I help customers cut their energy bills by 20-30 percent, and I have even had people call me to say that I cut their bill in half. We mainly do insulation, duct and air sealing, heat pump improvements, water heater wraps, and LED lighting. Some customers are skeptical because they think it’s too good to be true or that they can’t afford the upgrade, but once I explain the program they realize it’s a good decision.

What’s next for you and your company?

We had three employees when I first started, but we’ve grown to 13 now, with the potential to hire a couple more because I’ve been approached by Honeywell to help with their energy efficiency work. We’re trying to get more energy efficiency work and stepping away from the lower-end equipment because we really want to push energy efficiency to generate savings. We’re moving more towards weatherization and new home installations instead of retrofits. Clean energy is about helping the environment any way that we can. In my case, it’s by lowering electrical usage.



Credit: Solomon Maryland



CLEAN JOBS NORTH CAROLINA 2020 ECONOMY-WIDE VIEW

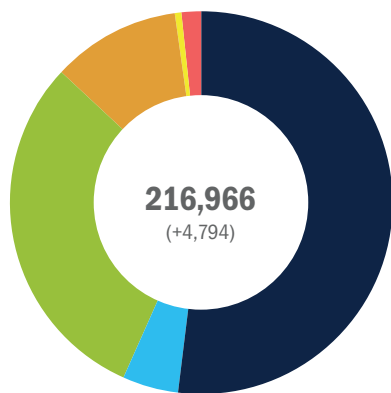
Viewed economy-wide, North Carolina's clean energy sector has been a key element of the state's overall economic success the past several years. Clean energy workers made up 2.5% of overall statewide employment at the end of 2019, and jobs have increased 5.2% since 2017—40% faster than statewide employment growth (3.7%) over that time.

Clean energy accounted for 38% of all new energy-related jobs in North Carolina in 2019, the most of any sector. Overall, clean energy workers accounted for over more than half of all energy jobs in North Carolina 2019, and 100,000 more people are employed in clean energy than fossil fuels statewide.

While clean vehicle employment dragged down overall growth—attribution at least in part to national market uncertainty around federal clean car standards—clean energy still accounted for the vast majority of job growth across the entire energy industry. Not counting the losses in clean vehicle occupations, the rest of the clean economy added jobs 19% faster than the statewide economy in 2019.

NORTH CAROLINA'S CLEAN ECONOMY

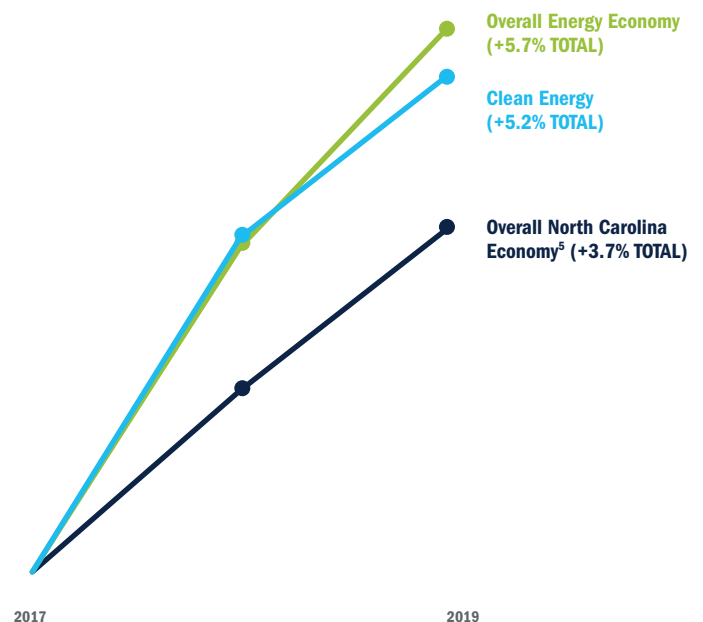
52% of all energy jobs in North Carolina are in clean energy industries (11X more than fossil fuels)⁴



- Clean Energy Economy: **112,720** (+1,807 jobs)
- Fossil Fuels: **10,313** (+291 jobs)
- Motor Vehicles: **65,932** (+1,798 jobs)
- Trad. Transmission & Distribution Employment: **23,187** (+694 jobs)
- Nuclear: **1,596** (-49 jobs)
- Other*: **3,218** (+253 jobs)

* Includes other energy subsectors such as corn ethanol, woody biomass, large hydropower, and others.

3-YEAR GROWTH TRENDS



CLEAN ENERGY POWERING NORTH CAROLINA'S CONSTRUCTION SECTOR



Nearly 50,000 North Carolinians are employed in construction work across the clean energy sector—installing new renewable energy systems, making buildings and schools more energy efficient, upgrading the electric grid, and more.

1 IN 4 NORTH CAROLINA CONSTRUCTION JOBS ARE IN CLEAN ENERGY

CLEAN JOBS NORTH CAROLINA 2020 CLEAN ECONOMY COMPARISONS

North Carolina's early policy leadership on renewable energy and energy efficiency has positioned it as one of the top states in the U.S. for clean energy workers. As of 2019, North Carolina had the ninth most jobs among all 50 states and the District of Columbia, and accounts for 3.4% of all U.S. clean energy jobs.

Notably, the state ranked among the top states for employment in more than 15 sectors and outperformed all states in its surrounding region across sectors. Florida remains the only state in the larger Southeast region with more clean energy jobs—with a majority of those jobs concentrated in Florida's central and southern regions.

North Carolina's consistent growth across multiple sectors and subsectors over the last three years has helped make it one of the most attractive markets for clean energy businesses and workers, and one of the most mature clean energy economies in the country, which bodes well for the sector's recovery after COVID-19.

NORTH CAROLINA CLEAN ENERGY EMPLOYMENT NATIONAL PERSPECTIVE Q4 2019

Where North Carolina Ranks

Top 5

ENERGY STAR APPLIANCE
& EFFICIENT LIGHTING (3RD)

GEOTHERMAL (5TH)

Top 10

GRID MODERNIZATION (8TH)

TRADITIONAL HVAC (8TH)

OTHER BIOFUELS (8TH)

SOLAR ENERGY (9TH)

Top 15

ENERGY STORAGE (15TH)

ELECTRIC VEHICLES (14TH)

HYDROGEN FUEL-
CELL VEHICLES (13TH)

PLUG-IN HYBRIDS (13TH)

HYBRID ELECTRIC VEHICLES (13TH)

3.4%

North Carolina workers account for 3.4% of all clean energy jobs nationwide.

TOP 10

North Carolina ranks among the top ten states for jobs in four of the five principal clean energy sectors—renewables (9th), clean fuels (8th), storage & grid (8th), energy efficiency (7th).

MORE JOBS THAN

10 STATES

North Carolina employs more clean energy workers than the bottom 10 states combined (107,700).

6.7%

North Carolina is home to 6.7% of the America's 430,000 clean energy jobs in rural areas, more than any other state.

A CLOSER LOOK REGIONAL BREAKDOWN Q4 2019

North Carolina is home to over 15% of the Southeast's 740,000 total clean energy jobs. A closer look at neighboring states reveals North Carolina's importance to the region's clean economy.

Total Clean Energy

North Carolina: **112,720 jobs**

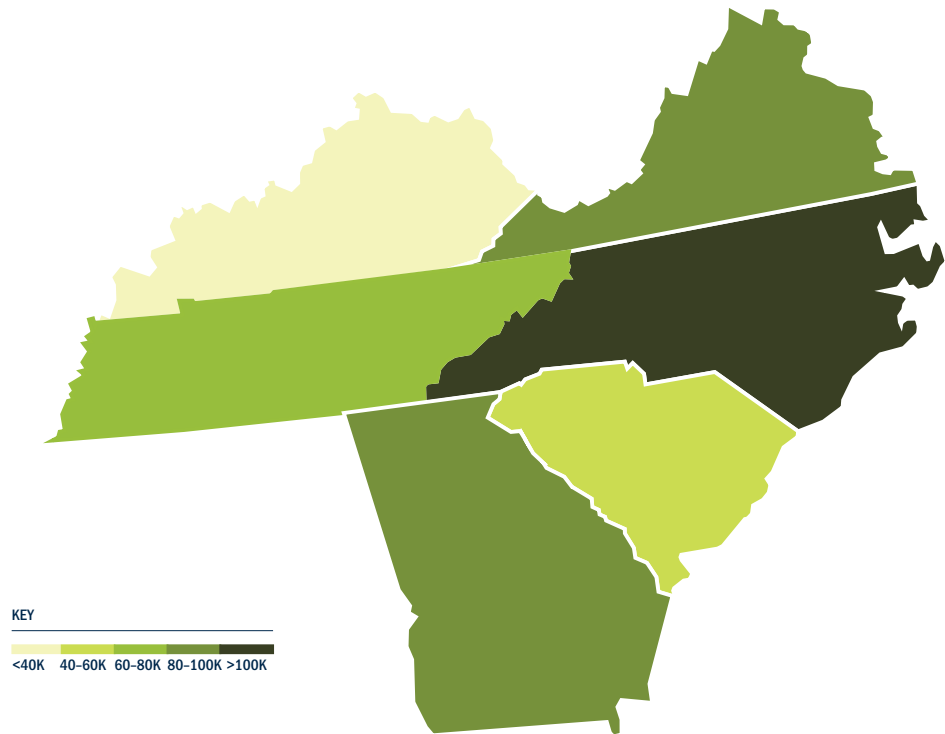
Virginia: **97,305**

Georgia: **83,806**

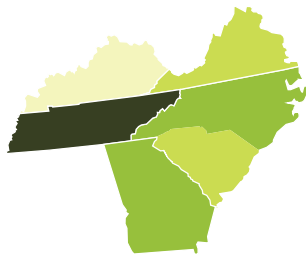
Tennessee: **79,626**

South Carolina: **46,527**

Kentucky: **38,266**



Clean Vehicles



Tennessee: **9,971 jobs**

Kentucky: **8,097**

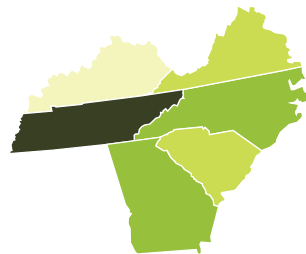
Georgia: **7,423**

North Carolina: **7,105**

South Carolina: **5,693**

Virginia: **5,245**

Grid Modernization



Tennessee: **8,002 jobs**

Georgia: **2,518**

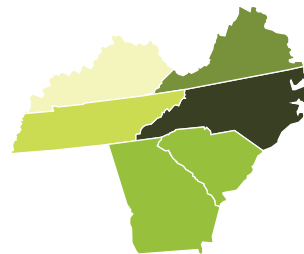
North Carolina: **2,296**

Virginia: **1,604**

South Carolina: **1,208**

Kentucky: **779**

Renewable Energy



North Carolina: **12,349 jobs**

Virginia: **9,057**

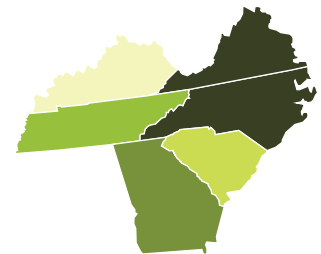
Georgia: **8,751**

South Carolina: **7,336**

Tennessee: **5,763**

Kentucky: **2,277**

Energy Efficiency



North Carolina: **88,001 jobs**

Virginia: **80,181**

Georgia: **62,924**

Tennessee: **53,916**

South Carolina: **30,794**

Kentucky: **26,221**

NORTH CAROLINA FIRST IN RURAL CLEAN JOBS

As state leaders work to address the growing rural-urban economic divide, clean energy provides a cross-cutting economic solution that benefits both areas. One out of every four North Carolinians employed in clean energy in 2019 was in a rural area—including 27% of all renewable energy workers—a greater percentage than any other state.

Rank	State	Clean Jobs	Renewable Energy	Energy Efficiency
1	North Carolina	28,894	3,297	22,442
2	Michigan	24,954	2,208	17,046
3	Texas	23,904	3,696	16,949
4	Wisconsin	19,513	1,365	16,312
5	Ohio	17,513	1,182	13,089
6	Indiana	16,009	1,870	10,329
7	Tennessee	14,725	771	10,183
8	Iowa	14,244	2,608	9,378
9	Minnesota	13,845	824	11,391
10	Illinois	13,502	1,751	9,938

25.6%

OF NORTH CAROLINA CLEAN ENERGY
EMPLOYEES WORK IN RURAL AREAS

14.4%

OF NORTH CAROLINA'S CLEAN ENERGY
EMPLOYEES WORK IN TIER 1 COUNTIES

NORTH CAROLINA CLEAN ENERGY JOBS IN TIER 1 COUNTIES⁶

Many of the largest utility-scale projects are in rural Eastern North Carolina counties deemed “Tier 1” by the North Carolina Department of Commerce, meaning they are economically challenged and in need of economic development. **16,100 North Carolinians in Tier 1 counties are employed in clean energy, 12 times more than fossil fuel industries employ.**

County	Tier	Clean Energy Jobs	Renewable Generation Jobs	Energy Efficiency Jobs	Fossil Fuel Jobs
Anson	1	131	12	110	20
Beaufort	1	437	22	337	12
Bertie	1	37	3	23	2
Bladen	1	123	13	87	6
Caldwell	1	256	13	208	10
Caswell	1	34	2	26	12
Chowan	1	74	6	56	12
Cleveland	1	1,190	146	875	53
Columbus	1	207	17	158	9
Cumberland	1	2,287	79	1,849	114
Duplin	1	257	26	173	28
Edgecombe	1	295	13	249	31
Graham	1	113	4	107	4
Greene	1	82	6	63	5
Halifax	1	168	13	126	10
Hertford	1	190	11	161	19
Hyde	1	38	2	30	2
Jones	1	42	6	31	1
Lenoir	1	794	31	625	31
Martin	1	362	295	63	3
Mitchell	1	124	9	107	15

County	Tier	Clean Energy Jobs	Renewable Generation Jobs	Energy Efficiency Jobs	Fossil Fuel Jobs
Nash	1	903	43	746	44
Northampton	1	80	4	54	4
Onslow	1	879	64	750	52
Pasquotank	1	249	16	193	13
Perquimans	1	42	2	32	2
Pitt	1	1,526	167	1,197	61
Richmond	1	305	64	221	21
Robeson	1	478	37	391	20
Rockingham	1	506	37	428	49
Rutherford	1	358	27	301	27
Sampson	1	671	410	170	219
Scotland	1	211	8	118	4
Swain	1	78	5	62	2
Tyrrell	1	22	1	15	1
Vance	1	224	12	188	79
Warren	1	35	2	28	2
Washington	1	30	6	15	2
Wayne	1	959	22	776	254
Wilkes	1	294	10	244	15
Wilson	1	1,095	75	903	50

PROFILES IN GROWTH A CLOSER LOOK AT NORTH CAROLINA'S BURGEONING SOLAR & STORAGE SECTORS



COMPANY: **Pisgah Energy**

OWNER: **Evan Becka**

FOUNDED: **2019**

LOCATION: **Asheville, North Carolina**

INDUSTRY: **Solar and Battery Storage**



The City of Asheville and Buncombe County have long been leaders in sustainability and clean energy. After launching a successful joint campaign to increase the community's energy efficiency and prevent the need for a local peaking power plant, both the city and county government resolved to power its facilities by 100 percent clean energy by 2030 and set a community-wide goal for the entire city and county to be powered by clean energy by 2042.

In October 2019, Buncombe County, City of Asheville, Asheville City Schools, Buncombe County Schools, and AB Technical Community College issued a historic request for proposals (RFP) to install 7 MW of solar PV arrays at 47 different schools and other public facilities.

To help manage the design, site assessments, technical aspects, budgets, and make the business case for these projects, this broad coalition turned to someone who had been long known in the community as an expert in solar—Evan Becka. With more than 20 years of experience in solar project design and development, Evan had recently founded Pisgah Energy, a solar energy storage design and development firm serving commercial, municipal, and institutional clients in the Southeast.

Evan and Pisgah Energy were a perfect fit to manage this work because they understood the values of this mountain community. As Evan explained, “We live here because we love the mountains. In fact, it was Appalachian State University’s renewable energy technology program that gave me the hands-on skills to get started in an industry where I felt I could make a real difference. It’s been 21 years and I can’t imagine doing anything else. We want to give back to the community that has given so much to us.”

Pisgah estimates that the projects in the RFP could reduce energy consumption by over 40 percent for these facilities. As for the business case for developing these projects, Evan said, “While these projects do make financial sense to all the agencies involved—utility bills will be reduced and savings will be realized—it’s the City and County’s strong commitment to reducing CO₂ emissions that is the real driving force here. Yes, it’s a good business case and, perhaps more importantly, it’s imperative for the health of our community and planet.”

Credit: 8M Solar



This Western North Carolina community is working to achieve their 100 percent clean energy goals and is a model both statewide and nationally for developing a localized clean economy. The community demanded clean energy, and elected officials responded affirmatively with smart policy. The company chosen to lead the initial design and project management was founded by a community member who first studied clean energy just an hour and a half up the road. With these clean energy projects saving community tax dollars through reduced consumption and spurring the economic development of locally generated clean energy, this “powerful” community effort is just one of the reasons that Asheville, North Carolina is known as Climate City, USA.⁷

FACES BEHIND THE NUMBERS USMAN NOOR, RENEWABLE ENERGY



COMPANY: **8M Solar**

OWNER: **Usman Noor, Ali Buttar**

FOUNDED: **2015**

LOCATION: **Cary, North Carolina**

INDUSTRY: **Solar and Battery Storage**

Usman Noor was born in Pakistan, and from a young age found it perplexing that there was an abundance of sunlight in his community, yet the electricity grid was often unreliable and not taking advantage of the ample, readily available solar resources. Usman's interest in the energy system led him to attend the top engineering school in Pakistan. After graduating, he decided to continue his education in the United States.

As an electrical engineering student at Cleveland State University, Usman befriended Ali Buttar, and both students decided to complete their senior capstone projects on aspects of solar energy. Ali went on to found YellowLite Solar, one of Ohio's first solar installation companies, and Usman was inspired to pursue a similar venture in a state where he saw favorable policies like net energy metering and a growing clean economy—North Carolina.



In 2015, Usman and Ali founded 8M solar in Cary as a full service solar and energy storage company, from residential installations to complex commercial design and construction. Usman knew that his experience as an engineer would differentiate his company and ensure top quality, and he spent the first two years after 8M's launch developing drawing and design standards. Usman's meticulous groundwork immediately started to pay off in 2018, the company's first full year of business. In 2019, 8M experienced a 700 percent growth in business, resulting in more jobs, more local investment, and more clean energy.

Then, as COVID-19 swept through the nation, 8M Solar and other North Carolina businesses experienced wide-ranging impacts, including decreased business. Usman says his company fell 20-30 percent short of business projections due to the pandemic, but thankfully he has not had to lay off any employees.

Usman explains that the biggest challenge his company faces is with local Homeowners Associations (HOAs). Under North Carolina law, HOAs and other community covenants can prohibit solar installations that are public-facing, and many HOAs have antiquated 1980's bylaws that block solar entirely. Many see this as a property rights issue, and in 2019, House Bill 750 was filed to stop HOAs ability to block solar, however, despite bipartisan support, the bill did not get a committee hearing.

Despite these obstacles, 8M Solar has quickly become a clean energy business leader, but Usman is not solely concerned with his bottom line. "We try to be fair and cognizant with everything. We make special exceptions for churches, mosques, and nonprofits. We are generally not in it for the money. We stay aligned with our principals and why we founded it. If you're a good company, there will be ample opportunities to make money, but there's something to be said for giving back when you can. As long as it helps our community so that we are a company doing the right thing, we're happy."

POLICIES MATTER

North Carolina's energy system is poised for a paradigm shift. The regulated-monopoly utility model has remained in place for over 100 years, but recently, the utilities and stakeholders have come to the realization that there need to be systemic changes to the utility business model in order to create a more sustainable energy system, both in terms of economics and clean energy generation. With North Carolina's vision of a clean energy future laid out in the North Carolina Clean Energy Plan,⁸ it's not a question of if the paradigm will shift, but when.

North Carolina General Assembly

In 2007, the North Carolina General Assembly passed the Renewable Energy and Energy Efficiency Portfolio Standard (REPS), making it the first state in the Southeast to adopt such a policy. It did so with bipartisan support. A decade later, the passage of House Bill 589 (HB 589) created a suite of programs intended to further advance clean energy, but the legislation has resulted in a mixed bag of programs that have had variable successes and failures.

The Solar Rebate Program, for example, has been extremely popular and typically sells out within hours, or even minutes, upon

release. On the other hand, Duke Energy's Request for Proposals (RFP) on their Community Solar program received zero bids from developers, and solar leasing has failed to gain much traction. A major component of HB 589 also required Duke Energy to procure 2,660 MW of renewable energy over a 45-month period through a process known as the Competitive Procurement of Renewable Energy (CPRE). Despite the intentions of House Bill 589, expansion of utility-scale solar has slowed and the vital net metering policy that compensates solar owners for their excess energy hangs in the balance, as it mandated net metering policy is set to be revisited, with current customers only grandfathered through 2027.

Many of the HB 589 programs from 2017 were designed to last for five years, so it is incumbent that policymakers and stakeholders work proactively to address the current challenges and obstacles that clean energy faces. Governor Roy Cooper has presented a strong vision for North Carolina's clean energy future, and there are stakeholder processes currently underway to determine the state's response to some of the biggest questions facing our energy system.

Executive Order 80

In October 2018, Gov. Cooper issued Executive Order 80 (EO 80), which was a historic commitment to decrease state greenhouse gas emissions to 40% below 2005 levels by 2025 and transition to a clean energy economy. EO 80 also directed state agencies to create several key plans to advance clean energy, including the Clean Energy and Clean Transportation Workforce Assessment, the Zero Emission Vehicle Plan, and most notably, the North Carolina Clean Energy Plan.

The Clean Energy Plan was released in October 2019 and provides a comprehensive outline of policy and action recommendations to foster and develop a true clean energy economy. As such, two primary stakeholder processes have convened a broad coalition of stakeholders to produce further recommendations that will help the state achieve its goals.

The A-1 stakeholder process is addressing carbon reduction and exploring ways to decarbonize the electric power sector. The group is discussing market-based carbon



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POLICIES MATTER

reduction programs, an updated REPS, a clean energy standard, a clean peak standard, all while maintaining electricity affordability and grid reliability.

The B-1 stakeholder process has been tasked with providing a suite of policy options for utility incentives and comprehensive system planning. This group is considering major regulatory reform changes, which include Performance Based Regulation, integration into wholesale energy markets, and the retiring of uneconomic assets through securitization and accelerated depreciation.

These stakeholder processes are integral to advancing North Carolina's clean energy future, and the policy recommendations provided to the governor, the North Carolina General Assembly, and the North Carolina Utilities Commission will present options for achieving the goals in EO 80 and shifting the paradigm for the state's antiquated regulatory model.

North Carolina Utilities Commission

In September 2020, Duke Energy will file its Integrated Resource Plans (IRP) for both of its service territories in North Carolina at the North Carolina Utilities Commission (NCUC). These annual plans explain how the utility plans to deal with supply and demand of electricity for the next 15 years.

With the recent cancellation of the Atlantic Coast Pipeline, it is uncertain how much this will divert their investments from natural gas to clean energy resources, but the \$8 billion, 600-mile natural gas pipeline certainly would have served as justification for further fossil fuel investment far into the future.



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As COVID-19 continues to create financial hardship for North Carolinians, utilities in the state have amassed a total of \$250 million in past due energy bills, \$90 million of which have been incurred by Duke Energy. This shortfall has produced a looming crisis for utilities and customers—a crisis that the NCUC is tasked with handling. With energy efficiency initiatives and demand-side management, clean energy can provide solutions, but this issue also calls into question the electricity ratemaking process and the energy burdens that many face, regardless of the current pandemic.

North Carolina's Clean Energy Future

The current developments that are shaping North Carolina's energy future represent a comprehensive effort by a broad, diverse

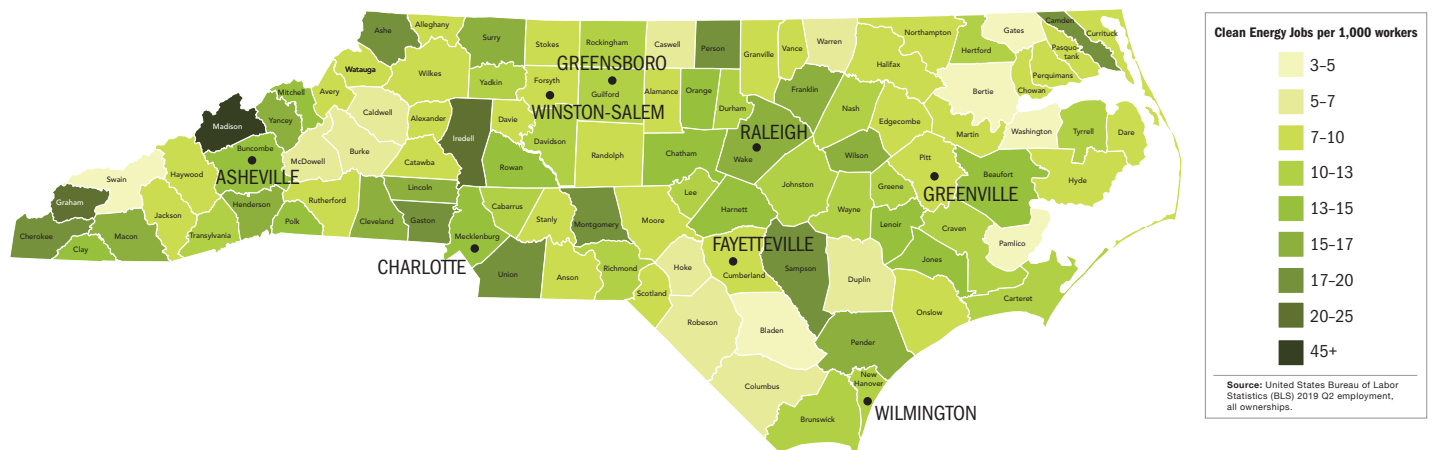
coalition to align the interests of the energy sector with those of North Carolina. In the General Assembly, the clean energy economy has been championed by Republicans and Democrats alike. Governor Roy Cooper has presented a vision of the State's clean energy future that is being developed by government agencies and a diversity of stakeholders. The North Carolina Utilities Commission will face major decisions in the coming months and years that could dramatically change our energy landscape, and with proper policy guidance and decreasing costs of clean energy resources, the path forward will reflect the will of our state. North Carolina has been working for decades to foster an equitable transition to clean energy and has never been closer to realizing that shared vision of a clean energy future.

CLEAN JOBS NORTH CAROLINA 2020 GEOGRAPHIC DRILLDOWN

Clean energy's impact in North Carolina can be felt in all 100 counties, metros, and municipalities—from the Outer Banks to the mountains of Western North Carolina and across the Piedmont. The state is home to two metros ranked among the top 50 for total clean energy jobs—Raleigh and Charlotte—with Asheville and Wilmington ranking in the top 25 for clean energy jobs per capita.

Share of Total County Employment

2.5% of all jobs in North Carolina are in clean energy industries⁹



Clean Energy Jobs by Municipalities Metro Areas¹⁰

Metro	Clean Energy Jobs*	Renewable Generation Jobs	Energy Efficiency Jobs
Charlotte	22,334	2,439	17,455
Raleigh-Cary	16,126	1,751	12,593
Greensboro	7,699	604	6,221
Durham	7,558	1,362	5,432
Asheville	7,177	886	5,515
Wilmington	5,121	429	4,114
Winston-Salem	4,413	368	3,547
Hickory-Lenoir-Morganton	3,283	255	2,655

Metro	Clean Energy Jobs*	Renewable Generation Jobs	Energy Efficiency Jobs
Fayetteville	2,805	279	2,215
Greenville	1,797	242	1,364
Burlington	1,449	111	1,173
Rocky Mount	1,354	103	1,097
Jacksonville	1,164	106	927
Goldsboro	813	70	651
Virginia Beach-Norfolk (NC-Only)	732	48	600

* Total includes all clean energy jobs categories, including solar, wind, EE, clean vehicles, battery storage, advanced biofuels, low-impact hydro and other areas

Note: Nearly 29,000 additional clean energy jobs are located in North Carolina's rural areas and not included in a metropolitan statistical area.

Clean Energy Jobs by County

County	Clean Energy Jobs*	Renewable Generation Jobs	Energy Efficiency Jobs
Mecklenburg	20,261	2,094	16,323
Wake	17,601	1,344	15,169
Guilford	6,354	293	4,990
Durham	5,265	1,179	3,718
Buncombe	3,920	749	2,944
Iredell	3,466	1,298	1,879
Forsyth	3,268	173	2,792
New Hanover	2,983	220	2,554
Gaston	2,914	387	1,952
Union	2,332	352	1,826
Cumberland	2,287	79	1,849
Cabarrus	1,636	224	1,264
Orange	1,586	574	918
Pitt	1,526	167	1,197
Catawba	1,472	80	1,057
Henderson	1,357	32	1,102
Johnston	1,326	64	1,115
Rowan	1,284	36	888
Cleveland	1,190	146	875
Wilson	1,095	75	903
Davidson	1,033	59	794
Alamance	999	55	799
Wayne	959	22	776
Craven	929	51	824
Surry	925	43	518
Nash	903	43	746
Onslow	879	64	750
Lenoir	794	31	625
Randolph	769	44	596
Brunswick	752	51	659
Lincoln	750	33	613
Harnett	746	43	614
Sampson	671	410	170
Lee	639	107	437
Moore	572	37	410
Rockingham	506	37	428
Carteret	498	30	438
Robeson	478	37	391
Beaufort	437	22	337
Chatham	430	101	299
Pender	426	23	331
Dare	425	27	380
Watauga	412	29	354
Person	372	22	201
Montgomery	370	229	117
Franklin	368	24	310

County	Clean Energy Jobs*	Renewable Generation Jobs	Energy Efficiency Jobs
Macon	363	12	326
Madison	362	295	63
Rutherford	358	27	301
Burke	345	10	238
Stanly	344	22	296
Granville	322	15	255
Richmond	305	64	221
Haywood	305	25	249
Edgecombe	295	13	249
Wilkes	294	10	244
Ashe	283	10	207
Cherokee	281	27	236
Duplin	257	26	173
Jackson	256	40	201
Caldwell	256	13	208
Pasquotank	249	16	193
Davie	225	13	199
Vance	224	12	188
Scotland	211	8	118
Columbus	207	17	158
Yadkin	206	13	177
Transylvania	204	34	161
McDowell	195	12	160
Hertford	190	11	161
Halifax	168	13	126
Currituck	150	11	128
Stokes	148	9	127
Yancey	147	21	114
Polk	136	24	105
Anson	131	12	110
Avery	125	8	109
Mitchell	124	9	107
Bladen	123	13	87
Martin	121	42	67
Alexander	119	3	99
Graham	113	4	107
Hoke	105	7	77
Greene	82	6	63
Northampton	80	4	54
Swain	78	5	62
Chowan	74	6	56
Alleghany	62	4	44
Clay	58	10	45
Pamlico	46	4	38
Camden	45	11	28
Jones	42	6	31

* Total includes all clean energy jobs categories, including solar, wind, EE, clean vehicles, battery storage, advanced biofuels, low-impact hydro and other areas

Clean Energy Jobs by County continued

County	Clean Energy Jobs*	Renewable Generation Jobs	Energy Efficiency Jobs
Perquimans	42	2	32
Hyde	38	2	30
Bertie	37	3	23
Warren	35	2	28

* Total includes all clean energy jobs categories, including solar, wind, EE, clean vehicles, battery storage, advanced biofuels, low-impact hydro and other areas

County	Clean Energy Jobs*	Renewable Generation Jobs	Energy Efficiency Jobs
Caswell	34	2	26
Washington	30	6	15
Tyrrell	22	1	15
Gates	13	1	9

Clean Energy Jobs by District

Data shows that distribution of clean energy jobs in North Carolina crosses all political boundaries, with clean energy jobs in every congressional, state senate, and state assembly district.

DISCLAIMER: The congressional and General Assembly districts below represent North Carolina district lines and boundaries as of January 2019 and have not been adjusted to reflect 2020 redistricting.¹¹

U.S. Congressional District

District	Clean Energy Jobs	Renewable Generation Jobs	Energy Efficiency Jobs
1 (Rep. Butterfield)	13,327	1,757	10,143
2 (Rep. Holding)	13,171	1,466	10,258
3 (Rep. Murphy)	7,645	603	6,174
4 (Rep. Price)	10,939	1,028	8,689
5 (Rep. Foxx)	12,488	1,514	9,622
6 (Rep. Walker)	6,450	484	5,231
7 (Rep. Rouzer)	6,239	743	4,818

District	Clean Energy Jobs	Renewable Generation Jobs	Energy Efficiency Jobs
8 (Rep. Hudson)	7,731	883	6,004
9 (Rep. Bishop)	16,176	1,915	12,514
10 (Rep. McHenry)	10,719	1,329	8,233
11 (Vacant)	5,533	430	4,472
12 (Rep. Adams)	620	50	499
13 (Rep. Budd)	1,682	147	1,345

Clean Energy Jobs by District State Senate

District	Clean Energy Jobs
1 (Sen. Steinburg)	3,024
2 (Sen. Sanderson)	2,238
3 (Sen. Smith-Ingram)	1,234
4 (Sen. Fitch Jr.)	2,087
5 (Sen. Davis)	2,517
6 (Sen. Brown)	1,284
7 (Sen. Perry)	210
8 (Sen. Rabon)	3,933
9 (Sen. Peterson)	2,543
10 (Sen. Jackson)	3,672
11 (Sen. Horner)	1,067
12 (Sen. Burgin)	3,045
13 (Sen. Britt)	1,211
14 (Sen. Blue)	5,918
15 (Sen. Chaudhuri)	3,546
16 (Sen. Nickel)	2,498
17 (Sen. Searcy)	453

District	Clean Energy Jobs
18 (Sen. Alexander, Jr.)	468
19 (Sen. DeViere)	2,103
20 (Sen. Murdock)	3,194
21 (Sen. Clark)	248
22 (Sen. Woodard)	3,176
23 (Sen. Foushee)	1,445
24 (Sen. Gunn)	1,791
25 (Sen. McInnis)	2,522
26 (Sen. Tillman)	4,054
27 (Sen. Garrett)	2,749
28 (Sen. Robinson)	<10
29 (Sen. Gallimore)	1,706
30 (Sen. Berger)	1,775
31 (Sen. Krawiec)	3,314
32 (Sen. Lowe, Jr.)	<10
33 (Sen. Ford)	264
34 (Sen. Sawyer)	2,545

District	Clean Energy Jobs
35 (Sen. Johnson)	2,418
36 (Sen. Newton)	4,343
37 (Sen. Jackson)	10,988
38 (Sen. Mohammed)	249
39 (Sen. Bryan)	915
40 (Sen. Waddell)	<10
41 (Sen. Marcus)	719
42 (Sen. Wells)	2,992
43 (Sen. Harrington)	2,204
44 (Sen. Alexander)	1,729
45 (Sen. Ballard)	1,730
46 (Sen. Daniel)	2,171
47 (Sen. Hise)	2,213
48 (Sen. Edwards)	3,475
49 (Sen. Van Duyn)	2,612
50 (Sen. Davis)	2,126

Clean Energy Jobs by District **State House of Representatives**

District	Clean Energy Jobs
1 (Rep. Goodwin)	1,115
2 (Rep. Yarborough)	1,581
3 (Rep. Speciale)	1,367
4 (Rep. Dixon)	1,450
5 (Rep. Hunter III)	316
6 (Rep. Hanig)	1,580
7 (Rep. Barnes)	1,578
8 (Rep. Smith)	915
9 (Rep. Jones)	800
10 (Rep. Bell)	654
11 (Rep. Dahle)	3,871
12 (Rep. Humphrey)	13
13 (Rep. McElraft)	1,319
14 (Rep. Cleveland)	855
15 (Rep. Shepard)	128
16 (Rep. Smith)	710
17 (Rep. Iler)	1,213
18 (Rep. Butler)	2,526
19 (Rep. Davis Jr.)	781
20 (Rep. Grange)	<10
21 (Rep. Smith Jr.)	314
22 (Rep. Brisson)	2,839
23 (Rep. Willingham)	319
24 (Rep. Farmer-Butterfield)	12
25 (Rep. Gailliard)	231
26 (Rep. McDowell White)	1,497
27 (Rep. Wray)	460
28 (Rep. Strickland)	297
29 (Rep. Alston)	3,858
30 (Rep. Morey)	2,579
31 (Rep. Forde-Hawkins)	151
32 (Rep. Garrison)	239
33 (Rep. Gill)	1,405
34 (Rep. Martin)	4,107
35 (Rep. Everitt)	958
36 (Rep. Von Haefen)	1,129
37 (Rep. Batch)	41
38 (Rep. Lewis Holley)	<10
39 (Rep. Jackson)	<10
40 (Rep. John)	590

District	Clean Energy Jobs
41 (Rep. Adcock)	24
42 (Rep. Lucas)	992
43 (Rep. Floyd)	1,154
44 (Rep. Richardson)	<10
45 (Rep. Szoka)	29
46 (Rep. Jones)	1,013
47 (Rep. Graham)	161
48 (Rep. Pierce)	835
49 (Rep. Ball)	<10
50 (Rep. Meyer)	1,319
51 (Rep. Sauls)	903
52 (Rep. Boles)	930
53 (Rep. Lewis Sr.)	139
54 (Rep. Reives, II)	559
55 (Rep. Brody)	2,375
56 (Rep. Insko)	134
57 (Rep. Clemmons)	2,756
58 (Rep. Quick, III)	1,329
59 (Rep. Hardister)	993
60 (Rep. Brockman)	1,675
61 (Rep. Harrison)	601
62 (Rep. Faircloth)	120
63 (Rep. Ross)	546
64 (Rep. Riddell)	<10
65 (Rep. Carter)	423
66 (Rep. Brewer)	41
67 (Rep. Sasser)	712
68 (Rep. Horn)	538
69 (Rep. Arp)	516
70 (Rep. Hurley)	927
71 (Rep. Terry)	2,377
72 (Rep. Montgomery)	297
73 (Rep. Zachary)	2,107
74 (Rep. Conrad)	285
75 (Rep. Lambeth)	275
76 (Rep. Warren)	1,851
77 (Rep. Howard)	1,226
78 (Rep. McNeill)	511
79 (Rep. Kidwell)	487
80 (Rep. Jarvis)	223

District	Clean Energy Jobs
81 (Rep. Potts)	12
82 (Rep. Baker)	3,371
83 (Rep. Pittman)	<10
84 (Rep. McNeely)	2,277
85 (Rep. Dobson)	1,729
86 (Rep. Blackwell)	928
87 (Rep. Hall)	100
88 (Rep. Belk)	7,509
89 (Rep. Setzer)	1,240
90 (Rep. Stevens)	700
91 (Rep. Hall)	30
92 (Rep. Beasley)	2,622
93 (Rep. Russell)	805
94 (Rep. Elmore)	168
95 (Rep. Fraley)	<10
96 (Rep. Adams)	<10
97 (Rep. Saine)	222
98 (Rep. Clark)	755
99 (Rep. Majeed)	926
100 (Rep. Autry)	699
101 (Rep. Logan)	<10
102 (Rep. Carney)	174
103 (Rep. Hunt)	<10
104 (Rep. Lofton)	<10
105 (Rep. Harris)	<10
106 (Rep. Cunningham)	<10
107 (Rep. Alexander Jr.)	<10
108 (Rep. Torbett)	1,653
109 (Rep. Bumgardner)	<10
110 (Rep. Hastings)	1,634
111 (Rep. Moore)	104
112 (Rep. Rogers)	545
113 (Rep. Johnson)	2,106
114 (Rep. Fisher)	4,088
115 (Rep. Ager)	579
116 (Rep. Turner)	284
117 (Rep. McGrady)	<10
118 (Rep. Presnell)	775
119 (Rep. Queen)	797
120 (Rep. Corbin)	710



About E2

E2 (Environmental Entrepreneurs) is a national, nonpartisan group of business leaders, investors, and professionals from every sector of the economy who advocate for smart policies that are good for the economy and good for the environment. E2 members have founded or funded more than 2,500 companies, created more than 600,000 jobs, and manage more than \$100 billion in venture and private equity capital.

E2 releases more than a dozen clean energy employment reports annually—including Clean Jobs America—with state-specific reports covering more than 20 states every year. Clean energy jobs have grown every year since the first national report was released in 2016.

For additional insight into E2's Clean Jobs America 2020 or our other annual Clean Jobs reports, visit e2.org/reports.



NC SUSTAINABLE
ENERGY ASSOCIATION

About NCSEA

North Carolina Sustainable Energy Association (NCSEA) is a 501(c)(3) non-profit advocacy organization driving policy and market development to create clean energy jobs, economic opportunities, and affordable energy. NCSEA has served as a respected, trusted, and collaborative resource to North Carolina and beyond since 1978. Our goal is to cultivate a robust clean energy system and energy economy that unifies and benefits all market actors: consumers, businesses, the Clean Energy Industry, and utility energy providers.

NCSEA pioneered the first state-based Clean Energy Industry census in 2008. The goal: create a baseline measurement of our Clean Energy Industry and repeat each year to determine whether the growing suite of recently adopted North Carolina clean energy policies are succeeding in driving the growth of our state's energy economy, measured in jobs, number of clean energy firms, and industry revenue.

This year, NCSEA is excited to partner with E2 to release Clean Jobs North Carolina 2020.

For more information about NCSEA and our work, visit energync.org.

ENDNOTES

- 1 Unless otherwise stated, all data is from the 2020 U.S. Energy and Employment Report (USEER), March 2020, NASEO and EFI. All employment findings in USEER is based on survey and data analysis collected from Q4 2019 prior to any onset of the COVID-19 crisis. See Pages 201-206 for methodology questions.
- 2 https://energync.org/wp-content/uploads/2019/05/NCSEA_Economic_Impact_Analysis_of_Clean_Energy_Development_in_North_Carolina_2019.pdf.
- 3 Estimates are developed by BW Research Partnership using Bureau of Economic Analysis (BEA) RIMS II data and data collected in the employer survey for the USEER 2020, available at www.usenergyjobs.org.
- 4 Based on the 2019 U.S. Energy and Employment Report individual state snapshot for North Carolina, available at <http://usenergyjobs.org>.
- 5 United States Bureau of Labor Statistics (BLS) Q2 employment (2017, 2018, 2019), all ownerships.
- 6 https://files.nc.gov/nccommerce/documents/files/2020-Tiers-memo_asPublished_120219.pdf.
- 7 U.S. News and World Report, Dec. 26, 2018. Welcome to 'Climate City' available at <https://www.usnews.com/news/cities/articles/2018-12-26/asheville-north-carolina-brands-itself-as-climate-city>.
- 8 <https://deq.nc.gov/energy-climate/climate-change/nc-climate-change-interagency-council/climate-change-clean-energy-16#:~:text=Clean%20Energy%20Plan%20Goals&text=Reduce%20electric%20power%20sector%20greenhouse,attain%20carbon%20neutrality%20by%202050.&text=Foster%20long%2Dterm%20energy%20affordability,modernizing%20regulatory%20and%20planning%20processes>
- 9 United States Bureau of Labor Statistics (BLS) Q2 employment (2017, 2018, 2019), all ownerships.
- 10 Based on the metropolitan and nonmetropolitan area definitions used by the Bureau of Labor Statistics' OES survey, see the MSA definitions page available at <https://www.bls.gov/oes/current/oesrcma.htm>.
- 11 <https://www.ncleg.gov/Redistricting>.

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