

2016

North Carolina Clean Energy Industry Census



NC SUSTAINABLE
ENERGY ASSOCIATION

2016 North Carolina Clean Energy Industry Census

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About the NC Sustainable Energy Association:

The NC Sustainable Energy Association (NCSEA) is a 501(c)(3) nonprofit membership organization of individuals, businesses, government, and nonprofits interested in North Carolina's sustainable energy future. NCSEA is the leading North Carolina nonprofit devoted to leading public policy change and driving market development in ways that will create clean energy jobs.

Founded in 1978, NCSEA works every day to support and attract clean energy jobs, economic opportunities, and affordable energy to benefit North Carolina. Today, our team of clean energy advisors, analysts, and advocates works closely with policymakers, consumers, and industry leaders to research, inspire and drive clean energy progress statewide.

Acknowledgments:

NCSEA would like to thank all of the companies, institutions, and organizations that responded to the 2016 Southeast Clean Energy Industry Census. The willingness of respondents to generously donate their time and insights allows NCSEA to capture and share important data about the clean energy industry in North Carolina with regulators, legislators, and decision-makers in the state and beyond.

NCSEA also appreciates the efforts of partner organizations, Southface, the South Carolina Clean Energy Business Alliance (SCCEBA), and the Virginia Energy Efficiency Council (VAEEC) on the Southeast Clean Energy Industry Census. Additional thanks are due to Karen Eller, Donna Hughes, and everyone at the Center for Urban Affairs and Community Services at North Carolina State University for their continued support of this project. Finally, NCSEA thanks the many Stanback interns whose work contributed to this report.

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Introduction

About The Census

Since 2008, NCSEA has surveyed companies, institutions, and organizations (collectively referred to as “firms”) in the clean energy industry to quantify their impact on the state’s economy. The 2016 North Carolina Clean Energy Industry Census (North Carolina Census) represents the ninth edition of this survey report.

This is also the fourth year NCSEA has partnered with the South Carolina Clean Energy Business Alliance, Southface in Georgia, and the Virginia Energy Efficiency Council (collectively referred to as the “Partners”) to produce the Southeast Clean Energy Industry Census (Southeast Census).¹ For the Southeast Census, the Partners surveyed firms to understand employment, revenue, and policy drivers of the clean energy industry. This report presents the survey results and analysis that pertain to North Carolina’s clean energy industry. Please visit www.cleanenergyindustry.org for information on the Southeast Census results.

Survey Process

Each Partner compiled a list of firms in its state. Each state-level Census relied on a common questionnaire developed by the Partners, as well as an online survey tool and phone-banking system managed by the North Carolina State University Center for Urban Affairs and Community Services (NC State).

Data Analysis

With Partner input, NCSEA performed analysis of all self-reported Census data from responding firms. Each firm classified themselves among a range of clean energy business activities and sectors. This level of granularity, outlined in Tables 1-2, allows for a more thorough analysis of activities within the clean energy economy.

Information about employment, revenue, and the general business climate was provided directly by firms operating in the industry. Data in this report is presented in aggregate in order to protect the privacy of responding firms, and includes a conservative modeling of firms that did not respond but are anticipated to be active in North Carolina’s clean energy industry. Readers interested in additional analysis on census data and related market intelligence should contact NCSEA staff directly at info@energync.org.²

Table 1. Clean Energy Business Activities

Design or Construction of New Buildings
Sale of Building System Components
Sale of Renewable Energy Systems
Installation, Design, or Development of Renewable Energy Systems
Installation or Maintenance of Building System Components
Manufacturing/Production
Professional Services, Education, or Consulting
Research and Development

Table 2. Clean Energy Business Sectors

Alternative Fuel Vehicles
Biomass/Biofuels
Energy Efficiency
Energy Storage
Fuel Cells
Geothermal
Hydropower/Marine
Smart Grid
Solar
Wind

About This Report

NCSEA created the Census to measure the impact of North Carolina's clean energy policies and identify where policies are or are not achieving the results policymakers, economic developers, and industry envisioned. This report provides a snapshot of North Carolina's current clean energy industry by addressing common questions such as:

- How many firms currently work in the clean energy industry?
- What business sectors are they in, and what kinds of work do they do?
- How many people do these firms employ?
- How much revenue do these firms generate?
- What is the business climate surrounding these firms?
- What will drive future growth in this industry?

The North Carolina Census is an invaluable resource for stakeholders because it presents clear analysis on employment, revenues, geographic presence, export activity, and business climate. Among its many uses, the Census provides data for:

- Benchmarking the overall industry and specific sectors;
- Supporting decision-makers in answering policy questions;
- Promoting the success of clean energy policies, businesses, and industries;
- Identifying policy challenges and possible solutions; and
- Tracking the development of clean energy markets in North Carolina.

This report presents self-reported data provided by 671 firms operating within North Carolina. These respondents represent approximately 67% of the estimated 997 firms currently conducting clean energy-related business in North Carolina. These 671 responding firms and the 326 modeled firms represent a significant portion of the state's clean energy industry, but certainly do not cover all activity. The conservative nature of this analysis means that the true economic impact of the clean energy industry in North Carolina is larger than what is presented here. Please refer to Appendix B for greater detail of survey methodology and other data related questions. Additional information on the data analysis is available at www.cleanenergyindustry.org.

Highlights

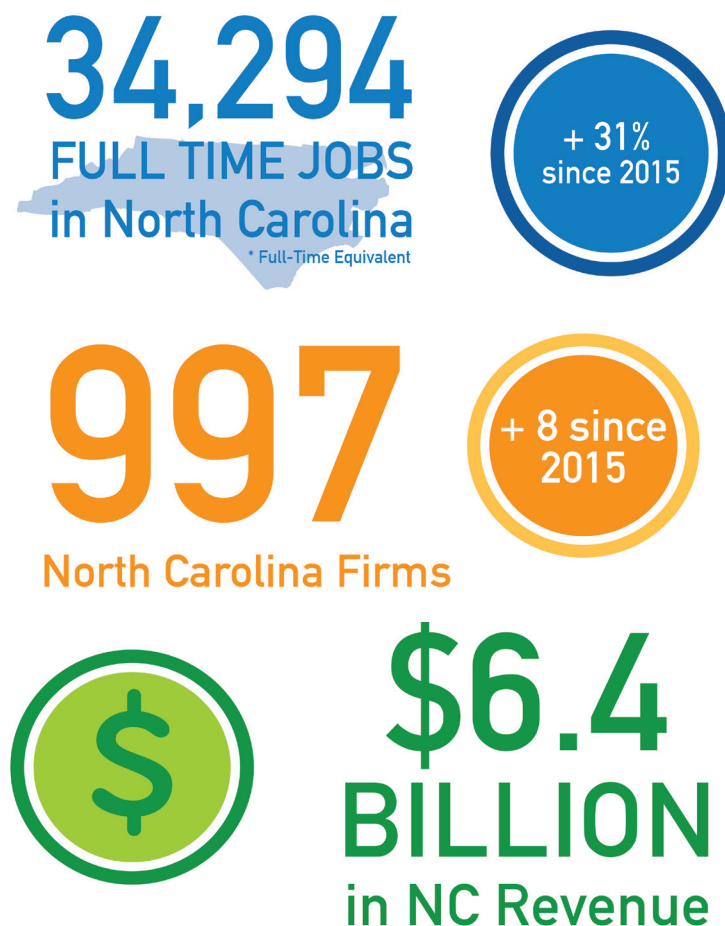
2016 Highlights

North Carolina's clean energy industry has been an increasing part of the state's economy since the first 2008 report. The industry now includes almost 1,000 firms, provides more than 34,000 full-time equivalent jobs (FTE), and generates \$6.4 billion in annual gross revenues. Clearly, North Carolina's clean energy industry is a major economic driver for the state.

From 2015 to 2016, employment in the industry increased 31% from 26,154 FTE to 34,294 FTE. This represents over 8,000 new jobs for North Carolinians all across the state in both rural and urban areas.

The 2016 Census found that revenues generated by clean energy activities totaled \$6.4 billion. This represents a slight decrease from last year's reported number, but is likely due to a number of firms' unwillingness to disclose revenue statistics in this year's survey.

Figure 1. NC Clean Energy Firms, Revenue, and Employment



Firms

Firms

North Carolina's clean energy industry continues to be dominated by firms in two sectors: Energy Efficiency and Solar. The combination of these sectors represents 59% of all firms (39% Energy Efficiency, 20% Solar).

The Sale of Renewable Energy Systems dominated all clean energy activities, with 42% of all firms reporting this activity. This is a large increase over the 9% reported in 2015. Research and Development was also a leading activity with 21% of firms participating.

Figure 2. NC Clean Energy Firms by Sector

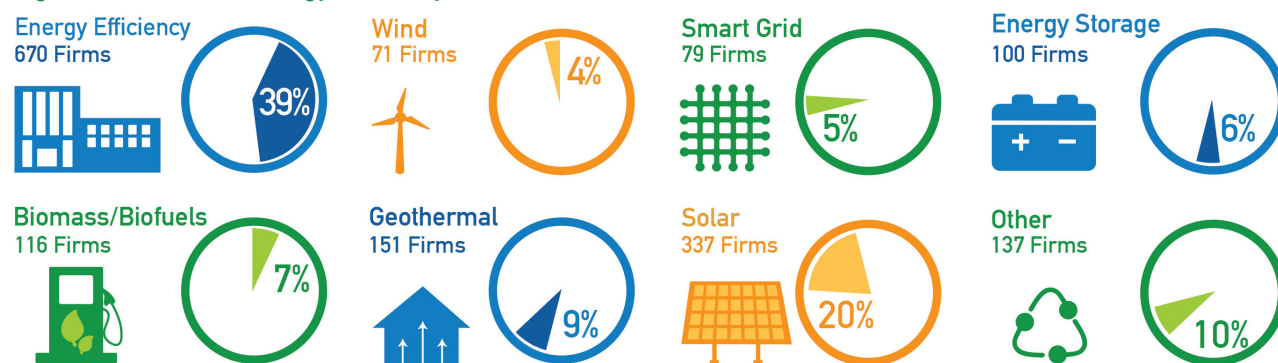


Table 3. NC Clean Energy Firms by Sector

Sector	Total	Percent
Alternative Fuel Vehicles	66	4%
Biomass/Biofuels	116	7%
Energy Efficiency	670	40%
Energy Storage	100	6%
Fuel Cells	29	2%
Geothermal	151	9%
Hydropower/Marine	41	3%
Smart Grid	79	5%
Solar	337	20%
Wind	71	4%
Total	1,660	100%

Table 4. NC Clean Energy Firms by Activity

Activity	Total	Percent
Design or Construction of New Buildings	72	4%
Sale of Building System Components	125	7%
Sale of Renewable Energy Systems	721	42%
Installation, Design, or Development of Renewable Energy Systems	107	6%
Installation or Maintenance of Building System Components	31	2%
Manufacturing/Production	162	10%
Power Generation	45	3%
Professional Services, Education, or Consulting	85	5%
Research and Development	363	21%
Total	1,709	100%

Employment

Employment

The 2016 Census found the Energy Efficiency sector continued to dominate clean energy employment in North Carolina. Indeed, this sector provided nearly one-half (47%) of all industry employment with 16,107 FTE. It is interesting to note that the majority of jobs in Energy Efficiency has shifted from those involved with the Design and Construction of New Buildings (2,887 FTE) to those involved with the Sale of Building System Components (4,382 FTE).

Also worth noting is the rise in jobs in the Biomass/Biofuels sector. With an additional 4,374 FTE added this year, there are now 5,619 FTE working in this sector. This accounts for more than three-times the number of jobs identified in 2015 - now surpassing the number of jobs in the Solar sector (5,439 FTE), which saw a decline in the customer-owned rooftop solar market due to state policy and utility program changes. Finally, with more than half of these jobs (3,613 FTE) involved in Power Generation activities, North Carolina shows an increased development of Biomass/Biofuels projects.

Figure 3. NC Clean Energy Employment by Sector

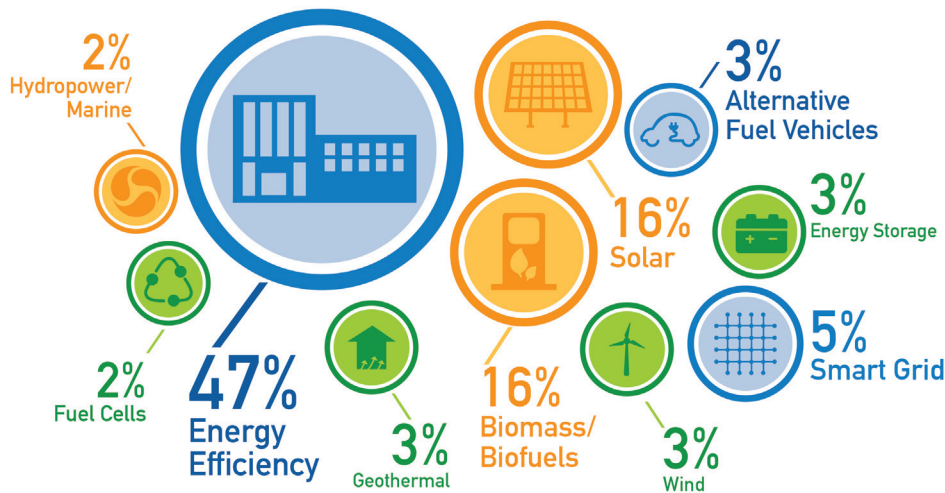


Table 5. NC Clean Energy Employment by Sector

Sector	Total	Percent
Alternative Fuel Vehicles	892	3%
Biomass/Biofuels	5,619	16%
Energy Efficiency	16,107	47%
Energy Storage	1,138	3%
Fuel Cells	622	2%
Geothermal	1,042	3%
Hydropower/Marine	726	2%
Smart Grid	1,815	5%
Solar	5,439	16%
Wind	894	3%
Total	34,294	100%

Table 6. NC Clean Energy Employment by Activity

Activity	Total	Percent
Design or Construction of New Buildings	3,439	10%
Sale of Building System Components	4,539	13%
Sale of Renewable Energy Systems	1,214	4%
Installation, Design, or Development of Renewable Energy Systems	5,763	17%
Installation or Maintenance of Building System Components	3,775	11%
Manufacturing/Production	3,610	11%
Power Generation	4,282	12%
Professional Services, Education, or Consulting	6,188	18%
Research and Development	1,483	4%
Total	34,294	100%

Revenue

Revenue

Unsurprisingly, the Energy Efficiency sector was the top earner this year, bringing in more than \$2.5 billion. Interestingly, the Design and Construction of New Buildings generated the greatest revenue for the second consecutive year, despite the fact that it did not have the sector's largest number of jobs. For the second year in a row, the Solar sector accounted for the second-highest earnings, with \$1.4 billion in revenue. We also saw a marked increase in revenues for the Geothermal sector (\$275 million) and the Fuel Cells (\$92 million) sector.

Professional Services, Education, and Consulting was the most lucrative of all business activities. Notably, it was the highest-grossing activity for the aforementioned Geothermal and Fuel Cells sectors, which experienced significant growth in 2016.

Overall, the 2016 Census revenues are down slightly from the 2015 results. This may be a directional finding, as changing federal and state policies and reductions in utility program offerings have created market uncertainties that have caused income reductions. This may also be attributable to firms' unwillingness to disclose revenue information.

Figure 4. NC Clean Energy Revenue by Sector

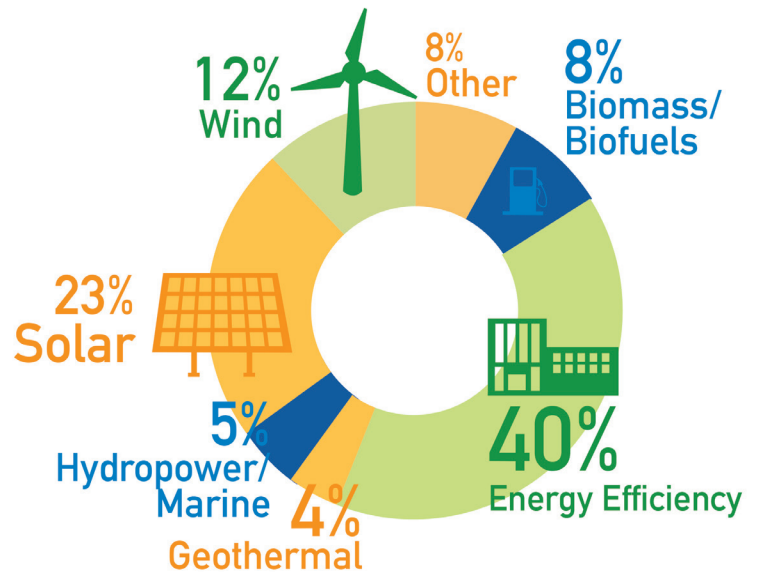


Table 7. NC Clean Energy Revenue by Sector

Sector	Revenue	Percent
Alternative Fuel Vehicles	\$194,097,884	3%
Biomass/Biofuels	\$480,414,763	8%
Energy Efficiency	\$2,522,266,544	40%
Energy Storage	\$137,924,029	2%
Fuel Cells	\$92,020,566	2%
Geothermal	\$274,928,261	4%
Hydropower/Marine	\$298,485,680	5%
Smart Grid	\$124,983,826	2%
Solar	\$1,445,340,665	23%
Wind	\$786,433,742	12%
Total	\$6,356,895,960	100%

Table 8. NC Clean Energy Revenue by Activity

Activity	Revenue	Percent
Design or Construction of New Buildings	\$931,816,512	15%
Sale of Building System Components	\$729,207,817	11%
Sale of Renewable Energy Systems	\$548,946,597	9%
Installation, Design, or Development of Renewable Energy Systems	\$1,742,490,898	28%
Installation or Maintenance of Building System Components	\$426,617,158	7%
Manufacturing/Production	\$389,156,258	6%
Power Generation	\$580,253,828	9%
Professional Services, Education, or Consulting	\$871,320,305	13%
Research and Development	\$137,086,588	2%
Total	6,356,895,960	100%

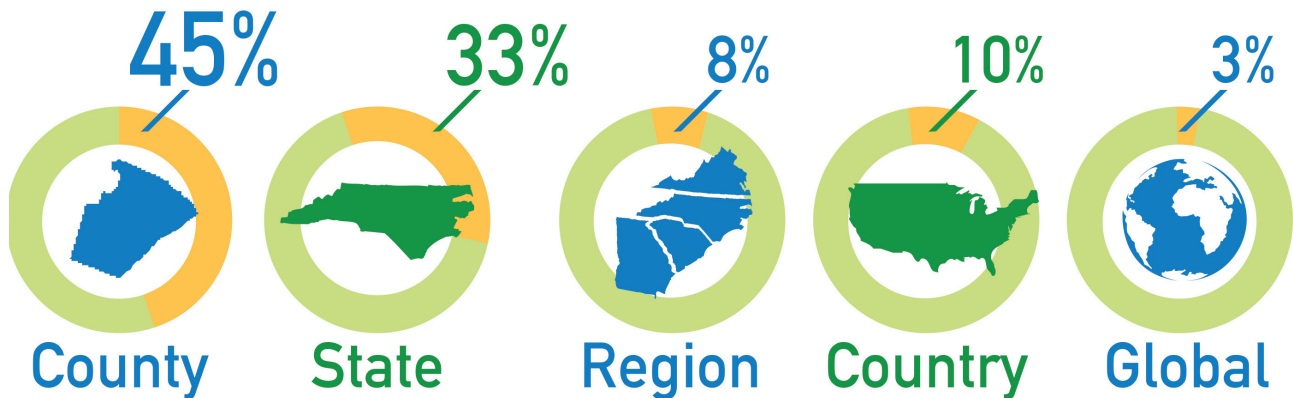
Exports

Exports

While some clean energy goods and services generated in North Carolina remain close to home, more than 20% are exported outside of the state. Firms engaged in clean energy product Manufacturing/ Production led out of state exports, with approximately 53% going to other markets. Research and Development activities also have a strong out-of-state presence, with 38% of work destined for broader markets. This is beneficial for bringing in revenue from outside North Carolina.

Locally-bound products and services come from firms in the Geothermal and Energy Efficiency sectors, whose business activities are conducted close to their physical office locations. The Solar sector keeps nearly 74% of their goods and services in North Carolina, whereas Energy Storage sends the highest percentage of work out of state - 35% of products and services in this sector end up in regional, national, and global markets.

Figure 5. NC Clean Energy Products by Destination Market

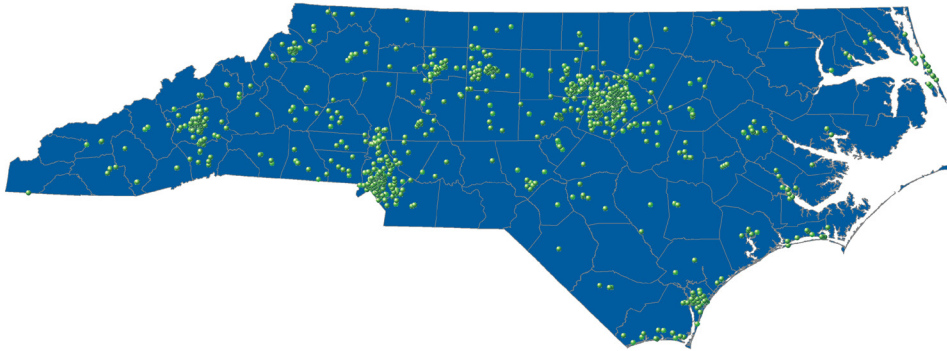


Geography

Geography

Firms across the state provide goods and services needed to meet the rising demand for clean energy, contributing jobs and revenues to rural and urban counties alike. There are, however, some distinct clusters of the industry growing around the urban centers of the Triangle, Triad, Charlotte, and Asheville as shown in Figure 6.

Figure 6. Clean Energy across NC



Conclusion

Conclusion

The 2016 North Carolina Census results show that the clean energy industry continues to grow and mature, but growth was not uniform across all sectors and activities. North Carolina has almost 1,000 clean energy firms that employ 34,294 full-time equivalent jobs. This represents a 31% growth in employment from the 2015 Census. Additional jobs continue being added to the industry, and the rate of growth has more than doubled since 2015. This increasing growth rate is a positive signal that the industry can continue its success in some but not all clean energy sectors in spite of political and regulatory uncertainty.

Challenges face all businesses, but to continue growing, the clean energy industry will need to remain adaptable. Similarly, state clean energy policy and utility business models must also continue to adapt to shifting market and technology dynamics. Market conditions will almost certainly change in coming years but technologies that are both cost competitive and effective will still see the highest demand and continue to thrive.

APPENDIX A: Sector Definitions

2016 Southeast Clean Energy Industry Census Sector Definitions

The clean energy industry is inclusive of both energy efficiency and renewable energy technologies and contains the following ten business sectors:

- 1. Alternative Fuel Vehicles** - Alternative Fuel Vehicles are those that run exclusively on alternative fuels, including electricity or a blend of traditional petroleum fuels and alternative fuels. These include, but are not limited to:
 - Hybrid electric vehicles
 - Electric vehicles
 - Flexible-fuel vehicles
 - Biofuel vehicles, and
 - Natural gas vehiclesThis sector also includes firms involved in the conversion of traditional fuel vehicles to run on alternative fuels.
- 2. Biomass/Biofuels** - This sector relates to the generation of heat or electricity from either the combustion of organic and waste materials or their conversion to biofuels. These organic and waste materials include, but are not limited to:
 - Plant-based sources (e.g., wood, grasses, or natural oils)
 - Municipal wastewater
 - Municipal solid waste
- 3. Energy Efficiency** - This sector employs technologies, products, and services that reduce the amount of energy required for processes, tasks, or buildings. Examples of firms in this sector, include, but are not limited to:
 - Developers or installers of more efficient lighting technologies or HVAC systems
 - Producers or installers of other energy conservation technologies for buildings
 - Energy Star, LEED, or EarthCraft builders
 - Developers of more efficient manufacturing processes
- 4. Energy Storage** - This sector covers energy storage devices or physical media that are used to store energy, in various forms, for use at a later time. Technologies and products currently included in the sector are:
 - Batteries
 - Mechanical storage mechanisms such as compressed air or flywheels
 - Thermal storage
- 5. Fuel Cells** - This sector includes technologies or devices that convert chemical energy from a fuel source into electricity through an oxidizing reaction. Fuel sources may include:
 - Hydrogen
 - Hydrocarbons such as natural gas, methanol, or other alcohols
- 6. Geothermal** - This sector includes both Geothermal Energy and Ground Source Heat Pump (GSHP) technology. Geothermal Energy utilizes the thermal energy (heat) stored in the Earth to generate electricity, while GSHPs are central heating and cooling systems that transfer heat to or from the ground.
- 7. Hydropower/Marine** - Hydropower refers to harnessing the force of falling or flowing water, including marine waves, for useful purposes such as to generating electricity or creating mechanical force.

- 8. Smart Grid** – This sector incorporates technologies and products related to updating the current electricity grid infrastructure with increased multidirectional communication, data collection, and automation. This includes, but is not limited to:
- Digital metering equipment
 - Sensors, controls or related software
- 9. Solar** – This sector includes technologies and products related to the conversion of sunlight either directly into electricity through photovoltaic cells or indirectly through concentrated solar power. The sector also includes solar thermal products that harness sunlight to meet thermal requirements for residential, commercial, or industrial processes.
- 10. Wind** – The wind sector includes products related to the harnessing of wind energy. This includes, but is not limited to:
- Wind turbines for the creation of electricity
 - Wind pumps for pumping and drainage power
 - Windmills for mechanical power

To qualify as being active in a specific sector, a firm must perform at least one of the following nine activities with that sector:

- Design or Construction of New Buildings
- Sale of Building System Components
- Sale of Renewable Energy Systems
- Installation, Design, or Development of Renewable Energy Systems
- Installation or Maintenance of Building System Components
- Manufacturing/Production
- Power Generation
- Professional Services, Education, or Consulting
- Research and Development

APPENDIX B: Methodology

Methodology

The 2016 Southeast Clean Energy Industry Census is a collaboration between the North Carolina Sustainable Energy Association (NCSEA), the South Carolina Clean Energy Business Alliance (SCCEBA), Southface in Georgia, and the Virginia Energy Efficiency Council (VAEEC). These organizations are collectively referred to as the Partners.

Each Partner compiled a list of clean energy companies, organizations, and institutions (collectively referred to as firms) in its state. Each state-level Census relied on a common questionnaire developed by the Partners, as well as an online survey tool and phone-banking system managed by North Carolina State University Center for Urban Affairs and Community Services (NC State). NCSEA performed the data analysis of all Census data with input from Southface.

Results in this report are specific to clean energy business conducted within North Carolina. Please see www.cleanenergyindustry.org for information regarding all states included in the Southeast Census.

A Conservative Approach

The Partners utilized the approach taken by NCSEA during the first five iterations of the North Carolina Clean Energy Industry Census from 2008 - 2012. Over the nine years of conducting the census, NCSEA has identified about 1,000 firms believed to be in North Carolina's clean energy industry. The 2016 North Carolina Clean Energy Industry Report presents direct findings from self-reported data provided by 671 firms, as well as information attributed to an additional 326 modeled firms. Taken together, these represent a significant portion of the state's clean energy industry, but certainly do not cover all activity.

Moreover, because two employees who spend 50% of their time on clean energy are counted as 1 FTE, the actual number of people directly engaged in North Carolina's clean energy industry is greater than 34,294 FTE identified in this report. The conservative nature of the analysis means that the true economic impact of the clean energy industry in North Carolina is larger than what is presented in the 2016 Census.

Identifying Clean Energy Firms

1. NCSEA reviewed the 2016 list of clean energy firms and removed firms that are no longer in North Carolina's clean energy industry.
2. NCSEA compiled a preliminary list of North Carolina firms potentially in the clean energy industry from the following sources:
 - Lists of firms maintained by NCSEA
 - Publicly available industry websites
 - Lists maintained by other organizations
 - Online searches
3. NCSEA then assessed whether each firm is involved in a clean energy business sector included in the Census.
4. For firms deemed to be within the scope, NCSEA identified primary and secondary contacts and obtained their email and telephone information.
5. NCSEA shared its preliminary list of clean energy firms with other Partners in order to eliminate duplicate entries.
6. NCSEA delivered its preliminary list of North Carolina clean energy firms to NC State. NC State conducted the online survey and follow-up phone interviews.

7. NCSEA delivered additional lists of newly identified clean energy firms to NC State in July and August 2016.

Performing the Survey

1. Each North Carolina firm received an email from NCSEA that included a hyperlink to the online survey, as well as unique login and password credentials.
2. NCSEA sent multiple reminder emails to those North Carolina firms that had not completed the survey.
3. NC State conducted phone interviews with North Carolina firms that had not yet completed the online survey.
4. The Partners closed the survey on October 30, 2016.

Identifying Business Units

Firms were asked to self-identify as being involved in the clean energy industry by indicating they had at least one employee dedicating a portion of their time to one of the nine business activities in one of ten clean energy business sectors. Each activity within a clean energy industry sector is defined as a clean energy business unit (e.g., Research and Development/Solar). The 2016 Census has 90 activity/sector cross-sections resulting from combinations of the following activities and sectors:

Activities:

1. Design or Construction of New Buildings
2. Sale of Building System Components
3. Sale of Renewable Energy Systems
4. Installation, Design, or Development of Renewable Energy Systems
5. Installation or Maintenance of Building System Components
6. Manufacturing
7. Power Generation
8. Profession Services, Education, or Consulting
9. Research and Development

Sectors:

1. Alternative Fuel Vehicles
2. Biomass/Biofuels
3. Energy Efficiency
4. Energy Storage
5. Fuel Cells
6. Geothermal
7. Hydropower/Marine
8. Smart Grid
9. Solar
10. Wind

Through this selection process, each responding firm indicated its clean energy business unit(s). Firms were asked to provide their total full-time equivalent (FTE) employment and total gross annual revenue at all locations. Firms were also asked to complete metrics for each of their clean energy business unit(s), including:

- Percentage of total staff time allocated to each business unit;
- Percentage of that work occurring in Georgia, North Carolina, South Carolina, and/or Virginia; and
- The percentage of goods and services delivered to each geographic market for each business unit.

Calculating Full-Time Equivalent Employees of Responding Firms

The Partners used full-time equivalent employees, or FTEs, as opposed to the number of individual employees. FTE is representational of a single 30 hour per week block of employment. NCSEA calculated clean energy FTE employees by multiplying a firm's total number of FTE employees at the time of the survey by the percentage of total staff time that the firm dedicated to each of its clean energy business units in North Carolina. FTEs provide a high degree of flexibility for accurately modeling the equivalent man-hours spent working on clean energy. For example, two employees who spend 50% of their time on clean energy would be calculated as a clean energy FTE of 1.0. Because Census analysis is based on direct responses of firms, any FTE job modification or lack of participation by major employers will have a more pronounced impact on FTE job totals of smaller sectors (e.g., Biomass/Biofuels and Energy Storage) than larger sectors (e.g., Energy Efficiency and Solar).

Calculating Annual Revenue of Responding Firms

The Partners asked firms to report their total gross annual revenue from the most recent fiscal year (2015/2016 in this case) by selecting from the following revenue ranges:

1. Less than \$100,000
2. \$100,000 to less than \$250,000
3. \$250,000 to less than \$500,000
4. \$500,000 to less than \$1 million
5. \$1 million to less than \$2.5 million
6. \$2.5 million to less than \$5 million
7. \$5 million to less than \$10 million
8. \$10 million to less than \$25 million
9. \$25 million to less than \$50 million
10. \$50 million to less than \$100 million
11. \$100 million to less than \$250 million
12. \$250 million to less than \$500 million
13. \$500 million or more
14. Prefer not to answer
15. Do not know

Firms were then assigned a revenue number equal to the median value the range they selected. In other words, a firm falling in the “less than \$100,000” bracket was classified as “\$50,000.” Firms in the “\$500 million or more” bracket were classified as \$500 million. To calculate a firm’s revenue by clean energy business unit, NCSEA multiplied the firm’s total revenue by the percentage of total staff time that the firm dedicated to each business unit active in North Carolina. As with the FTE analysis jobs, any revenue modification, lack of providing revenue data, or lack of participation by major firms will have a more pronounced impact on revenue totals of smaller sectors than larger ones.

**Note – The 2016 Census utilized self-reported revenue numbers provided in public financial documents to establish revenue brackets for selected firms.*

Modeled Firms

NCSEA used survey response data to estimate the total number of clean energy firms active in North Carolina. This included firms that responded to the Census survey as well as additional firms that were modeled based on the data from responding firms. NCSEA used the following process for estimating the total number of clean energy firms and assigning them characteristics:

1. NCSEA compiled an updated list of firms potentially involved in North Carolina’s clean energy industry. All of these firms were contacted via email and/or telephone and a percentage of them provided complete survey responses. NC State placed all of the firms, regardless of whether they provided responses, into the following categories:
 - Completed Interviews – Firms that completed the survey through a phone interview with NC State.
 - Completed Online – Firms that completed the survey online via the email link.
 - Respondent Will Do Online – Firms that indicated to NC State over the phone that they would take the survey online, but did not complete the survey.
 - Respondent Ineligible – Firms that self-identified as not being involved in the clean energy industry.
 - Duplicate ID – Firms that appeared on the initial list twice.
 - Attempts Exhausted – Firms that NC State was unable to contact over the phone and did not complete the survey online.
 - Wrong Number – The provided phone number was incorrect.
 - Out of Service – The provided phone number was no longer in service.
 - Refused – Firms that indicated they were not willing to participate in the survey but did not self-identify as being ineligible.
2. NCSEA identified the firms in the Completed Interviews, Completed Online, Respondent Will Do Online, and Refused categories as active in the North Carolina clean energy industry.
3. NCSEA identified the firms in the Respondent Ineligible, Duplicate ID, Wrong Number, and Out of Service Categories as not active in the North Carolina clean energy industry.
4. NCSEA estimated the percentage of the remaining firms, those in the Attempts Exhausted category, that are active in the North Carolina clean energy industry using the following calculation:

$$\frac{\text{Completed Interviews, Completed Online, Respondent Will Do Online, and Refused Categories}}{\text{Total Number of Firms Contacted}} \times \text{Attempts Exhausted} = \text{Additional Firms Active in NC Clean Energy}$$

5. NCSEA added the firms in Step 2 and 4 to determine the estimated number of firms active in North Carolina's clean energy industry.
6. NCSEA determined the number of modeled firms by subtracting the number of Completed Interviews and Completed Online responses from the total number of firms in the industry.
7. NCSEA calculated an 80% trimmed mean for the FTE and revenue in each business unit (activity/sector cross-section) by removing the upper and lower 10% of the reported FTE and associated revenue.

NCSEA applied the resulting trimmed means of FTE and revenue for the 90 activity/sector cross-sections to the modeled firms based on their relative percentages in the direct response data, i.e., information provided through the Completed Interviews and Completed Online responses.

A Note about Removed Firms

The Partners assessed all responses and identified firms that provided data that grossly overstated employment or revenues. These firms were contacted again in an effort to validate their responses. The Partners kept in the data-set corrected responses from firms who retook the Census and eliminated from the data-set responses from firms that could not be reached.

Endnotes:

1. The Southeast Census is a partnership between NCSEA, South Carolina Clean Energy Business Alliance (SCCEBA), Southface in Georgia, and the Virginia Energy Efficiency Council (VAEEC).
2. Since 2008, NCSEA has expanded its data collection to include over twenty unique datasets measuring a diversity of market factors such as costs, projects, and resources. On a fee-for-service basis, NCSEA can assist private, public and non-profit entities needing more customized intelligence into clean energy market and policy in North Carolina.