2 0 1 0
North Carolina Renewable Energy & Energy Efficiency Industries Census

NC SUSTAINABLE ENERGY ASSOCIATION

October 2010

NC SUSTAINABLE
ENERGY ASSOCIATION

Authors:
Paul Quinlan
Richard Crowley

Designed by Cristina Starr

Mission:
Founded in 1978, The NC Sustainable Energy Association is a 501(c)3 non-profit membership organization of individuals, businesses, government and non-profits working to ensure a sustainable future by promoting renewable energy and energy efficiency in North Carolina through education, public policy and economic development.

P.O. Box 6465
Raleigh, NC 27628
www.energync.org
info@energync.org
919-832-7601

Acknowledgements:
The North Carolina Sustainable Energy Association (NCSEA) would like to thank all of the firms that responded to the 2010 Survey. Additional thanks to the Center for Urban Affairs and Community Services at the North Carolina State University for assistance in programming the online survey and administering telephone interviews.

NCSEA deeply appreciates the time and comments provided by firms that tested the 2010 survey, including Argand Energy Solutions and Wellons Energy Solutions. We would also like to thank the North Carolina Technology Association for assisting in the survey distribution.

This report and our improved survey infrastructure are made possible through the generous support of the Energy Foundation and Z. Smith Reynolds Foundation.

Select photographs in this publication were provided by Argand Energy Solutions, Southern Energy Mangement, Semprius, and NCSEA.

INTRODUCTION

Following one of the longest and most severe recessions in U.S. history, public and private sector leaders across our nation remain interested in creating and expanding 'green jobs.' These much-needed jobs are putting North Carolina citizens back to work, providing valuable business and economic opportunities for our local communities and ensuring a cleaner, more sustainable future. North Carolina's emerging green energy economy – still in its infancy, but rapidly growing – has become a vital component of our state's economic landscape in the early years of the 21st Century.

In the last few years, several national studies have calculated and explored the benefits of green jobs. Despite the continued use of the term, many still wonder – *what is a green job?* In September 2010, the U.S. Bureau of Labor Statistics (BLS) published a final definition of green jobs for the purpose of labor market data collection.[1] Green jobs – as defined by the BLS – are either:

- Jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources.
- Jobs in which workers' duties involve making their establishment's production processes more enviromentally friendly or use fewer natural resources.

More specifically, the BLS intends to identify and count jobs associated within five categories: energy from renewable sources; energy efficiency; pollution reduction and removal, greenhouse gas reduction, and recycling and reuse; natural resource conservation; and environmental compliance, education and training, and public awareness.

The North Carolina Sustainable Energy Association (NCSEA) conducts an annual statewide survey of firms operating in the first two BLS categories – renewable energy and energy efficiency industries. The purpose of this survey is to document on-going employment trends and industry dynamics within these markets.

NCSEA, which is the only organization in the nation that conducts such an annual statewide survey of sustainable energy firms, also uses the survey to examine timely policy questions impacting the growth of renewable energy and energy efficiency firms. Consequently, NCSEA does not conduct a 'green jobs' study, but rather a focused examination of two critical segments within the larger green economy.

The 2010 North Carolina Renewable Energy and Energy Efficiency Census surveyed 1,161 firms believed to be conducting renewable energy and energy efficiency activities in North Carolina.[2] The majority of firms represent businesses, but several state agencies, educational institutions, and non-profit organizations are included. Survey responses were collected from July 15 to August 31 through an online platform, postal mail and telephone interviews. Firms were asked to confirm they meet at least one of the following eligibility criteria prior to participating:

- Allocate at least 50% of staff time to work related to renewable energy or energy efficiency;
- Generate at least 50% of revenue from work related to renewable energy or energy efficiency; or
- Generate at least $25,000 in economic gain (revenue, avoided costs, etc.) from work directly related to renewable energy or energy efficiency.

This report presents key findings from data collected through the 2010 Census. The findings are drawn from full or partial data received from 546 firms. An additional 292 firms indicated they did not qualify or did not wish to participate in the 2010 Census. The survey requested firms to classify and rank their organization among a selection of business types and business focuses (see Exhibit 1). Data analysis and reported findings consider the primary business type and business focus identified by each firm. All findings are presented in aggregate to protect the confidentiality of participants. The total number of firms providing data for a particular calculation or analysis is noted throughout the report (e.g. n=540).

Data is self-reported with NCSEA conducting spot checks to correct apparent errors in provided data. In instances where firms completed more than one survey (e.g. postal mail and online), NCSEA prevented double counting by using the most complete response, the response from the most senior staff, or merged the responses. Data in this report is compiled using summary formulas and does not contain statistical analysis. Readers interested in any statistical analysis should contact NCSEA directly with their questions.

Exhibit 1: ***Business types and focuses analyzed by NCSEA, 2010.***

Business Activities	Business Focuses
Research and development	**Solar**
Manufacturing	**Wind**
High performance building or retrofitting	**Biomass**
Renewable energy systems retailer or distributor	**Hydroelectric**
Renewable energy systems installer, designer or developer	**Geothermal**
Power generation owner or operator	**Smart grid**
Education, services and consulting	**Energy efficiency or building sciences**
	Energy storage, including fuel cells

EMPLOYMENT TRENDS

The renewable energy and energy efficiency industries currently support 12,500 full-time equivalent employees (FTEs) in North Carolina, a 22% increase from 2009.[3]

Amidst economic difficulties, the renewable energy and energy efficiency industries continue to provide and expand employment in North Carolina. NCSEA estimates 12,500 jobs are supported by renewable and efficiency firms in North Carolina. This statewide figure is extrapolated from data collected from 540 reporting firms or 47% of the number of firms identified by NCSEA for the 2010 Census.[4]

This is the second consecutive year that NCSEA noted growth in its estimate of employment in the renewable and efficiency industries – increasing 22% from 10,250 jobs in 2009. NCSEA attributes employment growth to hiring conducted by firms, more time focused on renewable energy and energy efficiency business activities, and the entrance of new firms to the North Carolina marketplace. Responding firms anticipate an additional 20% growth in employment over the next 12 months.

Employment growth is reported in each business type (e.g. R&D, manufacturing, etc.) categorized by NCSEA. However, the rate of employment growth among renewable energy retailers and distributors in 2010 is significantly less than the expected rate of employment growth reported in 2009. A similar, but less pronounced trend is present among renewable energy installers, designer and developers. Elevated expectations related to the North Carolina Renewable Energy and Energy Efficiency Portfolio Standard (REPS) and the American Recovery and Reinvestment Act (ARRA) may account for these high employment projections. Conversely, manufacturing and research and development firms report better than expected rates of employment growth – ARRA funding may have had a positive impact among these groups as several North Carolina firms were awarded funding.


Courtesy of Southern Energy Managemnet

While a strong employment base exists in manufacturing and research and development, North Carolina maintains a robust presence of firms and jobs across a variety of business types.

Manufacturing accounts for nearly one-third of the renewable energy and energy efficiency jobs in North Carolina and remains the largest source of employment for the third consecutive year (see Exhibit 2). Additionally, manufacturing continues to maintain the largest average number of jobs per firm – providing on average over 25 jobs per firm. Within manufacturing, the largest number of firms focus on energy efficiency or building sciences followed by solar energy.

Firms conducting research and development account for the second largest portion of employment by providing

Exhibit 2: ***Estimated jobs by primary business type (n = 540), 2010.***[5]

Primary Business Type	# Responding Firms	% of Responding Firms	Average # of Jobs	Estimated Jobs	% of Estimated Jobs
Research and development	37	7%	6.4	2,963	24%
Manufacturing	56	10%	25.3	3,959	32%
High performance building or retrofitting	198	37%	2.7	1,622	13%
Renewable energy systems retailer or distributor	23	4%	2.2	269	2%
Renewable energy systems installer, designer, or developer	96	18%	6.5	1,395	11%
Power generation owner or operator	30	6%	11.7	1,420	11%
Education, services and consulting	100	19%	3.7	866	7%
SUMMARY	540	100%	8.4	12,494	100%

Note percentages may not add up to 100% due to rounding.

Exhibit 3: ***Estimated jobs by primary business focus (n = 539), 2010.***[6]

Primary Business Focus	# Responding Firms	% of Responding Firms	Average # of Jobs	Estimated Jobs	% of Estimated Jobs
Solar	108	20%	4.4	1,351	11%
Wind	23	4%	19.4	1,195	10%
Biomass	44	8%	6.1	644	5%
Hydroelectric	18	3%	7.5	273	2%
Geothermal	14	3%	6.8	215	2%
Smart grid	14	3%	28.6	927	7%
Energy efficiency or building sciences	310	57%	4.4	7,326	59%
Energy storage, including fuel cells	8	1%	12.0	563	5%
SUMMARY	539	100%	11.2	12,494	100%

Note percentages may not add up to 100% due to rounding.

nearly one-quarter of all estimated jobs. Research and development firms maintain at least one company in every focus area except hydroelectricity. Similar to manufacturing, energy efficiency or building sciences and solar energy were the two primary focus areas of research and development firms, with smart grid and biomass tied for third.

The overlapping focus areas between manufacturing and research and development indicate North Carolina is strongly positioned to develop and scale-up emergent technologies. The state's comparative advantage is further enhanced by the presence of a skilled workforce, prominent research and educational institutions, a robust transportation infrastructure, a high quality of life, and well regarded business climate. The recent passage of a renewable energy manufacturing tax credit in 2010 will also provide North Carolina's manufacturers with support to increase their capacity.

The dispersion of firms and employment across the remaining business types illustrates the diverse nature of the renewable and efficiency industries in North Carolina. One particular business type worth noting is high performance building or retrofitting. This category is an important source of employment, but is structurally different from others as it consists of a large number of firms supporting a low average number of jobs per firm.

The majority of firms and employment occur at firms focused on energy efficiency and building sciences.

The dominance of energy efficiency or building science as a primary buinsiness focus in terms of percentage of firms and jobs reflects the large scope of this category (see Exhibit 3). This primary business focus is highly correlated with firms selecting high performance building or retrofits as their primary business type. This data illustrates the numerous occupations required to deliver energy efficiency products and building science services to customers in the residential, commercial and industrial sectors.

Firms primarily focused on solar energy support a considerable number of jobs, but the employment is largely spread across a number of smaller firms installing, designing, and developing projects. Conversely, firms primarily focused on wind energy offer a comparable number of jobs, but the employment is spread across a much smaller number of firms – representing wind turbine component manufacturing in North Carolina. Finally, the significant presence of employment from smart grid focused firms suggests North Carolina may be uniquely situated to pioneer widespread development and implementation of smart grid products and services.

Renewable energy and energy efficiency firms conservatively generate more than $3.5 billion in annual revenue from North Carolina business activities.[7]

As noted in prior years, firms in the renewable and efficiency industries remain comparatively young and small – six out of ten firms support five or less full-time equivalent employees in North Carolina. Nevertheless, NCSEA estimates the renewable and efficiency industries conservatively generate more than $3.5 billion in annual revenue from activities within North Carolina. This figure remains unchanged from 2009 as NCSEA's ability to precisely calculate annual revenue is limited by the use of broad ranges in revenue related survey questions. This conservative estimate is offered to provide a sense of the scale of economic activity generated by renewable energy and energy efficiency in North Carolina.

Similar to the diversity found in primary business types and primary business focuses, North Carolina renewable energy and energy efficiency firms display diversity in revenue generation. Exhibit 4 reveals a shift in business models as annual revenue increases. The majority of firms generating less than $10 million in annual revenue derive at least 50% of their revenue from renewable and efficiency activities. Meanwhile, firms generating higher levels of annual revenue are more likely to be involved in other business activities – as evidence by the smaller percentages of revenue derived from renewable and efficiency activities. However, even among these larger firms, several respondents indicate at least three-quarters of their North Carolina revenue originates from renewable energy and energy efficiency activities.

Over two-thirds of firms indicate the final destination for the majority of their products and services is within North Carolina; signficant variation exists within individual businss types and focuses.

Similar to 2009, North Carolina remains the primary market for the majority of products and services produced by the state's renewable energy and energy efficiency firms (see Exhibit 5). This trend highlights the importance of the North Carolina marketplace for the collective success and growth of these firms. However, the dependence on the North Carolina marketpalce varies considerably across both primary business types and primary business focus areas.

Within primary business types, manufacturing and research and development firms display the greatest global reach. These firms, coupled with renewable energy retailers and distributors, maintain the greatest footprint in the U.S. market. Not surprisingly, the vast majority of high performance building or retrofiting firms – who account for the largest number of firms – indicate North Carolina is the end destination for the majority of their products or services.

Exhibit 4: ***Percent of North Carolina revenue derived from renewable energy and energy efficiency activities, 2010.***

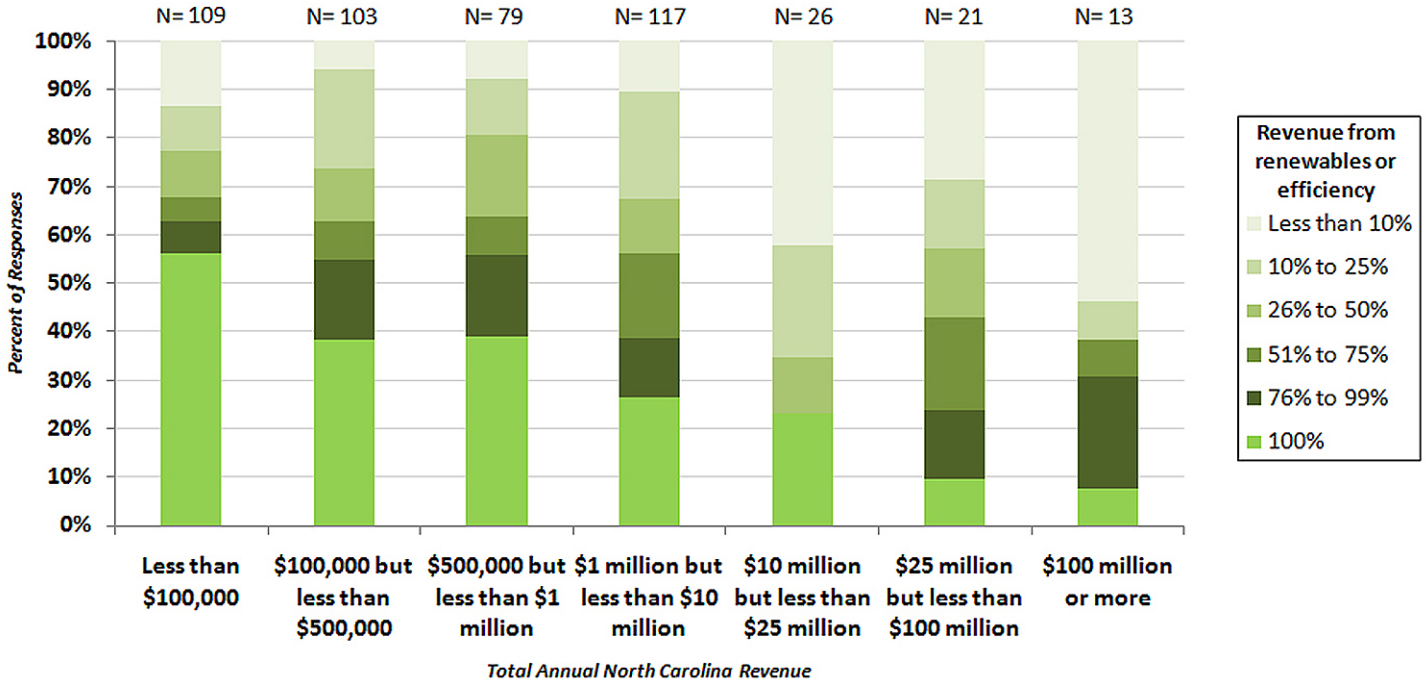
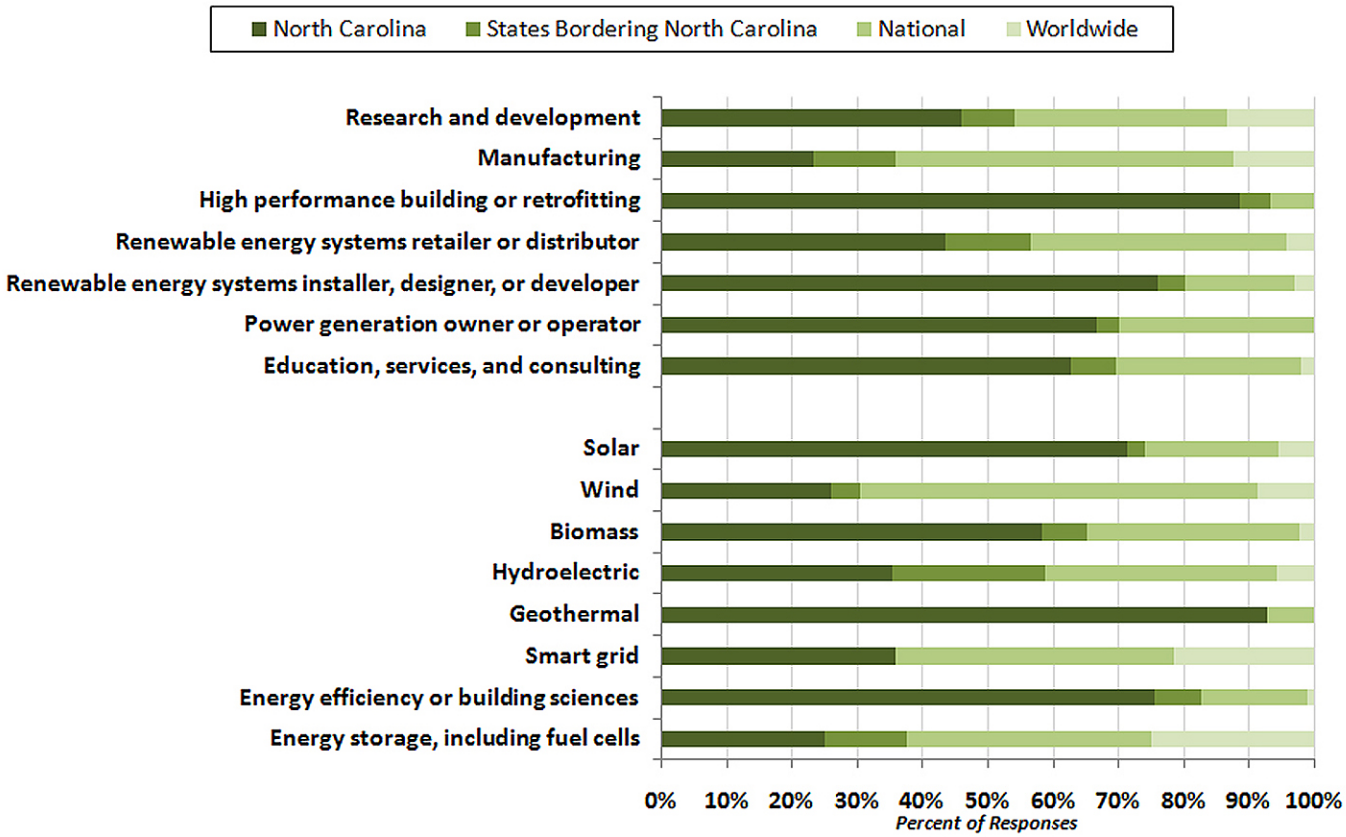


Exhibit 5: ***Primary destination for the majority of products and services (n = 534), 2010.***



Across primary business focuses, smart grid and energy storage firms are most likely to deliver products and services to the international markets, while wind energy firms largely contribute to national markets. Firms focused on solar energy, geothermal and energy efficiency or building science maintain the strongest ties to the North Carolina market – over 70% of responding firms in each of these primary business focuses select North Carolina as the primary destination for the majority of their products and services.

Renewable energy and energy efficiency firms maintain a presence in all 100 counties; two-thirds of counties host the primary business location of a responding firm.

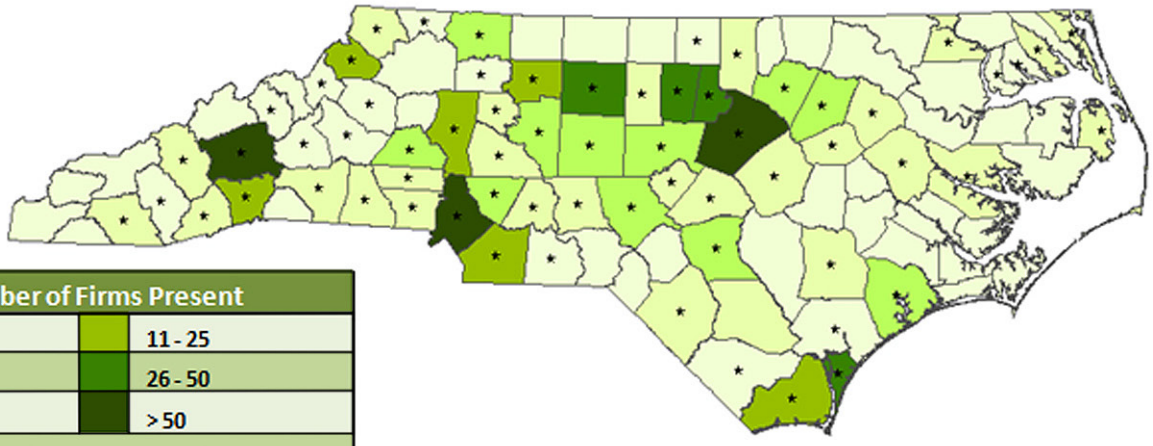
Courtesy of Semprius

NCSEA examines the geographic distribution of the renewable energy and energy efficiency industries through two metrics - 'presence' and primary business location. Presence refers to a primary business location, satellite office, manufacturing facility, or remotely located employees. In this report, the presence is measured by aggregating survey responses and actively verifying the presence of at least one firm in counties lacking survey respondents. The primary business location is comparable to the firm's North Carolina headquarters.

Firms report a presence or are verified in all 100 North Carolina counties (see Exhibit 6). As in past years Wake, Mecklenburg, and Buncombe counties host the greatest presence of firms. Wake County leads the state with 128 reporting firms, followed by Mecklenburg County with 94 reporting firms, and Buncombe County with 56 reporting firms.

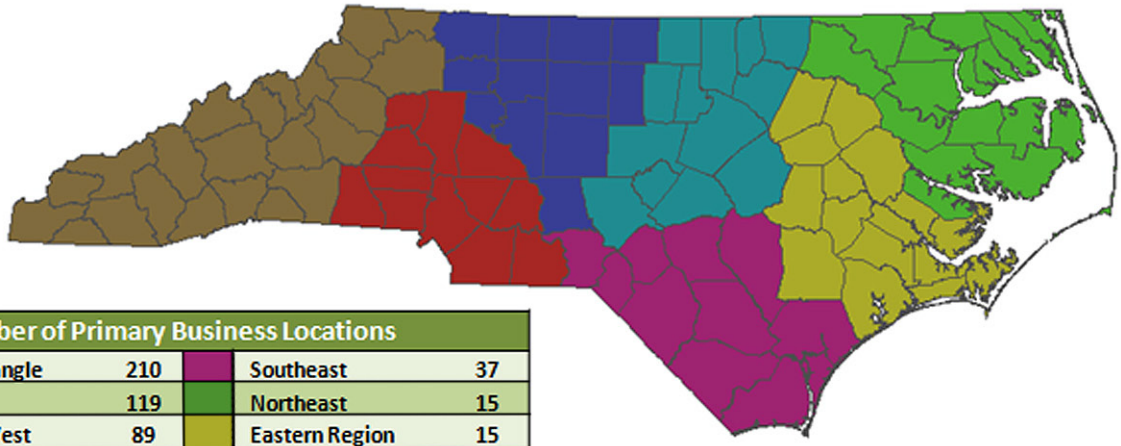
A similar trend is evident among primary business locations sorted across the seven economic development regions and the 17 Council of Governments (COGs) in North Carolina (see Exhibits 7 and 8). The Research Triangle at 210 reporting firms and Triangle J COG at 198 reporting firms host the greatest number of primary business locations among economic development regions and COGs. The Charlotte Economic Development Partnership and Centralina COG regions rank second respectively.

Exhibit 6: ***Presence of responding and verified renewable and efficiency firms by county (n = 548), 2010.***



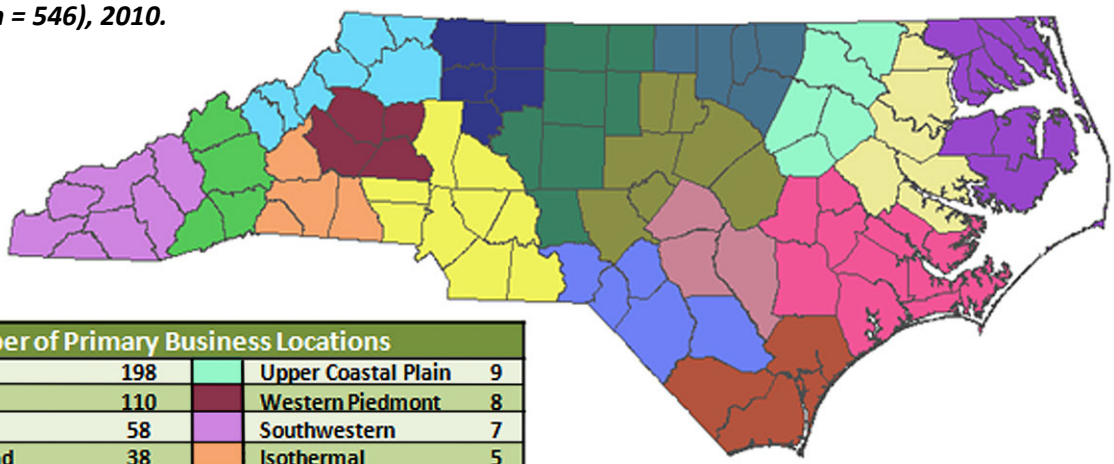
Number of Firms Present			
	1 - 2		11 - 25
	3 - 5		26 - 50
	6 - 10		> 50
★	County Contains a Primary Business Location		

Exhibit 7: ***Primary business location of responding renewable and efficiency firms by economic development partnership regions (n = 546), 2010.***



Number of Primary Business Locations					
	Research Triangle	210		Southeast	37
	Charlotte	119		Northeast	15
	Advantage West	89		Eastern Region	15
	Piedmont Triad	61			

Exhibit 8: ***Primary business location of responding renewable and efficiency firms by councils of government regions (n = 546), 2010.***



Number of Primary Business Locations					
	Triangle J	198		Upper Coastal Plain	9
	Centralina	110		Western Piedmont	8
	Land-of-Sky	58		Southwestern	7
	Piedmont Triad	38		Isothermal	5
	Cape Fear	32		Mid-Carolina	5
	Northwest Piedmont	23		Eastern Carolina	5
	High Country	20		Mid-East	5
	Albemarle	11		Lumber River	2
	Kerr-Tar	10			

Firms overwhelmingly agree that in the next five years the renewable energy and energy efficiency industries will be a leading sector in North Carolina and that our state will be a renewable and efficiency leader in the Southeast.

The majority of firms agree that renewable energy and energy efficiency will be a leading industry sector in North Carolina by 2015 (see Exhibit 9). A similar number of firms indicate North Carolina will be a leading state for renewable energy and energy efficiency in the Southeast. When inquired about North Carolina's prospect at being a national leader for renewable energy and energy efficiency, participants remain optimistic – 57% agree with the statement. However, the percentage of firms disagreeing more than doubles relative to the other two statements.

Three out of four firms focusing on energy efficiency and building science or solar energy indicate renewable energy and energy efficiency will be a leading sector in North Carolina and that our state will be a regional leader. However, only slightly over half of these firms believe North Carolina will be a national leader. Firms focused on geothermal are particularly enthusiastic about North Carolina's future, with all but one geothermal firm agreeing that renewables and efficiency will be a leading sector in the state, and that North Carolina will be a regional and national leader in renewable energy and energy efficiency. Other business focus categories are far less enthusiastic – less than half of hydroelectric firms indicate renewables and efficiency will be a leading sector in North Carolina and only one-third suggest North Carolina would be a national leader.

Many firms provided additional insight in their survey comments. Some firms report that North Carolina retains strong solar thermal prospects both regionally and nationally - one firm suggests North Carolina is already the national leader in this arena. Other firms indicate North Carolina renewable energy and energy efficiency policies have established the state as a regional leader, but a lack of continued public policy and market development will result in North Carolina being passed by other Southeastern states. Moreover, a number of firms responding neutral to North Carolina's potential as a national leader specify their sentiment will turn negative if additional state policies and market developments are not pursued.

A holistic approach to public policy and market development is critical for the renewable and efficiency industries.

A majority of responding firms assert each of the business dynamics found in Exhibit 10 are either important or very important to their business. These findings indicate the success – and future growth – of renewable and efficiency industries in North Carolina will depend on numerous factors. As a result, an integrated approach to public policy and market development will be critical to ensure the

Exhibit 9: ***Perception of North Carolina's renewable and efficiency industries through 2015 (n = 538), 2010.***

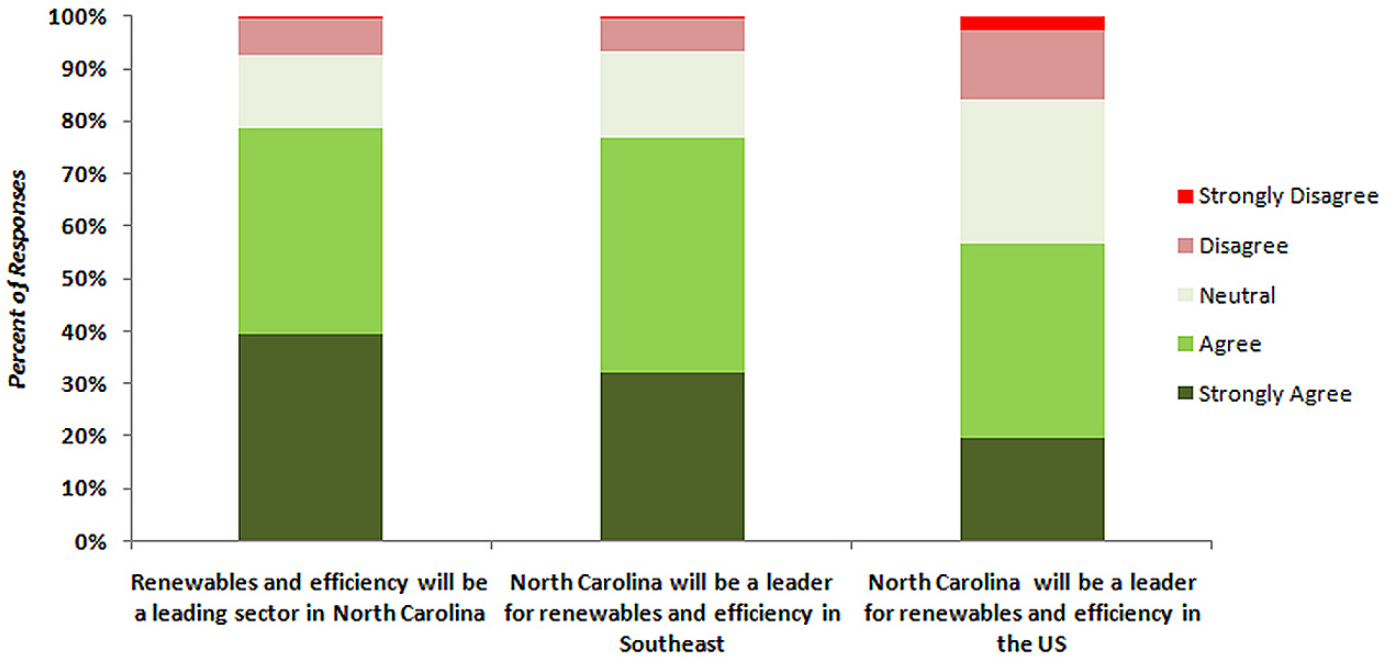


Exhibit 10: ***Importance of North Carolina dynamics to renewable and efficiency firms (n = 521), 2010.***

	Percent of Responses				
	Very Important	Important	Neutral	Not Important	Not Applicable
State financial incentives (e.g. tax credits)	56%	28%	7%	5%	4%
Access to finance	51%	23%	11%	10%	5%
State regulatory structure	32%	40%	17%	8%	3%
Local permitting and siting	29%	41%	17%	7%	6%
Recruitment potential & workforce availability	18%	40%	24%	13%	4%

Note percentages may not add up to 100% due to rounding.

renewable and efficiency industries become a leading sector in North Carolina's economy and the state becomes a leader in the Southeast during the next five years.

Firms indicate that consumers are unable to justify initial investments for energy efficiency; consumers' understanding of energy efficiency may also be limited.

Firms were asked to share their perceptions of consumer knowledge and attitudes towards energy efficiency. The corresponding responses do not capture consumer knowledge and attitudes, but rather offer perceptions on the topic from the vantage point of firms providing renewable and efficiency products or services to consumers.

Responding firms agree consumers are unable to justify expensive initial investments in energy efficiency (see Exhibit 11). Consumers may not fully understand the variety of technologies and practices encompassed by 'energy efficiency.' For example, firms focusing on geothermal are most likely to agree with this statement, indicating a potential lack of understanding that geothermal applications can provide efficiency improvements. Over half of responding firms suggest there is a lack of energy efficiency information – this perception is most prevalent among education, services and consulting firms. Firms indicate consumer concerns over maintenance requirements are limited relative to the other factors considered.

Exhibit 11: ***Perception of consumer knowledge and attitude towards energy efficiency (n = 527), 2010.***

	Strongly Agree or Agree	Neutral	Strongly Disagree or Disagree
Consumers feel that upfront investment costs are too high to justify the initial expense	79%	13%	8%
Consumers do not understand what "energy efficiency" actually entails	72%	16%	12%
Consumers feel there is a lack of information available about energy efficiency options	58%	25%	17%
Consumers feel that energy efficiency systems require more work to maintain	33%	34%	33%

"NC has the potential to become a leader in the Southesast and the US, but effective policies are required to take advantage of that potential."

- Renewable Energy Developer

WHAT IS A SUSTAINBLE ENERGY JOB?

ENERGY EFFICIENCY

Energy efficiency jobs encompass a wide variety of technologies, and as such have a large range of required skills, training, and educational opportunities. These jobs can range from actual installation and verification of renewable energy systems (e.g. energy auditors, energy engineers, facility managers, systems technicians, etc.) though the design and development of cutting edge performance technology (e.g. research associates, mechanical engineers, professors, etc.) or public advocacy and education on the energy and financial benefits of implementing energy efficiency systems. Jobs can also be found building energy efficiency products either as completed systems, or as components. Consulting and evaluation jobs offer individuals the chance to work with facilities to identify and implement energy saving changes to how the facility operates (e.g. lighting technician, HVAC systems, boiler operator, etc.). Energy efficiency jobs also play an important role in green buildings, from architects focusing on reducing the energy consumption of new buildings though construction crews at the sites and to weatherization installers and technicians working to retrofit existing buildings and reduce energy consumption.

RENEWABLE ENERGY

A diversity of jobs exists in the renewable energy sector, encompassing a wide range of skills, training, and education. Often jobs in the renewable energy sector do not necessitate learning entirely new skills but rather adapting existing capabilities to meet the requirements of the renewable technologies. Examples of renewable energy jobs include renewable energy engineers who conduct site evaluations and project designs (e.g. GIS specialists, civil engineers, production managers, etc.), systems installers (e.g. solar panel installers, welders, pipefitters, electrical engineers, etc.) who construct the physical generation system, and renewable energy technicians that ensure these systems are functioning properly. Jobs also include areas like component manufacturers (e.g. fiberglass blade manufactures, glass manufactures, gear and bearing manufactures, etc) working to build renewable energy systems either in part or as a whole, consultants working with clients to ensure financing and legal requirements are met. These are only a few of the many jobs and titles that we find in the renewable energy sector.

CONCLUSION

The renewable energy and energy efficiency industries in North Carolina consist of over 1,100 firms, displaying an incredible diversity across locations, business activities and employment levels. Collectively, NCSEA estimates renewable and efficiency industries support over 12,500 full-time equivalent employees, generate more than $3.5 billion in annual revenue, and maintain a verifiable presence in all 100 North Carolina counties. NCSEA estimates total employment expanded 22% from 2009 to 2010.

Manufacturing firms support the greatest number of jobs per firm and provide more jobs than any other primary business type. Within manufacturing, the largest number of firms focus on energy efficiency or building sciences followed by solar energy. As for business focus, firms primarily pursuing energy efficiency or building science provide nearly 60% of the estimated total employment and overwhelmingly deliver their products and services to the North Carolina market. In addition, sizeable employment arises from firms focusing on solar energy or wind energy. Firms focused on solar are more likely to participate in the installation of products while firms focused on wind are more likely to manufacture wind turbine components.

Responding firms anticipate a 20% increase in employment over the next year and strongly confer that renewable energy and energy efficiency will be a leading sector in the North Carolina economy by 2015. Firms indicate North Carolina will remain a renewable energy and energy efficiency leader in the Southeast, but are less enthusiastic about the state playing a leadership role nationally without continued public policy and market development improvements. A telling comment from a firm with multiple U.S. locations noted the ease of business development in other regions of the country in comparison to North Carolina. It is clear the North Carolina renewable energy and energy efficiency industries have potential for strong employment growth and regional leadership; however, long-term success will depend on an integrated approach to public policy and market development, which provides greater certainty in policy and the regulatory environment and continued advancements in consumer education.

APPENDIX A: SURVEY QUESTIONS

1. Prior to starting the survey, please verify that your company or organization meets AT LEAST one of the following criteria:

a) At least 50% of company or organization staff time is dedicated to work related to renewable energy or energy efficiency.

b) At least 50% of company or organization revenue comes from work related to renew able energy or energy efficiency.

c) Your company or organization generates at least $25,000 in economic gain (gross revenue, avoided costs, etc.) from work directly related to renewable energy or energy efficiency.

☐ YES - My company or organization meets at least one of these criteria.

☐ NO – My company or organization does not meet any of these criteria.

****If you do not meet any of the criteria it is not necessary for you to complete this survey, but we would appreciate your responses if you would like to participate and voice your opinions.****

Section 1: Industries Census Contact & Company Demographics

2. What is your company or organization's name and website?

Company Name:

_____

Website:

_____

Format: http://www.name.domain

3. Please provide your contact information. *Contact information is protected as a trade secret and used for Annual Industries Census ONLY.*

Prefix:

_____

First Name:

_____

Last Name:

_____

Job Title:

_____

Address:

_____

City:

_____

County:

_____

State:

_____

Zip Code:

_____

Email:

_____

Phone:

_____

4. If you are willing, please provide an alternate company contact in the event we cannot reach you to participate in the future Annual Industries Census. *This person will only be contacted in the event we are unable to reach you.*

Prefix:

_____

First Name:

_____

Last Name:

_____

Job Title:

_____

Email:

_____

Phone:

_____

5. If your company or organization's primary North Carolina address differs from the mailing address in Question 3, please provide your company or organization's primary North Carolina address. *Primary address refers to company's NC headquarters, or the location of the NC-based management team.*

Primary NC Address:

_____

City:

_____

County:

_____

Zip Code:

_____

6. Is your company or organization's headquarters located in North Carolina?

☐ YES
☐ NO

7. Does your company or organization have more than one location in North Carolina?

☐ YES
☐ NO

7(a) If you responded "yes" to Question 7, please check the counties your company or organization has a presence in, otherwise skip this page and proceed to question 8. *Presence means a satellite office, manufacturing facility, or county of residence for remote employees.*
(All 100 counties were listed)

Section 2: Company Competencies and Employment Dynamics

8. In what year was your company or organization:

a. Originally founded or incorporated:

_____

b. First operating in North Carolina:

_____

c. First operating in renewable energy / energy efficiency:

_____

9. Please select by order of importance up to three business activities of your company or organization.

	Most Important	2nd Most Important	3rd Most Important
Research and Development			
Manufacturing			
Architect / Construction / Home Builder / Building Retrofits			
Renewable energy systems installer, designer or developer			
Renewable energy systems retailer or distributor			
Power generation facility owner or operator			
Education, Services and Consulting (law, engineering, finance, etc.)			

10. Please select by order of importance up to three market focuses of your company or organization.

	Most Important	2nd Most Important	3rd Most Important
Solar			
Wind			
Biomass			
Hydroelectric			
Geothermal			
Smart Grid			
Energy Efficiency / Building Sciences			
Energy Storage, including fuel cells			

11. In the past 12 months, what was the final destination of the majority of your company or organization's renewable energy or energy efficiency products or services? PLEASE CHECK ONLY ONE BOX.

- ☐ The majority was within North Carolina
- ☐ The majority was within States bordering North Carolina (GA, TN, SC, VA)
- ☐ The majority was within the United States
- ☐ The majority was outside the United States

12. Please estimate your company or organization's current total North Carolina employment. *Please estimate based on full-time equivalent staff time (for example, two employees working half-time equal one full-time equivalent).*

Number of Full Time Equivalent Employees: _____

13. Please estimate what percent (%) of time is spent by your North Carolina employees on renewable energy or energy efficiency activities:

Time dedicated to Renewables or Energy Efficiency:
_____%

14. Please estimate how many North Carolina full-time equivalent employees working on renewable energy or energy efficiency your company or organization has:

a. Hired in the past 12 months:
_____

b. Laid off in the past 12 months:
_____

15. Please estimate how many North Carolina full-time equivalent employees working on renewable energy or energy efficiency your company or organization:

a. Anticipates hiring in the next 12 months:
_____

b. Anticipates laying off in the next 12 months:
_____

16. Please select the range that best captures your company or organization's total North Carolina annual gross revenue for the most recently concluded fiscal year:

- ☐ Less than $100,000
- ☐ $100,000 but less than $500,000
- ☐ $500,000 but less than $1 million
- ☐ $1 million but less than $10 million
- ☐ $10 million but less than $25 million
- ☐ $25 million but less than $100 million
- ☐ $100 million or more
- ☐ Prefer not to answer
- ☐ Do not know

17. What percent of your firm's annual North Carolina gross revenue was attributable to the renewable energy or energy efficiency in the most recently concluded fiscal year?

- ☐ Less than 10%
- ☐ 10% to 25%
- ☐ 26% to 50%
- ☐ 51% to 75%
- ☐ 76% to 99%
- ☐ 100%
- ☐ Prefer not to respond.

Section 3: North Carolina Business Climate

18. Please check the box that best describes the importance of each factor listed below to your company or organization's North Carolina business.

	Very Important	Important	Neutral	Not Important	Not Applicable
Access to finance					
State regulatory structure					
Local permitting and sitting					
Recruitment potential & workforce availability					
State financial incentives (e.g. tax credits)					

19. Please indicate your level of agreement with the following statements on the potential for growth in the renewable energy and energy efficiency industries over the next five years.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Renewable energy & energy efficiency positioned to become a leading industry sector in North Carolina					
North Carolina is positioned to become a leading state in renewable energy & energy efficiency in the Southeast					
North Carolina is positioned to become a leading state in renewable energy & energy efficiency within the United States					

(Optional) Please provide any additional clarifications on your ranking of the three statements.

20. Based on your company or organization's perception of consumer sentiment, please indicate your level of agreement on the following statements regarding energy efficiency.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Consumers feel there is a lack of information available about energy efficiency options					
Consumers feel that upfront investment costs are too high to justify the initial expense					
Consumers feel that energy efficiency systems require more work to maintain					
Consumers do not understand what "energy efficiency" actually entails					

21. What does your company or organization perceive as the primary barrier to the energy efficiency and renewable energy industries in North Carolina?

Primary barrier to energy efficiency: _____

Primary barrier to renewable energy: _____

22. In the 2008 and 2009 surveys companies indicated that there was a lack of economic, regulatory, technical and educational materials available to them. Please indicate how likely you would be to utilize the following options if they were made available in North Carolina.

	Very Likely	Likely	Indifferent	Unlikely
Industry specific networking events				
Webinars and podcasts				
Industry mentoring partnerships				
Workforce training opportunities				
Regulatory and educational workshops				

(Optional) If you are willing, please elaborate on any specific items or topics that you believe would be helpful to North Carolina companies or organizations:

_____

23. Participant suggestions, concerns and general industry observations from past surveys were instrumental in improving our existing questions and formulating new questions for 2010. If you are willing, we would appreciate any feedback about the survey questions, recommended areas for next year's survey to address, or comments about the renewable energy and energy efficiency industries that you are willing to share.

_____

_____

24. Would you like to be notified when a summary report of this survey is completed and receive future communications from NCSEA?

- ☐ Yes, please notify me when a summary report is available online and NCSEA may notify me about other initiatives, business events and news.
- ☐ Please notify me when a summary report is available online, but I would prefer not to receive further communications from NCSEA.
- ☐ No, please do not contact me until the 2011 Census.

APPENDIX B: METHODOLOGY

A. Survey Design & Administration

The 2010 North Carolina Renewable Energy and Energy Efficiency Industries Census consists of 24 questions. The survey requests information on North Carolina business units and activities only. NCSEA maintains an internal list of firms believed to be engaged in renewable energy and energy efficiency activities in North Carolina. The list of firms is updated annually and company contacts are confirmed prior to the start of the Survey in July.

Survey responses were solicited from 1,161 identified firms from July 15, 2010 to August 31, 2010. Survey responses were collected through an online platform, postal mail and telephone interviews. Data collection was initiated by emailing contacts a unique login ID, a unique password, and a hyperlink to access the online survey platform. After an initial three week period, with weekly email participation reminders, a hardcopy of the survey was sent through postal mail to all non-respondent firms. Concurrently, telephone calls requesting firms either participate in the survey online or directly over the phone were also initiated to all non-respondent firms.

B. Estimating Statewide Employment

NCSEA calculates and reports employment data as "full-time equivalent" (FTE) employees. This metric is not attributable to a single employee, but rather represents the equivalent amount of work of a single full-time employee. An FTE employee calculation is conducted for each reporting firm by multiplying the total number of North Carolina employees by the percentage of time dedicated to renewable energy and energy efficiency activities.

To generate a statewide estimate of FTE employment related to renewable energy and energy efficiency, NCSEA first calculated a 90% trimmed mean for each primary business type by removing the upper and lower 5% of firms based on reported FTE employees. This step was taken to mitigate the impact firms supporting a relatively large number of renewable energy and energy efficiency employees. NCSEA may correct the data by using a best available representation for large non-reporting companies; however this was not deemed necessary for the 2010 Census.

NCSEA employed the following steps to estimate the number of FTE employees in the renewable and efficiency industries:

1. The survey demographic (total number of identified firms) was reduced by 15% to account for companies that NCSEA identified who may actually not meet the Census criteria.

2. The remaining number of firms were allotted across each business type based on the percentage of responding firms as classified by the reported primary business type. This generated a hypothetical number of firms for each business type.

3. Within each business type, the hypothetical number of firms was reduced by the number of responding firms. This generated the hypothetical number of firms not responding within each business type.

4. This number was multiplied by the trimmed mean for each business type. This generated an estimated number of FTE employees for the non-responding firms within each business type.

5. The estimated number of FTE employees was added to the total number of reported FTEs for each business type. This generated a weighted FTE employee estimate for each business type.

6. The weighted FTE employee estimates for each business type were aggregated to generate a statewide FTE employment estimate, which was rounded to the nearest multiple of 25.

This process was used to populate data in Exhibit 2. Data displayed in Exhibit 3 was calculated in a similar manner using the estimated statewide FTE employment as the starting point, instead of the reduced company demographic used in Exhibit 2.

C. Estimating Annual Revenue

NCSEA requests firms report their (1) total North Carolina annual gross revenue and (2) the percent of North Carolina revenue that is directly attributable to renewables or energy efficiency activities. Considering the broad range in the revenue and percent brackets, NCSEA estimates statewide annual revenue using the following steps:

1. Responding firms were assigned a median value for their annual North Carolina revenue bracket and percent of revenue attributable to renewables and efficiency. For example, a firm reporting "less than $100,000" in annual revenue and "51% to 75%" for percent of revenue generated from and renewable and efficiency activities would be coded a median value of "$50,000" and "63%" respectively.

2. Responding firms reporting "$100 million or more" in annual revenue were assigned an annual revenue of $100 million.

3. The two median values (or $100 million in certain in-

stances) were multiplied to calculate the estimated annual revenue from renewables and energy efficiency activities for each firm.

4. The estimated annual revenue for each firm was aggregated to generate an estimate of total annual revenue for all responding firms.

5. The estimate of total annual revenue was used to calculate the average annual revenue from renewable and efficiency activities among responding firms.

6. The average annual revenue per firm from renewable and efficiency activities was multiplied by 85% of the survey demographic (total number of identified firms) minus the number of responding firms. This generated an estimate of total annual revenue for all non-responding firms. A segment of the survey demographic is excluded from the calculation to account for firms that NCSEA identified who may actually not meet the Census criteria.

7. The estimate of total annual revenue for all responding firms was added to the total annual revenue for all non-reporting firms to generate a final statewide estimate.

It should be noted NCSEA does not adjust or correct annual revenue for the firms that earn over $100 million dollars in revenue – the highest bracket value provided in the survey. This deliberate action ensures a conservative estimate of annual revenue by compensating for overestimates that may occur in smaller firms based on our methodology.

Endnotes:

1. U.S. Bureau of Labor Statistics, U.S. Department of Labor. Green Jobs. Link: http://www.bls.gov/green/
2. See Appendix A for 2010 survey questions and Appendix B for a detailed methodology.
3. A full-time equivalent employee is a measure equal to the work of one full-time employee. For example, work of two half-time employees would be equal to one full-time equivalent employee. Throughout this report, the term "job" is used to refer to the work of a full-time equivalent employee.
4. See Appendix B for a detailed methodology.
5. Ibid.
6. Ibid.
7. Ibid.

ABOUT THE NORTH CAROLINA SUSTAINABLE ENERGY ASSOCIATION

The North Carolina Sustainable Energy Association (NCSEA) works to ensure a sustainable future by promoting renewable energy and energy efficiency in North Carolina through education, public policy and economic development. Founded in 1978, NCSEA is a 501(c)3 non-profit membership organization of individuals, businesses, government and non-profits interested in North Carolina's sustainable energy future. Located in Raleigh, but active throughout the state, NCSEA is the only non-profit in North Carolina devoted to leading public policy change and driving market development in ways that will create green jobs in a new energy economy.

NCSEA knows that it takes much more than one program, policy or group to achieve a sustainable energy future and economy for North Carolina, which is why we work with NCSEA members, government officials, business leaders, communities, partner organizations and the general public. We believe the key to success is through removing policy barriers to market development, advocating for policies that will lead to a sustainable energy future, and educating North Carolinians about sustainable energy - all of which will help our green energy economy grow.

To learn more about NCSEA, download publications, and view the latest news, events and information related to renewable energy and energy efficiency in NC, visit www.energync.org.

ADDITIONAL RESOURCES

North Carolina Resources

North Carolina Sustainable Energy Association
www.energync.org

Database of State Incentives for Renewables and Efficiency (DSIRE)
www.dsireusa.org

North Carolina State Energy Office
www.energync.net

North Carolina Solar Center at NC State University
www.ncsc.ncsu.edu

Energy Center at Appalachian State University
www.energy.appstate.edu

Center of Energy Research & Technology (CERT) at NC A&T State University
www.cert.ncat.edu

North Carolina Community College System
www.ncccs.cc.nc.us

North Carolina Green Business Fund
www.ncscitech.com/gbf

North Carolina Renewable Energy Tracking System (NC-RETS)
www.ncrets.org

North Carolina GreenPower
www.ncgreenpower.com

North Carolina General Assembly
www.ncleg.net

North Carolina Utilities Commission
www.ncuc.net

National & International Resources

Department of Energy
www.energy.gov

Energy Information Administration
www.eia.doe.gov

Office of Efficiency and Renewable Energy
www.eere.energy.gov

U.S. Environmental Protection Agency – Clean Energy Portal
www.epa.gov/cleanenergy

U.S. Census Department
www.census.gov

Industrial Assessment Center
iac.rutgers.edu/database

The National Renewable Energy Laboratory
www.nrel.gov

Federal Energy Regulatory Commission
www.ferc.gov

International Energy Association
www.iea.org

Energy Star
www.energystar.gov

NCSEA'S BOARD OF DIRECTORS AND STAFF

BOARD OFFICERS

Joe Lemanski
Chair
Greenfire Development
Durham, NC

David Kirkpatrick
Past Chair (2009)
SJF Ventures
Durham, NC

Maria Kingery
Chair Elect (2011)
Southern Energy Management
Raleigh, NC

Rick Waechter
Treasurer
Old Peak Finance
Chapel Hill, NC

Sascha Struckmeyer
Secretary
Wells Fargo Bank
Charlotte, NC

Steve Kalland
(Permanent)
NC Solar Center, NCSU
Raleigh, NC

BOARD MEMBERS

Kim Beer
International Health
Care Consultant
Chapel Hill, NC

Carrie Cullen Hitt
The Solar Alliance
N. Scituate, MA

Masaki Furukawa
Innovative Design Inc.
Raleigh, NC

John Ganzi
Environment & Finance Enterprise
Chapel Hill, NC

Zoe Gamble Hanes
Blanco, Tackberry
Charlotte, NC

Richard Harkrader
Carolina Solar Energy
Durham, NC

Brownie Newman
FLS Energy
Asheville, NC

Olee "Joel" Olsen
O2energies
Charlotte, NC

Chris Senior
Anchorage Building Corp.
Chapel Hill, NC

Jim Wood
Solar Hot USA
Fayetteville, NC

STAFF

Ivan Urlaub
Executive Director
ivan@energync.org

Paul Quinlan
Deputy Director &
Strategic Projects
paul@energync.org

Julie Robinson
Director of Marketing
& Communications
julie@energync.org

Cristina Starr
Education & Outreach Manager
cristina@energync.org

Rich Crowley
Manager of Market Reserach
rich@energync.org

Kurt Olsen (PT)
Staff Council
kurt@energync.org

Nichole Campbell
Office Manager
officemanager@energync.org

Patsy Paliotta (PT)
Policy Assistant &
Administrative Assistant
memberservices@energync.org

Tom Bean
Contract Lobbyist
Blue Rooster Consulting

www.energync.org

NC SUSTAINABLE
ENERGY ASSOCIATION