North Carolina

Renewable Energy & Energy Efficiency Industries Census

2011

NC Sustainable Energy Association

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The NC Sustainable Energy Association

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Since the inaugural North Carolina Renewable Energy and Energy Efficiency Industries Census in 2008, the North Carolina Sustainable Energy Association has worked diligently to document the evolution of North Carolina's clean energy sector. Most recently, NCSEA published the "2011 North Carolina Clean Energy Data Book." This document was the first comprehensive review and aggregation of the many clean energy sector successes in North Carolina. The results include:

- Over 1,800 registered renewable energy systems contributing over 2,800 MW of nameplate capacity
- Over 1,500 registered and certified energy efficient commercial buildings accounting for over 129.5 million square feet of floor space

And the best part of the story is that this impressive list of accomplishments is only a fraction of the potential opportunities out there in the state! North Carolina has the companies and the workforce to continue to build on its already impressive list of accomplishments, and NCSEA looks forward to documenting this evolution and working with North Carolina businesses to tell their success stories in 2012 and beyond.

Thank you for your support, and congratulations on all your accomplishments.

Paul Quinlan
Managing Director, North Carolina Sustainable Energy Association

About the North Carolina Sustainable Energy Association:

Founded in 1978, the North Carolina Sustainable Energy Association is a membership based 501c3 non-profit organization of individuals, businesses, governments and non-profits that works to ensure a sustainable future by promoting renewable energy and energy efficiency to the benefit of North Carolina through public policy, education and economic development.

Acknowledgements:

The North Carolina Sustainable Energy Association would like to thank all of the firms that responded to the 2011 Census. Additional thanks to the Center for Urban Affairs and Community Services at the North Carolina State University for assistance in programming and administering the Census.

The North Carolina Sustainable Energy Association also deeply appreciates the time and comments provided by firms that tested the 2011 Census, including Olde Heritage Builders, Yes! Solar Solutions and Methane Power. We would also like to thank the North Carolina Energy Services Coalition (ESC) and in particular NORESCO.

This report and our improved Census infrastructure are made possible through the generous support of the Energy Foundation and Z. Smith Reynolds Foundation. GIS software was made available though the Environmental Systems Research Institute (ESRI).

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About the Industries Census: 2009 - 2011

North Carolina is slowly recovering from one of the longest and most severe recessions in our nation's history. Retaining existing jobs, developing new employment opportunities and fostering innovative economic development is a priority for businesses, policy stakeholders and regulatory decision makers. Since the passage of the Southeast's first renewable energy and energy efficiency portfolio standard in 2007, the clean energy sectors – broadly categorized as renewable energy and energy efficiency – have burst onto the North Carolina scene; and the state has been quick to capitalize on its early advantage in this sector. North Carolina boasts an international smart grid cluster, two of the 50 fastest growing companies in the nation (both are renewable energy companies) and regional initiatives, including the Evolve Energy Partnership, Charlotte New Energy Capital and the Research Triangle CleanTech Cluster. These assets are all supported by a diverse sector with industry activities across all major focus areas. In only a few short years, the clean energy sector has become a North Carolina success story and a valued component of our state's economic landscape.

The North Carolina Sustainable Energy Association ("NCSEA") conducts an annual statewide Census of firms identified as operating in the clean energy sector, with the intent of documenting on-going employment trends and industry dynamics across key business activities and focuses.

Exhibit 1: ***Business activity and focus areas analyzed in the 2011 Census.***

Business Activities	Business Focuses
Research and development	Solar
Manufacturing	Wind
New energy efficient design and construction	Biomass
Energy efficiency retrofitting of existing buildings	Hydroelectric
Renewable energy systems installer, designer, or developer	Geothermal
Renewable energy systems retailer or distributor	Smart grid
Power generation owner or operator	Energy efficiency / building sciences
Education, services and consulting	Energy storage (inc. EV's)

Note: throughout the report the abbreviation "EV's" stands for "electric vehicles"

The North Carolina Renewable Energy and Energy Efficiency Industries Census and the resulting annual report are a unique undertaking found nowhere else in the nation. Unlike national reports that use industry codes or national data to model a large swath of companies in the broader "green" economy, the North Carolina Renewable Energy and Energy Efficiency Industries Census uses confidential direct responses from North Carolina clean energy firms to answer time sensitive questions about the market realities facing their companies and their greater industry segment within the clean energy economy. Consequently, NCSEA does not conduct a "green jobs" study, but rather a focused examination of two critical clean energy segments (renewables and efficiency) that make up a sub-section of the larger "green" economy.

The 2011 Census was distributed to 1,641 firms believed to be conducting renewable energy and energy efficiency activities in North Carolina. Responses were collected from July 15, 2011 to September 31, 2011 using an online platform or telephone survey. Firms were asked to confirm they meet at least one of the following eligibility criteria prior to participating in the Census:

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

This report presents both key findings from data collected through the 2011 Census and aggregate industry trends distilled from the 2009 through 2011 participant responses. All employment numbers are reported as "full time equivalent" or FTE employees, however for ease of the reader, we use the standard term "employees". For details about why and how NCSEA calculates FTE employees, as well as additional analysis methodology and a copy of the 2011 Census questions, readers should consult Appendices A and B respectively. Finally, key NCSEA highlighted points are identified in the text using **blue font** and comments from 2011 Census participants can be found inside of the blue boxes identified using ***red font***.

Sector Employment Trends

- **North Carolina's clean energy sector accounts for 14,800 full time equivalent (FTE) employees in 2011.**
- **North Carolina's clean energy sector employment grew by 18%** from 12,500 FTE employees in 2010.
- **NCSEA conservatively estimates that at least 1,084 firms are currently conducting business in the clean energy sector in 2011.** An additional 600 firms indicated that they had been active in the clean energy sector and could reenter the sector should the market dictate.
- With the exceptions of smart grid and manufacturing, the average **firms operating in the clean energy sector employed fewer than 10 employees.**

Exhibit 2: ***Summary of North Carolina's clean energy sector in 2011.***

Primary Business Type	Estimated Firms	Sector Share	Estimated Employees	Average Firm Size	Share of Sector Employment
Research and development	64	6%	3,003	4.4	20%
Manufacturing	81	8%	3,071	16.6	21%
New energy efficient design and construction	425	39%	1,428	1.9	10%
Energy efficiency retrofitting of existing buildings	115	11%	2,876	2.3	19%
Renewable energy systems installer, designer, or developer	172	16%	2,117	2.5	14%
Renewable energy systems retailer or distributor	33	3%	355	2.0	2%
Power generation owner or operator	43	4%	1,034	7.6	7%
Education, services and consulting	151	14%	935	2.4	6%
Primary Business Focus					
Solar	228	21%	1,868	2.3	13%
Wind	46	4%	1,424	5.2	10%
Biomass	79	7%	773	6.3	5%
Hydroelectric	26	2%	163	3.5	1%
Geothermal	33	3%	1,394	2.3	9%
Smart Grid	23	2%	1,553	13.2	10%
Energy Efficiency / Building Sciences	633	58%	7,034	2.9	47%
Energy Storage, (inc. EV's)	16	2%	610	7.4	4%

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

Exhibit 3: ***Estimated employment within each business activity and focus category, 2011.***

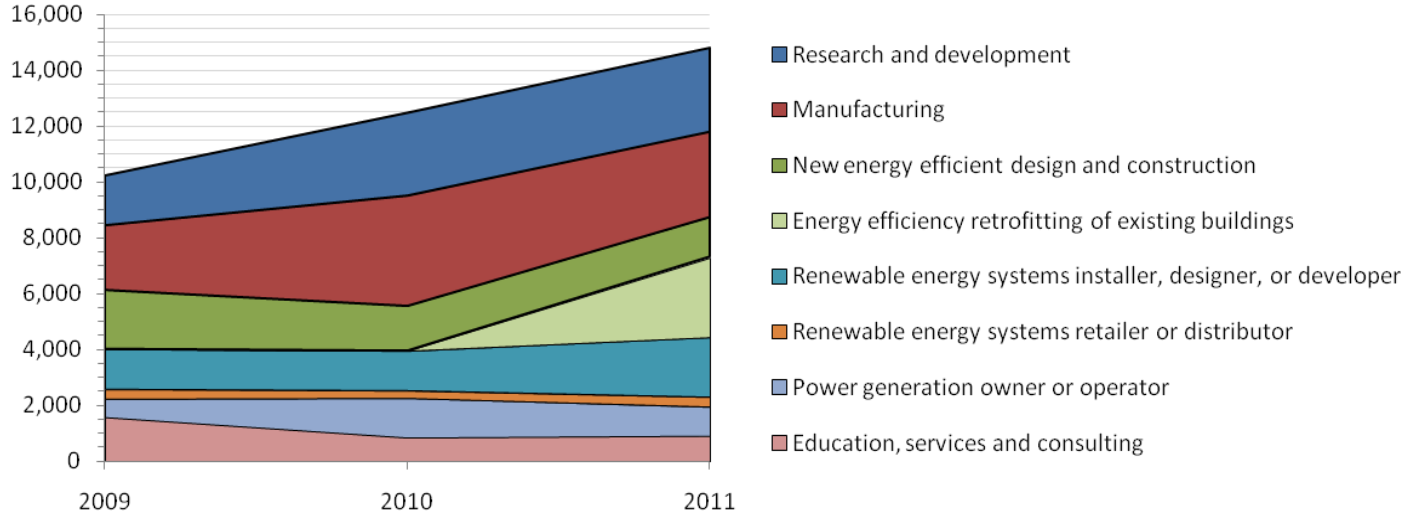
	Solar	Wind	Biomass	Hydroelectric	Geothermal	Smart Grid	Energy Efficiency / Building Sciences	Energy Storage, (inc. EV's)
Research and development	*263*	*289*	*49*	*0*	*12*	*386*	*1,960*	*45*
Manufacturing	*311*	*711*	*93*	*18*	*34*	*338*	*1,080*	*486*
New energy efficient design and construction	*119*	*86*	*79*	*1*	*48*	*76*	*1,001*	*19*
Energy efficiency retrofitting of existing buildings	*915*	*52*	*270*	*54*	*1,183*	*16*	*2,272*	*6*
Renewable energy systems installer, designer, or developer	*44*	*205*	*34*	*2*	*0*	*1*	*167*	*36*
Renewable energy systems retailer or distributor	*78*	*34*	*148*	*64*	*6*	*523*	*68*	*1*
Power generation owner or operator	*138*	*46*	*101*	*25*	*111*	*190*	*180*	*0*
Education, services and consulting							*307*	*18*

Note: FTE employment may not add up to14,800 due to rounding. For several technologies, system retrofitting and installing were reported in aggregate.

Sector Employment Growth

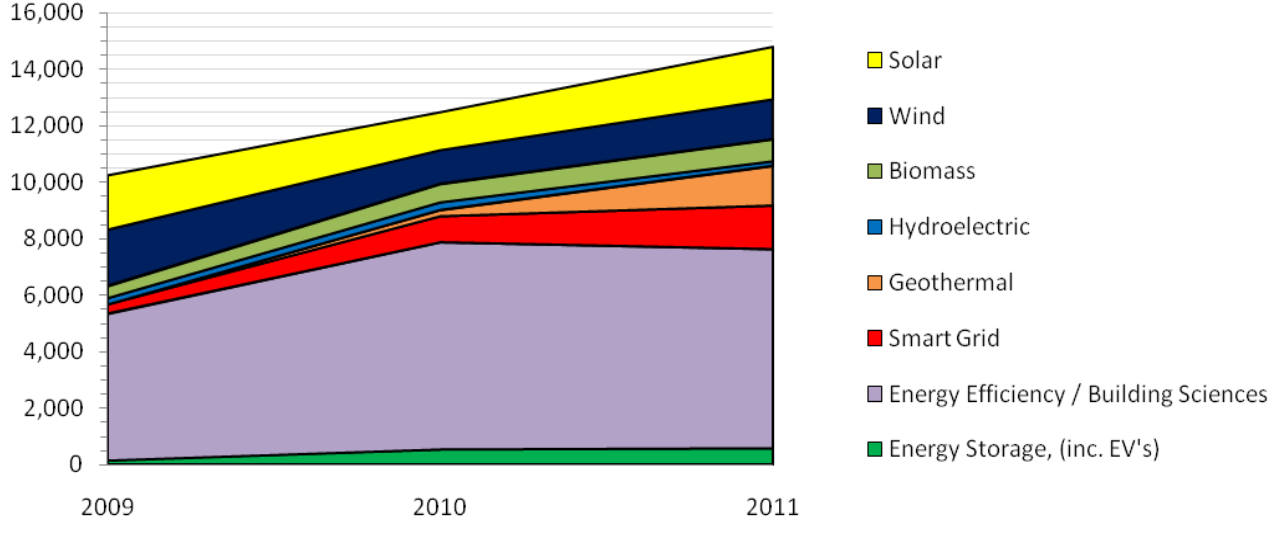
- **North Carolina has seen strong growth in the energy efficiency retrofitting of existing buildings** business activity, while new energy efficient builder employment has declined slightly.
- **Manufacturing has declined by nearly 25%,** from a high of nearly 4,000 employees in 2010 to slightly over 3,000 employees in 2011.
- Growth in education, services and consulting activities has largely stagnated since 2009.

Exhibit 4: ***Sector employment growth since 2009 by business activity, 2011.***



- Employees are distributed across the industry technology focuses; however, within business focuses, **nearly half of the employment in North Carolina was reported in the energy efficiency space.**
- Based on the 2011 responses, **North Carolina has seen strong growth in both the geothermal and smart grid business focuses** within the clean energy sector.
- **Energy storage, including electric vehicles, has increased significantly since 2009**, although the number of firms and clean energy employees remains small in comparison to the other business focuses.

Exhibit 5: ***Sector employment growth since 2009 by business focus, 2011.***



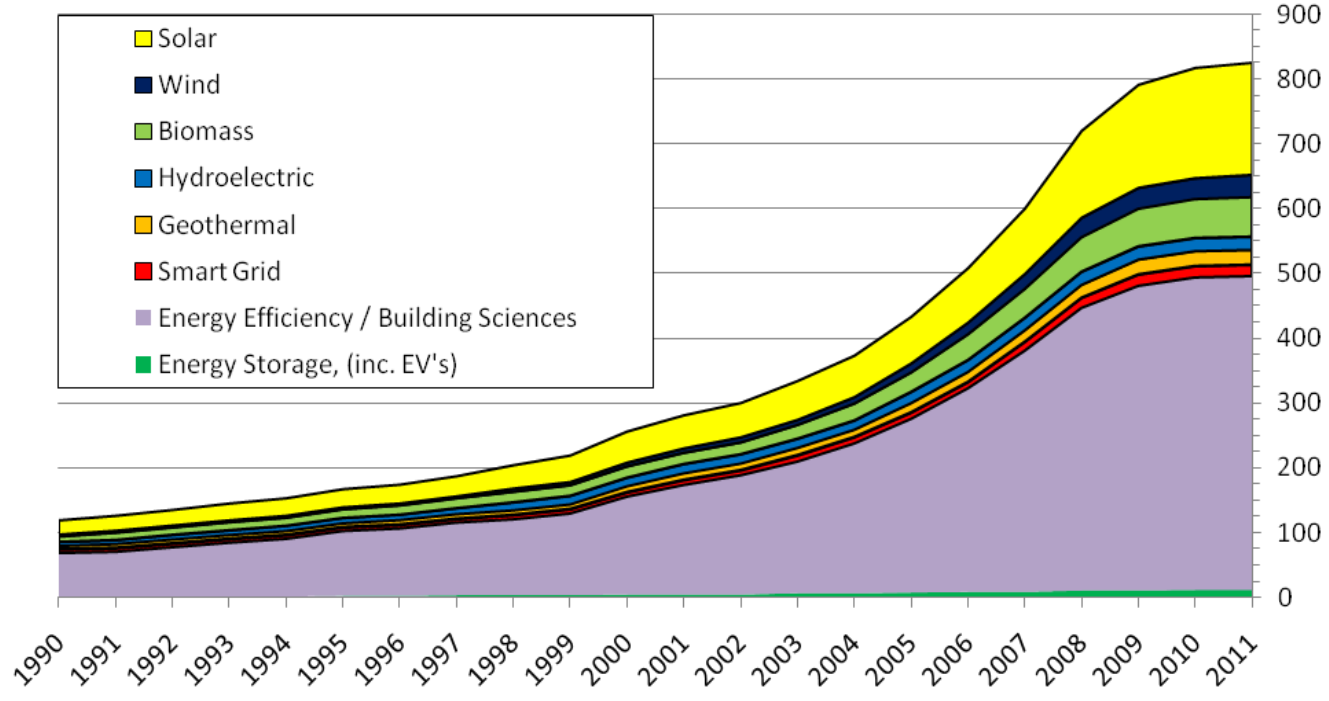
When asked what the greatest threat facing the clean energy sector, one firm offered the following response:

"Under and unemployment in North Carolina. We are losing our customer base and losing manufacturing."

Sector Evolution

- Each year NCSEA asks firms to indicate the year that they started working in the clean energy sector; and to date, nearly 825 firms have provided a response.
- **Starting in 2004, significant numbers of firms focused on energy efficiency entered the North Carolina clean energy sector.** However, there has been a noticeable slowdown in new energy efficiency industry entrants since 2009.
- **Starting in 2007, there has been notable entry into the sector for the solar, wind and biomass focuses** – with the number of solar firms in particular increasing substantially from 2007 to 2011.

Exhibit 6: ***Number of firms in the clean energy sector by reported year entering the sector, 2011.***



Firms have frequently indicated that North Carolina policy conditions and business incentives have been important factors in their decision to enter the North Carolina clean energy sector; several of the reoccurring statements across multiple companies can be paraphrased as follows:

When asked the greatest strength, one company articulated the following reoccurring comment:
"[The greatest strength is North Carolina has] one of the largest state renewable energy tax credits available for businesses at 35% up to $2.5 million… [and is] the only state in the southeast with a renewable energy portfolio standard."

Another company clarified just how important these state policies are to their multinational business:
"The renewable energy portfolio standard law sets North Carolina apart from every other Southeastern state. Without this law in place, our industry would not be able to gain a foothold, much less prepare to export products to Europe."

Finally, one company noted the following as to what they saw as the largest strength in North Carolina…
"#1 The Renewable Portfolio Standard & Senate Bill 3."
and then added the second key element of <u>why</u> this law has had a positive impact on North Carolina business…
"#2 The entrepreneurial spirit of North Carolina businesses."

Sector Presence in North Carolina

- **In 2011, clean energy firms had a physical office location in 87 counties in North Carolina.** If remote employees were included, NCSEA suspects all 100 North Carolina counties would report industry participants.
- **Wake County reported the largest number of clean energy sector offices at 396.** Mecklenburg and Buncombe came in 2nd and 3rd respectively.
- **There are four distinct industry clusters in North Carolina: the Research Triangle, Charlotte, Asheville and the Triad.** Smaller clusters exist in Wilmington, Boone and Hickory.

Exhibit 7: ***Clean energy firm's office locations in North Carolina by business activity, 2011.***

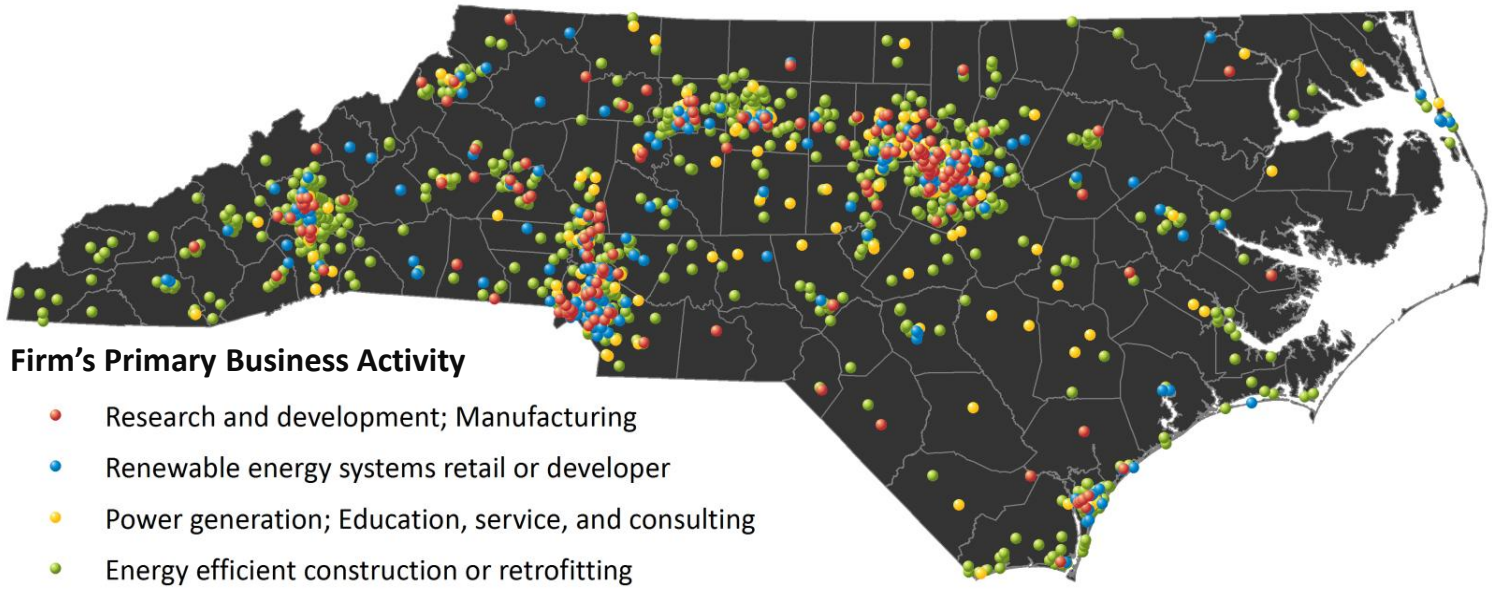


Exhibit 8: ***Clean energy firm's office locations in North Carolina by business focus, 2011.***

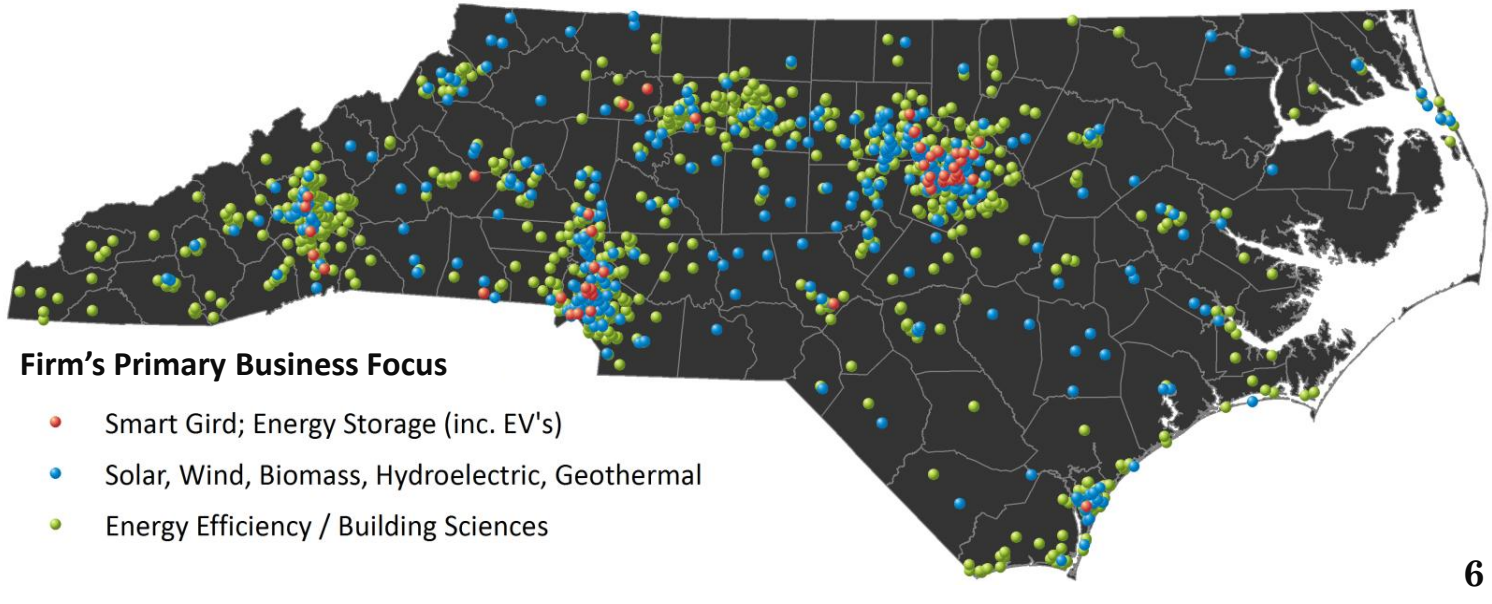


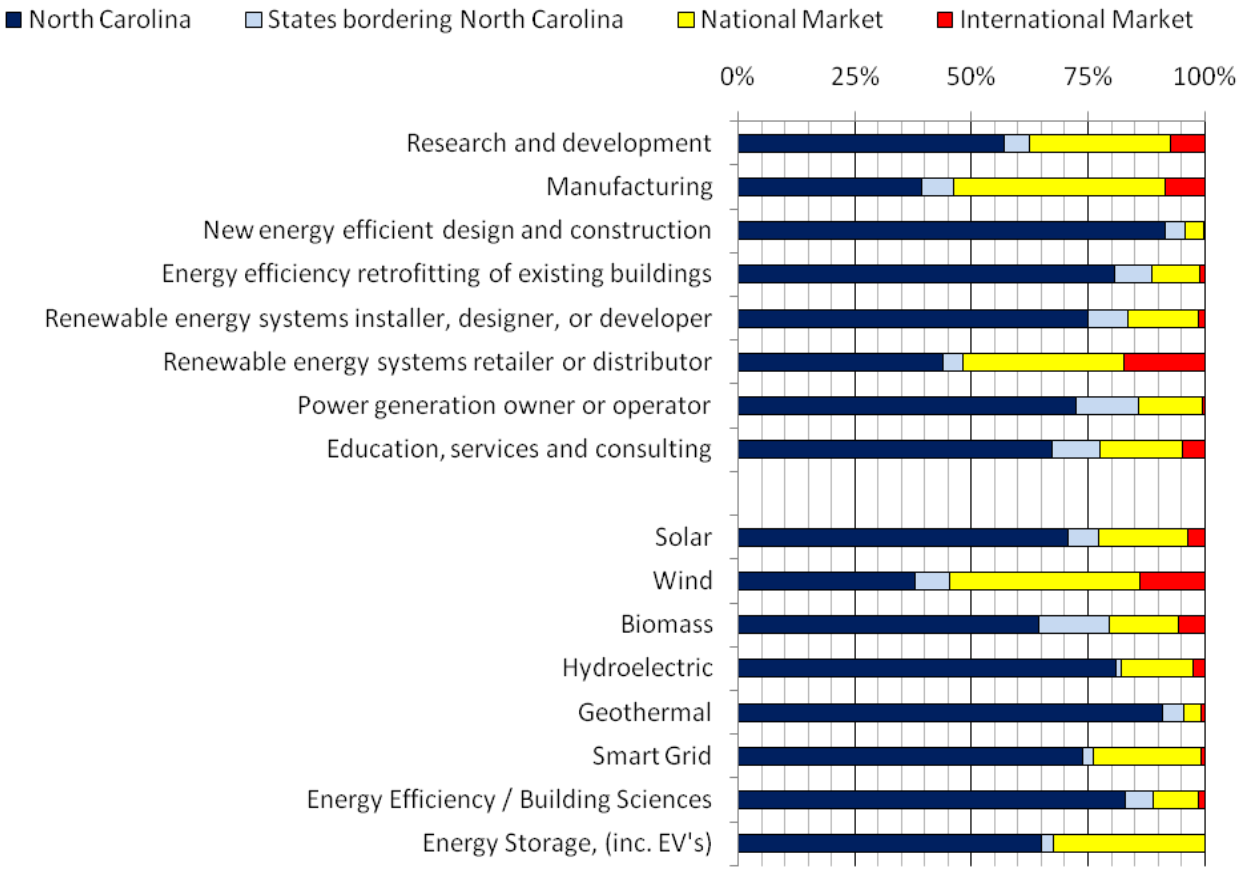
Exhibit 9: ***Top 10 counties in North Carolina by reported number of clean energy offices.***

County Name	Rank	Offices
Wake County	1	396
Mecklenburg County	2	271
Buncombe County	3	225
Guilford County	4	90
Durham County	5	87
Orange County	6	86
New Hanover County	7	85
Forsyth County	8	68
Chatham County	9 (tied)	34
Henderson County	9 (tied)	34

Sector Services & Products Destinations

- **The North Carolina market was the final destination for the majority of services and products.**
- Within the business activities, multiple firms indicated a sizable percent of their services went to the national and international markets. **Manufacturing and renewable energy system retailers indicated over half of their business went to national and international markets.**
- **Nearly 60% of the wind industry's products are destined for export from North Carolina.** Energy storage, including electric vehicles, also reported that sizable percentages of their services and products were destined for the national market.
- Multiple companies indicated that they shipped to international locations. **The most common destinations included Canada, China, Mexico, Japan and Western European states.** Firms also indicated shipping to the Caribbean, in particular Haiti and South American countries, including Brazil and Argentina.

Exhibit 10: ***Proportion of products and services shipped from the North Carolina clean energy sector to select markets, 2011.***



Despite a significant share of services and products in many business focuses and activities being destined for national and international markets, the importance of the North Carolina marketplace cannot be overstated - one company shared the following comment:

"The clean energy market in North Carolina has made it possible for me to grow my business… which is built on clean energy consulting."

Another firm offered a more succinct evaluation of North Carolina:

"[North Carolina] is a good location from a product distribution standpoint!"

Sector Revenue Impact

Exhibit 11: ***Number of firms by North Carolina annual gross revenue and percent derived from clean energy activities, 2011.***

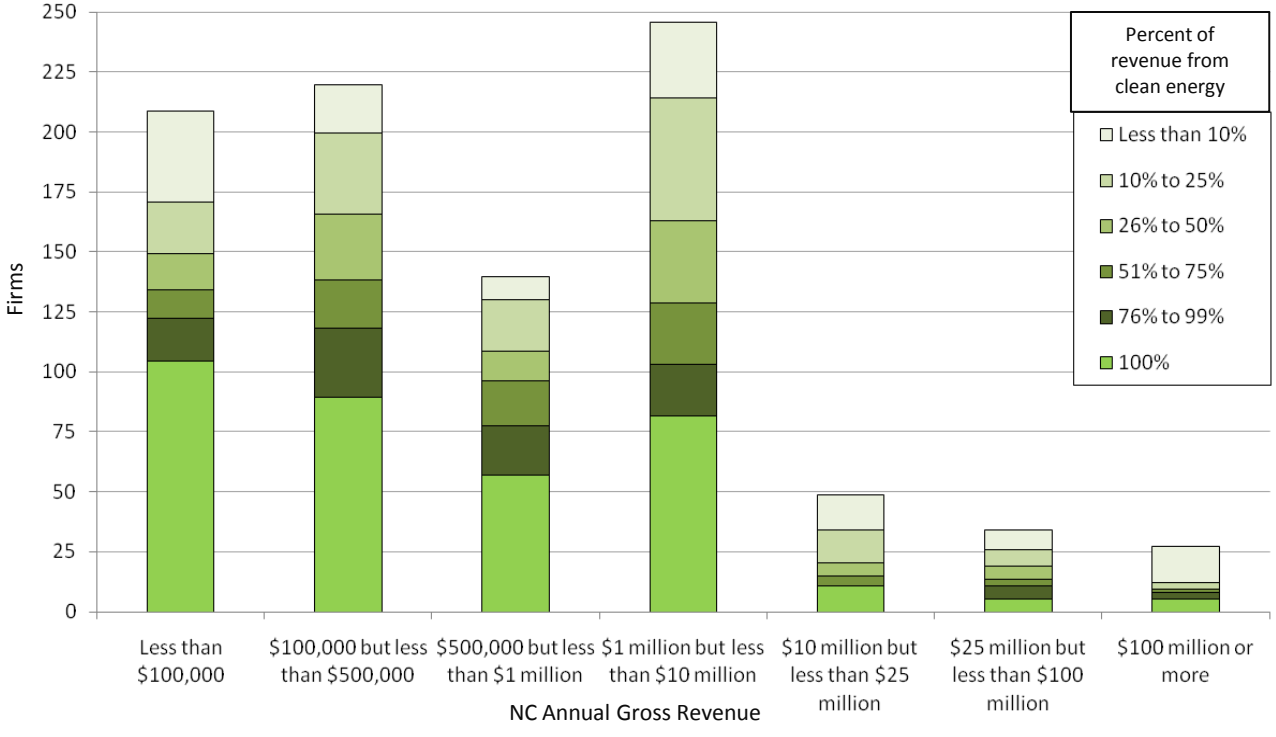
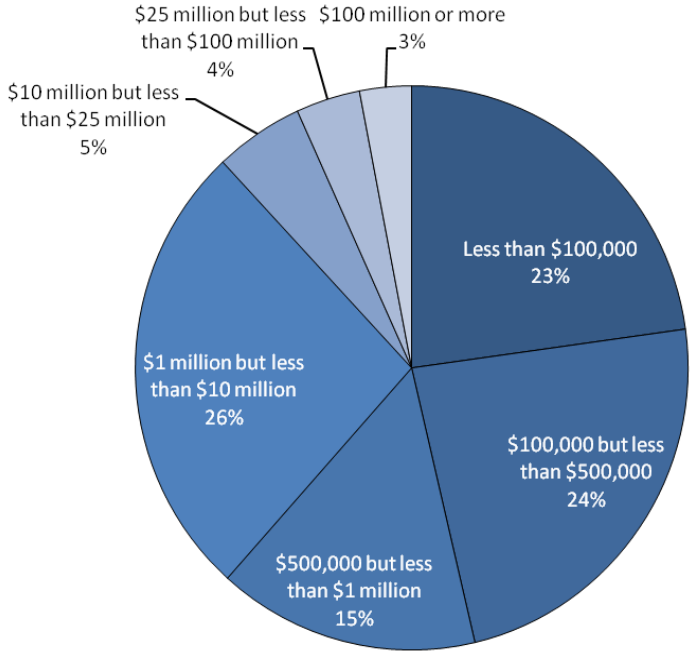


Exhibit 12: ***Clean energy sector company distribution by annual gross revenue, 2011.***



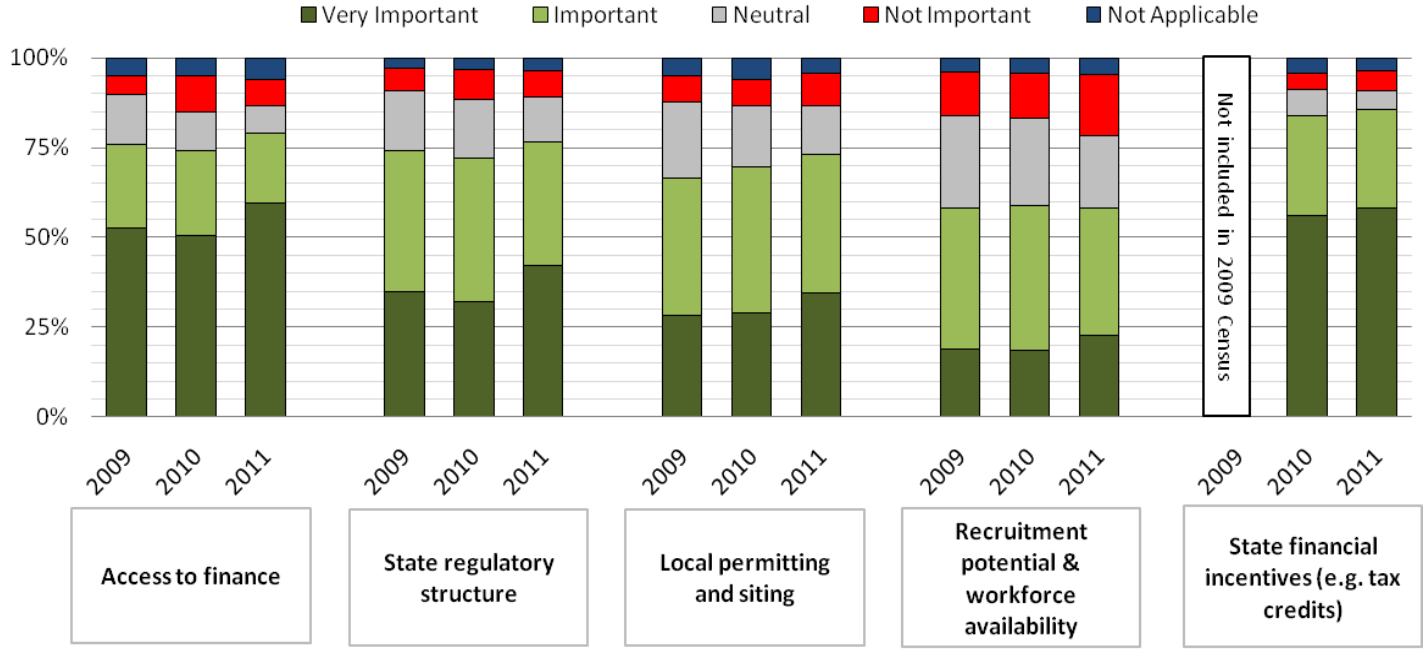
- **In 2011, the clean energy sector conservatively generated over $3.1 billion in North Carolina annual gross revenues.**
- **The clean energy sector is dominated by small revenue firms. Nearly a quarter of the firms in the clean energy sector reported annual gross revenues of less than $100,000 and 62% of industry participants had annual gross revenues of under $1 million.**
- Within individual revenue classes, the percentage of total revenue derived from clean energy activities varies. **Every income bracket had at least one company reporting that 100% of their revenue is derived from clean energy activities.**
- Smaller revenue firms were more likely to rely on clean energy derived revenue as a majority source of their income.
- Two North Carolina clean energy firms were featured in Inc. magazine's top 50 fastest growing energy companies in America. Greenspring Energy, a Maryland headquartered firm with an office in Charlotte, was the fastest growing energy firm profiled by Inc. and the 15th fast growing firm in America. FLS Energy, headquartered in Asheville, was the 5th fastest growing energy firm in America and the 46th fastest growing firm in America.

Valuation of Select Business Assets & Energy Policies

The "business climate" portion of the Census is adjusted annually to reflect ongoing legislative and public policy discussions impacting North Carolina's clean energy sector. In 2011, these questions focused on specific renewable energy and energy efficiency policies, in addition to the select business assets that the Census has tracked since 2009. Page 10 provides a proportional breakdown of the importance of existing North Carolina business assets. Pages 11 and 12 detail the impact that participants believe specific North Carolina renewable energy and energy efficiency policies would have on their operations should those policies be enacted in North Carolina. Each option was evaluated as a stand-alone policy.

- **86% of responding firms indicated that state financial incentives were either "very important" or "important"** to their North Carolina operations in 2011.
- **Access to finance was "very important" to 3 out of every 5 firms surveyed.** Participant comments indicate that despite the sector growth and success, the clean energy industry is still heavily impacted by the slow economy.
- The percentage of firms indicating that local permitting and siting is "very important" to their business increased for the third straight year.
- The percent of firms indicating that North Carolina's regulatory structure was a "very important" business asset to them increased by 10% from 2010.

Exhibit 13: ***Importance of select business assets since 2009 to the North Carolina clean energy sector, 2011.***



2011 participants shared some of the following comments on the importance of the business assets and the impact these assets have:

"[The biggest threat is] not enough access to finance or capital for small business"

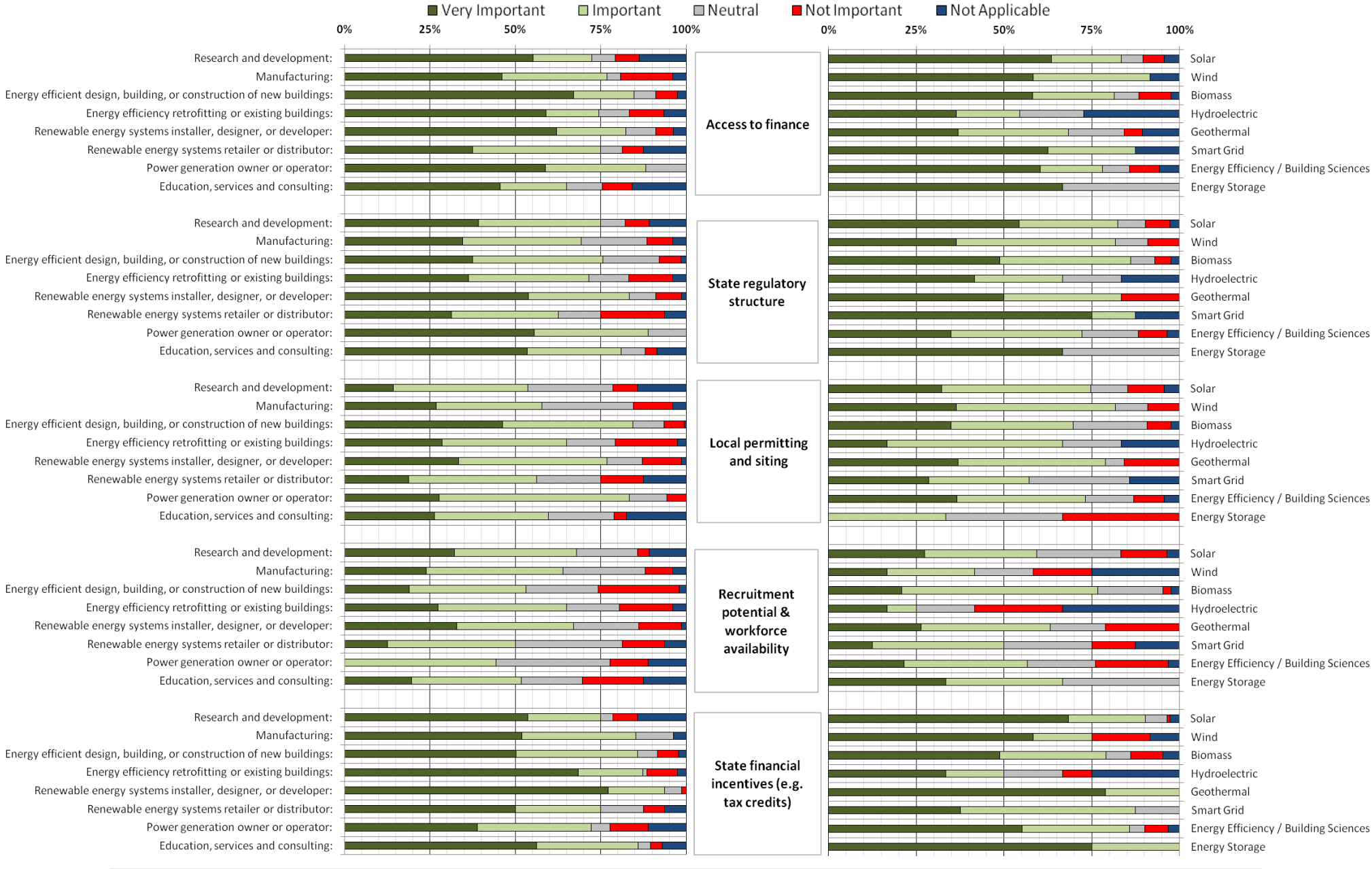
"Financing is the life blood of our industry."

"Regulations are hard to understand. Get information out about [existing] regulations… [and] reduce the amount of regulations to open more opportunities for renewable energy."

"[The state has] a large trained workforce for energy efficiency… [but a lack of project financing] is leaving trainees without adequate opportunity to find work in the industry."

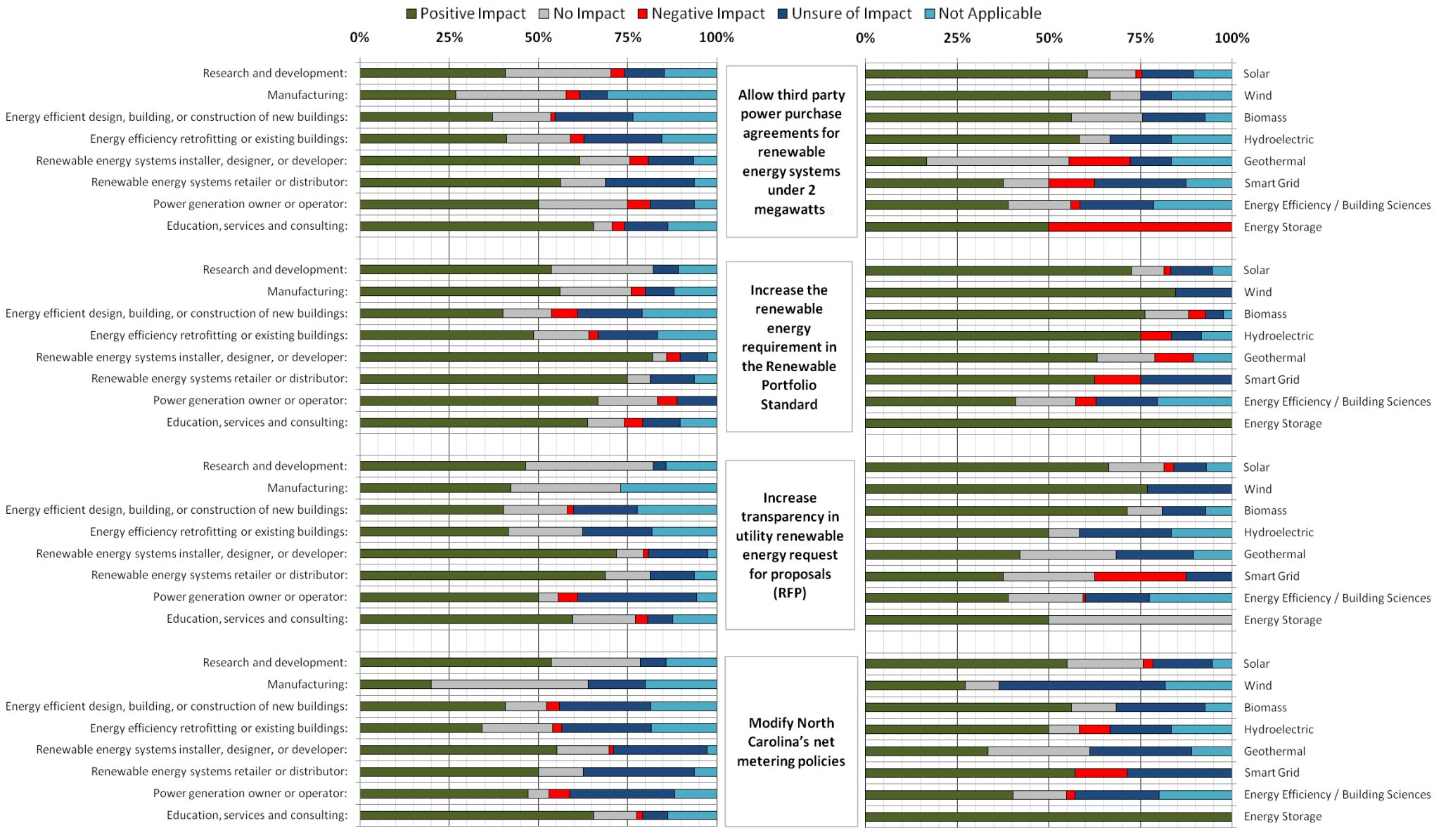
"We need to spend more money on the power infrastructure by encouraging public/private investment."

Exhibit 14: ***Importance of select business assets detailed by business activities and focuses, 2011.***



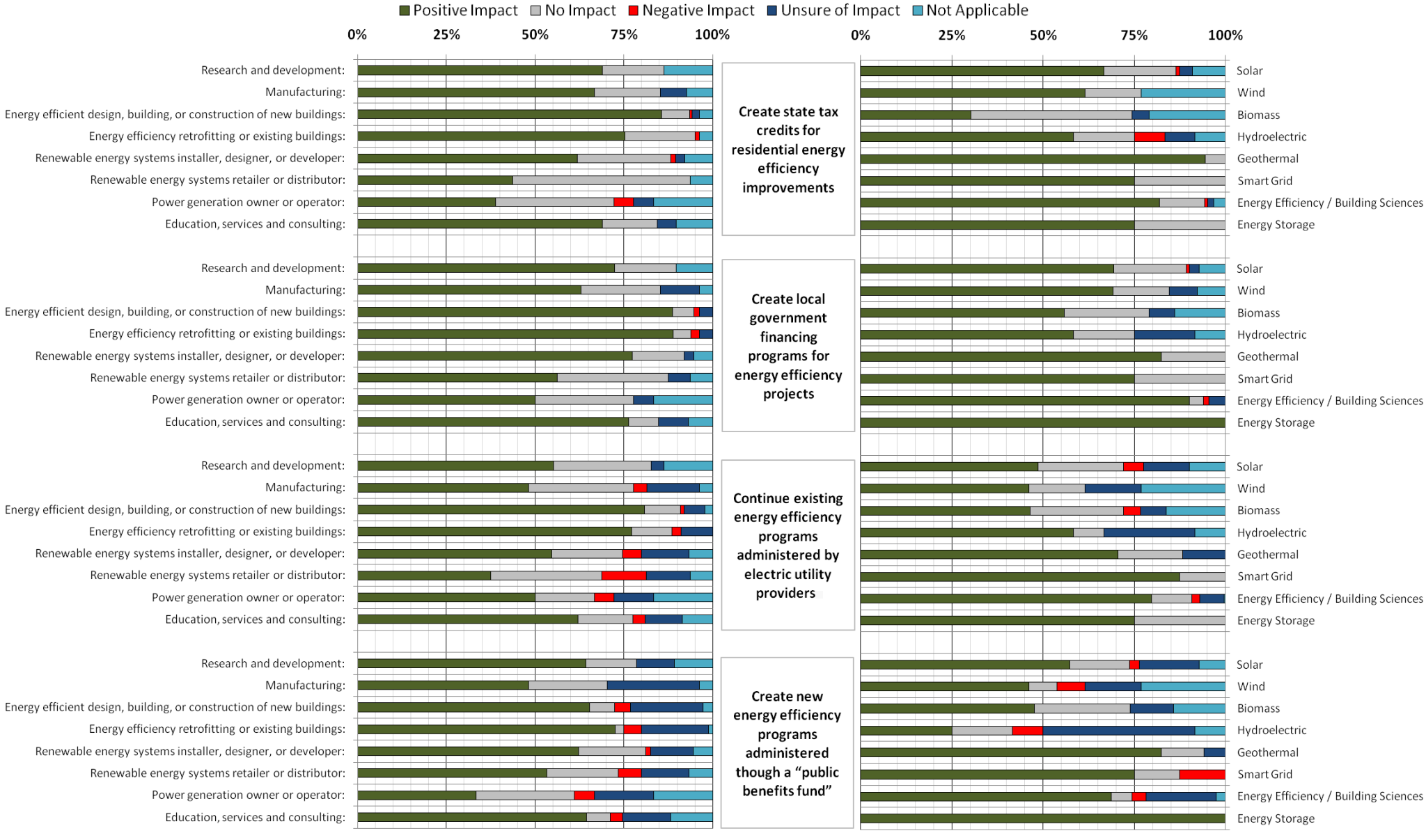
"The industry in NC has developed the critical mass to effectively compete throughout the Southeast as other states pursue larger renewable objectives."

Exhibit 15: ***Importance of selected renewable energy policies detailed by business activities and focuses, 2011.***



"[The] single greatest opportunity to improve alternative energy business in the state would be to allow private energy producers to sell power directly to private energy consumers as long as they don't use regulated transmission facilities."

Exhibit 16: ***Importance of select energy efficiency policies detailed by business activities and focuses, 2011.***



"North Carolina does not offer funding for middle income homeowners for energy efficiency retrofits (just for low income). [The biggest opportunity is] to set up funding for energy efficiency retrofits for residential and commercial [buildings through] a public fund to loan money for energy efficient retrofits."

Conclusions from the 2011 Census

Key 2011 Findings

- ***North Carolina's clean energy sector accounts for 14,800 full time equivalent (FTE) employees in 2011.***
- ***In 2011, the clean energy sector conservatively generated over $3.1 billion in North Carolina annual gross revenue.***
- ***North Carolina's clean energy sector grew by 18%.***
- ***NCSEA conservatively estimates that at least 1,084 firms are currently conducting business in the clean energy sector in 2011.***
- ***Firms maintained a physical office in 87 of North Carolina's 100 counties.***
- ***Wake, Mecklenburg and Buncombe counties all reported over 200 clean energy firm offices within county limits.***
- ***The North Carolina market was the final destination for the majority of firms' services and products.***

In 2011, employment in the North Carolina clean energy sector continued to grow – although at a slower pace than the 20% firms indicated they had anticipated in 2010. The slow down in employment growth is not entirely unexpected due to the continuing economic climate in America; however unlike many sectors the clean energy economy can boast of four straight years of double digit sector employment growth.

More so than in past years though, participant comments emphasized the growing concern in the clean energy sector over the financial, social and political pressures impacting the sector. Despite the fiscal returns that clean energy investments offer in the residential sector, investment decisions must compete against basic standard of living needs such as food and transportation. Investments in the commercial and industrial space must adhere to abbreviated project timelines, aggressive return on investment goals and challenges of the prolonged economic downturn. Finally, at the governmental level, the clean energy sector must compete with convoluted or confusing statistics regarding employment, sector growth and investments occurring in clean energy. NCSEA will be releasing a report looking at the impacts and evolution of these concerns more in depth. Readers should continue to check the NCSEA website for this release in early 2012.

In spite of these competing pressures, North Carolina's clean energy sector is expanding. There are over 1,000 firms employing 14,800 employees in more than 2,000 physical offices across 87 North Carolina counties. While these firms are operating in a complex and often uncertain market space, many have expressed optimism over the future of the clean energy sector. In addition to the growing number of firms, North Carolina offers access to an impressive array of business support assets, workforce training and development resources. In 2011, participants commented in particular about several programs, including the North Carolina Solar Center and their Database on State Incentives for Renewables and Efficiency (DSIRE). North Carolina's Small Business and Technology Development Centers also received praise from Census participants for the business guidance and strategic development assistance they provide. Industry training programs and North Carolina's workforce received particular praise from several business activity and focus areas, although others noted that more work is still needed in this space. In aggregate though, the clean energy sector was largely positive on the skilled workforce available in North Carolina, even though the economic climate has made it more difficult than anticipated to capitalize on this base. The State clearly has assets in place that have not only proven themselves historically to be effective, but are also highly prized by companies doing business in North Carolina as a tangible resource that supports continued development in the clean energy sector.

In reviewing all Census comments collected since 2008, there is one additional theme that has constantly been stressed by the clean energy sector – the importance of communication and education of what "clean energy" really means to the consumer. This has been echoed by all business activities and focuses from new entrants in the sector though established multinationals. North Carolina has thousands of high performance energy efficient homes, a multitude of commercial and industrial energy efficiency success stories and literally thousands of renewable energy systems installed across the State. It is a testament to the effectiveness of the sector and its ability to improve both the quality of living and the economic development opportunities for the State of North Carolina and its residents – a story that the state should proudly tell in boasting of its regional leadership and role in the greater national clean energy economy.

Appendix A: Methodology Notes from the 2011 Census

A. Census Survey Implementation

During the first phase of the survey, an email containing a hyperlink, login ID and password to the secure Census server was sent to all companies that NCSEA had an email address and point of contact identified (roughly 1,650 firms). After an initial three week period, phone calls to collect Census responses from non-respondents was initiated; calls continued until the Census window was closed. The survey window for 2011 ran from July 15 to September 31.

B. Calculating Full-Time Equivalent Employees

NCSEA uses "full time equivalent" employees, or FTEs, as opposed to the number of individual employees. We calculate FTE employees by multiplying a company's total number of North Carolina employees by the percentage of time that the company spends operating in the renewable and energy efficiency industries. We believe this represents a more appropriate and accurate estimate of the amount of employment in the industry. The distinction between these two items is that an FTE is representational of a single 40 hour per week block of employment and is not attributable to any individual person. Because they are 40 hour blocks, FTE's are not restricted to whole numbers. Employees, on the other hand, are a measure of a specific number of people. They are generally measured as whole numbers, although part time employees may be calculated as 0.5. Although this may sound like an unnecessary distinction, FTEs provide a high degree of flexibility in accurately modeling the equivalent man-hours spent working on renewables and energy efficiency. For example, an employee who spends ¾ of their time on renewables would be calculated as a renewable FTE of 0.75; however they would still be represented in a head count as one employee.

C. Estimating Statewide Figures

NCSEA uses a weighted metric based on the most recent company responses from the last three years to estimate the total clean energy sector impacts in North Carolina for the total number of firms identified as participants – for 2011 this was approximately 1,150 unique company responses from the 1,650 companies surveyed out of an industry total of 1,800 identified firms.

1. Firms that have closed, merged, exited North Carolina or that NCSEA has confirmed are no longer active are removed from the Census demographic.
2. The number of unique participants over the last three years is subtracted from the number of firms NCSEA has identified as active in the North Carolina clean energy sector. This leaves us with a set of firms that NCSEA was unable to reach, but are operating in the sector.
3. The number of unique firms responding is broken into percent of firms that "meet our criteria for the Census", "did not meet criteria but participated regardless," and "did not meet criteria".
4. The number of outstanding firms from step 2 is multiplied by the percent of firms that "meet our criteria for the Census" from step 3 to account for any of the outstanding firms that may not have qualified for the Census had NCSEA been able to reach them.
5. The number derived from step 4 is added to the number of participants that met NCSEA's criteria for participation to generate an estimate of active industry participants for the reporting year. In 2011, this yielded a combined number of 1,084 firms.
6. The proportional demographic is modeled across all business activities and focuses on the distribution of the responding firms for that Census year to generate a hypothetical number of firms for population for each business activity or focus.
7. The number of actual respondents is subtracted from the modeled hypothetical business population to generate the number of estimated businesses that did not respond for each business activity or focus.
8. A 90% trimmed mean is calculated for each business activity by removing the upper and lower 5% of the reported FTE positions. In instances where the absence of a company will artificially and significantly alter the statewide FTE estimate, NCSEA may correct the data by using a best available representation for the missing company.
9. The trimmed mean is multiplied by the non-responding companies from step 7 to generate a hypothetical number of FTEs for the non-respondent companies in each business activity or focus.
10. The estimated outstanding FTE employees from step 9 is added to the reported number of employees from the Census participants to generate an estimated industry FTE employment number (Exhibit 2).

D. Estimating the Business Activity and Business Focus FTE Employment Matrix

New to 2011, NCSEA has provided an estimated number of FTE employees using a business activity and focus crosstab matrix. This matrix is a best estimate provided to add an additional level of granularity to the clean energy sector employment – there are two major assumptions that the reader should understand prior to using these numbers for any additional analysis.

1. (Assumption 1) NCSEA calculated the FTE employment by multiplying a company's total number of North Carolina employees by the percentage of time that the company spends operating in the renewable and energy efficiency industries.
2. (Assumption 2) The FTE employment number for each firm was then allocated to the primary and if the company indicated secondary, business activity and focus categories using a 75% / 25% split.
3. The numbers generated in step 2 were totaled for all reporting companies in the cross tab matrix and used to generate an FTE percent distribution for the sector.
4. The total estimated employment for the clean energy sector was multiplied by the percentages generated in step 3 to create the estimated crosstab matrix presented in Exhibit 3 of this report.

E. Geocoding Sector Maps

NCSEA used ESRI's ArcINFO 10 software to generate all maps in this report. Firms' reported primary location in North Carolina was geocoded using the physical building address. Secondary office locations were geocoded only to the city and not to the street level. In all instances, locations are accurate (to the best of NCSEA's knowledge) down to the county level - and in most cases down to the street level.

F. Calculating Annual Gross Revenue

NCSEA asks companies to report total North Carolina revenue and the percent of revenue that is directly attributable to renewables or energy efficiency activities. NCSEA uses a weighted metric based on the most recent company responses from the last three years to estimate this number. Due to the large revenue and percent brackets, NCSEA calculates the estimated statewide annual revenue using the following steps:

1. Responding companies are grouped in a matrix by their statewide revenue and the proportion of this revenue that is derived from renewables and energy efficiency activities, including the "prefer not to answer" and the "do not know" categories.
2. The proportion of companies falling in each cell of the revenue to percent income matrix is calculated and then multiplied against the outstanding number of firms that NCSEA does not have revenue information from to generate a estimated distribution of what the outstanding company distribution is.
3. Companies in all brackets except "$100 million or more" are assigned the median value for each of their respective brackets. *Example: a company falling in the "less than $100,000" and "51% to 75%" brackets would be classified as "$50,000" and "63%".*
4. Companies in the "$100 million or more" bracket are assigned an income of $100 million.
5. Companies that responded "prefer not to answer" or "do not know" are assigned a flat revenue of $25,000 – the assumption being that this is the minimum economic gain from the first question of the Census that firms had confirmed they met.
    - *An NCSEA review of respondents in these two brackets confirmed that multiple firms are likely to have generated significantly more then $25,000 from their clean energy activities in North Carolina.*
6. The assigned revenue and percent are multiplied for each company in the combined reported plus modeled industry distribution to calculate the revenue derived from renewables and energy efficiency.
7. The revenue derived from renewables and energy efficiency for all companies is added together to generate the modeled revenue from reporting companies.

NCSEA does not attempt to estimate actual annual gross revenue for the firms that earn over $100 million in revenue. This deliberate under-estimate of these firms' revenues provides a buffer against over-estimates that may occur in smaller firms based on our methodology.

Appendix B: 2011 Census Questions

North Carolina Renewable Energy and Energy Efficiency Industries Census 2011

The North Carolina Sustainable Energy Association would like to thank you for participating in the 4th annual Renewable Energy and Energy Efficiency Industries Census. The goal of the project is to understand the employment and industry dynamics of firms working in various capacities within the energy efficiency or renewable energy fields in North Carolina.

The survey is 23 questions, and should require only about 15 minutes to complete. The questions asked all refer only to your company or organizations renewable energy and energy efficiency business units. **ALL CONTACT INFORMATION AND ANSWERS YOU PROVIDE ARE KEPT CONFIDENTIAL.** Results from the survey and any additional analysis are only made available in aggregate form.

Our goal is to keep this survey as brief and simple as possible. If you have any questions or concerns regarding the survey please contact us directly; contact information can be found below and at the bottom of each survey page:

Rich Crowley
919-832-7601 extension 111
Census@energync.org

1. **Prior to starting the survey, please verify that your company or organization meets AT LEAST one of the following criteria:**
   1) At least 50% of company or organization stafftime is dedicated to work related to renewable energy or energy efficiency.
   2) At least 50% of company or organization revenue comes from work related to renewable energy or energy efficiency.
   3) Your company or organization generates at least $25,000 in economic gain (either gross revenue or avoided costs) from work directly related to renewable energy or energy efficiency.

   ☐ YES – My firm meets at least one of these criteria.
   ☐ NO – My firm does not meet any of these criteria.
   ☐ My firm does not meet criteria, but I would like to participate in the census.

   If you answered "No" please indicate the reason why, so that NCSEA can evaluate if we should check back with you in 2012 or remove your company from the industry database:

   ☐ My firm no longer conducts business related to renewables or energy efficiency. *(example: Energy Star certified builder, but no longer building Energy Star homes)*
   ☐ My firm is no longer in business in North Carolina.
   ☐ My company actually meets the criteria, but I am unable to participate in the 2011 census.
   ☐ Other reason: _____

Section 1: Industries Census Contact & Company Demographics

2. **Please complete or verify your company or organization's name and website?**

   Company Name: _____
   Website: _____
   Format: http://www.name.domain

3. **Please complete or verify your professional contact information?**
   Contact information is kept confidential 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 complete or verify an alternate company contact in the event we are unable to reach you in a future Industries Census.**
   Person will only be contacted in the event we are unable to reach you.

   Prefix: _____
   First Name: _____
   Last Name: _____
   Job Title: _____
   Email: _____
   Phone: _____

5. **Does your company or organization have more than one physical location in North Carolina engaged in renewable or energy efficiency activities?**

   ☐ YES
   ☐ NO

   Primary North Carolina office location (city):_____
   Additional office locations (cities):_____

6. **Are any of your North Carolina locations a division, regional, or corporate headquarters for your company or organization's renewable or energy efficiency activities?**

   ☐ YES
   ☐ NO

Section 2: Company Profile and Employment Dynamics

7. Please indicate or verify the year your company or organization was:

a. Originally founded or incorporated: _____
b. First operating in North Carolina: _____
c. First operating in renewable energy / energy efficiency: _____

8. Please rank the importance of the following business activities for your company or organization's North Carolina renewable or energy efficiency locations (select up to 3):

	Most Important	2nd Most Important	3rd Most Important
Research and Development:			
Manufacturing:			
Energy efficient design, building, or construction of new buildings:			
Energy efficiency retrofitting of existing buildings:			
Renewable energy systems installer, designer, or developer:			
Renewable or energy efficiency systems retailer or distributor:			
Renewable energy or cogeneration system owner or operator:			
Education, Services and Consulting (law, engineering, finance, etc.):			

9. Please rank the importance of the following market focuses for your company or organization's North Carolina renewable or energy efficiency locations (select up to 3):

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

10. In the past 12 months, what percent of your company or organizations renewable or energy efficiency products and services were provided to customers in:

_____%: North Carolina
_____%: States bordering North Carolina (GA, TN, SC, VA)
_____%: The United States
_____%: International Markets

(Optional) Please indicate the Countries outside the United States that your North Carolina business units most frequently provide services to.

_____

11. 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: _____

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

Average employee time dedicated to renewables or energy efficiency: _____%

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

d. Hired in the past 12 months: _____
e. Laid off in the past 12 months: _____

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

f. Hiring in the next 12 months: _____
g. Laying off in the next 12 months: _____

15. Please select the range that best captures your company or organization's North Carolina business units total 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

16. What percent of your company or organization's North Carolina business units annual gross revenue was attributable to renewable energy or energy efficiency activities 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.
- ☐ Do not know

Section 3: North Carolina Business Climate

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

	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).					

18. How would the following renewable energy policy changes impact your business?

	Positive Impact	No Impact	Negative Impact	Unsure of Impact	Not Applicable
Allow third party power purchase agreements for renewable energy systems under 2 megawatts.					
Increase the renewable energy requirement in the Renewable Portfolio Standard.					
Increase transparency in utility renewable energy request for proposals (RFP).					
Modify North Carolina's net metering policies.					

19. How would the following energy efficiency policy changes impact your business?

	Positive Impact	No Impact	Negative Impact	Unsure of Impact	Not Applicable
Create state tax credits for residential energy efficiency improvements.					
Create local government financing programs for energy efficiency projects.					
Continue existing energy efficiency programs administered by electric utility providers.					
Create new energy efficiency programs administered though a "public benefits fund".					

20. Within the renewable energy and energy efficiency industries, what does your company or organization perceive as North Carolina's most significant:

Strength: _____
Weakness: _____
Opportunity: _____
Threat: _____

21. Each year, participant suggestions, concerns, and general industry observations are instrumental in shaping the census questions. If you are willing we would appreciate any feedback or general comments you are willing to share.

_____
_____
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_____

22. What is your preferable way for NCSEA to contact you should we have a question about your survey responses?

- ☐ Contact me by phone
- ☐ Contact me by email

23. Would you like to be notified when a summary report of this survey is completed?

- ☐ Yes, please notify me when the final census report is available online. NCSEA may also notify me about pending legislation, business and networking events, and other industry news.
- ☐ Yes, please notify me when the final census report is available online, but I would prefer not to receive additional notifications from NCSEA.
- ☐ No, please do not contact me until the 2012 census.

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Energy Association

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