NORTH CAROLINA ENERGY INDUSTRY

OUR HOME IS YOUR HOME FOR BUSINESS

NC

Nothing Compares

NORTH CAROLINA

INVEST IN
NORTH CAROLINA

Energy companies choose North Carolina for its winning combination of location, innovation, low business costs, and existing industry strength.

North Carolina was the first state in the Southeast to adopt a Renewable Energy Portfolio Standard (REPS), and has developed a diverse energy sector as a result. The state now has three active nuclear plants, 50+ hydroelectric and natural gas power plants, 425+ solar and wind production companies, and 100+ biofuel firms. The state produced 186 trillion BTUs of renewable energy in 2013. In addition to energy production firms, North Carolina is also home to thousands of companies engaged in energy storage, efficiency, and technology innovation.

North Carolina has a long history of implementing state policies that support and encourage clean energy development. The state's Utility Savings Initiative encourages energy efficiency in public buildings in part by overseeing the performance contracting process. The North Carolina Utilities Commission has also maintained net metering and interconnection standards since 2005.

Consider **North Carolina** for your next trade or investment decision, and find out why ***Nothing Compares.***

In North Carolina, we have a **vibrant community** of inventors, investors, and institutions committed to **clean energy technologies.** Our state's success stems from long-term government policies and innovative public-private partnerships.

-Gary Rackliffe, Vice President, Smart Grids North America, ABB Inc.

UNMATCHED
BUSINESS ENVIRONMENT

#1
Top Competitive State

- Site Selection (2015 Prosperity Cup)

#2
Best State for Business

- Forbes (2015)

#3
**Lowest State &
Local Business Tax
Burden in the U.S.**

- Ernst & Young (2015)

#4
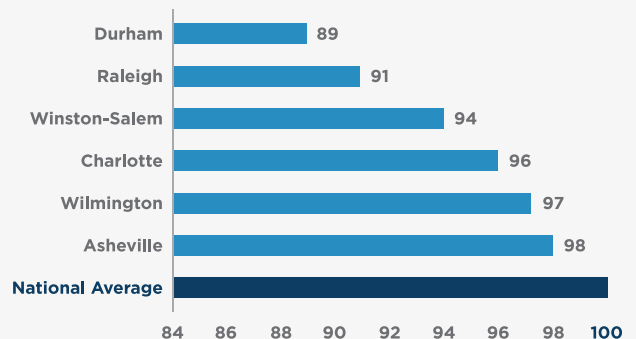**Best Labor Climate**

- Area Development (2015)

Highly Skilled Workforce

North Carolina's **53 colleges & universities and nationally recognized, 58-campus community college system** produce a highly skilled workforce.

- **108,800 degrees awarded** from North Carolina colleges and universities in 2014
- **460,000 manufacturing employees**
- **8% workforce growth** since 2007.

Most Innovative State

North Carolina is one of the **top 10 most innovative states in the U.S.**

- Consumer Electronics Association (2015)

Low Construction Costs

Average construction costs in North Carolina's metropolitan areas are **18% below the national average.**

Source: RSMeans

Low Cost of Living

The cost of living in many of North Carolina's metropolitan areas is **well below the national average.**

Metro	Index
Durham	89
Raleigh	91
Winston-Salem	94
Charlotte	96
Wilmington	97
Asheville	98
National Average	100

Index (100 = National Average)

Source: Council for Community and Economic Research

ENVIRONMENTAL TECHNOLOGY

Environmental technology companies thrive in North Carolina's growing energy cluster. Collaborations among environmental technology and clean energy firms, various industry support organizations, and top-tier research universities contribute to the state's strong renewable energy sector. In 2015, North Carolina's clean energy industry boasted nearly $7 billion in gross revenue.
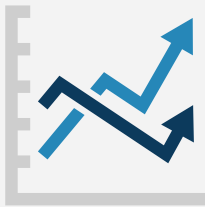
18% Growth in Environmental Technology Employment

(2009 to 2014)

1,500 Environmental Technology Establishments

#4 in University Technology Licenses

342 university technology licenses and options executed in 2014.

Largest U.S. EPA Research Lab

The U.S. Environmental Protection Agency has its health & environment research center and largest research lab in North Carolina.

ENVIRONMENTAL TECHNOLOGY COMPANIES

PENTAIR

Ensolve Biosystems Inc.

sensus

ALEVO
REDEFINING ENERGY

APEX INSTRUMENTS SOURCE TESTING EQUIPMENT

RTI INTERNATIONAL

SIEMENS

ABB

EOS Remediation, LLC

VEOLIA

O2 energies

EATON

SMART GRID

North Carolina has 75+ companies engaged directly in smart grid innovation, as well as hundreds of other companies actively contributing to the sector's success. Industry giants such as ABB, Siemens, and Duke Energy work alongside North Carolina's many meter hardware firms, energy management businesses, information technology companies, and strategy & consulting services.

#2 Smart Grid Cluster

North Carolina has the second largest smart grid cluster in the United States, with more than 60 smart grid companies in the Research Triangle region alone.

56,400 Engineers & Technicians

The state's workforce includes more than 56,000 engineers and engineering technicians, a 7% increase since 2011.

SPECIALIZED RESEARCH & DEVELOPMENT CENTERS

ABB Smart Grid Center of Excellence
The center includes a testing and development laboratory, a verification center to certify customer solutions before deployment, and a demonstration center that showcases ABB's smart grid technologies and collaborative partnerships.

The Duke Energy Smart Grid Laboratory at the Energy Production and Infrastructure Center (EPIC)
The state-of-the-art laboratory facility is designed to test and evaluate smart grid enabling technologies. It supports education, research, and outreach activities to modernize the power grid.

FREEDM Systems Center
The FREEDM Systems Center is a National Science Foundation Engineering Research Center at North Carolina State University dedicated to revolutionizing all aspects of the electric grid infrastructure.

PowerAmerica
In 2014, the U.S. Department of Energy selected North Carolina State University to coordinate the Next Generation Power Electronics Innovation Institute (PowerAmerica). The institute focuses on wide bandgap semiconductor research & development.

SMART GRID COMPANIES

DUKE ENERGY   Schneider Electric   SIEMENS   ABB

SAS   IBM   CREE   Itron

SOLAR ENERGY

As the third largest state for solar capacity in the U.S., North Carolina has quickly become a hub for solar activity. Currently, North Carolina has more solar capacity than all other Southeastern states combined. The state ranks #2 in new solar capacity installation for the second consecutive year, and there is still ample room for growth. North Carolina offers property tax abatement for solar energy electric systems for 80% of the appraised value.

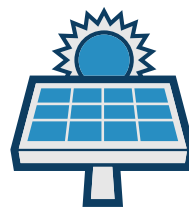## North Carolina Solar Plant Locations, 2015

= Solar Power Plant
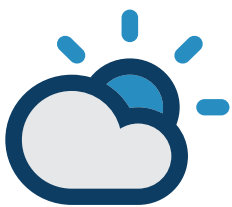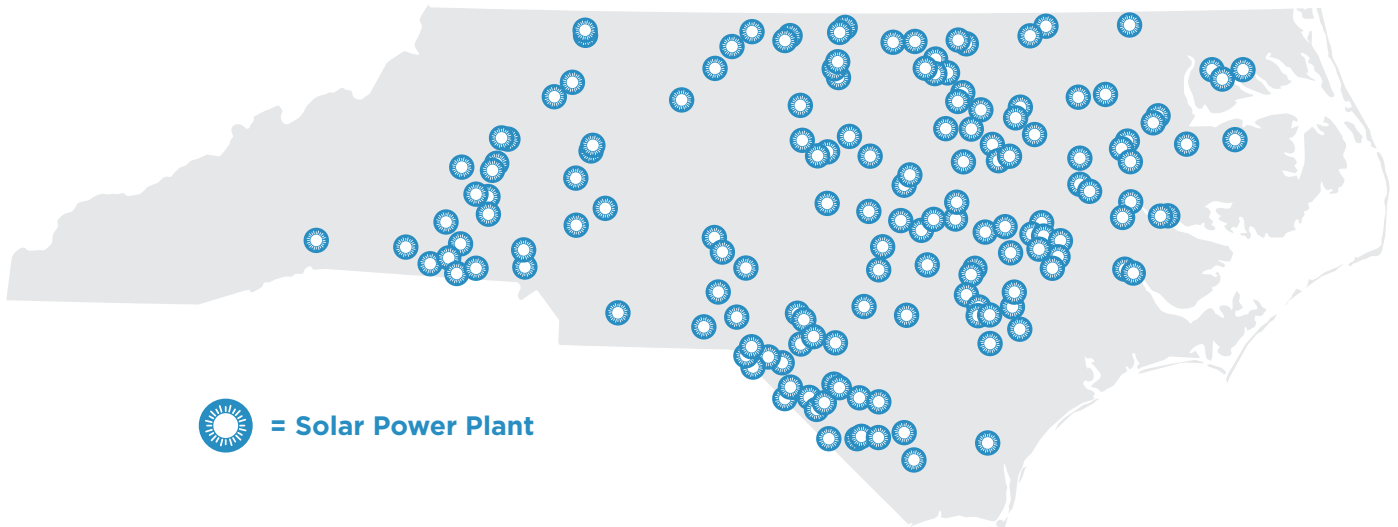
#3 for Solar Capacity

North Carolina has the 3rd largest solar capactiy in the country.

2.807 GW of Solar Power

As of February 2016, approximately 2.807 gigawatts of solar photovoltaic (PV) energy power North Carolina.

350+ Solar Energy Firms

North Carolina's 350+ solar energy firms make up 20% of the state's clean energy industry.

$1.8 Billion in Revenue

The state's solar industry generated more than $1.8 billion in revenue in 2015.

Map Source: U.S. Energy Information Administration

BIOENERGY

North Carolina's bioenergy sector has grown 9% since 2011. A majority of the state's bioenergy derives from wood & wood waste, municipal solid waste & landfill gas, and swine & poultry waste. In a field advanced by resources, technology, and opportunity, North Carolina offers an advantageous environment for growth and innovation.
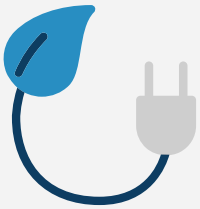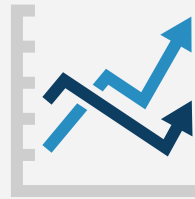
660+ MW of Biopower

North Carolina ranks 7th in the U.S. for installed biopower capacity in 2014.

100+ Firms

More than 100 bioenergy firms operate in North Carolina.

9% Growth

North Carolina's biopower workforce grew 9% in the last five years, outpacing the U.S. average.

13,500+ Graduates

More than 13,500 NC residents graduated from industry-relevant programs in 2013, supporting the states robust bioenergy workforce pipeline.

Company Spotlight

Duke Energy

As the largest electric utility in the United States, Duke Energy participates in a variety of clean energy sectors, including bioenergy. The utility, headquartered in Charlotte, NC, currently supplies customers with power from landfill methane gas projects. Duke Energy has taken steps to procure electricity derived from swine & poultry waste as stipulated in North Carolina's Renewable Energy and Energy Efficiency Portfolio Standard, and recently announced a deal to procure power from a new swine waste biogas plant.

WIND ENERGY

North Carolina has some of the best wind energy resources on the East Coast. In fact, the U.S. Department of the Interior recently designated three areas off North Carolina's coast – totaling 308,000 acres – for potential commercial wind energy development. Iberdrola Renewables partnered with Amazon to build North Carolina's first major wind farm with 104 turbines over 34 square miles. Both on and offshore, the state's significant wind resources make it an ideal place for future wind energy investment.
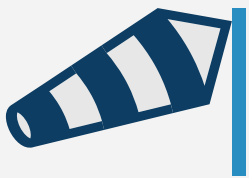
85 Wind Energy Firms

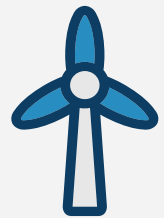85 firms operate in North Carolina's wind power sector.

1,700+ Employees

Seven percent of all North Carolinians employed in the clean energy industry work in wind energy.
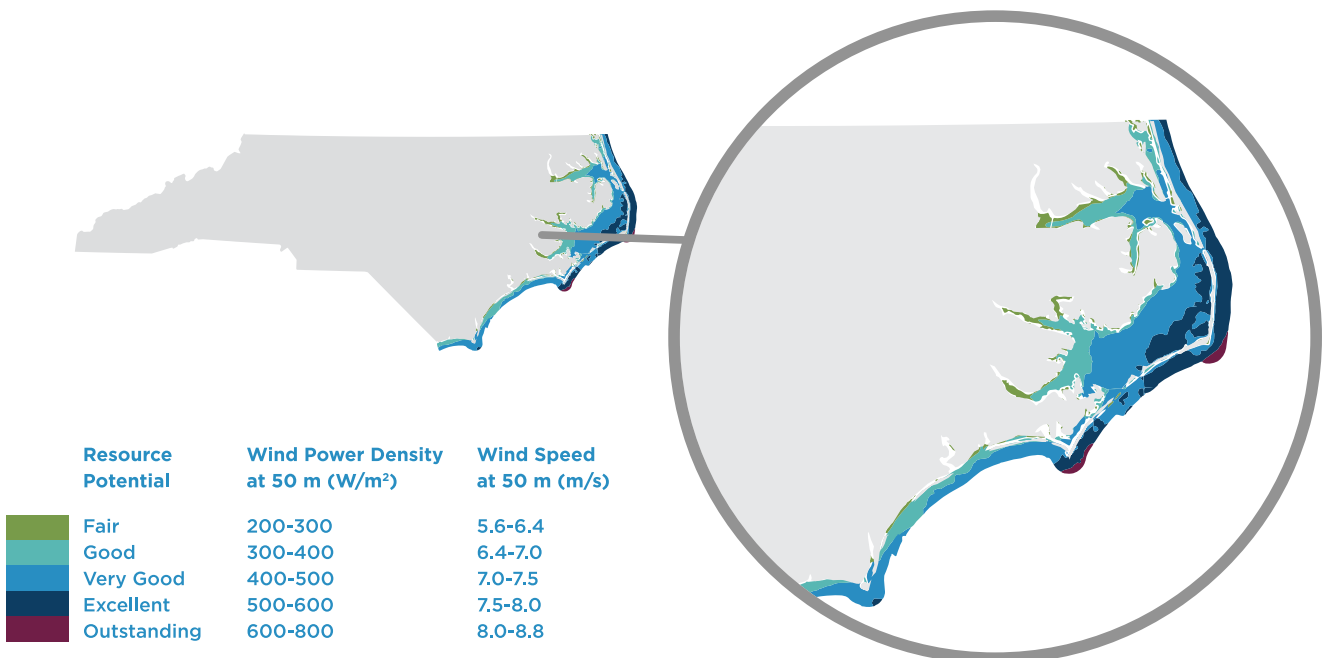
$911 Million in Revenue

The state's wind energy production generated over $900 million in revenue in 2014.

#4 for Turbine Manufacturing

North Carolina has the fourth fastest growing turbine manufacturing sector in the U.S.

North Carolina Wind Resource Map

Resource Potential	Wind Power Density at 50 m (W/m²)	Wind Speed at 50 m (m/s)
Fair	200-300	5.6-6.4
Good	300-400	6.4-7.0
Very Good	400-500	7.0-7.5
Excellent	500-600	7.5-8.0
Outstanding	600-800	8.0-8.8

Map Source: NC Wind Energy-
Appalachian State University

SKILLED WORKFORCE & INDUSTRY SUPPORT

North Carolina has one of the fastest growing renewable energy clusters in the U.S., boasting 45% growth by revenue from 2014 to 2015. With nearly 1,000 firms and 26,000+ full-time employees, NC clean energy generates nearly $7 billion in annual gross revenues. Booming smart grid, solar, wind, and bioenergy sectors underpin the industry's growth. Education and industry support organizations across the state also fuel to North Carolina's renewable energy industry success.

Universities
Undergraduate and Graduate Degrees

Elite higher education institutions across the state support North Carolina's workforce.

North Carolina is home to 53 colleges and universities across the state. Almost all offer coursework relevant to the energy industry, including North Carolina State Universities top-ranked nuclear energy program. In fact, NC State is home to the first university-based nuclear reactor for teaching and research. The University of North Carolina at Charlotte's Energy Production & Infrastructure Center (EPIC) is a national leader in energy research & development. EPIC connects students and faculty with companies in the energy industry to collaborate on interdisciplinary research and learning.

Community Colleges
Vocational Degrees

Pioneering the nation's most advanced programs in vocational and technical education.

The North Carolina Community College System (NCCCS) is widely regarded as offering some of the most comprehensive and advanced vocational and technical programs in the U.S. More than 800,000 students enroll at one of NCCCS's 58 campuses each year. Sustainable Technologies degree programs prepare students to enter the renewable energy, green construction, and other waste reduction-oriented sectors. Courses include Renewable Energy Technology, Photovoltaic/Solar Technology, Nuclear Technology, and Energy Use Analysis, to name a few. The state's community colleges also offer specialized training and resources for energy companies.

NCWorks
Customized Training Programs

Providing customized training and recruiting services for North Carolina businesses.

The North Carolina Community College System (NCCCS) and North Carolina's Department of Commerce developed NCWorks, a free, customized job training and recruiting program for new and expanding businesses. NCWorks offers comprehensive training via NCCCS's extensive catalog of established programs as well as customized curricula tailored to address specific needs.

North Carolina Sustainable Energy Association (NCSEA)

NCSEA is a nonprofit organization that supports market development and public policy to create clean energy jobs, economic opportunities, and affordable energy to benefit all of North Carolina.

E4 Carolinas

E4 Carolinas is an industry-led energy trade association that coordinates and promotes the energy cluster in the Carolinas through industry support, education, economic development and policy.

NC Clean Energy Technology Center

The NC Clean Energy Technology Center serves as a clearinghouse for renewable energy programs, information, research, technical assistance, and training for the companies and citizens of North Carolina and beyond. The center has partnered with EnergySage to develop an online solar marketplace.

Research Triangle Cleantech Cluster

The Research Triangle Cleantech Cluster (RTCC) represents business, government, academic, and nonprofit leaders to promote the cleantech economy and ensure the Triangle region is recognized for its leadership in research, innovation and growth in the clean technology sector.