NCSEA
Clean Energy Employment Perspectives

NC Sustainable Energy Association

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NC Sustainable Energy Association

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

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2015 Clean Energy Census

- The Success Story of Clean Energy
- Key Economic Indicators
  - Full-Time Employees
  - Clean Energy Revenues
  - Export Activity
- Nearly a decade of data
  - 2008-2016

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Clean Energy Sectors

- **Alternative Fuel Vehicles** – Alternative Fuel Vehicles are those that run exclusively on alternative fuels, including electricity, or a blend of traditional petroleum fuels and alternative fuels.
- **Biomass/Biofuels** – This sector relates to the generation of heat or electricity from either the combustion of organic and waste materials, or their conversion to biofuels.
- **Energy Efficiency** – This sector employs technologies, products, and services that reduce the amount of energy required for processes, tasks, or buildings
- **Energy Storage** – This sector covers energy storage devices or physical media that are used to store energy, in various forms, for use at a later time.
- **Fuel Cells** – This sector includes technologies or devices that convert chemical energy from a fuel source into electricity through an oxidizing reaction.
- **Geothermal** – This sector includes both Geothermal Energy and Ground Source Heat Pump (GSHP) technology. Geothermal Energy utilizes the thermal energy (heat) stored in the Earth to generate electricity, while GSHP are a central heating and cooling system that transfers heat to or from the ground.
- **Hydropower/Marine** – Hydropower refers to harnessing the force of falling or flowing water, including marine waves, for useful purposes such as to generating electricity or creating mechanical force.
- **Smart Grid** – This sector incorporates technologies and products related to updating the current electricity grid infrastructure with increased multidirectional communication, data collection, and automation. This includes, but is not limited to, digital metering equipment, sensors, controls, and related software.
- **Solar** – This sector includes technologies and products related to the conversion of sunlight either directly into electricity through photovoltaic cells or indirectly through concentrated solar power. The sector also includes solar thermal products that harness sunlight to meet thermal requirements for residential, commercial, or industrial processes.
- **Wind** – The wind sector includes products related to the harnessing of wind energy. This includes, but is not limited to, wind turbines for the creation of electricity, wind pumps for pumping and drainage power, and windmills for mechanical power.

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NC Clean Energy Employment by Sector

Sector	Total	Percent
Alternative Fuel Vehicles	809	3%
Biomass/Biofuels	1,245	5%
Energy Efficiency	13,037	50%
Energy Storage	1,159	4%
Fuel Cells	244	1%
Geothermal	756	3%
Hydropower/Marine	350	1%
Smart Grid	1,291	5%
Solar	5,541	21%
Wind	1,721	7%
Total	26,154	100%

8% increase since 2014

NC Clean Energy Employment by Activity

Activity	Total	Percent
Design or Construction of New Buildings	4,286	16%
Sale of Building System Components	3,129	12%
Sale of Renewable Energy Systems	1,254	5%
Installation, Design, or Development of Renewable Energy Systems	5,502	21%
Installation or Maintenance of Building System Components	2,022	8%
Manufacturing/Production	4,298	16%
Power Generation	1,523	6%
Professional Services, Education, or Consulting	3,191	12%
Research and Development	950	4%
Total	26,154	100%

9% increase since 2014

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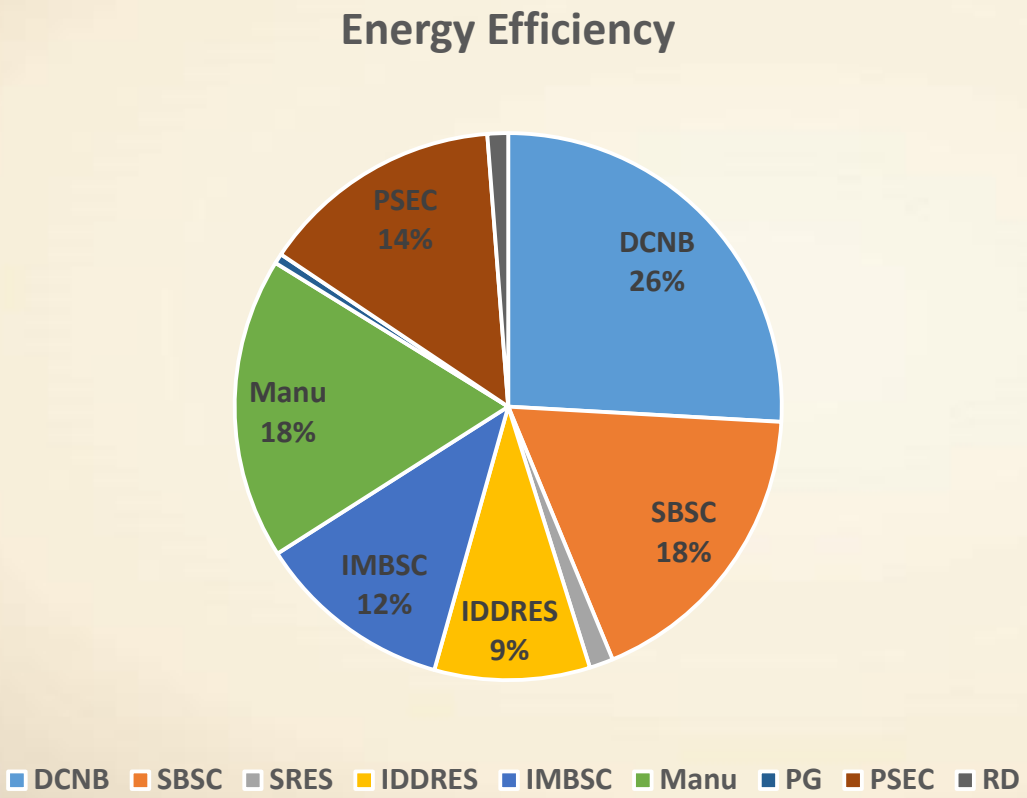
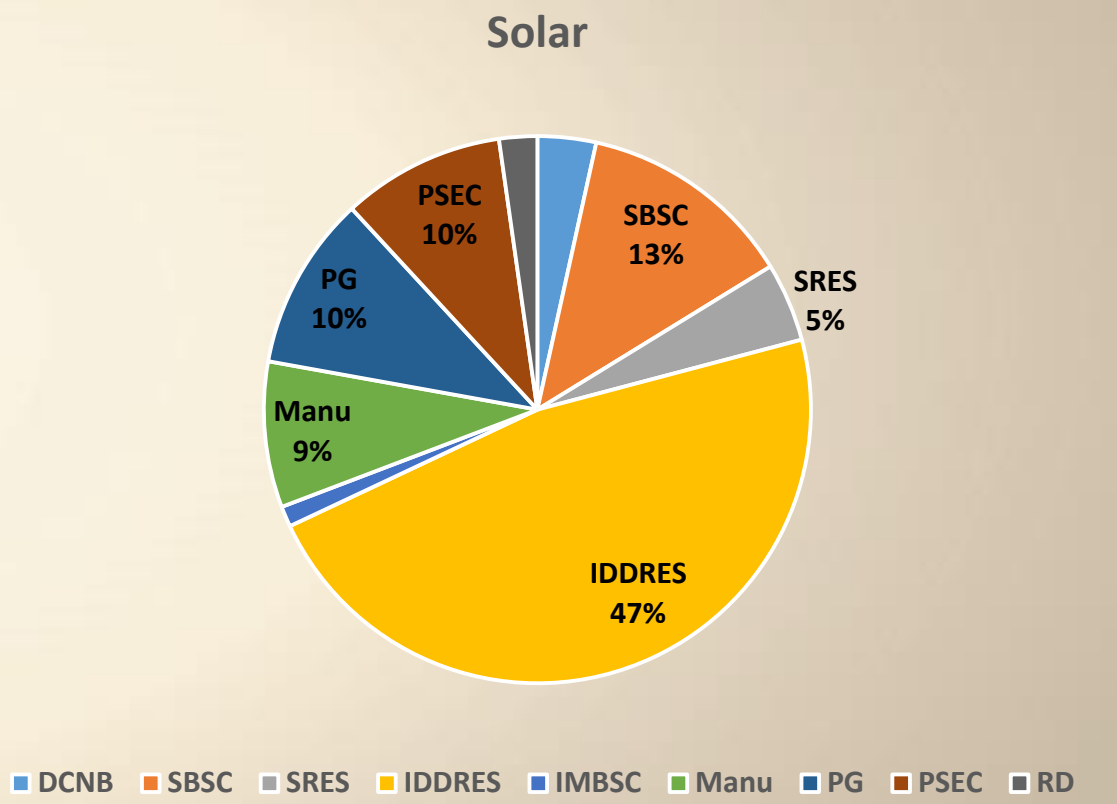
Where are the Jobs?





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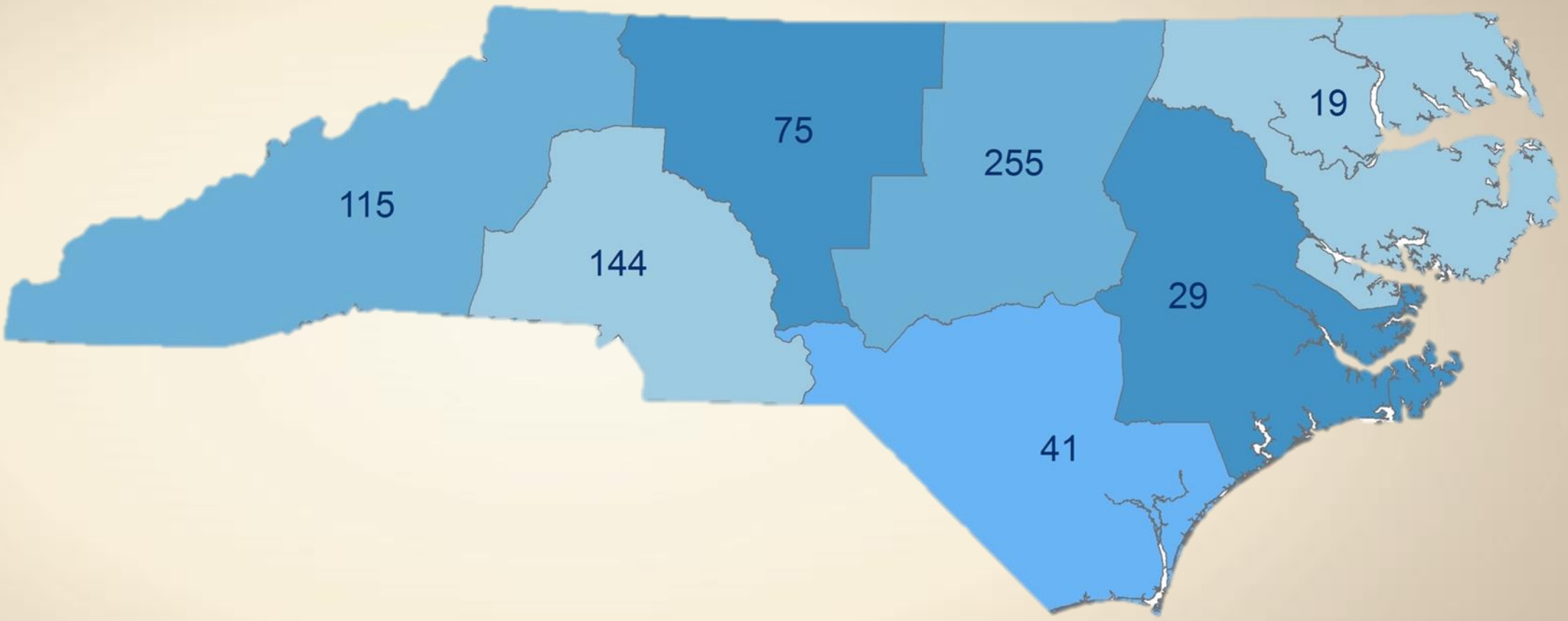
Clean Energy Companies in North Carolina



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Renewable Energy Deployment in NC

2.3GW

Of Renewables

1.15GW

In last 18mo

>3,000 BLDGs

EE Certified

Characteristics of RE Systems:

- **Average solar farm – 5MW**
- **Amazon Wind - First Wind Farm**

Grid Resources:

- **Energy Storage**
- **Data and Sensor Technology**
- **Smart Grid and Energy Management**

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Workforce Needs

- Diversity and Adaptability
- Soft Skills
  - Customer Service
  - Communication
  - Relationship Management
- Industry is Evolving
  - Policy Changes
  - Technology Advances
  - Costs

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NCSEA Resources

- Website
  - www.energync.org/
- Jobs Board
  - www.energync.org/networking/opening_search.asp
- Business Member Directory
  - www.energync.org/search/custom.asp?id=2375
- Events
  - https://energync.site-ym.com/events/event_list.asp
- Clean Energy Current
  - info@energync.org

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