North Carolina

Clean Energy Plan Development

Workshop 6

Welcome, Opening Remarks, and Introductions – 9:00am

North Carolina DEQ and Rocky Mountain Institute

Objectives

- Prioritize and build out recommendations for *Customer Choice and Economic Development* and *Carbon Reduction and Resilience* strategies
- Share and discuss other related efforts going on in the state that can inform the development of North Carolina's Clean Energy Plan
- Present and solicit feedback on potential *Energy Efficiency* recommendations

Agenda

- Welcome, Opening Remarks, and Introductions
- Worksheet Activity on Prioritization Criteria for Recommendations
- Prioritization of *Customer Choice and Economic Development* Recommendations

BREAK

- Breakout Activity on Prioritized *Customer Choice and Economic Development* Recommendations

LUNCH

- Prioritization of *Carbon Reduction and Resilience* Recommendations
- Small Group Reflection on *Energy Efficiency* Recommendations
- Other Collaborative Efforts informing the Clean Energy Plan (Part 3)

BREAK

- Breakout Activity on Prioritized *Carbon Reduction and Resilience* Recommendations
- Next Steps

Ground Rules

- Be Present
- Democracy of Time

Check-In

As we begin this last workshop, what is one question you are still holding?

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Factors to Consider for Prioritizing Recommendations

Rocky Mountain Institute

Recommendation Evaluation Worksheets

- Individually fill out worksheets to assess how each recommendation meets or does not meet criteria for prioritization
- Criteria used:
  - Accelerates carbon reduction in North Carolina
  - Enhances equitable access and a just transition to clean energy
  - Expands customer options and ability to choose clean energy
  - Maintains a safe, reliable, and affordable energy system
  - Essential or very important for enabling other potentially important actions?
  - Within the existing statutory/legal authority of a North Carolina state agency, private business, or utility?
  - Supported by a wide variety of stakeholders?
- Use 1-3 scoring:
  - 1 = does not meet criteria
  - 2 = partially meets criteria or neutral
  - 3 = meets criteria

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Prioritization of Customer Choice and Economic Development Recommendations

Rocky Mountain Institute

Prioritization Activity

- Choose two recommendations for *Customer Choice and Economic Development* and write on two index cards
- Pass around pairs of index cards until the alarm rings.
- When the alarm rings, stop and read the two cards you have and individually rate the recommendation on each card with a score of **1 to 5 for how important it is to include this recommendation in the Clean Energy Plan**

  1 = not important at all and 5 = extremely important
- Repeat 5 times
- At the end of five cycles, participants sum the five scores on the back of the last two cards they are holding

Customer Choice and Economic Development

Recommendations

1. End ban on third-party sales of electricity
2. Require utilities to invest in a specific amount of solar paired with storage
3. Require utilities to provide an easy option to purchase renewable energy through electric bills
4. Restore the 35% renewable energy state tax credit
5. Enact a statewide commercial PACE and Pay As You Save programs
6. Design tariffs that provide accurate price signals to demand-side resources about costs and value to the grid (e.g. more robust Time of Use (TOU) pricing and/or Real Time Pricing)
7. Improve interconnection processes
8. Identify optimal locations for distributed generation based on current grid infrastructure
9. Upgrade electric grid to accommodate more DERs
10. Develop a local government supported green energy bank
11. Implement compensation tariffs for DERs such as a Value of DER tariff

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Breakout Activity on Prioritized Customer Choice and Economic Development Recommendations

Rocky Mountain Institute

Building Out Recommendations

1. Which values does this recommendation address? What other challenges does this recommendation help solve?
2. What does implementation of this recommendation look like? What are the action items?
3. What are the entities responsible for implementation and how do they correspond to each action item?
4. What would success look like in the near- and long-term?
5. What metrics or data would need to be collected to track whether we're succeeding?

Building Out Recommendations

- **Values**:
  - Environment & Carbon Reduction
  - Reliability
  - Affordability
  - Efficiency
  - Economic/Job Growth
  - Environmental Justice
  - Utility Compensation Aligned with Public Interest
  - Equity
  - Public Health
  - Resiliency
  - Innovation

- **Potential Responsible Entities:**
  - Governor, Legislature, NCUC, DEQ, North Carolina Community Action Association (NCCAA), NC Department of Health and Human Services (DHHS), Local Gov, North Carolina Electric Membership Corporation (NCEMC), Commerce, North Carolina Office for Recovery and Resiliency (NCORR), Higher Education, Utilities, etc.

- **Near-term = 1-3 years; Longer-term = 3+ years**

LUNCH UNTIL 1:10

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Prioritization of Carbon Reduction and Resilience Recommendations

Rocky Mountain Institute

Prioritization Activity

- Choose two recommendations for *Carbon Reduction and Resilience* and write on two index cards
- Pass around pairs of index cards until the alarm rings.
- When the alarm rings, stop and read the two cards you have and individually rate the recommendation on each card with a score of **1 to 5 for how important it is to include this recommendation in the Clean Energy Plan**

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Carbon Reduction and Resilience Recommendations

- Update the State Energy Assurance Plan to reflect 1) existing reporting requirements (fed, state, local, etc.) to reduce redundancies. 2) cybersecurity concerns and publicly available data
- Coordinate resilience planning with DROC (disaster recovery operations center) and require NC Emergency Management's Recovery Support Functions to address cybersecurity concerns in conjunction with energy resiliency issues.
- Develop an active energy Resilience Planning Resource to assist local governments and disadvantaged communities
- Use defense in depth or a layered grid approach to increase reliability and improve resilience
- Develop a system that formalizes how to quantify human costs of power outages
- Create pilots that offer DER & community energy solutions and microgrids at state facilities an critical facilities (e.g., emergency responder stations, public shelters, medical facilities)
- Set carbon mass cap on the electric power sector for 2030, 2040 and 2050
- Require addition of carbon pricing when considering least cost resources for IRP
- Increase renewable energy and energy efficiency targets in state renewable portfolio standard for 2030.
- Use innovative rate design to encourage customer behavior that helps achieve clean energy goals, such as "clean peak" generation and storage deployment
- Evaluate benefits and disadvantages of establishing an instate carbon (GHG) emissions trading program or NC joining a regional carbon (GHG) emissions trading program
- Incorporate GHG scoring for state funded projects (e.g. State Transportation Improvement Program, Clean Water State Revolving Fund, Drinking Water State Revolving Fund)
- Develop implementation pathways for policy measures identified in a study currently underway that will determine the extent and location of available biogas/biomethane resources in the state and the percentage of NC's GHG reductions that can be met with biomethane
- Facilitate renewable natural gas (RNG) transport to end users and buyers to accelerate development / accelerate GHG reductions from in-state biomethane sources
- Create technical support services for biomethane development, particularly for suppliers who own the waste but are not engaged in biomethane production for their primary income.
- Conduct an analysis of the costs and benefits of using electrification to reduce energy burden and GHG emissions in consumer end-use sectors in NC, such as in homes, buildings, transportation and agriculture sectors
- Develop rate structures that help make charging EVs economic and encourage off-peak charging of vehicles (e.g. time of use pricing)
- Amend building codes and standards to support EV adoption
- Increase the use of EVs in public transportation and evaluate options for transitioning public transit, public and private fleet transportation, and other modes of transport to higher utilization of EVs.
- Increase electric transportation access for low-income consumers.
- Adopt EV bulk purchasing programs to address EV adoption obstacles
- Adopt procurement policies for all state agencies to purchase a certain number of EVs based on operational and economically feasible options for the agency.
- Encourage public and private entities to promote EV adoption by offering EV charging infrastructure at the workplace.

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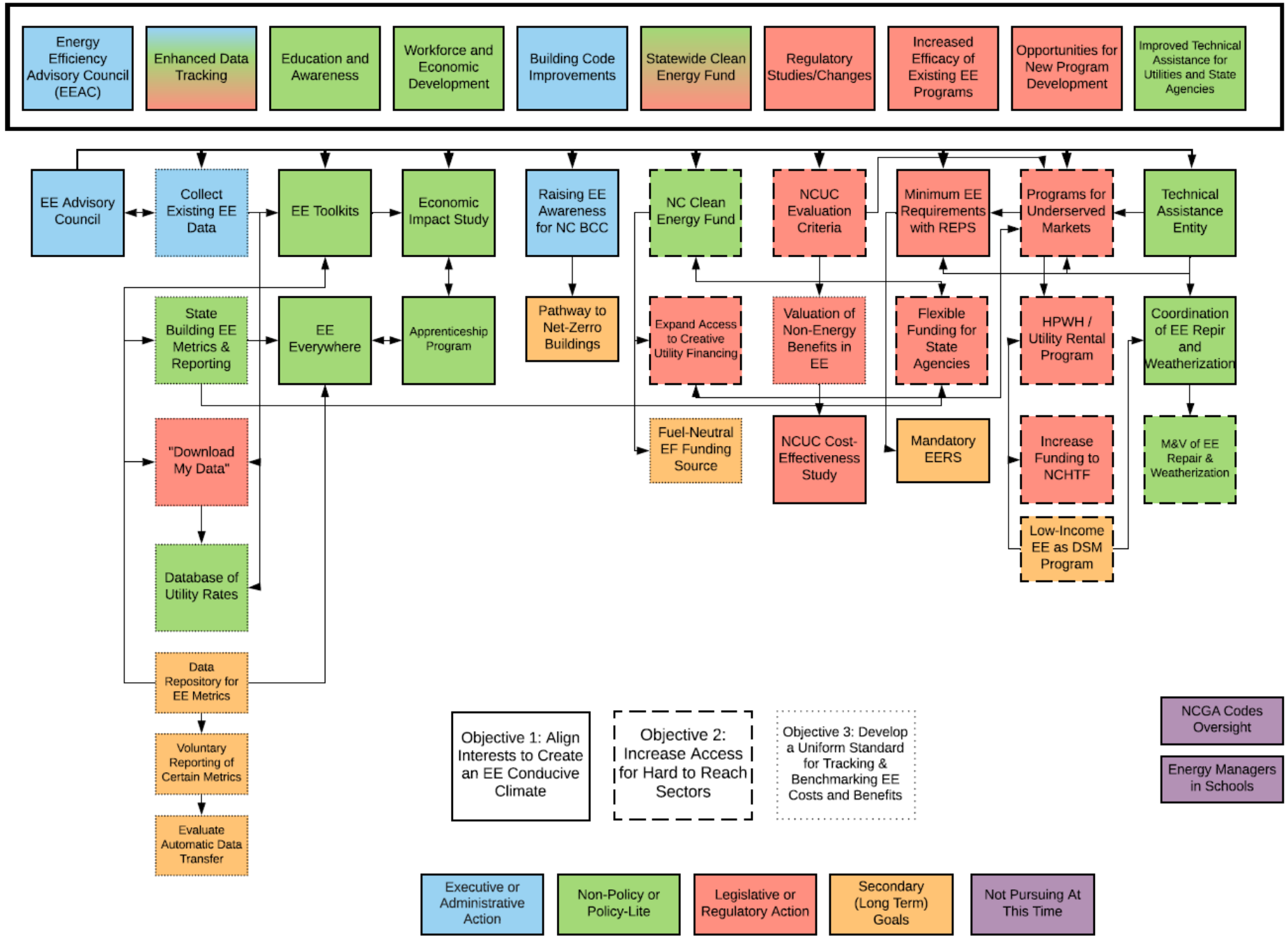
Group Exercise on Energy Efficiency Recommendations

Rocky Mountain Institute

FOCUS AREAS


Energy Efficiency Advisory Council (EEAC)
Enhanced Data Tracking
Education and Awareness
Workforce and Economic Development
Building Code Improvements
Statewide Clean Energy Fund
Regulatory Studies/Changes
Increased Efficacy of Existing EE Programs
Opportunities for New Program Development
Improved Technical Assistance for Utilities and State Agencies
EE Advisory Council
Collect Existing EE Data
EE Toolkits
Economic Impact Study
Raising EE Awareness for NC BCC
NC Clean Energy Fund
NCUC Evaluation Criteria
Minimum EE Requirements with REPS
Programs for Underserved Markets
Technical Assistance Entity
State Building EE Metrics & Reporting
EE Everywhere
Apprenticeship Program
Pathway to Net-Zerro Buildings
Expand Access to Creative Utility Financing
Valuation of Non-Energy Benefits in EE
Flexible Funding for State Agencies
HPWH / Utility Rental Program
Coordination of EE Repir and Weatherization
"Download My Data"
Fuel-Neutral EF Funding Source
NCUC Cost-Effectiveness Study
Mandatory EERS
Increase Funding to NCHTF
M&V of EE Repair & Weatherization
Low-Income EE as DSM Program
Database of Utility Rates
Data Repository for EE Metrics
Voluntary Reporting of Certain Metrics
Evaluate Automatic Data Transfer
Objective 1: Align Interests to Create an EE Conducive Climate
Objective 2: Increase Access for Hard to Reach Sectors
Objective 3: Develop a Uniform Standard for Tracking & Benchmarking EE Costs and Benefits
NCGA Codes Oversight
Energy Managers in Schools
Executive or Administrative Action
Non-Policy or Policy-Lite
Legislative or Regulatory Action
Secondary (Long Term) Goals
Not Pursuing At This Time

Energy Efficiency Recommendations

Which 1-3 recommendations do you see as having the most impact on achieving the CEP's vision?

The vision for NC's energy future:

- Is an energy system that is clean, equitable, modern, resilient, and efficient; in addition to being safe, affordable, and reliable,
- Increases deployment of both grid scale and distributed energy resources such as solar, energy efficiency, battery storage, wind, electrification, and other innovative technology solutions, and
- Gives customers more options and control over their energy use and supply, provides equitable access to renewable energy and energy efficiency opportunities, and offers fair rates for these services.

Energy Efficiency Recommendations

What recommendations related to energy efficiency are missing from this list?

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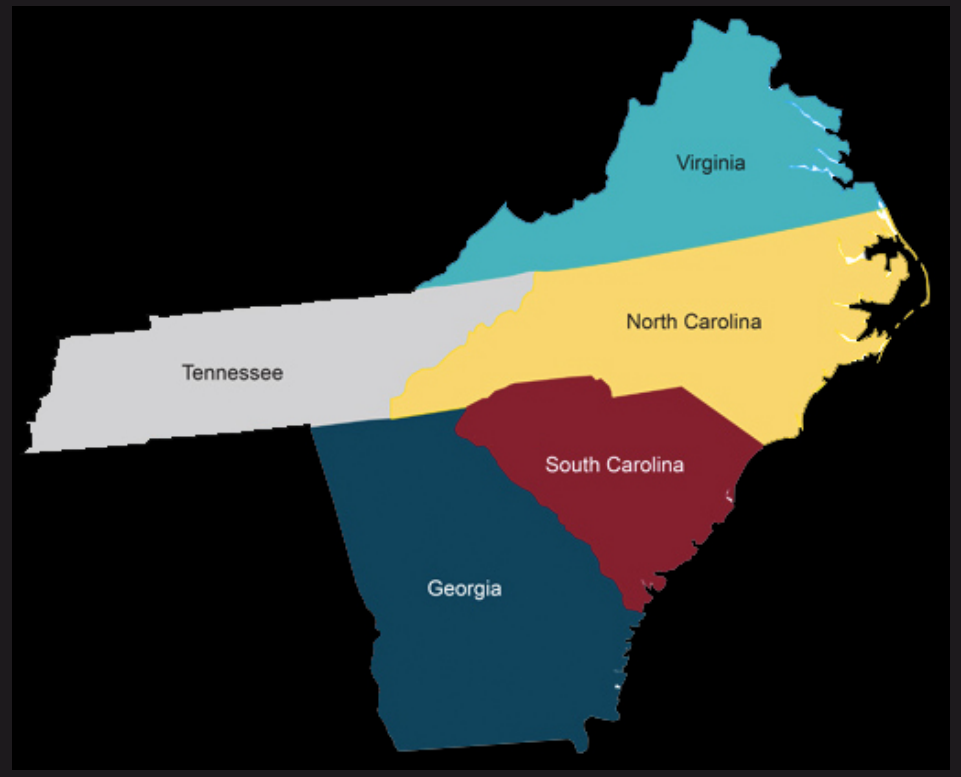
Clean Energy Plan Development

Other Collaborative Efforts Informing the Clean Energy Plan

David Doctor, Southeast Energy Innovation Collaboration (SEIC)

E4 Carolinas

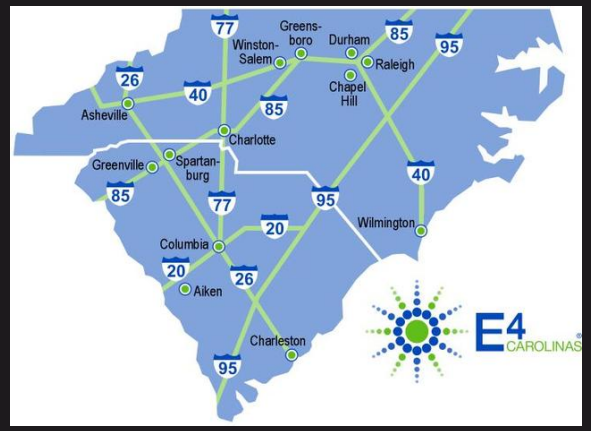


Believed to be the largest and most diverse in the United States:

An Innovation Leader

North Carolina's Energy Economy

The Key to Southeast Energy Innovation Leadership



E4 Carolinas

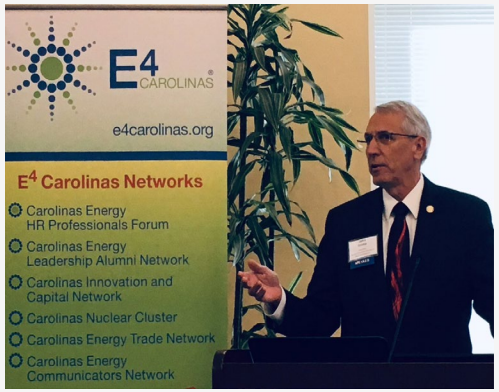
- Trade association for **ALL** Carolina energy
- 140+ full members/118 associate members
  - All North Carolina utilities are members
- Creating value for Carolina Energy Economy
  - Economic Development
  - Innovation
  - Policy
  - Networking
  - Workforce

• Energy • Economy • Environment • Efficiency •

Economic Development

SOUTHEAST ENERGY INNOVATION COLLABORATIVE

Innovation



Policy

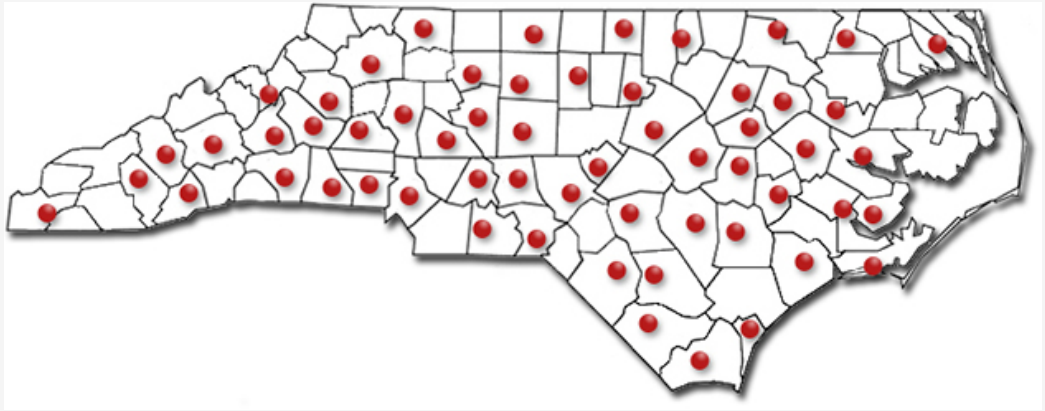
Networking

Workforce

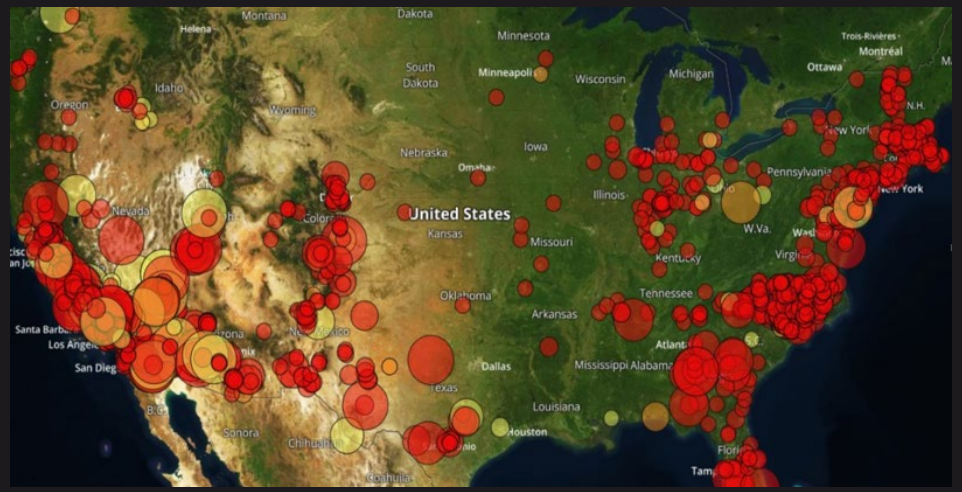
Energy Research Leadership

Energy Research & Education

- U.S. leading energy research universities
  - NC investments in energy research
  - Emerging research areas
- Community College – industry support

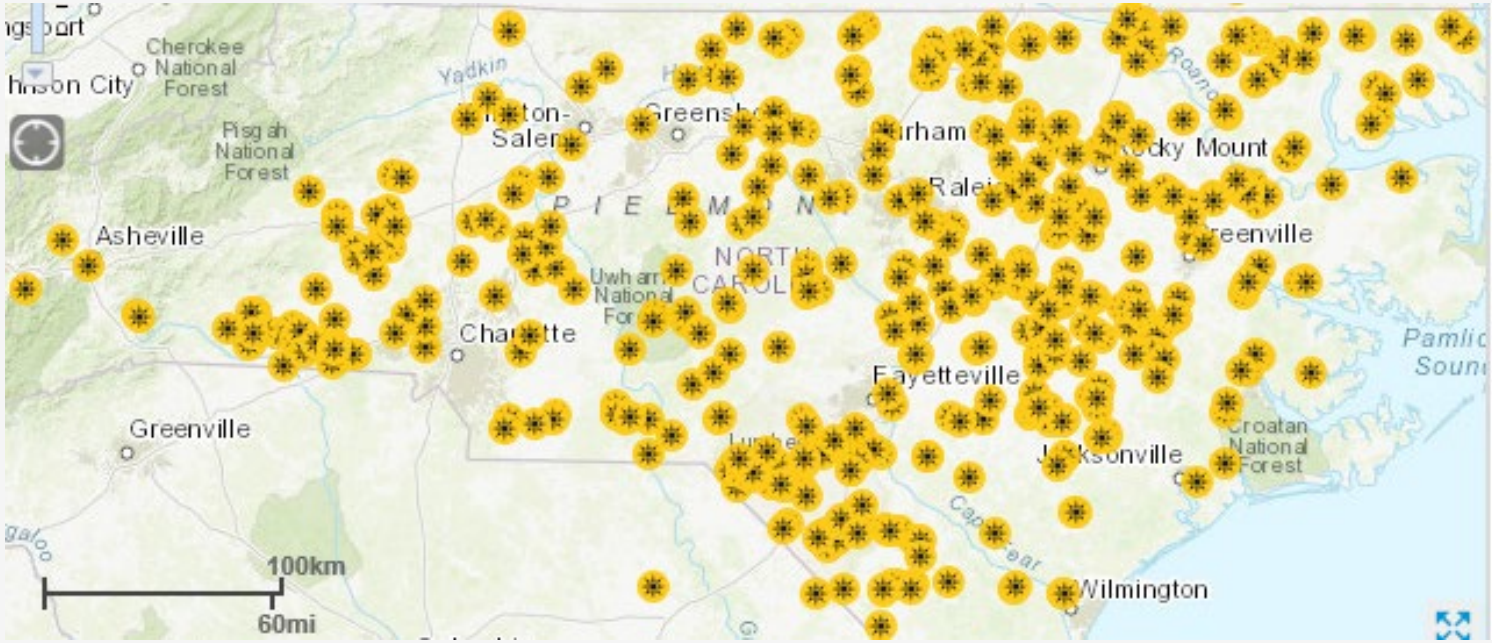


Solar Energy Leadership



A national and global solar energy leader

- Policy built an industry
- Second in U.S. solar generating capacity
- 589,000 MWh consumed (5.4% of NC supply)
- 5,220 MW generating capacity (~31% load factor)
- 512 grid scale solar installations (1 MW+ 12/31/17)
- 3,357 MWh of grid scale solar
- 1,843 MWh smaller/most "behind the meter"



Nuclear Energy Leadership

A national and global nuclear energy leader

- Policy built an industry
- Sixth in U.S. nuclear generating capacity
- 3,875,000 MWh consumed (35.4% of NC supply)
- 7,424 MW generating capacity (~92% load factor)
- 4 plants with 7 reactors
- Leading nuclear workforce and service industry

State	Dec. 2018 MW Capacity	% of US Total Nuclear MW	% of State Power MW
Illinois	8,855	12.4%	57%
Pennsylvania	7,626	10.6%	39%
South Carolina	4,510	6.3%	56%
New York	3,988	5.6%	35%
Alabama	3,952	5.5%	33%
North Carolina	3,875	5.4%	35%

Manufacturing & Engineering

- Global leading manufacturers
- Global leading EPC companies

Energy Manufacturing & Engineering Leadership

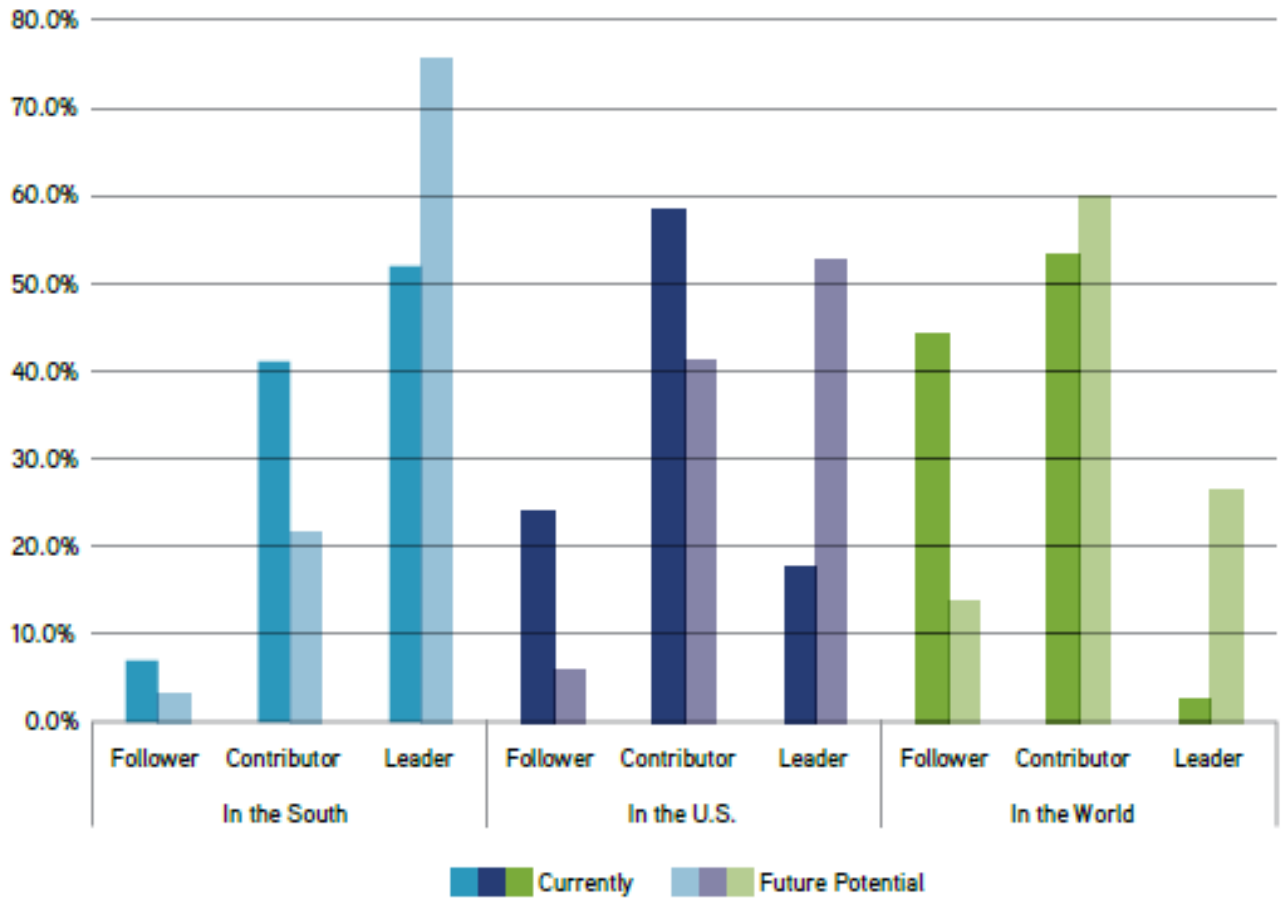
McDERMOTT
SIEMENS
wood.
B&W
Itron
framatome
ZACHRY
BURNS McDONNELL
TOSHIBA Leading Innovation
HDR
sensus a xylem brand
GE HITACHI
ABB
IR Ingersoll Rand
BLACK & VEATCH Building a world of difference
AECOM
Westinghouse
ATKINS Member of the SNC-Lavalin Group
FLUOR

Energy Innovation Initiative

- 2 year collaboration with NC DOC Office of Science, Technology & Innovation
- 2018 Southeast Energy Industry Study
- 2019 Carolina Energy Economy Findings & Recommendations

2017 Study Findings

Figure 6: Current and Future Potential Rankings of the Carolinas' Energy Innovation Assets to Other Areas



Energy Innovation Initiative

- 2 year collaboration with NC DOC Office of Science, Technology & Innovation
- 2017 Southeast Energy Industry Study
- 2018 Carolina Energy Economy Findings & Recommendations

2018 Report Recommendations

1. Convene Stakeholders Meeting
2. Establish a Director of Energy Resources
3. Report on Stakeholder Recommendations
4. Identify and Fill Gaps in Carolinas' Energy Innovation Ecosystem
5. Attract Investors, Practitioners and Customers

Energy Innovation Initiative

- 50+ energy innovation professionals
- All energy sectors/supply chain members
- Issues/solutions summits + work groups

Issues and Solutions Summits

Issues Summit – 10/25/18

- Steering Committee formed; Summer 2018
- 50+ energy professionals convened
- All energy sectors/supply chain members represented
- Five Working Groups established
- 12 issues in need of solution identified

Solutions Summit – 1/31/19

- 12 solutions presented and prioritized
- Draft plan organized by OSTI and E4 Carolinas

Energy Innovation Initiative

- 2 year collaboration with NC DOC Office of Science, Technology & Innovation
- Energy innovation essential to sustaining our clean energy economy

Next Steps to Energy Innovation Leadership

- **Create Energy Innovation Asset Inventory**
- **Establish Forum for Energy Leadership and Vision**
- **Foster Energy Sector Collaboration**
- **Increase Energy Innovation Branding**

Energy Innovation Initiative

- 2 year collaboration with NC DOC Office of Science, Technology & Innovation
- Sustained energy innovation essential to sustaining our clean energy economy

Sustaining Steps to Energy Innovation Leadership

- Build Common Metrics and Reporting Tools
- Assess Energy Workforce Needs
- Support Energy Innovation with Market Signals
- Develop Integrate Energy Infrastructure Technology Roadmaps
- Foster Energy Entrepreneurship
- Ensure Transmission and Distribution System Resilience and Security
- Drive Collaboration Between Community Colleges & Universities
- Increase Consumer Access and Awareness

Energy Innovation Initiative

- 2 year collaboration with NC DOC Office of Science, Technology & Innovation
- Energy Innovation Pathway Implementation

The Pathway to Energy Innovation Leadership

- **Plan draft review by Working Groups in August 2019**
- **NC DOC and E4 Carolinas publishes plan September 2019**
- **Working Groups facilitate Next Steps implementation**
- **Funding for Inventory development and Branding program**

Energy Innovation & Policy Fuel Economic Development

- Increased products & services sold
- Job growth
- New ventures created
- New companies attracted to NC

Energy Innovation Leadership

Examples – North Carolina Solving World Energy Problems

Net Power (Durham) – Developer of revolutionary carbon-capture power generation technology, based on the Allum Cycle

Albemarle (Charlotte) – A world leader in the development and distribution the lithium chemicals and products essential for devices and EVs

Atom Power (Charlotte) – Developer of the world's first solid state circuit breaker, which makes structure's electrically safe and programmable

NuScale Power (Wilmington/Charlotte) – recipient of over $50 million in DOE funding for a leading SMR design.

Tokai Carbon (Charlotte) – The nation's leader in developing and distributing of carbon and graphite products essential for Li-on batteries

Ingersoll Rand (Davidson) – A global leader in building efficiency and energy storage technologies

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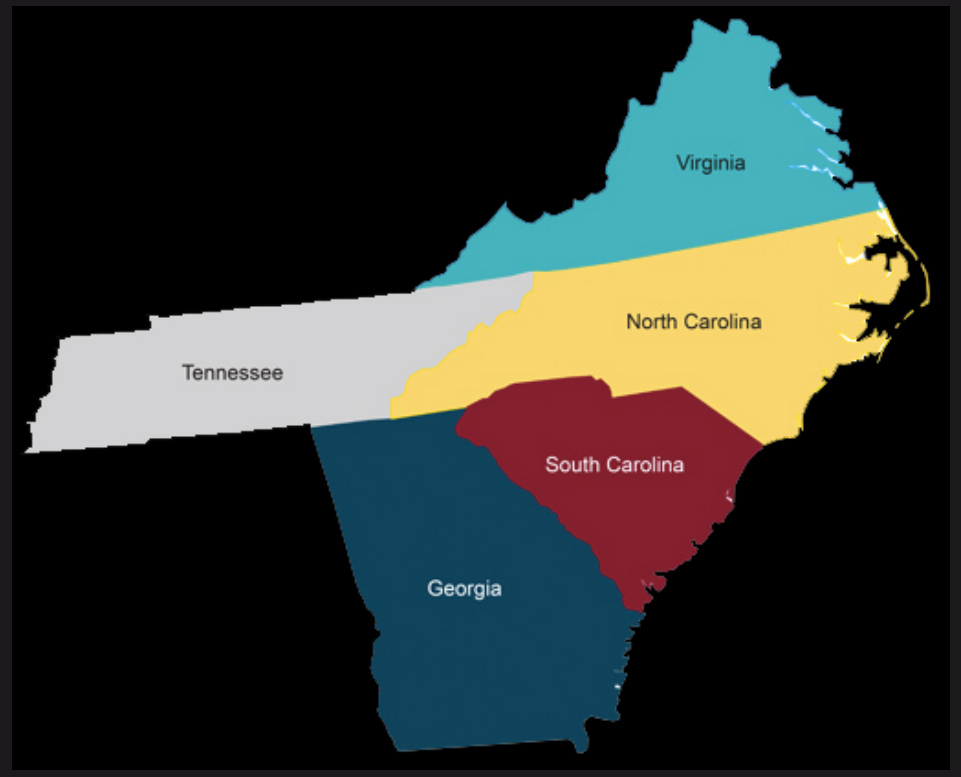

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Check-Out

What is one thing that you will be taking away from this process?

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Next Steps
NC DEQ