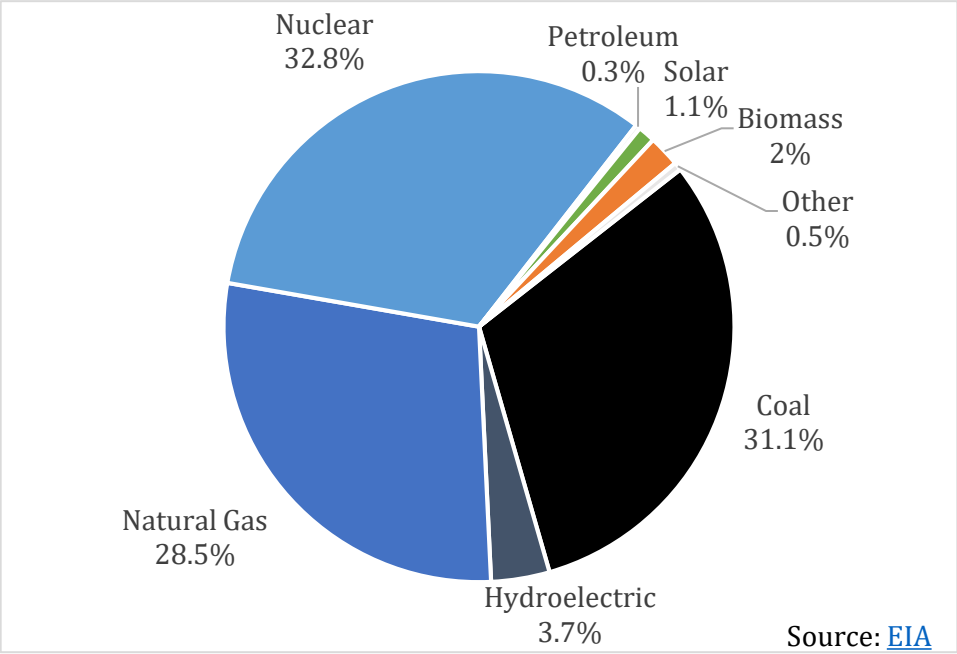
State Brief: North Carolina

Background

North Carolina's energy mix is dominated by nuclear, coal, and natural gas. A seven member, bi-partisan Utilities Commission serves the state. The state is under divided government, with Republicans in control of both legislative chambers and recently elected Democrat Roy Cooper in the Governor's office.

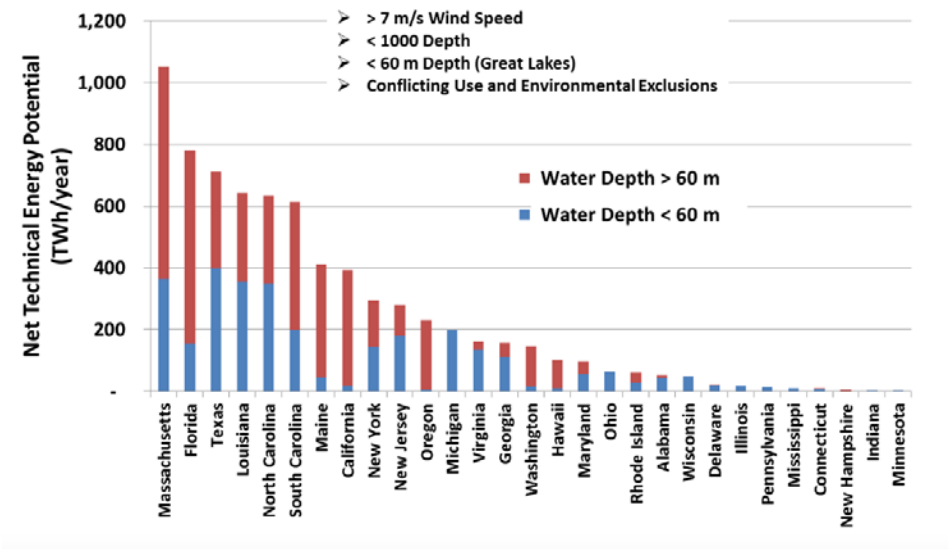
The state has been a clean energy leader in the Southeast and this thriving sector is expected to grow. While the contribution of solar to North Carolina's energy mix has increased, progress has been slower with wind development. However, the state's first wind farm was completed in February.

North Carolina's Energy Mix



Source: EIA

A recent study from the U.S. Department of Energy assessing the nation's off-shore wind energy potential rates North Carolina as a leading state – particularly when looking at depths of less than 60 meters (see below). This may be seen as an opportunity to add to the state's considerable manufacturing capacity since no large wind companies have yet to establish off-shore wind manufacturing in North America. A 2013 study for the DOE examined the supply chain requirements for off-shore wind manufacturing facilities.



Policy Strengths and Opportunities[1]

An important framework for policymakers to consider, the notion of "policy stacking" [2] was developed at the National Renewable Energy Laboratory (NREL). The basic idea behind policy stacking is that there is an interdependency and a sequencing of state policy that, when done effectively, can yield greater market certainty, private sector investment, and likelihood of achieving stated public policy objectives.

[1] For more information on policy opportunities, please visit the SPOT for Clean Energy. For more information on specific policy actions related to these opportunities, please review the *Clean Energy Policy Guide for State Legislatures*.

[2] V.A. Krasko and E. Doris, *National Renewable Energy Laboratory*, 2012. Strategic Sequencing for State Distributed PV Policies: A Quantitative Analysis of Policy Impacts and Interactions. http://www.nrel.gov/docs/fy13osti/56428.pdf.

In theory, but not always in practice, clean energy policies can be categorized into one of three tiers of the policy stack. Tier 1, Market Preparation Policies, remove technical, legal, regulatory, and infrastructure-related barriers to clean energy technology adoption. Tier 2, Market Creation Policies, create a market and/or signal state support for clean energy technologies. Tier 3, Market Expansion Policies, create incentives and other programs in order to expand an existing clean energy market by encouraging or facilitating technology uptake by additional market participants.

A simple example, before financial incentives for combined heat and power (CHP) will be successful, two key considerations for deployment are having clear interconnection standards and favorable stand-by rates for customers who opt to add CHP. In this example, policies to address interconnection and stand-by rates should be adopted before financial incentive programs are implemented.

Clean Energy Financing

Distributed generation (DG) provides localized generation that serves a specific part of the grid. It may include generation serving a specific residence or business, a neighborhood, or a region served by a substation. DG has the benefit of reducing stress on large transmission infrastructure by providing distribution level power (as opposed to central generation). Because small-scale renewable energy systems require large upfront investments, overcoming the upfront cost barrier is arguably the biggest challenge to clean energy deployment at the consumer level. Financing is key; and many states provide financing and financial incentives to spur adoption of these technologies.

To promote wide-spread deployment of DG, there are a handful of policy opportunities in North Carolina.

1. Third-Party Financing – Traditional purchases of solar systems require large up-front expenditures. And while North Carolina offers a number of incentives to enable the purchase of solar systems, third-party financing could contribute to additional market growth for this sector. Third-party ownership attempts to address affordability by allowing a system to be purchased by a third party with the generation sold over time to the customer – offsetting the power purchased from a utility. By doing this, the third party can monetize the tax credits, capitalize on commercial benefits like depreciation, and take advantage of large-scale financing at low rates to procure systems at a very low cost – passing on the savings to the consumer in the form of low price per kilowatt hour (kWh) rates that are comparable, and often lower, than established utility rates.

2. Property Assessed Clean Energy (PACE) – PACE is a financing mechanism used by local governments that allows property owners to finance energy efficiency and renewable energy improvements through their property tax payment. The repayment of qualified energy improvements is done via a voluntary property tax assessment collected by local governments, just as other public infrastructure investments are financed. The financing for PACE projects may be provided by municipal bonds or third-party capital secured by the property assessment payments. Repayment responsibility transfers to the next owner if the property is sold. While PACE programs can be designed for both the residential and the commercial markets, residential PACE takes a much more committed and engaged approach on the part of the state. Commercial PACE programs have been expanding rapidly in recent years with a robust market evolving around these programs. State legislative authority must be in place to allow local governments to establish energy financing districts. While PACE enabling legislation was enacted in North Carolina, there are no active programs in the state. To spur residential PACE programs, legislators might consider amending statute to reflect the Department of Housing and Urban Development's (HUD) guidance for determining eligibility for Federal Housing Authority (FHA) insured mortgage financing:
    a. Collection: The PACE obligation is collected and secured by the creditor in the same manner as a special assessment against the property;
    b. Enforcement: The property may only become subject to an enforceable claim (i.e., a lien) that is superior to the mortgage for delinquent regularly scheduled PACE payments. The property shall not be subject to an enforceable claim superior to the mortgage for the full outstanding PACE obligation at any time;

c. Property Transfer: There are no terms or conditions that limit the transfer of the property to a new homeowner. Provisions to require the consent of a third-party prior to conveyance are prohibited, unless these provisions can be terminated at the option of, and with no cost to, the homeowner;
d. Disclosure: The existence of a PACE obligation on a property is readily apparent to all parties to an FHA-insured mortgage transaction in the public records and must show the obligation amount, the expiration date and cause of the expiration of the assessment, and in no case, can default accelerate the expiration date.

3. Green/Infrastructure Bank - A green bank blends public and private capital to fund the upfront cost of clean energy improvements. The intent is to reduce the risk for the investor and to scale the market for projects. Sometimes these banks will attempt to address a limitation in the private lending sector – for example, while most bank commercial loans are 5-10 years, the NY Green Bank extends these terms for 20 years and assumes the risk of the investment on the back end. In this way, the public bank is partnering with the private lending institutions to address barriers for businesses. These entities can be housed within an existing state agency with administrative, rule making, and underwriting authority. North Carolina does not currently have any designated green banks or infrastructure banks. Interested policymakers might be interested in the resources offered by the Coalition for Green Capital.

4. DG and Solar Incentives – North Carolina offers loans, tax credits, and other incentives for solar and DG technologies. To increase the deployment of DG, the state's offerings could be expanded to include additional technologies, including combined heat and power. In addition, through the 2009 American Recovery and Reinvestment Act, states were provided with low interest bond financing for renewable energy and energy efficiency projects through Qualified Energy Conservation Bonds (QECBs). These funds may still be available.

Grid Modernization

In the last two decades, digital technologies have been developed that enable utilities to better manage the grid and also provide opportunities for consumers to customize their services to fit their priorities. These technologies allow a two-way flow of information between the electric grid and grid operators and between utilities and their customers. Emerging technologies improve system reliability and resiliency by enabling better tracking and management of resources.

These technologies allow grid operators to incorporate central and distributed energy resources, energy storage technologies, electric vehicles, and assist in addressing the challenges associated with planning, congestion, asset utilization, and energy and system efficiency. This can make the operational side of the utility more efficient. On the customer's side of the meter, advanced metering infrastructure, dynamic pricing, and other emerging technologies allow an exchange of information and electricity between a consumer and their electric provider. Grid modernization will be associated with greater consumer choice, allowing customers to meet their energy priorities by producing their own energy or to selecting to receive innovative energy efficient or clean energy services from different providers.

Grid modernization efforts compliment other policies such as demand response policies, customer data management, smart metering infrastructure, electric vehicles and others. Policy approaches around grid modernization should be seen as an umbrella to put in place a structure that supports and ties together these other individual policy initiatives.

In terms of state efforts to modernize the grid, North Carolina just missed the top 10 in the latest Grid Modernization Index. North Carolina moved up ten spots from 2014, earning eleventh overall for state support, customer engagement, and grid operations. In March 2016, the North Carolina Department of Environmental Quality released an Energy Policy Council Report that developed a comprehensive strategy for energy development in the state. In addition, Senate Bill 619, which remains in the Senate at the time of this writing, directs the Joint Legislative Commission on Energy Policy to conduct a study of the costs and benefits associated with grid modernization. While the state demonstrates leadership in grid modernization, and in line with the notion of policy stacking, discussed above, there are supportive policies that North Carolina's policymakers could adopt to advance in-state modernization efforts.

1. Customer Data Access – Some utilities in North Carolina have implemented the Green Button program to ease customer access to energy data, however North Carolina does not have clear state policies governing customer data access and privacy protections. To address this, policymakers should develop legislation or rules that, at minimum, do the following: clarify who owns the energy data associated with consumer energy usage; protect customer privacy; outline the process for allowing direct access of data to third parties; promote access to the highest resolution of data by third parties.

2. North Carolina's renewable portfolio standard (RPS) could be updated and increased to contribute to a modernized grid.

3. Currently, North Carolina does not have a requirement for energy storage. Improvements to the state's energy storage policies (see below) would enhance efforts to modernize North Carolina's grid. Enhancing clean energy financing (above) and electric vehicle policies (below), would likewise improve the chances of successful grid modernization.

Energy Storage

Energy storage offers a unique opportunity to dynamically manage supply and demand to maximize the value of grid resources. By deploying storage in strategic locations, utilities can more effectively manage their energy portfolios. First, storage can dispatch power to better integrate intermittent resources like renewable energy. Second, it provides management of intermittent demand – helping to flatten peak demand requirements for the utility. Third, the responsiveness of energy storage can allow the utility to implement voltage regulation and other ancillary services, useful for improving system efficiency. Finally, energy storage can help the commercial sector avoid costly "demand charges." As utilities around the country consider extending demand charges to the residential sector, this will become an even more important issue.

Storage provides multiple benefits to both the customer and the utility. State planning and regulatory policies can help maximize these benefits through a combination of 1) establishing a framework for easy integration of energy storage into the grid and 2) establishing a marketplace that monetizes the benefits of energy storage for cost effective investment.

North Carolina does not have a procurement target or goal for energy storage. However, utilities in the state are actively pursuing energy storage technologies and developing storage projects. For instance: In November of 2016, Duke Energy proposed a solar and battery storage project to power a remote communications tower in the Great Smoky Mountains National Park.

There are a number of policy opportunities to take advantage of the growing technological advances and declining costs within the energy storage sector.

1. The state received an "A" for interconnection rules in the latest Freeing The Grid report. However, the state can advance efforts to link distributed systems by extending interconnection standards to municipalities and electric co-operatives. The best practices for interconnection could be established in statute, or legislation could provide an instruction to the NCUC to implement these best practices.

2. Instruct the utilities commission to evaluate the value of energy storage in multiple strategic locations across the utility system and consider a requirement to deploy storage where it will be cost effective, or identify the price point at which it will be cost effective. The Sound Energy and Renewables Policy Act (HB 909) provides for an energy storage study to be completed by the end of 2018 (as of July 2017, the bill remains in the House).

3. Policymakers can require the inclusion of energy storage as a critical piece of the energy system as both a demand and supply management resource. Some states have required utilities to evaluate the cost effectiveness of "non-wires" alternatives (NWAs) to large generation investments that are more traditional utility avenues for meeting demand. Or, states may want to require utilities to develop a distribution investment plan that identifies the locations on the distribution system where energy storage or other distributed resources would offer the system the greatest value.

4. Provide incentives for customers to purchase storage to both manage load and store locally produced renewable energy. Allow utilities that provide incentives to customers to install smart meters that enable dynamic energy management from multiple distributed battery systems.

5. Clear data access policies that allow third parties to provide energy management services based on signals from the utility can greatly increase the value of efforts to monetize the value stream offered by energy storage.

6. Provide an option for utility customers (targeted at commercial users) to pay an additional charge to be included in a "high reliability zone" provided through a combination of distributed generation and energy storage – forming a utility integrated "microgrid".

7. Provide financing for commercial businesses to install energy storage to reduce their demand charges.

8. For existing financial incentive programs, energy storage may be included as an incentivized energy resource. Policymakers might start first with a policy to incentivize those who have solar systems, along with a utility incentive that will allow the utility to maximize the benefit of solar by aligning solar resources with peak load.

Electrification of the Transportation Sector

One of the most important barriers to increased adoption of electric vehicles (EVs) is their higher up-front cost as compared to a similar conventionally-fueled vehicle. In addition, there has been a complicated relationship between increased adoption of EVs and the availability of EV charging stations. Put simply, consumers want to be sure their car will get them where they need to go. The good news is that both supportive policies for developing charging infrastructure and technological advancements have eased "range anxiety." For instance, the most recent GM Bolt has an estimated range of 240 miles.

North Carolina is in a good position to explore the potential for new incentives or credits related to electric vehicles (EVs) or residential EV supply equipment (EVSE). Policy could be updated to further encourage and prepare for increased market penetration of EVs.

1. Charging Infrastructure Plan – Locating charging infrastructure is different than locating conventional fueling stations. For the most part, EVs are cars used for commuting and local trips. Furthermore, while one fuels a conventional vehicle when they are going somewhere, stopping at a gas station for the specific purpose of filling up, a driver of an EV is generally looking to refuel when they are stopping somewhere: when going shopping, going into a restaurant, or going to work. Charging infrastructure plans should target these types of locations and attempt to pair the appropriate level of charging infrastructure with a reasonable amount of time a person may be stopped at that location. Legislation could direct a state agency to develop such a plan through a stakeholder process.

2. Parking Infrastructure Requirements – In tandem with the development of a state-wide plan, legislation could set requirements for EV parking infrastructure. Some states have adopted permitting standards for parking lots, requiring, for instance, that for every 100 parking spaces, one EV charging spot must be provided.

3. EVSE Financing and Financial Incentives – The provision of financial incentives and innovative financing options can increase installations of charging stations. States have adopted a number of financial incentives including income and property tax credits, sales tax credits, low-interest loans, grants, and rebates. A handful of states qualify EV charging stations under their property assessed clean energy (PACE) programs.

4. EV Financing and Financial Incentives – Financial incentives and innovative financing options can also help spur greater market penetration of EVs. Sales and income tax credits are one of the simplest methods for addressing higher up-front costs. While sales tax credits are typically applied at the time of purchase, income tax credits may do less to address the upfront cost barrier as receipt of the credit is typically removed in time from the purchase. However, study by the Congressional Budget Office suggests that tax credits are important tools for ensuring increased adoption of alternatively-fueled vehicles. To increase the value of the incentive, some states offer transferrable tax credits, allowing the savings to be applied by the dealership at the time of

sale. States have also adopted a number of other financial incentives including low-interest loans, grants, vouchers, and rebates.

2017 Energy-Related Legislation Introduced by Attendee

Bill Number	Bill Summary	Bill Status	Sponsor
HR 17-401	The State of North Carolina should establish a transition from a fossil fuel-based economy to one hundred percent (100%) clean renewable energy for all energy sector economies, by December 31, 2050, to avoid climate catastrophe, to promote job creation and economic growth, and to protect the earth for current and future generations from climate catastrophe.	Introduced	Harrison
HB 17-427	Requires NC's utilities commission to pursue measure to make clean energy sources more affordable, by 1) establishing tiered electricity rates, 2) creating an energy efficiency bank, and 3) incentivizing customers to buy energy star certified.	Introduced	Harrison
HB 17-567	To study adverse impacts on drinking water of residents in divided neighborhoods surrounding coal combustion residuals surface impoundments.	Introduced	Harrison
HB 17-574	To better ensure compatibility of wind energy facilities with military operations and readiness.	Introduced	Harrison
HB 17-616	The North Carolina Public Benefit Corporation Act	Introduced	Harrison
HB 17-687	To amend various provisions related to coal ash cleanup.	Introduced	Harrison
HB 17-721	Prohibits the purchase of use or coal extracted from mountaintop removal by units, imposes a carbon-neutral requirement on new coal plants, and provides for the state divestment of state investments in the coal sector,	Introduced	Harrison
HB 17-786	The Energy and Water Efficient Schools Act. Requires reporting and benchmarking of energy/water performance of education facilities, and provides for a revolving loan fund.	Introduced	Harrison
HB 17-811	Allows state agencies to redirect energy savings to finance energy/water efficiency projects.	Introduced	Harrison
HB 17-848	To provide that school systems derive sixty percent of their energy needs from renewable energy by 2030.	Introduced	Harrison

News

- February 9th, 2017: Amazon Wind Farm US East Completed in North Carolina.
- April 18th, 2017: A Divide Emerges Among North Carolina Republicans on Wind Energy.
- June 6th, 2017: Solar Reform Bill Sailing to N.C. House Floor Vote Wednesday.
- June 6th, 2017: Consensus Bill Proposes Bidding Process for N.C. Solar Development.
- June 7th, 2017: Bill That Creates 'Fundamental Shift' in North Carolina Solar Policy Moves Forward.

Other Resources

- NC Sustainable Energy Association, Policy Engagement: https://energync.org/filings/
- North Carolina State University: http://ncsustainabilitycenter.org/news/clean-energy-creates-jobs-in-nc
- Research Triangle Park: http://environmentrtp.org/news/new-report-shows-clean-energy%E2%80%99s-positive-impact-north-carolina%E2%80%99s-economy-and-utility-rates
- Southeast Clean Energy Industry Census: http://www.cleanenergyindustry.org/
- The American Council for an Energy-Efficient Economy State and Local Policy Database, North Carolina: http://database.aceee.org/state/north-carolina
- The Database of State Incentives for Renewables and Efficiency, North Carolina: http://programs.dsireusa.org/system/program?state=NC
- U.S. Energy Information Administration, North Carolina: https://www.eia.gov/state/?sid=NC
- SPOT for Clean Energy, North Carolina: https://spotforcleanenergy.org/state/north-carolina/