Energy Policy Council
2024 Biennial Report

A Report to the: North Carolina Governor,
Speaker of the North Carolina House of Representatives,
President Pro Tempore of the North Carolina Senate,
Environmental Review Commission,
Joint Legislative Commission on Energy Policy, and
Chair of the Utilities Commission.

October 21, 2024
Public Comment

This page is intentionally left blank.

Transmittal Page

Pursuant to N.C.G.S. §113B-12, this comprehensive report providing a general overview of the energy conditions of the State of North Carolina is hereby transmitted to the Governor, the Speaker of the North Carolina House of Representatives, the President Pro Tempore of the North Carolina Senate, the Environmental Review Commission, the Joint Legislative Commission on Energy Policy, and the Chair of the Utilities Commission.

Respectfully submitted,

_____

Mark Robinson, Lieutenant Governor

Chair, Energy Policy Council

This page is intentionally left blank.

Table of Contents

Appendices

This page is intentionally left blank

List of Abbreviations

ASCE	American Society of Civil Engineers
Btu	British thermal units
CHP	combined heat and power
CO_2	carbon dioxide
C-PACE	Commercial Property Assessed Capital Expenditure
CPCN	Certificate of Public Connivence and Necessity
CPRE	Competitive Procurement for Renewable Energy Program
cu ft	cubic feet
PACE	Property Assessed Capital Expenditure
DEC	Duke Energy Carolinas
DEP	Duke Energy Progress
DEQ	North Carolina Department of Environmental Quality
EA	energy assurance
ECPA	Energy Conservation and Policy Act
EE	energy efficiency
EEC	Energy Efficiency Certificate
EERS	Energy Efficiency Resource Standard
EI	energy infrastructure
EIA	Energy Information Administration
EO	Executive Order
EPC	North Carolina Energy Policy Council
EV	electric vehicle
FERC	Federal Energy Regulatory Commission
GHG	greenhouse gases
GW	gigawatts
HB	House Bill
HERO	High Efficiency Residential Option
HERS	Home Energy Rating System
IIJA	Infrastructure Investment and Jobs Act
IRA	Inflation Reduction Act
IRP	Integrated Resource Plan
ISOP	Integrated System and Operations Planning

kg/MWH	kilogram per megawatt-hour
kWh	kilowatt-hour
lb/MWH	pound per megawatt-hour
MMBtu	million British Thermal Unit
MMT	million metric ton
MW	megawatt
MWh	megawatt-hour
NASEO	National Association of State Energy Officials
NCBCC	North Carolina Building Code Council
NCDHHS	North Carolina Department of Health and Human Services
NCDOI	North Carolina Department of Insurance
NCDOT	North Carolina Department of Transportation
NC-RETS	North Carolina Renewable Energy Tracking System
NCUC	North Carolina Utilities Commission
NERC	North American Electric Reliability Corporation
NO_X	oxides of nitrogen
PV	photovoltaic
RE	renewable energy
REC	Renewable Energy Credit
REPS	Renewable Energy and Energy Efficiency Portfolio Standard
RNG	renewable natural gas
SEEM	Southeastern Energy Exchange Market
SERC	SERC Reliability Corporation
SHEA	Southeast Hydrogen Energy Alliance **SO_2** sulfur dioxide
U.S.	United State of America
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
USI	Utility Savings Initiative
WAP	Weatherization Assistance Program
ZEV	zero-emissions electric vehicles

1. Energy Policy Council Overview

1.1 Overview of the Energy Policy Council

Under the North Carolina Energy Policy Act of 1975[1], the General Assembly determined that energy is essential to the health, safety, and welfare of the people of this State and to the workings of the State economy. It further recognized that it is in the State's best interest to support the development of a reliable and adequate supply of energy for North Carolina that is secure, stable, and predictable in order to facilitate economic growth, job creation, and expansion of business and industry opportunities. The Act created the Energy Policy Council ("Council") to advise the Governor and the General Assembly about legislation and regulations to protect the environment, advance domestic energy exploration and development, and encourage economic development in North Carolina. The Council's responsibilities include the preparation of comprehensive energy policy that addresses present and future energy needs while positioning North Carolina and the nation toward achieving energy independence.

Members of the Council possess expertise in research and policy, the utility industry, environmental management, and a diverse suite of energy resources and delivery practices. The Council also develops contingency and emergency plans to address possible energy shortages in order to protect the public's health, safety, and welfare, and makes recommendations about energy efficiency and conservation programs. The Council is an independent body that is supported by staff in the North Carolina Department of Environmental Quality.

Pursuant to Chapter 113B of the North Carolina General Statutes, the Council's responsibilities include;

- Developing a comprehensive State Energy Policy for the Governor and the General Assembly that addresses energy requirements in the short- (10 years), mid- (25 years), and long-term (50 years) in order to achieve maximum effective management and use of present and future sources of energy,
- Conducting an ongoing assessment of the opportunities and constraints presented by various uses of all forms of energy to facilitate the expansion of domestic energy supplies and to encourage the efficient use of energy,
- Reviewing and coordinating energy-related research, education, and management programs that inform the public, and actively engage in discussions with the federal government to identify opportunities to increase domestic energy supply within North Carolina and its adjacent offshore water,
- Recommending to the Governor and the General Assembly, legislation, rulemaking, and any necessary modifications to energy policy, plans, and programs,
- Recommending an energy efficiency program that is designed to protect the public health and safety of the citizens of North Carolina, and considering the conservation of energy

[1] North Carolina Energy Policy Act of 1975, North Carolina General Statues § 113B-1, https://www.ncleg.gov/EnactedLegislation/Statutes/HTML/ByChapter/Chapter_113B.html

through reducing wasteful, inefficient, or uneconomical use of energy resources, and

- Developing contingency and emergency plans to protect the public from possible shortages of energy, to be compiled into an emergency energy program.

In order to fulfill its statutory directives, the full Council meets quarterly. In addition, there are four committees of the Council, which include

- Energy Infrastructure,
- Energy Innovation,
- Energy Assurance, and
- Energy Efficiency.

These committees meet more frequently to receive information pertinent to their charge and to develop recommendation for the full Council's consideration.

Since the Council convened after the 2022 Biennial report, full Council meetings were held on the following days (in order from last to first).

- October 18, 2024
- September 18, 2024
- May 15, 2024
- February 21, 2024
- November 15, 2023
- August 16, 2023
- May 17, 2023
- February 15, 2023

The agendas, minutes, and associated presentations and materials from these meetings are available on the Council's Web Page.

1.2 Energy Policy Council Members and Committees

The Council is chaired by the Lieutenant Governor or his designee. As of September 27, 2024, the designee is Krishana Polite and previous designee was Brian LiVecchi. The Council is supported by 12 additional members appointed according to §113B-3. Together, the Council works to identify and utilize all domestic energy resources in order to ensure a secure, stable, and predictable energy supply and to protect the economy of the State, promote job creation, and expand business and industry opportunities while ensuring the protection and preservation of the State's natural resources, cultural heritage, and quality of life. The Council anticipates that much of the work it will perform going forward will be completed by the committees as described below. Krishana Polite (formerly Brian LiVecchi) serves on each committee but only votes in the case of a tie.

1. The Energy Infrastructure (EI) Committee focuses on utility-scale generation, transmission,

and distribution; exploration for and penetration of traditional and renewable energy (RE) resources; identifying new energy resources; smart grid technology deployment; and grid modernization. The members of the EI Committee are given below.

- John D. White
- Joseph Carroll
- Venu Ghanta
- Chris Millis
- Krishana Polite, acting for Lt. Governor Robinson
- William "Gus" Simmons (former member and Chair)
- Kendal Bowman (former)
- Brian LiVecchi (former) acting for Lt. Governor Robinson

2. The Energy Assurance (EA) Committee focuses on: energy supply networks and disruptions; system security (both physical and cyber vulnerabilities); microgrid deployment; distributed generation (small-scale renewable, combined heat and power); alternative fuels; and resiliency in building codes. The members of the EA Committee are given below.
   - Paul Worley (Chair)
   - John Hardin, acting for Department of Commerce Secretary Sanders
   - Chris Millis
   - Dr. Scott Palmtag
   - Krishana Polite, acting for Lt. Governor Robinson
   - Herb Eckerlin (former)
   - Jenny Kelvington (former)
   - Brian LiVecchi (former), acting for Lt. Governor Robinson
3. The Energy Efficiency (EE) Committee focuses on: life-cycle cost analyses for new and existing development; performance contracting; expansion of existing programs to all sectors; transportation applications; energy efficiency building code adoption; and synergies across State and other programs. The members of the EE Committee are given below.
   - Scott Tew (Chair)
   - Paolo Carollo
   - John Szoka
   - Sushma Masemore, acting for Department of Environmental Quality Secretary Kelley, formerly Secretary Biser
   - Krishana Polite, acting for Lt. Governor Robinson
   - Brian LiVecchi, (former) acting for Lt. Governor Robinson
4. The Energy Innovation (EIn) Committee focuses on: early-stage and innovative energy

solutions for the transition to a sustainable clean energy economy, including but not limited to evaluation of novel energy-generating technologies, energy-saving technologies, energy-transfer processes and end-user energy delivery systems. The members of the EIn Committee are given below.

- John Hardin (Chair), acting for Department of Commerce Secretary Sanders
- Susan Munroe
- Chris Millis
- Dr. Scott Palmtag
- Krishana Polite, acting for Lt. Governor Robinson
- Brian LiVecchi, (former) acting for Lt. Governor Robinson

1.3 Purpose of this Report

Pursuant to § 113B-12, this 2024 biannual report has been prepared by the Council for transmittal to the following persons listed below.

- Governor
- Speaker of the House of Representatives
- President Pro Tempore of the Senate
- Environmental Review Commission
- Joint Legislative Commission on Energy Policy
- Chairman of the Utilities Commission

The report supports the mission of the EPC. Specifically, Chapter 2 contains policy and program recommendations prioritized by the Energy Infrastructure Committee, Energy Innovation Committee, Energy Assurance Committee, and the Energy Efficiency Committee for consideration by the Governor and Legislature. Chapter 3 summarizes key findings and energy landscape discussion that support the committees' recommendations. Chapter 4 provides North Carolina's energy profile statistics including a general overview of the energy resources utilized in the State, projected trends in energy consumption and environmental emissions, demographic data, and economic trends. The chapter concludes with recent legislative and regulatory actions that could shape the state's energy profile in the future.

The 2024 Biennial Report has undergone a public review process from October 21, 2024, to November 11, 2024, prior to adoption and discussion by the full Energy Policy Council. The Council considered the public comments, discussed, and voted on the final recommendation at its November 20, 2024, joint meeting.

2. Energy Policy Council Recommendations

2.1 Energy Infrastructure Committee

The Energy Infrastructure (EI) Committee focuses on areas including: electricity generation, transmission, and distribution; exploration for and penetration of traditional and renewable energy resources; identifying new energy resources; smart grid technology deployment; and grid modernization.

Current 2024 Recommendations

Following are the EI Committee's 2024 recommendations related to energy infrastructure planning, bioenergy, and renewable energy.

Recommendation #EI 1:

Electricity Infrastructure. Electricity providers in North Carolina should further invest in the generation, transmission, and distribution infrastructure to support future load and economic growth in the State, with specific focus on the development of lower carbon-emitting sources of electricity, carbon capture, and practices that support further decarbonization of our energy sector, consistent with House Bill (HB) 951 and the North Carolina Utilities Commission Carbon Plan, while ensuring any generation or resource changes maintain or improve upon the adequacy and reliability of the existing grid and take into account customer affordability. North Carolina's legislative and regulatory bodies should evaluate additional supportive funding and legislation, regulation, and policies needed that support these investments, including the disposition of expired or expended assets as applicable, the adoption of clean energy resources, and further reduction of carbon emissions from the energy sector.[2]

Recommendation #EI 2:

Expansion of Natural Gas Infrastructure. Natural Gas distribution companies in North Carolina should further invest in the transmission and distribution infrastructure to support future load and economic growth in the State, with specific focus on infrastructure that supports the addition and incorporation of renewable natural gas and the cost-effective expansion of natural gas service to unserved customers; while endeavoring to provide the highest levels of reliability and customer service in a safe, cost-prudent manner. The State's citizens and its industries are requesting greater access to natural gas and the State's elected leadership need to provide supporting policies and legislation that increase the availability of interstate supplies and intrastate infrastructure to meet this growing demand. Legislators and policy makers should streamline permitting for infrastructure development while protecting and reaffirming access to all sources of energy for consumers. The State's natural gas supply and delivery infrastructure can support the transition to an overall carbon emission reduction solution that properly includes cost and reliability considerations.

Recommendation #EI 3:

Renewable Fuels Production Appraisal. North Carolina holds significant bioenergy production

[2] Session Law 2021-165, House Bill 951, H951v6.pdf (ncleg.gov)

potential, nationally recognized as having the third-richest bioenergy resources in the U.S. External demand for renewable fuels, through policies such as the federal Renewable Fuel Standard and state Low Carbon Fuel Standards, has bolstered the economic value of renewable fuels production, given the determination that renewable fuels from agricultural waste-derived biogas has a very beneficial impact to offset existing carbon emissions from the agricultural, power, and transportation sectors.

Several analyses of the economic, social, and environmental costs associated with the development of biogas resources within North Carolina have been conducted through various private and public initiatives over the past decade, yet there has been no effort to culminate the information available into a cohesive evaluation of the benefits of, associated emissions impacts of, and plan to use this rich resource for North Carolina. There is limited data available associated with health, social, and environmental impacts on the surrounding community.

North Carolina's legislative and regulatory bodies should review and revise existing policies and regulations necessary to support the greater incorporation of renewable natural gas into our energy fuel portfolio, and develop additional supporting legislation, regulation, and policies that support investments in the development of North Carolina's renewable fuels production capabilities to achieve further reduction of carbon emissions from the energy sector.

Recommendation # EI 4:

Energy Policy, Regulations, and Rules Review. North Carolina has existing statutes that require state agencies to examine and review certain rules on a recurring basis, such as N.C. Gen. Stat. §150B-21.3A, adopted in 2013 which requires such a review on a 10-year cycle. Given the rapid innovation that is occurring within the energy sector, and the timelines set forth for reducing carbon emissions associated with our electricity generation, and the ongoing transition to alternate transportation fuels, a focused review effort to examine rules that impact the development of in-state energy resources is needed. The existing North Carolina General Statutes, Rules, and Policies should be examined for inappropriate or unnecessarily inhibitive barriers to energy innovation and the development of in-state energy resources. The existing North Carolina General Statutes, Rules, and Policies regarding the use and management of conventional fossil-derived energy resources should be examined for applicability and consistency of outcomes as pertains to the incorporation of North Carolina's lower carbon-emitting resources and the piloting of innovative energy resources and technologies. This initial examination will identify policy and regulatory changes that should be enacted by or before the 2026 legislative session. Subsequent, similar reviews should occur every four (4) years thereafter, recognizing that the subsequent reviews will likely require less time and effort. The North Carolina Legislature should enact such a rule's review and direct the State Energy Office to facilitate the process in conjunction with the Energy Policy Council. Additional funding to support additional staff resources may be required.

Recommendation # EI 5:

Net Zero Vehicle Charging and Fueling Infrastructure. Transportation electrification will lead to a significant increase in the amount of electricity consumed by customers as they switch to

electric vehicles (EV). The North Carolina Legislature should commission and fund a study, in consideration of existing analysis conducted by State agencies and other entities, to investigate the infrastructure upgrades needed to enable broad-scale EV charging at home and on highway corridors to identify needs, level of investment required, and to ensure cost effective deployment of new infrastructure, including life cycle cost-benefit analysis. Additionally, the State should support research and development for deployment and utilization of alternative transportation fuels such as hydrogen, compressed natural gas, renewable natural gas, propane, renewable propane, and fuel cell technologies that result in lower vehicle emissions.

2.2 Energy Assurance Committee

North Carolina's energy infrastructure, consisting of diversified electricity generating plants, transmission and distribution lines, petroleum and natural gas pipeline systems, and renewable resources, is susceptible to both natural and man-made occurrences that may result in local or statewide energy supply emergency events. As stated on the National Association of State Energy Officials (NASEO) website, we work to "achieve a robust, secure and reliable energy infrastructure that is also resilient - able to restore services rapidly in the event of any disaster."[3] The Energy Assurance (EA) Committee engages with energy providers and other stakeholders to address energy assurance in the State's electric sector, and its natural gas, petroleum and propane pipelines to consider threats for disruption and any other occurrences or issues that may jeopardize North Carolina's energy supply and public safety. The EA Committee focuses on identifying and planning for potential energy emergency threats, preparing for them and mitigating their impacts.

Current 20224 Recommendations

Following are the EA Committee's 2024 recommendations related to energy assurance planning.

Recommendation # EA 1:

The drive to decommission coal-fired generation units, the need to provide reliable on-demand dispatchable power to support non-dispatchable generation, and the demand for a system-wide increase in generation has resulted in approximately one-third of North Carolina's grid being dependent on natural gas as a fuel source. The importance of an uninterrupted supply of natural gas grows even more critical as recent efforts to provide increased capacity and supply redundancy, such as the Atlantic Coast Pipeline (ACP) and the first iteration of the Mountain Valley Pipeline (MVP), were prohibited from commencing construction. Although those previous projects were thwarted by regulatory agencies, multiple natural gas companies have newly proposed projects under development to increase supply to the state. While these proposed projects would provide further resiliency for our natural gas supply, until these projects are operational the current state redundancy of the natural gas supply combined with recent attacks on critical energy infrastructure, which include both physical (Moore County-2022) and cyberattacks (Colonial Pipeline-2021), it is imperative to evaluate the impact of potential fuel supply disruptions on North Carolina's electrical grid.

As a result, the Energy Assurance Committee encourages strong communication between our state-level agencies, and collaboration with federal agencies and industry experts to address fuel supply disruptions, curtailment actions, and adequate fuel storage. One component in this effort shall include evaluating the recent (2024) statewide tabletop exercise for natural gas to identify areas of improvement in the event execution and establishing a plan of action to repeat the exercise. We recommend that the North Carolina Department of Environmental Quality's Energy Office lead an effort to solicit feedback from all participants in the recent 2024 statewide tabletop exercise, generate a corrective action plan, report its findings to the Energy Assurance Committee by December 2024, and collaborate with the Energy Assurance Committee to conduct an improved statewide tabletop exercise for natural gas by March 2025.

Recommendation # EA 2:

The impact of electric grid reliability and resiliency on North Carolina's economy and citizens needs to be thoroughly investigated. With the transition from coal-fired plants to natural gas being nearly complete, the supply chain for natural gas becomes crucial for power generation. The reliability of the grid for this form of dispatchable energy generation heavily relies on a continuous supply of natural gas, making the security of the natural gas pipeline network and the power grid a top priority in safeguarding against cyber-attacks and physical damage.

Protecting the power grid is especially important due to its broad footprint and the necessary components for power transmission, especially in rural or unpopulated areas. These factors make the grid vulnerable to physical damage, highlighting the need for support from various parties such as local law enforcement, power company security measures, and the public to report any suspicious activities. It is crucial to conduct stakeholder outreach to emphasize the importance of the power system operating as a "grid" and to clarify that certain activities are illegal and carry consequences. Continued investments in grid modernization are essential to strengthen the system against attacks and ensure redundancy in the power supply.

Furthermore, there is a need for a comprehensive review of dispatchable power and renewables. Availability is the primary difference between dispatchable and non-dispatchable resources. The impacts on grid reliability and resiliency resulting from non-dispatchable forms of energy generation need to be carefully evaluated. To ensure uninterrupted energy supply across the grid, non-dispatchable energy generation must be backed by redundant dispatchable sources when the non-dispatchable fuel source is unavailable. This aspect of non-dispatchable fuel sources raises reliability concerns as it increases the dependency on the immediate availability of dispatchable power sources. The assessment of non-dispatchable energy generation on the electrical grid should also consider the economic impacts of the redundancy required to deliver reliable energy to the state's energy consumers, as well as whether additional security measures are necessary to protect these generating facilities from physical and cyber-attacks.

With this in mind North Carolina Department of Environmental Quality State Energy Office has partnered with Duke Energy to meet the growing electricity demand by implementing advanced transmission technology to improve reliability throughout the eastern part of the state. The North Carolina Innovative Transmission Rebuild is awarded a 57-million-dollar competitive grant in conjunction with Duke Energy. This project funded through the Bipartisan Infrastructure Law (B.I.L) will reconstruct transmission lines with high-temperature, low-sag and advanced conductors that will enhance resiliency and reliability within the existing right of way. The Grid Deployment office at the Department of Energy (DOE) administered the Grid Resilience and Innovation program that aims to enhance grid flexibility and improved resilience.

Recommendation # EA 3:

The advancement and implementation of the North Carolina Energy Security Plan are in progress. As stipulated by the Bipartisan Infrastructure Law (BIL), also referred to as the Infrastructure Investment and Jobs Act of 2021, states are required to submit annual State Energy Security Plans (SESPs) to the US Department of Energy to qualify for federal funding. SESP's are developed in collaboration with industry partners and critical components of the Energy Security Plan entail evaluating present energy security status, planning risk assessment and mitigation strategies, documenting a detailed energy profile that outlines energy sources,

identifying potential hazards, and organizing coordination and response mechanisms. SESP's are critical to North Carolina, given that we are a coastal state, and susceptible to tropical storms.

By aligning our SESP's with the funding opportunities provided by the Bipartisan Infrastructure Law (BIL), we can better compete for federal funding that uphold national objectives while more directly meeting the demands of North Carolina's expanding population and diversified economy across multiple regions and urban centers.

In the current global landscape, our energy delivery systems face both international and local cyber and physical security challenges.

With these opportunities and threats in mind, it is important that our SESP's evaluate and make recommendations that include, but are not limited to the following:

- Collaborate with NC Emergency Management to carry out peer evaluations centered on the energy system to perpetually enhance our procedures for supplying alternative energy sources and reinstating functionality in the event of physical or cyber-attacks, as well as pinpointing potential vulnerabilities.
- Conduct comprehensive risk evaluations to determine and alleviate possible threats to energy infrastructure, including reinforcing regulations and pursuing prosecutorial action against crimes that result in infrastructure damage and public harm.
- Evaluate the condition and potential threats to electrical substations and other energy facilities in localized flood-prone areas as these can change over time and collaborate with local governments to best address their priorities.
- Utilize data-driven methods to prioritize capital investment in the energy system for emergency response. These investments may include backup power solutions for crucial infrastructure such as hospitals and emergency providers, particularly in regions vulnerable to storms and frequent power outages; or public vehicle charging station facilities as noted in North Carolina's Clean Transportation Plan.
- Assess approaches such as segmenting the grid into smaller, more controllable units as a possible viable strategy to reduce the extent of system-wide power disruptions, and adoption of Smart Grid technology to enhance the electrical supply's efficiency, reliability, and security.
- Strengthen partnerships with utility companies, university research centers, and the broader private energy sector to bolster the robustness of our energy systems and stay abreast of verified novel technologies and eco-friendly options.

2.3 Energy Efficiency Committee

The Energy Efficiency Committee has focused on reducing wasteful and inefficient uses of energy resources through state policy and practice, along with consideration of policies and programs to advance energy efficiency in State-owned buildings, minimize fuel consumption by motor vehicles, and to otherwise maximize efficient use of energy resources in the State. The Committee has also focused on mechanisms for financing energy efficiency.

As its starting point, the Committee assessed which prior Committee recommendations, previously approved by the EPC, had been implemented by either legislative or executive action. The Committee also assessed which recommendations were in progress or successful completed to assist with revisions to previously approved recommendations or development of new recommendations.

Current 2024 Recommendations

Following are the EE Committee's 2024 recommendations related to energy efficiency.

Public Buildings

Recommendation #EE 1:

Increase the state buildings energy use reduction goal from 30% to 40% by 2030, thereby potentially saving an additional $2 billion in reduced utility costs. In 2013, North Carolina agencies and universities achieved the 30% energy use reduction goal established by G.S. §143-64.12. In 2021, the reduction level had marginally increased to 31%. The proposed increase to 40% percent energy use reduction from the 2002-2003 baseline year will enhance the state's competitiveness for federal grant funding opportunities and encourage further energy savings. To achieve this goal, state agencies should revert to an annual energy reporting period for public buildings and institutions under the Utility Savings Initiative (USI) program.

Recommendation #EE 2:

Strengthen and support the state's USI program for public facilities by providing a 1% pass-through of the annual avoided utility costs realized by the USI program. The USI program has supported state agencies and universities in avoiding $1.6 billion in utility expenses since the 2002-2003 baseline year. To assist state facilities in meeting the proposed 40% percent energy use reduction goal from the 2002-2003 baseline year, USI will use the proposed 1% pass-through budget (approximately $1.14 million) to support training, engineering and technical assistance, outreach, and incentives/grants for energy project investments.

Recommendation #EE 3:

Establish a program with state governmental entities to allow utility savings to be reinvested in short duration, rapid payback, and energy conservation measures. Reinvesting energy cost reductions incentivizes state agencies and universities to re-commission buildings, optimize building automation systems, and upgrade equipment. One such measure is to allow state governmental entities flexibility in how to fund EE projects, including the ability to carry an EE reserve fund. Another is to allow for annual Office of State Budget and Management (OSBM) increases that reflect known utility rate increases and utilize utility savings realized by state

entities to remain available to the agency for additional EE projects.

Recommendation #EE 4:

Require commissioning of all new state buildings after 6 months of occupancy so issues can be addressed during the warranty period. This will ensure they are brought online in optimal performance, thereby saving taxpayers on long-term costs of building operations. Commissioning a new building adds roughly 0.6% to the total construction cost, but with the energy savings, the payback period can be less than 5 years.

Recommendation #EE 5:

Strengthen the USI Public Buildings programs by:

a. Funding the Energy Management Diploma training.

b. Requiring commissioning for North Carolina Connect Bond projects per S.L. 2015-280.

c. Providing commissioning training using a state commissioning working group.

d. Creating an outreach/education program for K-12 schools and community colleges to provide technical support and training for districts and campuses lacking in-house energy management.

e. Piloting a voluntary utility consumption reporting program with K-12 schools to assess energy savings potential.

f. Requiring all new or pending state building leases to incorporate energy efficiency measures (LED lighting, programmable HVAC, building envelope, etc.) into the standard contract terms.

g. Utilize Infrastructure Investment and Jobs Act funds, Inflation Reduction Act funds and utility electricity demand side management programs, based on availability of funding and application for funding, to provide additional support for energy efficiency projects such as: submetering within state owned buildings; hiring Energy Managers to provide oversight and energy management services; and installing energy efficiency technologies and improvements in public buildings.

Commercial and Residential Energy Efficiency

Recommendation #EE 6:

The NCUC shall establish a policy to ensure that all North Carolina utilities provide a secure and reliable manner to transfer to its customer or designees upon request utility billing usage data in a timely and non-cost prohibitive manner. This policy will allow all customers to leverage tools or systems such as the United States Environmental Protection Agency (USEPA) Portfolio Manager Program.[3] This policy will assist utility customers to potentially manage energy and water use and costs as well as work with utilities to identify the best opportunities for utility service efficiency programs. Any policy shall appropriately ensure that a specific customer utility usage data is not disclosed to any other party without the specific customer's knowledge

[3] Portfolio Manager | ENERGY STAR

and consent.

Recommendation #EE 7:

Examine the costs and benefits associated with adopting a minimum requirement for commercial buildings to require properly certified commissioning. Promote training, awareness, and incentives related to improving energy efficiency in the commercial energy sector.

Recommendation #EE 8:

The legislature should investigate modifications to the existing Commercial PACE legislation by giving local governments the authority to delegate the development and administration of a PACE program to a statewide or regional third-party entity.

Recommendation #EE 9:

Create statewide project management coordination system for delivery of EE, urgent repair, and weatherization programs. North Carolina energy efficiency, urgent repair, and weatherization programs are administered separately by multiple agencies, creating significant inefficiencies, and falling short of their goals. A coordinated communication between the participating agencies and building an effective and efficient energy services delivery mechanism is needed to relieve or eliminate energy burden and improve housing conditions. Participating agencies include NC Department of Health and Human Services (NCDHHS), DEQ's Weatherization Assistance Program (WAP), NC Housing Finance Agency, NC Community Action Agencies, utilities and private entities.

Recommendation #EE 10:

Create new programs and incentives for improving the energy efficiency of manufactured housing. The Committee recommends that effective existing programs be expanded statewide.

Recommendation #EE 11:

Increase funding to the North Carolina Housing Trust Fund, which has a long history of creating high-quality, multi- and single-family affordable housing opportunities for low-income communities. The legislature should provide additional funding to improve energy efficient affordable housing options. By investing in the Housing Trust Fund, the state can meet many challenges of EE in low-income communities while also creating jobs and new economic opportunities that healthy housing provides.

Building Codes

Recommendation #EE 12:

The NC Department of Insurance (NCDOI), in consultation with State Agencies, NC Residential Code Council (NCRCC) and the NC Building Code Council (NCBCC), should assess the costs and benefits of measures intended to encourage builders or owners to exceed code standards, including programs such as Duke Energy Carolina's approved NCUC filing to expand Duke Energy Progress's incentive for new construction built to or above the Energy Conservation Code's High Efficiency Residential Option ("HERO"), or programs offered by electric and natural gas utilities that provide discounts for Energy Star rated homes. Educate consumers and

realtors about metrics to assess residential EE, such as the Home Energy Rating System ("HERS") Index or other energy efficiency ratings.

Recommendation #EE 13:

Monitor developments and open a dialogue with the NC Building Code Council (NCBCC), the NC Residential Code Council (NCRCC) and the General Assembly, particularly those legislative proposals that support or discourage energy efficiency requirements for buildings and support improvements in the legislative process for adopting the most current International Residential Code (IRC) and International Building Code (IBC). Encourage participation between the NCBCC and the General Assembly for balancing issues of costs and policy for advancing energy efficiency in existing residential buildings because of the benefits to homeowners and renters. Consider new tax incentives for home improvements.

Recommendation #EE 14:

Implement and return to a building code cycle of 3 years, instead of the recently adopted change to a 6-year cycle. The 3-year code cycle would improve energy efficiency benefits, overall cost benefits, and allow the State to qualify for certain Federal funds that it does not qualify for under the current 6-year cycle.

Recommendation #EE 15:

Establish a defined pathway to increase statewide goal to 70% reduction from 2005 levels by 2030 and net-zero energy ready targets for new buildings by 2050 considering costs, benefits, and including targets for reduction of embodied carbon in new buildings and future infrastructure. North Carolina's most current residential and commercial energy codes most closely follow the 2012 International Energy Conservation Code. The latest energy codes are between 1–2 percent more energy efficient than the prior 2012 North Carolina Energy Conservation Code. The EE Roadmap contains several elements for a pathway to net-zero energy ready new buildings that should be considered, including code updates or shorter code cycles to ensure a closer alignment to national and international standards.

Recommendation #EE 16:

NCUC should continue its efforts working with utilities to understand utility efficiency cost-effectiveness testing and leverage insights gained from any existing or future utility workstreams to determine valuation of non-utility benefits derived from utility efficiency investments including methodologies to estimate benefits to public health (via air and water quality), economic development, environmental health (GHG emission reduction, air and water quality), resiliency measures, and increased property value and reduced tenant turnover for utility efficiency investments at the utility-scale and at the building level.

Industrial Energy Efficiency

Recommendation #EE 17:

Identify and implement measures intended to encourage adoption of prevailing energy efficiency solutions in industrial settings. Possible areas to consider would include the following:

a. Advancement in energy efficiency technology solutions
b. Building automation systems
c. Ensuring routine inspections and maintenance of mechanical equipment (i.e., boilers, chillers, and piping) for optimal performance efficiency per original designed.

Recommendation #EE 18:

Identify and create opportunities to engage industrial firms to design energy efficiency programs for industrial applications that would improve the number of industrial customers' participation in the electric utility programs adopted pursuant to the state Renewable Energy and Energy Efficiency Portfolio Standard (REPS).

Recommendation #EE 19:

Investigate opportunities that would expand combined heat and power (CHP) deployment for industrial, large commercial and public buildings to lower operating costs at facilities, support resiliency with microgrids and other DERs, and assist with the goal of reaching carbon neutrality by 2050.

Transportation Efficiency

Recommendation #EE 20:

Continue support for improved traffic flow strategies and best practices by:

a. Supporting NC Department of Transportation (NCDOT) and other stakeholders to provide knowledge and training for community planners who must plan for increasing population in both large urban areas and small rural communities. In many areas, the lack of planning to address population demands impedes efficient traffic infrastructure.

b. Focusing efforts on education, performance assessment, and the provision of knowledge and global benchmarking tools available to local and regional planners and leaders to better inform their decision-making. Investigate and evaluate tools (including Artificial Intelligence powered software) and policies at the State level that allow city planners to assess and improve the efficiency of traffic systems, and more importantly, to gain knowledge of possible options with high return for investment that can be used to fund future projects.

Recommendation #EE 21:

Evaluate options for establishing targets for transitioning public transit, private and fleet transportation, and other modes of transport to higher utilization of cleaner fuels, including conversion of and engine rebuild for school buses and other vehicles.

Statewide Policy and Planning

Recommendation #EE 22:

The State Energy Office will coordinate with other state agencies and interested partners to evaluate the scope to conduct an analysis of the costs and benefits of using electrification to reduce energy burden and greenhouse gas emissions in consumer end-use sectors in NC, such as in homes, buildings, transportation, industrial and agricultural operations and initiate an analysis

of the costs and benefits of electrification of these end-use sectors.

Recommendation #EE 23:

Establish minimum energy efficiency goals within the current REPS program to align with carbon reduction goals in Session Law 2021-165 (HB 951). The legislature should incorporate a 25 percent minimum, up to 40 percent maximum EE contribution to the REPS goal for investor-owned utilities, subject to cost-effectiveness screens.

Recommendation #EE 24:

Support the capitalization and development of programs with the NC Clean Energy Fund and the State to issue loans, provide credit enhancements, and invest in clean energy and EE projects, to the benefit of NC businesses, congregations, nonprofits, and consumers.

2.4 Energy Innovation Committee

The Energy Innovation Committee focuses on early-stage and innovative energy solutions for the transition to a sustainable clean energy economy, including but not limited to evaluation of novel energy-generating technologies, energy-saving technologies, energy-transfer processes, and end-user energy delivery systems. The Committee focuses on the advancement of cost-effective, emerging technologies and the development of energy initiatives that will create clean energy jobs, reduce climate change and secure the electric grid.

As its starting point, the Committee assessed innovative, emerging and alternative energy technologies which may be used to achieve targets for greenhouse gas emissions and carbon neutrality in House Bill 951.[4] In addition, the Energy Innovation held a joint Committee meeting with the Energy Infrastructure Committee and reviewed previous Energy Infrastructure Committee recommendations that were more emerging and innovative. Those recommendations were transferred to the Energy Innovation Committee, updated and included in the current 2024 recommendations.

Current 2024 Recommendations

Following are the EIn Committee's 2024 recommendations related to energy innovation.

Recommendation #EIn 1:

Hydrogen Energy Production Appraisal. North Carolina should invest in the evaluation of potential sources of innovative hydrogen energy that may be developed from within North Carolina, as well as the needed transmission and distribution infrastructure to support the incorporation of hydrogen-based fuels into our energy portfolio, while endeavoring to provide the highest levels of reliability and customer service in a safe, cost-prudent manner. The North Carolina Legislature should commission and fund a study effort to assess North Carolina's hydrogen energy production capabilities, particularly clean hydrogen, and the infrastructure improvements needed to support the incorporation, distribution, storage, and use of hydrogen energy fuels. Such a study effort should estimate the costs and prioritization for such infrastructure improvements. We recommend this study be accomplished and published in advance of the 2026 Biennial Report of the Energy Policy Council, so that additional policy recommendations may be informed by the findings of the study. Efforts should be taken to build on the information and findings in the U.S. National Clean Hydrogen Strategy and Roadmap (June 2023), as well as to coordinate with the U.S. Department of Energy Hydrogen Program, led by the Hydrogen and Fuel Cell Technologies Office (HFTO) within the Office of Energy Efficiency and Renewable Energy (EERE).

Recommendation #EIn 2:

Renewable Natural Gas Production and Expansion of Renewable Natural Gas Usage. North Carolina holds significant bioenergy production potential. External demand for renewable natural gas (RNG), through policies such as the federal Renewable Fuel Standard and state Low Carbon Fuel Standards, has bolstered the economic value of RNG production, given the determination that RNG from agricultural waste-derived biogas may be beneficial to offsetting

[4] H.B. 951, 2021 General Assembly, Session Law 2021-165. (North Carolina 2021).

existing carbon emissions from the agricultural, power, and transportation sectors. RNG has been determined to be an alternative to natural gas, and thus, can be used to create electricity, satisfy thermal needs, and serve as a transportation fuel in a manner that both reduces emissions from fossil fuels and from the production of food, feed, and fiber. Several analyses of the economic, social, and environmental costs associated with the development of biogas resources within North Carolina have been conducted through various private and public initiatives over the past decade, yet there has been no effort to assemble the information available into a cohesive evaluation of the costs and benefits of, associated emissions impacts of, and plan to use this resource for North Carolina. There is limited data available associated with health, social, and environmental impacts on the surrounding community. Pursuant to the North Carolina Carbon Plan (House Bill 951 (S.L. 2021-165), North Carolina's legislative and regulatory bodies should review and revise existing policies and regulations necessary to support the further deployment of RNG into our energy portfolio, and develop supporting legislation, regulation, and policies that support investments in the development of North Carolina's RNG production capabilities that result in reduction of carbon emissions.

Additionally, in light of the opportunity to turn excess methane into new revenue streams for North Carolina's farmers and municipalities, the amount of natural gas currently being consumed by the citizens of the State, and the environmental benefits of utilizing these resources, the State should enact legislation and adopt policies in 2025 that promote the usage of RNG by customers of the natural gas local distribution companies. RNG resources should be broadly defined to include biomass, biogas and biomethane from agricultural waste, landfill gas, and gas produced from wastewater treatment facilities. Support should be provided in the form of legislation that allows the North Carolina Utilities Commission (NCUC) to authorize cost recovery for infrastructure investments associated with RNG and any capital or operating costs incurred by the local distribution companies related to processing, pipeline interconnection, storage, and distribution of RNG.

Recommendation #EIn 3:

Development of the North Carolina Energy Innovation Grant and Loan Programs. North Carolina's elected leaders should develop financial support programs, such as grant and loan programs, to further foster North Carolina's energy resource development and innovation that help achieve the goals of the North Carolina Carbon Plan. Grant programs should be developed to assist smaller municipalities and smaller farming operations to implement innovative systems and processes to produce clean energy fuels and clean energy. Loan programs should be established to provide bridge funding to aid public sector organizations in implementing innovative clean energy technologies and provide gap funding loans to small private sector organizations in implementing innovative clean energy technologies. The loan programs should be established as a revolving loan program to provide for the replenishment and continuation of the program. Specific focus should be given to energy innovation projects that have potential to encourage broader application. This funding program should be administered by the North Carolina Department of Commerce in a manner similar to existing programs for other types of critical infrastructure. The program should be funded at a minimum of $30 million initially, with half of the funds directed to energy innovation grants.

Recommendation # EIn 4:

Manufacturing for Smart Grid Infrastructure Technologies Appraisal. The rapid population migration and growth of energy-intensive industry sectors, such as information technology, in North Carolina presents long-term grid-based reliability and peak load challenges. These challenges are exacerbated during extreme climate events (i.e. hurricanes and temperature extremes), resulting in high negative economic impacts.

Smart grid infrastructure technology is a collection of digital technologies such as power/current sensors, controls, data centers and smart meters that are used to monitor and manage the electricity distribution network. The use of smart grids to improve the efficiency, reliability, and safety of power distribution can increase the deployment of a broad range of energy technologies used to support increasing energy demands. State policymakers and economic development officials should provide guidance on how the state's manufacturing economy can mature and produce innovative smart grid technologies for power transmission and management that respond to the increasing energy demand in North Carolina and in the United States.

Specifically, the state should study the state, domestic, and global outlook for smart grid implementation relative to the current and future potential for North Carolina manufacturing in this sector. The study should identify the needs for workforce and manufacturing, prioritizing strategic efforts that enable organizations to increase product capacity and meet workforce objectives (skill, labor resourcing, etc.) to reduce costs. It also should define the support needed for standardization for technology testing and policy guidance of these technologies. The study should provide courses of action (COAs) for implementation these strategic efforts that leverage a mix of resources from both state and federal sources, with COAs based on both key economic impact indicators and projected positive impact on North Carolina's own energy transmission infrastructure.

Recommendation # EIn 5:

Establish the North Carolina Nuclear Energy Authority and Nuclear Education and Workforce Grant program. The proposed North Carolina Nuclear Energy Authority would serve as the central body for all nuclear-related projects and programs in the state. It would coordinate efforts across various sectors, drive technological advancements, and ensure that educational and financial resources are effectively allocated to support North Carolina's nuclear energy ambitions.

The Authority would play a central role in advancing nuclear energy generation within the state by focusing on several key areas, including developing and recommending comprehensive nuclear energy policies, working closely with both the private sector and government bodies to facilitate the development and deployment of advanced nuclear technologies, including Small Modular Reactors (SMRs). A significant focus would be on the research, development, and deployment of SMRs, which represent a promising avenue for safer, more efficient nuclear power. The Authority would promote and work to advance projects related to these and other emerging technologies, ensuring that North Carolina remains at the forefront of nuclear innovation. The Authority would also collaborate with the Departments of Commerce and Environmental Quality to leverage the NC Energy Innovation Grant Program (EIn #4) and/or other funding sources, loan, or grant programs designed to support cutting-edge nuclear energy projects. This collaborative approach would be critical in fostering advancements and ensuring

the successful implementation of new technologies.

The Authority would also serve as the facilitator of education and workforce development initiatives through administration of the proposed Nuclear Education and Workforce Grant program aimed at expanding educational opportunities related to nuclear energy across K-12 and postsecondary institutions. The program would encompass a range of educational institutions, from K-12 schools and community colleges to universities, ensuring that all students have access to the resources and training necessary for careers in nuclear energy. This would involve supporting programs that foster a deeper understanding of nuclear energy and its applications, and would be instrumental in bolstering the state's nuclear energy workforce and fostering innovation within the industry. By investing in educational programs that align with the needs of the nuclear power sector, North Carolina can enhance its capacity for advanced nuclear energy development and support its ongoing energy goals. The Nuclear Education and Workforce Grant program would provide support to instructors and institutions focusing on education that directly supports the needs of the industry, and developing a skilled workforce capable of meeting the industry's needs. ApprenticeshipNC, NC Edge, and other extant workforce development programs are uniquely positioned to make use of these funds, immediately enhancing the potential for long-term growth and sustainability of North Carolina's nuclear energy sector.

Recommendation # EIn 6:

Encourage offshore wind as an innovative energy resource to support and help secure a reliable, clean, and resilient energy future for North Carolina. North Carolina faces significantly increasing demand for energy across all rate classes, yet the state's largest investor-owned electric utility (Duke Energy) is required to achieve significant carbon reductions pursuant to HB 951. To meet these increasing energy demands while also achieving the legislatively mandated carbon reductions, North Carolina should consider all available clean energy resources, including offshore wind.

Offshore wind is an innovative and nascent energy technology for the United States and North Carolina. There currently are only three operating offshore wind farms in the United States (Rhode Island, Virginia and New York), but more than a dozen are in permitting or under construction, with three wind energy areas off the coast of North Carolina currently leased by private developers. Recognizing these facts, Duke Energy, in its Carbon Plan filings to the North Carolina Utilities Commission, characterizes offshore wind as a "long lead generation" energy resource, the same category in which it classifies small modular nuclear reactors (SMR).

When developed, the three areas under lease off the North Carolina coast have the potential to generate at least 6 gigawatts (GW) of clean energy. To achieve this energy production efficiently, effectively, and responsibly, North Carolina should learn and build upon the best practices being employed in other states along the Atlantic coast as well as the 30-plus years of offshore wind deployment in Europe, the UK, and Asia. Adding offshore wind to the state's energy portfolio would increase resource diversity, complement existing generation mix, and contribute to the HB 951 carbon reduction target.

To support the deployment of offshore wind as an innovative energy resource and to support and secure a reliable and resilient energy future in North Carolina, the Council encourages state policymakers to consider offshore wind in addition to other long-lead generation resources.

3. Committee Updates

3.1 Energy Infrastructure Committee

North Carolina's energy infrastructure includes all systems involved in electric power generation, transmission, and distribution, as well as liquid and gaseous fuel distribution. The State depends on this infrastructure for its commerce and the support of its citizens. The State must ensure that this infrastructure is robust, reliable, and resilient both now and in the future. The infrastructure's inter-dependencies require each system to operate simultaneously to support each other as a united energy production and delivery system.

Developments Since 2022 Report

A significant development since the 2022 Report relates to Recommendation #EI 1 in the 2022 EPC Report, which recommended that electricity providers in North Carolina further invest in the generation, transmission, and distribution infrastructure to support future load and economic growth, consistent with House Bill (HB) 951, while ensuring any generation or resource changes maintain or improve upon the adequacy and reliability of the existing grid. In October of 2021, HB 951, was signed into law[5]. This law sets a goal for investor-owned utilities with greater than 150,000 customers to reduce CO_2 emissions by 70% in 2030 and be net-zero in 2050.

In August of 2023, Duke Energy filed its 2023 Carbon Plan.[6] The 2023 Carbon Plan (CPIRP) includes provisions for solar, battery storage, hydrogen-capable natural gas, onshore and offshore wind, pumped storage hydro, advanced nuclear, and coal plant closures. Focusing on the goal of transitioning from coal-fired generation to cleaner energy sources, the CPIRP evaluates a series of strategies to "replace before retire" the coal plants to maintain grid reliability. Three potential pathways were developed for this plan with varying paces of energy transition (reducing CO_2 emissions by 70% from 2005 rates by 2030, 2033, and 2035). Duke Energy highlights the importance of federal funding opportunities, such as IRA and IIJA funds for clean energy, and how they will be paramount to this transition in North Carolina. The CRIRP also emphasizes Duke Energy's commitment to stakeholder and community engagement, asserting that cost reduction, grid reliability, and customer satisfaction is top of mind for this transition to clean energy. Duke Energy also addresses the swiftly evolving energy technologies, and the impact they will have on North Carolina's transition to clean energy. The pathways established in this report are fluid and will be reevaluated often to account for both new developments and challenges encountered throughout this process.

At the federal level, significant funding opportunities have become available to assist with development and deployment of clean energy and climate resilience. This funding will support the investments in infrastructure needed to implement HB 951 as well as other clean energy goals. Since the last report, a significant amount of these federal funds has come to North Carolina. Legislators and policy makers should continue to consider these opportunities for both infrastructure and structure policies and programs that take advantage of this funding and support

[5] SL 2021-165 (HB 951) (ncleg.gov)
[6] https://www.duke-energy.com/our-company/about-us/irp-carolinas

North Carolina's clean energy goals.

- The federal government passed the Infrastructure Investment and Jobs Act (IIJA) on November 15, 2021.[7] More commonly known as the Bipartisan Infrastructure Law (BIL), this law provides an additional $62 billion for the US Department of Energy to implement infrastructure projects and workforce development.[8] A substantial portion of this funding is to support transmission and grid modernization and innovation.
- On August 16, 2022, Inflation Reduction Act became law.[9] This law focuses on reducing costs for implementing energy efficiency and clean energy projects at homes, commercial businesses and in rural communities primarily through tax incentives and rebates over the next ten years. It also promotes investing in domestic energy production such as natural gas pipelines.

The pace and cost of clean energy transformation must not leave anyone behind or further disadvantage low-income households who spend a larger percentage of their income on energy bills. The BIL is focused on supporting disadvantaged communities receiving funding through the Justice 40 initiative, which requires 40% of BIL funding be spent on disadvantaged communities.[10] The State should support the use of federal and state funding to implement projects and develop policies that provide benefits to disadvantaged communities, such as residential energy efficiency, community solar and local energy resilience.

Perspectives on Current Recommendations

Since infrastructure is vital to HB 951 and the energy transformation and there are significant federal resources now available for infrastructure, North Carolina's legislative and regulatory bodies should enact legislation, policies, and rules that support;

- transitioning to cleaner and zero-emitting energy resources,
- developing infrastructure to develop, deploy and use these new resources,
- supporting future energy demand and economic growth,
- providing the highest levels of safety reliability and resilience, and
- ensuring quality, affordable, and equitable customer service.

Some aspects of energy infrastructure to consider as part of these policies include the following;

- Retirement of coal plants,
- Technically challenging replacement resources (hydrogen, offshore wind, and nuclear),
- New production, transmission and distribution systems needed to support new resources,

[7] H.R.3684 - 117th Congress (2021-2022): Infrastructure Investment and Jobs Act | Congress.gov | Library of Congress
[8] Bipartisan Infrastructure Law Homepage | Department of Energy
[9] Text - H.R.5376 - 117th Congress (2021-2022): Inflation Reduction Act of 2022 | Congress.gov
[10] Justice40 Initiative - The White House

- Integration of high levels of renewable resources (solar and onshore wind) coupled with energy storage, and
- Development and modernization of new and existing transmission and distribution systems to allow integration of new resources and bi-directional flow.

Policies and programs must explicitly incent distribution grid upgrades and address barriers to transmission expansion.

North Carolina is examining clean energy opportunities under Executive Order 246 Climate and Equity, issued on January 7, 2022.[11] The order sets a goal for the state to have net-zero carbon emissions by 2050. This would require significant electrification of all economic sectors as well as new and innovative technologies and energy storage and management systems. The Governor's Office has developed a high-level analysis to outline decarbonization pathways in February 2023. According to the analysis there are multiple ways to meeting North Carolina's 2030 and 2050 climate targets. The key findings[12] of the analysis are:

- Finding #1: Accelerate a transition to ZEVs and electric heat pumps in buildings.
- Finding #2: Rapidly decarbonize electricity generation by scaling up renewable electricity sources and battery storage.
- Finding #3: Encourage high levels of energy efficiency, such as adoption of efficient appliances and vehicles, improvement of building shells, and reduction in vehicle miles traveled.
- Finding #4: Support commercialization of decarbonized fuels, at a minimum to green hydrogen for industry and large trucks and explore pilots for advanced biofuels using sustainable biomass feedstocks.
- Finding #5: Reduce non-energy GHG emissions from industry, agriculture, waste, and oil and gas systems.
- Finding #6: Prioritize sustainable management of NWL to enhance the critical role of carbon sequestration in helping achieve net-zero emissions.
- Finding #7: Reducing fuel combustion while decarbonizing the economy will create co-benefits for air quality improvement.

Given the goals of HB 951, other legislative requirements and federal funding opportunities, the Energy Infrastructure Committee recommends five actions for North Carolina's legislative and regulatory bodies, which include;

1. Evaluate additional supportive funding, legislation and policies that support investments for electricity infrastructure.
2. Streamline permitting for infrastructure development while protecting and reaffirming

[11] Executive Order No. 246 | NC Gov. Cooper
[12] https://governor.nc.gov/nc-pathways-report/open

access to all sources of energy for consumers.

3. Develop supportive legislation, regulation and policies for development of renewable fuels productions capabilities and incorporate renewable natural gas into the energy portfolio.
4. Examine existing NC General Statutes, Rules and Policies regarding use and management of conventional fossil-derived energy resources for applicability and consistency and identify policy and regulatory changes that should be enacted.
5. Commission and fund study to investigate the infrastructure upgrades required to enable broad-scale EV charging at home and on highway corridors and support research for deployment of alternative transportation fuels that lower vehicle emissions.

3.2 Energy Assurance Committee

The Energy Assurance (EA) Committee engages with energy providers and other stakeholders to address energy assurance in the State's electric sector, and its natural gas, petroleum and propane pipelines to consider threats for disruption and any other occurrences or issues that may jeopardize North Carolina's energy supply and public safety.

Developments Since 2022 Report

Electric Power Infrastructure

In the January 2024 "*Report on the NCTPC 2023-2033 Collaborative Transmission Plan*", the NCTPC stated that "reliability study results affirmed that Duke Energy Carolinas (DEC) and Duke Energy Progress (DEP) has planned transmission projects identified in the 2023 Plan to address the reliability concerns for the near-term (5 year) and the long-term (10 year) planning horizons."[13] A total of $2.44 billion in projects have been included in the Transmission Plan.

In the 2022-2023 Collaborative Transmission Plan, there are 58 major projects requiring more than $1.937 billion in investments to advance the state's electric transmission infrastructure.[14]The projects identified in the plan preserve system reliability and resiliency, support the growth of sustainable energy options, and improve electricity transfers across the transmission network. These projects will be completed over the coming decade.

Duke Energy completed the DEC/DEP Transmission and Distribution Climate Resilience and Adaptation Report in September 2023.[15] The report builds on the Duke Energy Climate Risk and Resilience Study which addresses current and future climate-related events that could impact the electricity transmission and distributions systems, and electricity substations. The report assesses the exposure and vulnerability of Duke Energy's systems, at the asset level, to the physical impacts of climate change under conservative and high greenhouse gas emissions scenarios.

SERC Reliability Corporation (SERC) is responsible for ensuring a reliable and secure electric grid across 16 southeastern and central states, including North Carolina. The focus of the 2022-2023 SERC Regional Risk Report[16] is to identify reliability risks within the SERC region electricity grid. The report lists the top ten major reliability risks in order of importance for 2023. The Energy Assurance Committee notes these risks (listed below) should be considered when designing energy assurance exercises for the electricity system.

1. Supply chain cybersecurity (third party and cloud-based services)
2. Cybersecurity threats from exploitation of both external and internal vulnerabilities
3. Shortage of required skillsets associated with a lack of knowledgeable staff

[13] http://www.nctpc.org/nctpc/document/REF/2024-01-19/2023%20NCTPC%20Report%201_19_2024_FINAL_DRAFT.pdf
[14] http://www.nctpc.org/nctpc/document/REF/2024-01-19/2023%20NCTPC%20Report%201_19_2024_FINAL_DRAFT.pdf
[15] https://www.duke-energy.com/-/media/pdfs/our-company/carolinsresiliencetransdiststudyfinal.pdf?rev=96f3343e986045c8b264d7a9e024edda
[16] https://www.serc1.org/docs/default-source/committee/ec-reliability-risk-working-group/2022-23-serc_regional_risk_report_final.pdf

4. Uncertainty due to changes in generating resources
5. Extreme weather
6. Aging infrastructure within the bulk power system and effects of increased control automation
7. Extreme physical man-made events: sabotage and attacks
8. Fuel diversity/fuel availability
9. Variable energy resource integration
10. Parallel/loop power flow issues

North Carolina Energy Security Plan

USDOE has determined that states may use up to $200,000 of their BIL funding to prepare or update their State Energy Security Plan. This plan must meet specific elements under section 366(c) of the Energy Conservation and Policy Act (EPCA), as amended by section 40108 of the IIJA.[17] The plan must assess the existing circumstances in the State and propose methods to strengthen the energy security of the State, in consultation with owners and operators of energy infrastructure. Specifically, the plan requires to;

- secure the energy infrastructure of the State against all physical and cybersecurity threats,
- mitigate the risk of energy supply disruptions to the State,
- enhance the response to, and recovery from, energy disruptions, and
- ensure that the State has reliable, secure, and resilient energy infrastructure.

The North Carolina State Energy Office has a State Energy Security Plan and is using BIL funds to enhance the Plan by addressing comments from USDOE on risk assessments of energy infrastructure, risk mitigation approaches to enhance reliability and end-use resilience, and coordination with Indian Tribes with respect to planning and response.

[17] State Energy Security Plan Administrative and Legal Requirements Document

3.3 Energy Efficiency Committee

Energy efficiency is a low-cost scalable solution to reduce energy usage and emissions. It is a rapidly growing field with creative new strategies implemented on a regular basis, resulting in many new clean energy jobs in the State. Each incremental investment in energy efficiency provides multiple benefits to consumers, including, but not limited to, lower energy bills, increased grid reliability, and the deferral of new generation, transmission and distribution infrastructure investments.

Perspectives on Current Recommendations

Since the release of the 2022 EPC Biennial Report, there have been policy developments and implementation on some of the EE Committee recommendations. The developments on the 2022 EE Committee recommendations are detailed below.

Recommendation EE #8, which recommended investigating state-level support for energy-related financing programs such as on-bill financing and Property Assessed Capital Expenditure (PACE) financing was implemented. In May of 2024, the N.C. Senate Committee on Judiciary passed Senate Bill 802: C-PACE Program[18] or commercial property assessed clean energy to assist property owners in securing low-cost, long-term financing for property improvements.

Recommendation EE#20, which recommended supporting the burgeoning electric vehicle (EV) industry in the transportation sector of the North Carolina economy. Governor Roy Cooper issued Executive Order 80 [19]in October of 2018. One goal of EO 80 was to increase the number of registered, zero-emission vehicles (ZEVs) to at least 80,000 by 2025. North Carolina Department of Transportation confirmed that North Carolina exceeded the 80,000 registered ZEVs in November of 2023.[20]

Recommendation EE#21, which recommended investigating the potential for improved traffic flow strategies and best practices implemented in other states. The NC Department of Transportation issued its Strategic Highway Safety Plan Update in May of 2024.[21] This plan addresses best practices and strategies for improved traffic flow including standardized highway signage, high occupancy lanes and best traffic flow designs.

In this report the EE Committee has 24 new or revised recommendations. There are five EE recommendations for public buildings; six EE recommendations for commercial and residential energy efficiency; five EE recommendations for building codes, three EE recommendations for industrial energy efficiency; two EE recommendations for transportation efficiency; and three recommendations for statewide policy and planning.

Emission Reductions Due to EE Measures

As part of the annual report prepared by the NCUC pursuant to N.C.G.S. § 62-133.8(j), the DEQ

[18] https://webservices.ncleg.gov/ViewDocSiteFile/87823
[19] https://governor.nc.gov/documents/files/executive-order-no-80-north-carolinas-commitment-address-climate-change-and-transition-clean-energy/open
[20] https://www.transportation.gov/sites/dot.gov/files/2024-04/NCDOT%20Carbon%20Reduction%20Strategy%20Report.pdf
[21] https://www.transportation.gov/sites/dot.gov/files/2024-04/NCDOT%20Carbon%20Reduction%20Strategy%20Report.pdf

provides an environmental review of the implementation of the REPS enacted in 2007.[22] This review summarizes the level of air pollution avoided from EE certificates (EECs) issued for each year using the North Carolina Renewable Energy Tracking System (NC-RETS).[23]

Section 4.1 of this report presents historical data on avoided energy use and air emissions due to EE measures. In 2023, North Carolina issued 272,220 MWh of EECs. Section 4.1 also shows that in 2023, EE measures avoided the emissions of the following pollutants;

- 1,484 tons of nitrogen oxides (NO_X) emissions avoided,
- 777 tons of sulfur dioxide (SO_2) emissions avoided, and
- 3.1 million tons of CO_2 emissions avoided.

This is approximately 6.7% of the total CO_2 released by the electric power sector in 2022, 45.7 million tons. This analysis shows that EE measures resulting from utility energy efficiency being tracked under the REPS are significantly decreasing air pollution emitted in North Carolina and neighboring states.

[22] Annual Reporting Regarding Renewable Energy and Energy Efficiency Portfolio Standard in North Carolina Required Pursuant to N.C.G.S. 62-133.8(j), North Carolina Utilities Commission, October 1, 2021, Retrieved from https://www.ncuc.net/reports/repsreport2021.pdf

[23] North Carolina Renewable Energy Tracking System, http://www.ncrets.org/.

3.4 Energy Innovation Committee

The Energy Innovation Committee (EIn) was created on November 16, 2022, during the full Energy Policy Council meeting where members unanimously voted to establish the Committee. The EIn Committee held its inaugural meeting on February 8, 2023, with the focus of defining innovation. The Committee defined innovation as something new that adds value, with newness being an essential aspect. While innovation and invention are similar concepts, innovation is distinctive from invention. While invention is something new, it may or may not add value. From the economic context, innovation is creating and adopting new products, services, or business models to add value. The definition of innovation led to the development of the mission statement and focus of the EIn Committee. The focus of EIn Committee is on early-stage and innovative energy solutions for the transition to a sustainable clean energy economy, including but not limited to evaluation of novel energy-generating technologies, energy-saving technologies, energy-transfer processes, and end-user energy delivery systems.

During the inception of the EIn Committee, the Committee researched and assessed innovative, emerging, and alternative energy technologies. An evaluation to compare energy technologies comprehensively was conducted by State Energy Office staff on behalf of the EIn Committee using a criteria-alternative matrix. The matrix compared technologies in the following areas: benefits and limitations intrinsic to the technology and economic, technological, environmental, and socio-political impacts. The energy technologies evaluated were bioenergy, energy storage, geothermal, hydropower, hydrogen, marine/tidal, nuclear, solar and wind. Energy experts made presentations to the EIn Committee during Committee meetings and during meetings of the full Energy Policy Council on some of these technologies. The 2024 EIn recommendations were created based on these energy technologies presentations, additional research conducted by the EIn Committee and State Energy Office staff, and revisions to recommendations previously included in the Energy Infrastructure Committee.

Perspectives on Current Recommendations

On June 9, 2021, Governor Roy Cooper issued EO 218 *Advancing North Carolina's Economic and Clean Energy Future with Offshore Wind*.[24] EO 218 sets a goal for 2.8 gigawatts (GW) of offshore wind by 2030 and 8.0 GW by 2040 off the coast of North Carolina. It also creates leadership positions in cabinet agencies and a taskforce to ensure responsible and economic development of the state's offshore wind resources.

The North Carolina Taskforce for Offshore Wind Economic Resource Strategies (NC TOWERS) issued its 2022-2023 Annual Report in June of 2023.[25] NC TOWERS report identified opportunities in workforce and the economy that will move forward offshore wind along North Carolina's coastline. NC TOWERS also identified challenges to offshore wind along North Carolina's coastline. As provided in the 2022-2023 Annual Report recommendations include:

- Enacting legislation recognizing offshore wind as a viable clean energy resource that will help reach goals of HB 951,

[24] https://governor.nc.gov/media/2438/open
[25] https://www.commerce.nc.gov/annual-report-north-carolina-taskforce-offshore-wind-economic-resource-strategies-nctowers/download?attachment

- Including funding in NC General Assembly budget to support infrastructure and readiness at Radio Island site,
- Leveraging Offshore Wind Tax Credits,
- Increasing offshore wind education, training and workforce development,
- Contributing to design and development of Regional Fisheries Administrator, and
- Expanding supply chain database and encouraging new and expanding businesses.

Under HB 951 and the federal BIL, hydrogen is identified as an energy resource that could aid in the decarbonization of multiple economic sectors such as electricity generation, heavy industry and transportation. This requires research and development for all aspects of the system; production, processing, delivery, storage, and end use. The U.S. National Clean Hydrogen Strategy and Roadmap released June 2023 explores opportunities for clean hydrogen to contribute to the national decarbonization goals across multiple sectors of the economy. [26]

Given that hydrogen is identified on State and Federal level as an energy resource that can assist in decarbonization and given the overall interest in hydrogen, it is prudent for the North Carolina legislature to commission and fund a study that will support the incorporation, distribution, storage, and use of hydrogen as an energy resource and further decarbonize our economy.

In addition to offshore wind and hydrogen, the EIn Committee has recommendations related to manufacturing for smart grid infrastructure technologies. North Carolina is experiencing rapid increases in population and growth of energy-intensive industry sectors, which are producing long-term grid-based reliability and peak load challenges. This recommendation from the EIn Committee focuses on the study of state, domestic and global outlook for smart grid implementation. The EIn Committee also has a recommendation focused on establishing a North Carolina Nuclear Authority and providing education and workforce opportunities.

Finally, The EIn Committee has a recommendation focused on the development of a North Carolina Energy Innovation Grant and Loan Program. The program would provide financial support through grants and loans to foster North Carolina's energy resource development and innovation that help achieve goals of the North Carolina Carbon Plan.

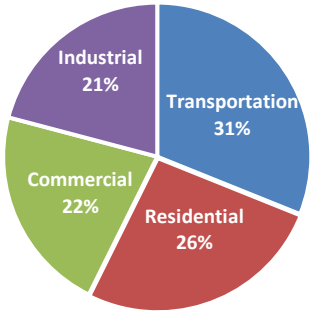
[26] https://www.hydrogen.energy.gov/library/roadmaps-vision/clean-hydrogen-strategy-roadmap

4. North Carolina's Energy Profile

4.1 State Energy Statistic

Demographics[27, 28, 29]		
Population	2020	10.44 million
Share of U.S.	2020	3.2%
State Ranking	2019	9th most populous
Rural Population	2019	43% of state's residents
Economics[30]		
Gross Domestic Product	2023	$766.9 billion (11th in the US)
Per Capita Personal Income	2023	$60,484 (36th in the US)
Energy Consumption[31,32]		
Total Energy Consumed	2022	2,569 trillion Btu (2.7% of U.S. total)
National Ranking		35th highest
Amount Energy Imported		76%
Total Consumption per Capita		249 million Btu

NC Energy Consumption by End Use Sector, 2022



Energy Consumption by Sector, 2022 [33]

Sector	Consumption trillion Btu
Transportation*	806
Residential	672
Commercial	558
Industrial	533
Total	2,569

*5th highest vehicle miles traveled in U.S.

[27] North Carolina Budget and Management, Facts and Figures, 2020 Census. Retrieved from https://www.osbm.nc.gov/facts-figures

[28] U.S. Census Bureau, 2020 Census, Annual Estimates of the Resident Population for the United States, Regions, States, District of Columbia, and Puerto Rico: April 1, 2020

[29] Is North Carolina Rural or Urban? | NC OSBM, North Carolina OSBM Standard Population Estimates, 2020

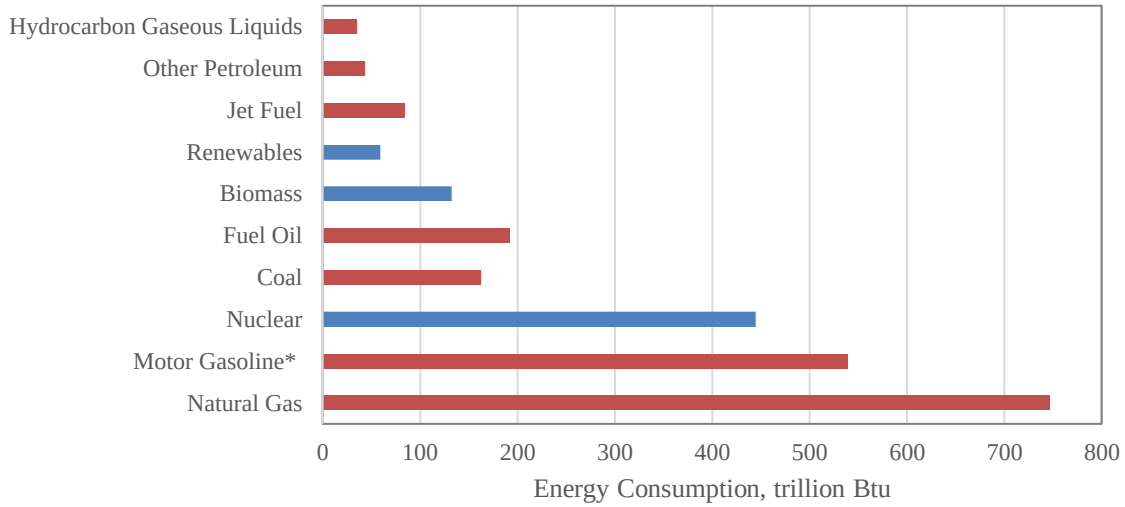
[30] U.S. Bureau of Economic Analysis Economic Profiles by State

[31] U.S. States Profiles and Energy Estimates, U.S. Energy Information Administration, 2022. Retrieved from https://www.eia.gov/state/seds/data.php

[32] EIA State Energy Data, State Profiles and Energy Estimates, Table C1. Energy Consumption Overview: Estimates by Energy Source and End-Use Sector, 2022 (Trillion Btu), https://www.eia.gov/state/seds/data.php.

[33] EIA Table C1. Energy Consumption Overview: Estimates by Energy Source and End-Use Sector, 2022

North Carolina Energy Consumption by Fuel Type, 2022



*Excluding ethanol

North Carolina Transportation Fuel Consumption by Resource Type, trillion Btu

Motor Gasoline	Distillate Fuel Oil (diesel)	Jet Fuel	Natural Gas	Lubricants	Aviation Gas	Electricity	Hydrocarbon Gaseous Liquids	Residual Fuel Oil
550.9	157.5	84.5	7.8	3.8	0.6	0.1	0.3	0.2

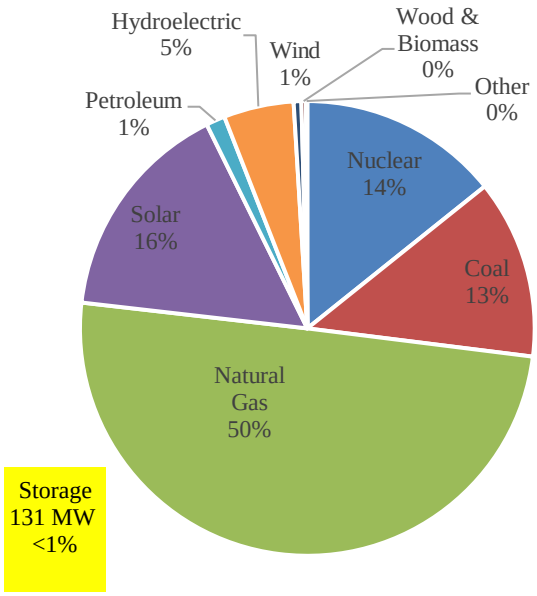
PRICES[34]

North Carolina Energy Prices for March 2024

Natural Gas	Units	North Carolina	U.S. Average
City Gate	$/thousand cu feet	$3.45	$4.05
Residential	$/thousand cu feet	$17.01	$13.85
Electricity		**North Carolina**	**U.S. Average**
Residential	cents/kwh	₵15.60	₵16.68
Commercial	cents/kwh	₵10.78	₵12.76
Industrial	cents/kwh	₵7.87	₵7.73

ELECTRICITY PROFILE[35, 36]

2022 Nameplate Capacity by Resource Type

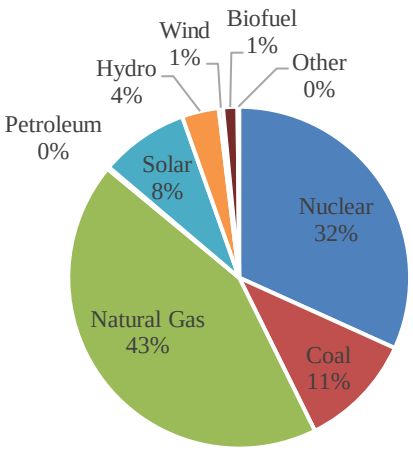


Primary Resource Type	Number of Plants	2022 Nameplate Capacity (MW)
Nuclear	3	5,395
Coal	4	4,816
Natural Gas	19	18,856
Petroleum	35	510
Hydroelectric	38	1,885
Solar	728	6,012
Wind	1	208
Wood	2	50
Other Biomass	17	71
Other	10	36
Total	**857**	**37,840**
Pumped Storage	1	95
Battery Storage	10	36

	Planned Capacity (MW)			
	2024	**2025**	**2026**	**2027**
Natural Gas	536	0	0	0
Solar	419	271	354	75
Battery	42.5	0	0	0

[34] U.S. EIA, North Carolina State Profile and Energy Estimates, Profile Data. https://www.eia.gov/state/data.php?sid=NC
[35] Existing Nameplate and Net Summer Capacity by Energy Source, Producer Type and State, 1990-2022, Detailed State Data
[36] Form EIA-860 detailed data with previous form data (EIA-860A/860B)

Electricity Generation by Source (2022) [37]



2022 Electricity Generation	
Resource Type	**MWh**
Nuclear	42,644,282
Coal	14,673,743
Natural Gas	58,131,396
Petroleum	277,752
Solar	11,263,943
Hydro	4,686,291
Wind	546,755
Biofuel	1,824,874
Other	208,620
Total	**134,257,088**

2022 Generation by Resource and Ownership in MWh

Total Generation	**127,855,040**	
Duke Energy	109,138,633	85%
Non-Duke Energy	18,716,407	15%
Total Fossil Generation	**73,082,891**	
Duke Energy	63,139,800	86%
Non-Duke Energy	9,943,091	14%
Total RE Generation	**16,496,989**	
Duke Energy	3,354,868	20%
Non-Duke Energy	13,142,121	80%
Total Biofuel Generation	**1,824,874**	
Duke Energy	0	0%
Non-Duke Energy	1,824,874	100%

Change in RE Electricity Generation from 2007 to 2022 in thousand MWh

Net Generation from Renewable Sources (thousand MWh)									
Source	**2007**	**2009**	**2011**	**2013**	**2015**	**2017**	**2019**	**2020**	**2022**
Hydroelectric	3,121	5,214	3,893	6,901	4,742	3,818	6,172	7,942	4,686
Solar PV	0	5	17	345	1,374	5,114	7,342	8,173	11,264
Wind	0	0	0	0	0	471	523	546	547
Biomass	1,585	1,757	1,953	2,200	2,045	2,117	699	582	1,364
Biogas	87	131	375	410	544	695	477	465	461
Total	**4,793**	**7,108**	**6,239**	**9,855**	**8,705**	**12,215**	**15,213**	**17,709**	**18,322**

[37] EIA Form https://www.eia.gov/electricity/data/eia923/ https://www.eia.gov/electricity/annual/pdf/epa.pdf

ELECRICITY EMISSIONS PROFILE[38, 39]

Electricity Generation CO2 Emissions

	2005	2022	2005	2022		2005	2022
Fuel Type*	**Net Generation (MWh)**	**Net Generation (MWh)**	**CO2 Emissions (MMT)**	**CO2 Emissions (MMT)**	**Percent Change in CO2**	**CO2 Intensity Factor kg/MWh**	**CO2 Intensity Factor kg/MWh**
Coal	77,994,318	14,673,743	71.43	15.10	-81%		
Natural Gas	3,142,892	58,131,396	1.45	25.88	1750%		
Diesel Fuel	246,883	277,752	0.24	0.73	13%		
Total Fossil Fuel	81,384,094	73,082,891	73.12	45.66	-10%		
Total Non-Emitting	44,655,954	16,496,989	0.00	0.00			
Total Biofuel	459,903	1,824,874	NA	NA			
Total - All Resources	**126,499,951**	**134,257,088**	**73.12**	**45.66**		**591.4**	**307.3**

* Does not include "other", non-fossil fuel CO2-emitting resources

2021 Duke Energy Dual Fuel Steam Plants - Fuel Consumption (MMBtu)

Plant	Coal	Diesel	Natural Gas	Total Energy	Percent Coal	Percent Natural Gas
Dual Fuel Plants						
James E. Rodgers Energy Complex	12,216,289	58,105	36,610,118	48,884,512	25%	75%
Belews Creek	30,737,179		60,574,294	91,311,473	34%	66%
Marshall (NC)	33,381,279	2,030	39,148,090	72,531,399	46%	54%
G G Allen	3,310,323	54,850		3,365,173		
Mayo	12,974,586	153,168		13,127,754		
Roxboro	59,422,550	327,680		59,750,230		
Total Energy	**152,042,206**	**595,833**	**136,332,502**	**288,970,541**	**53%**	**47%**

2021 CO2 Emissions Reductions from Use of Natural Gas in Coal Plants (MMT)

Plant Fuel	Coal	Diesel	Natural Gas	Total Emissions	Percent Reduction in CO2
Only Coal Scenario	7.062	0.04		7.102	
Actual Emissions	7.121	0.00	7.23	14.359	**102%**

[38] Source: EIA Form 923, EPA CO2 Emission Factor

2022 Electricity Sector Air Emissions and Emission Intensity[40]

Air Emissions

Pollutant	Units	Value	State Ranking
Sulfur dioxide	short tons	25,706	18
Nitrogen oxide	short tons	44,291	9
Carbon dioxide	thousand metric tons	41,255	15

Emissions Intensity

Pollutant	Units	**Value**
Sulfur dioxide	lb/MWh	0.4
Nitrogen oxide	lb/MWh	0.7
Carbon dioxide	lb/MWh	676

2023 Avoided Emissions from Energy Efficiency & Non-Emitting Renewables[41]

NC REPS Program	**2020 RECS (MWh)**	**CO2**	**NOx**	**SO2**
		Not Emitted (tons)	**Not Emitted (tons)**	**Not Emitted (tons)**
Non-Emitting RE*	9,623,286	2,997,654	1,443	755
EE Measures	272,220	84,797	41	21
Total**	**9,895,506**	**3,082,450**	**1,484**	**777**

* From NC-RETS which includes out of state resources that sell generation to NC as part of NC REPS.
** Does not include entities that opted out and customer sited generation and efficiency measures not included in REPS.

[40] North Carolina Electricity Profile 2022, Table 1, 2022 Summary statistics Energy Information Administration, Retrieved https://www.eia.gov/electricity/state/northcarolina/index.php
[41] NC RETS and EPA eGRID Emission Factors for SRVC region https://ncrets.org/public-reports/

4.2 State Regulatory Profile

Legislative Actions

A number of bills were introduced related to NC state energy policy. Below is list of key legislative changes made and proposed.

Table 4-1. Select Legislative Actions (2023-2024)

Legislation	Status	Date	Topic(s)
SL 2023-121	Law	6/19/2023	**Protect Critical Infrastructure** – Establishes that "it is unlawful to knowingly and willfully (i) destroy, injure, or otherwise damage, or attempt to destroy, injure, or otherwise damage, an energy facility or (ii) obstruct, impede, or impair the services or transmissions of an energy facility, or attempt to obstruct, impede, or impair the services or transmissions of an energy facility." Violating this law will result in a felony charge.
SL 2023-58	Law	6/26/2023	"Limit cities and counties from prohibiting consumer choice of energy service based upon the type or source of energy to be delivered; Require responsible decommissioning of newly sited utility-scale solar projects upon cessation of operations."
SL 2023-108	Law	8/16/2023	**NC Building Code** – "Prohibit further energy conservation and efficiency amendments to the North Carolina state building code until 2026."
SL 2023-138	Law	10/10/2023	**Clean Energy** – Change NC "Renewable Energy Portfolio Standard" to "Clean Energy Portfolio Standard"; Define "clean energy" to include renewable, nuclear, and fusion energy; Require that any new electric public utility will comply with carbon goals and is funded with the least cost path; Extend coal combustion residual closure deadlines; Modify dam safety fees; Other amendments to the G.S. in reference to local government proceedings.
SL 2024-44	Law	10/10/2023	**Commercial Property Assessed Capital Expenditure (C-PACE) Program** – Establishes C-PACE Program to provide qualifying property owners with access to low-cost long-term financing opportunities for projects including energy efficiency, water conservation, renewable energy, and resilience projects. Local governments

			can opt into program, creating the ability for their citizens to take advantage of C-PACE.
SL 2024-43	Law	6/27/24	**Rural Electrification Authority Fee Update** – During a fiscal year in which the General Assembly does not establish a rate for the NC Rural Electrification Authority's regulatory fee, it will be 6 cents per connected meter per quarter of the fiscal year. This is an increase from the previous rate of 4 cents per connected meter per quarter of the fiscal year.
SL 2024-45	Law	7/9/2024	**Regulatory Reform Act of 2024** – "Increase punishment for property crimes committed against critical infrastructure"; "Expand requirements for issuance of 401 certifications by the DEQ to projects located at an existing or former electric generating facility"; Update cost recovery for natural gas derived from renewable energy biomass production; DEQ must report quarterly on permit applications for natural gas pipelines and gas-fired electric generation facilities.
SL 2024-49	Law	9/11/2024	Building Code Council must amend North Carolina Energy Conservation Code to include minimum insulation requirements for "the use of air-impermeable insulation in areas with unvented attic and unvented enclosed rafter assemblies"
H225 and S316	Proposed legislation	Effective 12/1/2023	**Electric Vehicle Charging Stations** – Vehicles parked in EV parking spaces must be plugged in and charging. Violation of this results in an infraction and parking fine. EV spaces cannot displace handicap parking spots.
H318	Proposed legislation	Last edited 3/13/2023	**Residential EV Charging Space** – [IF RATIFIED] New construction one- and two-family homes must have at least one EV-ready parking space. Only applies to homes with designated parking spaces.
H385	Proposed legislation	Last edited 3/16/2023	**Cost of Natural Gas** – [IF RATIFED] Establishes that utility companies cannot charge more for natural gas from renewable energy biomass resources than the average cost of natural gas not from renewable energy biomass resources.
H414	Proposed legislation	Last edited 3/21/2023	**Broadband Speed Standardization** – [IF RATIFIED] "Conform the State Public Utility standard for broadband speed to the Federal

			Communications Commission's broadband speed benchmark."
H443	Proposed legislation	Effective 1/1/2023	**Renewable Energy Tax Credit** – Tax credit of 35% of cost of property for constructing, leasing, or purchasing renewable energy property in the taxable year that the property is placed in service.
H503	Proposed legislation	Last edited 3/29/2023	**Storm Resiliency Study** – [IF RATIFIED] NC Policy Collaboratory to conduct study on NC electricity market and report findings and recommendations to NC General Assembly.
H535	Proposed legislation	Effective 7/1/2023	**Solar Capacity Limit Increase –** Increases maximum total installed capacity of solar energy facilities from 1% to 10%; "A solar energy facility leased to an individual customer generator lessee pursuant to this section is limited to a capacity of (i) not more than the lesser of 1,000 kilowatts (kW) or one hundred percent (100%) of contract demand if a nonresidential customer or (ii) not more than 20 kilowatts (kW) or one hundred percent (100%) of estimated electrical demand if a residential customer."
H570	Proposed legislation	Last edited 4/6/2023	**Efficient Government Buildings & Savings Act** – [IF RATIFIED] DEQ State Energy Office will make a comprehensive plan for all state buildings (including agencies and universities) to reduce energy consumption by 40% by 2030 including: Building lights off between midnight and 6 am unless required; Indoor potable water use reduced by 30%; Outdoor potable water + harvested stormwater use reduced by 50%.
H720	Proposed legislation	Last edited 4/19/2023	**NC Clean Energy 2050 Goal** – [IF RATIFIED] Establish state energy goal of 100% clean energy by 2050; Promote the creation of green jobs
H775	Proposed legislation	Last edited 4/19/2023 Funding appropriation effective 7/1/2023	**Transformative Climate Communities –** [IF RATIFIED] Establish Transformative Climate Communities Fund to assist local governments with clean energy goals; Appropriates funds of $500,000 (FY23-24) and $750,000 (FY 24-25) from General Fund to State Energy Office
H801	Proposed legislation	Effective 1/1/20223	**Reenact Solar Energy Tax Credit** – Establish a tax credit of 35% for installation + use of qualifying solar energy equipment in the year the

			equipment is placed in service. No double tax credits allowed for the same piece of equipment.
H847	Proposed legislation	Last edited 4/26/2023	**Energy Savings Incentives for State Agencies** – [IF RATIFIED] Money saved by State agencies by using energy efficient practices will roll over into agency's next fiscal year budget to be used for one-time energy conservation expenditures (note: excludes UNC Board of Governors and UNC System institutions). Prevents NC Director of Budget from "decreasing recommended continuation budget requirements for utilities for State governmental units carrying forward a credit balance". Appropriates $100,000 in recurring funds to DEQ SEO to support efforts to assist State agencies and higher learning institutions in development and implementation of their own energy consumption reduction plans.
H889	Proposed legislation	Effective 7/1/2023	**Clean Energy Grants** – Establish North Carolina Clean Energy Innovation and Research fund and grant program to help foster growth of North Carolina's green economy.
S378	Proposed legislation	Last edited 3/28/2023	**NC State Building Code** – [IF RATIFIED] "Prohibit further energy conservation and efficiency amendments to the North Carolina State Building Code until 2031."
S423	Proposed legislation	Last edited 3/30/2023 Part II effective 7/1/2023	**Homeowner Solar Expansion Act** – [IF RATIFIED] Part I: Render residential property deed restrictions on solar collectors "void and unenforceable" Part II: Exempts third-party owners/operators of solar generation facilities located on a customer's property from the restrictions applied to public utilities.
S697	Proposed legislation	Last edited 4/10/2023	**Offshore Wind** – [IF RATIFIED] Moratorium placed on offshore wind permit application review and issuance. To prevent potential adverse effects to North Carolina's coastal resources.
S710	Proposed legislation	Effective 10/1/2023	**Community Solar –** Community solar facilities must offset the energy use of at least five subscribers; Single subscribers may not have interest of more than 40% (except for those facilities that are intended to support buildings during grid failure); Facilities must be located in the service territory.

S714	Proposed legislation	Last edited 4/10/2023 Funding appropriation effective 7/1/2023	**An Energy Resilient NC** – [IF RATIFIED] Establish Energy Resilient Communities Fund, special revenue fund within DEQ State Energy Office. Will provide grants to local governments to assist with reaching sustainability goals through clean energy projects. Total funding: $1,000,000 for 2023-24 FY and $3,000,000 for 2024-25 FY. Funding appropriated from General Fund to State Energy Office.

Regulatory Actions

Below is a summary of regulatory actions since the 2022 EPC Biennial Report.

Table 4-2. Select North Carolina Energy Regulatory Actions (2022-2024)

Docket Description	Docket No.	Website
2022 Duke Energy Carbon Plan	E-100, Sub 179	NCUC: Carbon Plan
2023 Duke Energy Carbon Plan/Integrated Resource Plan (CPIRP)	E-100, Sub 190	Dockets (ncuc.gov)
Technical Conferences on Duke Energy's 2023 CPIRP	E-100, Sub 190	ViewFile.aspx (ncuc.gov) ViewFile.aspx (ncuc.gov)
Dominion North Carolina Power's 2023 Integrated Resource Plan ("IRP")	E-100, Sub 192	Docket Details (ncuc.gov)
Duke Energy's Solar Procurement Plan Pursuant to 2022 Carbon Plan	E-2, Sub 1340, E-7, Sub 1310	Docket Details (ncuc.gov)
Securitization of Early Retirement of Subcritical Coal-Fired Facilities	E-100, Sub 177	Dockets (ncuc.gov)
Performance-Based Regulation of Electric Utilities	E-100, Sub 178	ViewFile.aspx (ncuc.gov)
Rulemaking Proceeding to Implement Securitization of Storm Costs and Reserves under N.C.G.S. §62-172	E-100, Sub 183	Dockets (ncuc.gov)
Modify Existing Power Purchase Agreements with Eligible Small Power Producers	E-100, Sub 181	ViewFile.aspx (ncuc.gov)
Consideration of Certain Standards to Promote Utility Demand Response Pursuant to the Infrastructure Investment and Jobs Act	E-100, Sub 189	Dockets (ncuc.gov)
Duke Energy Progress's Performance Based Rate Application (General Rate	E-2, Sub 1300	ViewFile.aspx

Case)		(ncuc.gov)
Duke Energy Carolinas' Performance Based Rate Application (General Rate Case)	E-7, Sub 1276	ViewFile.aspx (ncuc.gov)
Application of Dominion for General Rate Case	E-22, Sub 694	Docket Details (ncuc.gov)
Duke Energy's Annual (2024) Energy Efficiency and Demand-Side Management Annual Cost Recovery Review	E-7, SUB 1305, E-2 Sub 1342	Dockets (ncuc.gov) and Dockets (ncuc.gov)
Decommissioning Costs for Nuclear Power Plants	E-100, Sub 56	Docket Details (ncuc.gov)
Duke Energy's 2023 REPS Compliance Plans	E-100, Sub 193	Dockets (ncuc.gov)
Dominion North Carolina Energy 2023 IRP & REPS Compliance Report	E-100, Sub 192	Dockets (ncuc.gov)
Biennial Determination of Avoided Cost Rates for Electric Utility Purchases from Qualifying Facilities - 2023	E-100 Sub 194	Dockets (ncuc.gov)
Net Metering	E-100, Sub 180	Docket Details (ncuc.gov)
Amend Rules R8-63 and R8-64 to include transmission costs in CPCN	E-100, Sub 176	Docket Details (ncuc.gov)
Duke Energy's Application for a Certificate of Public Convenience and Necessity ("CPCN") for a 850 MW Natural Gas-fired CT at Existing Generating Facility in Catawba County	E-7, Sub 1297	Docket Details (ncuc.gov)
Duke Energy's Joint Application with the North Carolina Electric Membership Corporation for a CPCN for a 1,360 MW Natural Gas-fired Combined Cycle at an Existing Generating Facility in Person County	E-2, Sub 1318	Docket Details (ncuc.gov)
Low Income Affordability Collaborative Report and Affordability Stakeholder Group	E-2, Subs 1219,1193 & E7, Subs 1213,1215, 1187 and E-2, Sub 1300 and E-7, Sub 1276	ViewFile.aspx (ncuc.gov) Dockets (ncuc.gov)
North Carolina Transmission Planning Collaborative		nctpc.org/nctpc/home.jsp
Utilities Reporting on IIJA Activities	M-100, Sub 164	Docket Details (ncuc.gov)

Duke Energy EV Managed Charging Pilots	E-7, Sub 1266, E-2 Sub 1291	Docket Details (ncuc.gov)
Application for Approval of Proposed Electric Transportation Pilot	E-2, Sub 1197, E-7, Sub 1195	Docket Details (ncuc.gov)

Appendices

A. List of EPC Committee Meetings

Energy Infrastructure Committee

February 8, 2023

May 10, 2023

September 11, 2024

Energy Efficiency Committee

February 13, 2023

May 15, 2023

August 14, 2023

February 19, 2024

April 9, 2024

May 13, 2024

June 10, 2024

August 19, 2024

September 16, 2024

Energy Assurance Committee

February 10, 2023

May 12, 2023

February 16, 2024

May 10, 2024

June 14, 2024

July 12, 2024

August 2, 2024

August 16, 2024

September 13, 2024

Energy Innovation Committee

February 8, 2023

May 11, 2023

August 10, 2023

November 9, 2023

May 9, 2024

June 13, 2024

July 11, 2023

August 15, 2024

September 11, 2024

September 16, 2024

Joint EA and EI Committees

August 9, 2023

Joint EIn and EI Committees

February 14, 2024

B. Staff to the Council

Department of Environmental Quality State Energy Office

Julie Woosley

Star Hodge

Anika Pruim

Nyjah Bryant

Elise Easterling

Bridget Parrish

Matthew Davis

Matthew Pulliam

Hayward Fain

James Conlon

Natalie Narron

Ian McMillan

Carson Ford (former)

Paula Hemmer (former)

Kendrick Fentress

Sascha Medina

David Stratton

Amy Chapman

C. Public Comments

This report has undergone a public review process before discussion and before adoption by the full Energy Policy Council. A draft of the 2024 Energy Policy Council's Biennial Report was posted on the North Carolina Department of Environmental Quality's website from October 21, 2024, to November 11, 2024 for public comments. Comments were received from the following organizations:

The letters from the organizations are attached on the following pages.