
Recommendations for North Carolina policy makers, regulators and utilities to enable economic development, job creation and building infrastructure resiliency through new and increased investment in energy efficiency.
ABOUT THIS REPORT
This report offers North Carolina policy makers, regulators and utilities a business case detailing how new and increased investment in the state’s already strong energy efficiency industry will yield economic development, job creation and building infrastructure resiliency improvements for years to come. North Carolina’s little-known energy efficiency industry is roughly four times the size of the solar industry and is a major contributor to jobs and revenue across the state. To this point, the industry has contributed tremendous energy, health and safety benefits to citizens and businesses without much, if any, support from state and local governments. This report provides clear and actionable recommendations that state and local leaders can take to increase those benefits. Doing so is the first, best and least costly method to addressing our state’s current and future energy needs. Invest in less to create more for North Carolina.

ABOUT THE AUTHOR
North Carolina Building Performance Association (NCBPA) is a 501(c)(6) not-for-profit trade association of building performance professionals and companies seeking to lead high performance construction in the state through quality construction, workforce development, political advocacy, public education and member services. The association works with member companies and partner organizations to promote opportunities that improve the quality of buildings in North Carolina so that all residents and businesses can live and work in healthy, safe, durable, cost-effective and environmentally friendly homes and buildings. Visit www.BuildingNC.org for more information.

NORTH CAROLINA’S ENERGY EFFICIENCY INDUSTRY BY THE NUMBERS

<table>
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<th>Category</th>
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| Revenue | 13.9% Energy Efficiency
| | 11.4% Renewable & Storage
| | 115% Companies
| | 1,500 % of Electricity Generation
| | 327 Generation Jobs
| | 12.9% Energy Efficiency
| | 23.3% Coal
| | 30% Oil & Gas
| | 35.4% Nuclear
| | 3% Electric Generation & Transmission

NC’s National Rankings for Energy Efficient Construction
- Home Energy Ratings: 2nd
- National Green Building Standards Certifications: 2nd
- LEED Certifications: 7th

NC’s National Rankings for Energy Efficient Policy Support
- State Rankings in Support of Energy Efficiency: 30th
- Energy Star Rebates and Public Incentives: 2 of 20
- National Building Energy Codes: 4 of 7
- Points for State Government Agencies: 4 of 7

National Consumer Preferences on Energy Efficiency
- States that want energy state energy ratings: 91%
- Premise savings of sales of energy efficient homes: 2-6% (3-8%)
- Operational cost savings from energy efficient buildings: Over 10%
- Asset value gained by green buildings (over conventional buildings): 7%

<table>
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<th>Electric Utilities and % of NC Electricity Customers Served</th>
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| Investor-Owned Utilities | 55.1%
| Electric Membership Corporations | 31.9%
| Municipal Utilities | 13.2%

North Carolina’s Energy Usage National Rankings (2016)
- Total Energy Consumption Per Capita at 257 Million BTU: 38th
- Total CO2 Emissions at 127 Metric Tons: 14th
- Total Energy Consumption by Residential Users at 127 Million BTU: 10th
- Total Energy Consumption by Industrial Users at 2,554.9 Trillion BTU: 12th
- North Carolina’s Energy Usage Per Capita: 257 Million BTU
- Total CO2 Emissions: 127 Metric Tons
- Total Energy Consumption by Residential Users: 127 Million BTU
- Total Energy Consumption by Industrial Users: 2,554.9 Trillion BTU

Percentage Change
- Total Energy Consumption: 2-6%
- Total CO2 Emissions: 2-6%
- Total Energy Consumption by Residential Users: 2-6%
- Total Energy Consumption by Industrial Users: 2-6%
Energy efficiency is the least costly and highest returning solution for addressing North Carolina’s current and future energy needs. Why generate more when our state can simply use less? By having no state plan and little infrastructure in place to benefit from energy efficiency, North Carolina’s leaders are avoiding major economic development, workforce development and long-term building infrastructure resiliency opportunities available across the state. North Carolina’s energy efficiency industry accounts for $15 billion in annual state revenue (2.9% of GDP) and employs roughly 50,000 workers (42% of all state energy jobs). But, few elected officials and state agencies know of the industry or offer any tangible support for it. The state also lacks an active State Energy Plan, let alone one that prioritizes energy efficiency first! What would happen if the state invested in energy efficiency? Increased economic development, jobs and building infrastructure resiliency. With increased state and local government support, North Carolina would: • Become a national leader in smart manufacturing, energy efficiency research and development, and sustainable construction. • Fuel local economic development by addressing a major job shortage in energy efficient construction. • Reduce energy and water usage in private and public buildings, eliminating the need for costly and risky investment in nuclear and other sources of energy generation. • Reduce environmental carbon emissions and reliance on fossil fuels. • Improve the health, safety and utility affordability of its residents and their businesses. Energy efficiency is a shining example of small private businesses driving public benefits. Few state programs offer any support to the industry’s 1,500 companies and 50,000 employees. North Carolina’s energy efficiency industry is a model for hard-working companies and individuals delivering low-cost and high benefit products and services to needing consumers. Comprised primarily of small businesses with 1 – 499 employees, the industry accounts for up to 10% of construction jobs in the state and is the third largest small business industry sector by companies and fifth by employment. In North Carolina, there is a massive shortage of skilled labor in construction jobs, causing a backlog of residential and commercial construction projects. The state currently has few plans and resources in place to address this long-standing market challenge, with no plans for energy efficiency.

Energy efficiency does more than save energy. Health, safety, environmental and productivity improvements come with it.

Energy efficient homes and buildings use less electricity, gas and water than others. Because they are built better, they offer occupants improved comfort, improved health and safety, and lower environmental impacts, all of which are contributors to higher worker productivity and less sick days. Energy efficiency is also a large and low-cost carbon abatement resource. If tapped in substantial quantities, it can help achieve CO2 emissions reduction goals and lower the costs of doing so – whether or not specific climate policies are in effect.

Energy efficiency employs 42% of the state’s energy workers. More than double renewables, storage and nuclear combined.

North Carolina’s energy efficiency industry is roughly four times the size – by revenue, companies and workers – as the solar industry, which is considered a boom industry and tightly visible to consumers and policymakers. Our industry companies employ 50,000 workers, includes thousands of contractors and developers, various types of contractors, and product and service providers that create new, or retrofit existing, homes and buildings to use less energy. A typical day for an energy efficiency worker can include sophisticated energy modeling, product research and development, and crawling under, over and through houses and buildings.

Since 2003, roughly $45 million of state funding has yielded more than $1.3 billion in energy and water savings in public buildings. Two of the state’s only funded energy efficiency programs are the Performance Contracting Program and Utility Savings Initiative within the State Energy Office. These programs receive about $3 million in state funding per year and have yielded over $1.3 billion in energy and water savings in public buildings since 2003. These public programs enable private industry to retrofit existing buildings owned by the state, a win-win scenario. New construction minimum energy requirements take up most of the attention on building and energy code development in the state. But, with 99.9% of North Carolina homes and buildings already existing, greater attention is needed to benchmarking programs and performance-based incentives that would enable existing home and building energy efficiency retrofits across the state.

One dollar of state investment in energy efficiency can yield four dollars in energy savings.

North Carolina has no active State Energy Plan and few state resources to support energy efficiency, which could contribute to a 20% reduction in consumer energy usage at costs far less than new generation. Since buildings use approximately 40% of all energy in North Carolina, a sustainable focus on energy efficiency would maximally reduce energy capacity needs. Low income weatherization, multifamily energy efficiency retrofits and commercial building performance benchmarking are just a few sectors of the industry that would yield economic development, job creation and building infrastructure resiliency through increased statewide support of energy efficiency.

The business case for energy efficiency is clear: Invest in less to create more for North Carolina.
THE BENEFITS OF ENERGY EFFICIENCY

The energy efficient construction of new and existing homes and buildings offers owners, managers and occupants a wealth of benefits far exceeding the value of energy savings alone. They include:

- Improves the comfort, health and safety of occupants
- Increases the sales price and appraised value for owners
- Reduces environmental impacts through lower carbon emissions and fossil fuel usage
- Reduces electricity, gas and water usage and related utility costs
- Increases productivity by operating in cold and hot seasons
- Reduces maintenance and repair costs
- Offers energy independence and reliability through storms and outages
- Improves housing affordability through reduced utility costs
- Improves worker productivity through improved indoor environments

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Homes
Apartments
Office Buildings
Factories
Schools
Homeowners
Business Owners
Workers
Students
Seniors

ROADMAP TO GROWTH AND DEVELOPMENT THROUGH ENERGY EFFICIENCY

Utility and Regulatory Environment
Expand and modernize utility energy efficiency programs and the regulatory environment that regulates them to achieve at least 1% net utility energy efficiency savings by 2023

Adopt and provide education on improved building and energy codes, add an energy slot to the NC Building Code Council and promote above-code utility energy efficiency incentive programs

Support increased consumer education, decreased regulatory hurdles and offer public/private consumer financing programs to enable increased participation in energy efficient construction

Create and implement a statewide plan that establishes voluntary and mandatory energy, water and performance benchmarking in homes and buildings

Reduce the financial barriers that prevent builders, owners, occupants and federally-funded programs from participating in energy efficient construction in multifamily and low-income homes and buildings

Reinforce and increase the current low-level of state support for public entities involved with energy efficiency and establish an energy roadmap that prioritizes using less before creating new

Expand state and local support for workforce development programs that train students and displaced workers to fill the vital need for more skilled workers in the state’s energy efficiency trades

Building and Energy Codes
Reduce Market and Regulatory Barriers to Entry
Energy, Water and Performance Benchmarking
Multifamily and Low-Income Financial Barriers
Strategic State Support and Resources
Workforce Development
Expand and modernize utility energy efficiency programs and the regulatory environment that regulates them to achieve at least 1% net utility energy efficiency savings by 2023.

A small number of energy efficiency rebate, incentive and financing programs have ever been offered in North Carolina and few are currently available through utilities and nonprofit agencies. With the very limited number of federal energy efficiency tax credits having already expired and likely more to come, North Carolina’s economy, citizens and businesses could benefit from new and expanded state and local tax incentives and rebates. The Utilities Commission is authorized to approve an annual rider for the recovery of utility costs incurred through the adoption and implementation of new demand-side management and energy efficiency measures. It may also award incentives for public utilities that implement new programs. The Utilities Commission should require more energy efficiency rebate and incentive programs from Duke Energy using modernized cost-effectiveness testing requirements that reward performance-based programs and societal benefits. Industry recommends that the Utilities Commission expand existing energy efficiency utility programs, modernize its policies and procedures for measuring cost-effectiveness, and implement regulatory improvements that incentivize consumer and utility participation across the market.

Establish a Goal of at Least 1% Net Utility Energy Efficiency Savings by 2023

In past industry negotiations with Duke Energy, the utility committed to a 1% voluntary savings target from energy efficiency but later backed away. This 1% target is a small number for the utility but represents a major commitment to reducing the utility’s load, and subsequently consumer rates, through energy efficiency programs and measures. A carbon tax for commercial and industrial buildings would also encourage increased energy efficiency upgrades to avoid the new taxes.

Renewable Energy and Energy Efficiency Portfolio Standard (REPS)

North Carolina’s current REPS standards mandate that 12.5% of investor-owned utility energy capacity come from eligible energy sources such as energy efficiency and renewables by 2021 and 10% for electric cooperatives and municipal utilities by 2018. Currently, up to 25% of the requirement may come from energy efficiency and up to 40% beginning in 2021. Michigan created the Energy Optimization Standard (EOS) to go along with its renewable energy and energy efficiency standards that required a 10% annual reduction of the previous year’s retail electricity sales. To meet this EOS the utilities must offer energy efficiency programs and file an Energy Optimization Plan on how they plan to achieve these goals. California has a similar program called Energy Efficiency Resource Standard that requires a 10% reduction in electricity consumption in 10 years to be met through incentive programs, building code changes, appliance standards, market transformation efforts and more.

- Establish a mandate for regulated utilities to achieve at least a 1% annual energy savings target based on prior year sales by 2023.
- Add a “public goods charge” (PGC) on ratepayer electricity to create a public benefits fund.
- Establish a carbon tax focused on commercial and industrial buildings.
- Increase or remove current REPS energy efficiency limits.
- Prioritize energy efficiency before renewables.
- Incorporate annual energy reduction standards.
- Pass into law 2017’s HB401 “Supporting Clean Energy/Creating Green Jobs.”
Enable Utility Supported Consumer Financing Programs

Utilities can play an active role in helping consumers implement energy efficient upgrades in existing homes and buildings without taking on burdensome financial risk or liability. Two programs beginning to take shape should receive greater state and local support. Pay As You Save, or PAYS, is a financing option in which the utility pays for the full upfront costs of energy efficiency upgrades and recovers the costs through subsequent monthly charges, on the customer’s utility bill. The annual repayments are capped at 80% of the estimated savings. Customers thus pay only more than the savings. Eligibility is determined by utility bill payment history instead of credit score so more people can qualify. PAYS is also tied to the property, not the individual, so it can be transferred to new owners or renters. A study by Appalachian Voices determined that this program would yield French Broad EMC savings of $21.1 million in investment and 64 new local jobs. On-Bill Financing (OBF) is a similar program whereby the utility also provides up-front funding to help customers overcome the upfront financial burdens. OBF determines eligibility through utility payment history and a credit score, in some cases.

Improve Cost Effectiveness Testing for Utility and Creditworthiness

Regulated North Carolina utilities are required to meet cost effectiveness measures by the Utilities Commission. The screening procedures are used to ensure that evidenced-based performance data on the effectiveness of the programs – defined as a positive return of the value of individual and community non-energy costs reduced. Any and retrofits. The creation of an Energy Efficiency Bank would provide loans for energy efficiency or renewable energy projects that are not subject to the review process. Additionally, a tax on energy inefficient appliances, those without the ENERGY STAR® standards) via state or utility funded tax credits or rebates.

Commercial Buildings Energy Efficiency Opt-Out Allowance

Under its REPS statute, North Carolina affords large commercial energy customers with 1,000,000 kWhs of annual energy consumption the opportunity to opt-out of state-mandated utility energy efficiency programs (Commission Rule R8-69 (d)). Unfortunately, many take advantage of this option as their financial motivations are focused on short-term returns whereas the majority of energy efficiency options offered to them provide low upfront costs with long-term benefits. Allowing these customers to self-direct their energy efficiency spend to areas where they believe it to be most cost effective. California does not have the option of self-direct and North Carolina does not allow commercial entities to self-direct their energy efficiency spend to areas where they believe it to be most cost effective. California does not have the option of self-direct and North Carolina does not allow commercial entities to self-direct their energy efficiency spend to areas where they believe it to be most cost effective.

Enable Tiered Electricity Rates and Support Financing and Incentive Programs

Tiered electricity rates could be applied to residential, commercial, public and industrial customers in the state. They would work by charging higher energy users higher prices per kilowatt hour, thus encouraging customers to reduce their energy use in order to access lower rates for electricity. With the continued rollout of smart meters across North Carolina, utilities and the economic, cost effectiveness to the utility itself and a reasonable amount of utility risk – are used to approve of the programs continuing. Efforts to modernize cost effectiveness testing through energy efficiency projects by moderating cost effectiveness testing requirements. Incorporate higher cost effectiveness scoring for programs that incentivize efficient design that serve low-income households.

• Significantly raise the threshold for the opt-out option or eliminate it altogether.
• If the threshold remains in place, establish a self-direct option and create necessary state level EM&V policies and procedures at the Utilities Commission.

• Create an Energy Efficiency or “Green” Bank to support financing of energy efficiency and renewable energy projects at the state.
• Pass into law SB 236 “Efficient and Affordable Energy Rates” with some modifications:
  • Incorporate provisions that prevent low-income customers from increased utility burden by these types of integrated rate structures, which have occurred in other states.
  • Exempt customers that fall significantly below the poverty line.
• Allow utility bill repayment history, or an indicator other than the customer’s credit score, to be used to qualify individuals for the loans.
• Pilot tiered electricity rates and time-of-use rates with aggressive utility marketing of these opportunities for rate design, such as energy time-of-use (TOU) rates, may assist in more energy efficient technology implementation and retrofits.
• The creation of an Energy Efficiency Bank would provide loans for energy efficiency or renewable energy projects that are not subject to the new rate structure. Additionally, a tax on energy inefficient appliances, those without the ENERGY STAR® label, would further incentivize energy efficient purchases.
**Adopt and provide education on improved building and energy codes, add an energy seat to the NC Building Code Council and promote above-code utility energy efficiency incentive programs**

Raising minimum energy efficiency requirements and adding allowances for above-code programs and incentives are two of the most commonly used methods to support improvements to a state’s energy efficiency customer participation. North Carolina will adopt a new 2018 building and energy code on January 1 of 2019 following more than 18 months of debate and negotiations through the NC Building Code Council. Some low-level improvements to minimum energy efficiency requirements will be provided in the next code, but, as the next code is in place for a six-year period of 2019 – 2024 (a legislative change from 2014 that industry opposes), the new standards (based on the 2015 IECC’s requirements with weakening amendments) will be in place through 2024 if no major changes are made mid-cycle. To move North Carolina’s code forward in small steps over the coming years, industry proposes a variety of updates and changes that will yield benefits to builders and developers, contractors, utilities and North Carolina citizens and businesses.

**Support Transitioning to 2018 NC Building and Energy Code**

According to a report published by Pacific Northwest National Laboratory for the U.S. Department of Energy, adopting the base 2015 International Energy Conservation Code (IECC) would have provided cost-effective savings for residential buildings in North Carolina. Unfortunately, weakening amendments were accepted by the NC Building Code Council due to untrue cost and housing affordability concerns, ignoring this scientific data that showed an average life-cycle cost savings of $2,051.79 per home statewide. The average cost to transition a home from the current 2012 NC code to the base 2015 IECC code would only cost builders $73.92 upfront. These better homes and buildings would offer increased energy savings while adding very little to the upfront cost that would be recouped in the first eight months of ownership through energy savings alone. With electric costs subject to rise nearly $18 per home on average in 2018, the $73.92 upfront cost to builders would help reduce the future energy burden of homeowners by offsetting rising utility costs.

**Add an Energy Seat to Building Code Council**

Over the past several years, the most significant area of discussion and disagreement at the Building Code Council has involved how far code should mandate energy efficiency and, in the next code cycle, renewable energy measures. Industry believes that a major cause of these concerns is the lack of an energy industry representative on the Building Code Council that, like other trade representatives including plumbing, architecture, heating and air, and general contracting, would be able to represent industry regulations, standards and market opportunities specific to changing code requirements. There are currently 17 members on the council and an odd number is needed to prevent tie votes. To add an energy seat an existing seat would need to be removed or two new seats, one being energy, would need to be added.

**Support proper training and implementation of the new code via educational workshops to builders, contractors, code officials and others involved in residential and commercial construction.**

**Transition to the full 2015 IECC as soon as possible.**
Key Energy Stakeholder Education

Continuing education is needed at the Building Code Council, the Utilities Commission, Public Staff and for code officials statewide on a variety of energy-related issues. Leading into the next code cycle, many changes need to be learned by many parties and subsequently enforced at job sites. Leading into our next code cycle, solar panels, storage batteries and other advanced energy technologies are becoming more commonplace in North Carolina homes and buildings. Education is needed to ensure that minimum requirements are established and proper enforcement is available. Energy benchmarking programs would make code enforcement easier and yield benefits to building owners and operators, utilities and local economies through utility savings and improved access to usage data.

Implement Key Energy Efficiency Code Changes

To maintain reasonable minimum energy codes in the state and ensure that builders and consumers have cost effective options for achieving them, five key residential and commercial energy code activities need to be taken before the start of the 2019 – 2024 code cycle. Additionally, because roughly 99.9% of homes and buildings in the state already exist, greater attention should be made to the existing home and building market, where repairs and upgrades rarely take consider energy efficiency.

Educate key stakeholders on:
- Understanding the benefits of energy, water and performance benchmarking programs being added to future code requirements.
- Improving residential and commercial energy code compliance, inspection and enforcement policies and procedures in the field.
- How energy rating systems like the Energy Rating Index (ERI) and third-party verification offer new opportunities to streamline code official inspections and administrative processes.
- Energy efficiency code requirements for existing home and building repairs and retrofits.
- Make the new optional ERI pathway a requirement to achieving energy code compliance in all new home construction.
- Require the Department of Insurance to develop minimum ERI standards via a market analysis.
- Develop policies and procedures for code officials to pass homes using the new ERI option, as well as for homes that do not.
- Perform a study of commercial energy code compliance and code official enforcement to better understand and address gaps and weaknesses across the state.
- Examine opportunities to increase minimum energy code requirements for existing residential and commercial buildings.

Support increased consumer education, decreased regulatory hurdles and offer public/private consumer financing programs to enable increased participation in energy efficient construction

North Carolina’s energy efficiency industry has grown into a strong, reputable and beneficial sector of the state’s economy (2.9% of GDP) despite a lack of tangible state support and a policy and regulatory environment that limits contractor and consumer participation. It’s no secret that the state’s solar industry became the nation’s second largest due to a supportive policy and regulatory environment. The state’s energy efficiency market, on the other hand, is roughly four times larger and operates without many of the concerns policy makers and regulators have of the clean energy and fossil fuel markets. North Carolina citizens, businesses and government would benefit greatly from following the lead of its neighbor to the north, Virginia, which in early 2015 formed the Governor’s Executive Council on Energy Efficiency to develop strategies and recommendations to achieving retail electricity consumption reductions across the state.
Support Low-Cost Consumer Education Opportunities

North Carolina’s State Energy Office [SEO], utilities and local governments should act to introduce simple, low-cost and highly impactful energy efficiency education programs and workshops into communities across the state. Because energy savings can be attained via DIY projects with readily available materials, unlike solar or nuclear, energy efficiency is the path toward a zero-waste benefits. Promoting consumer behavior tips very easy to learn and can lead to interest in larger energy saving projects like insulation installation, lighting replacements and more. Michigan’s Energy Office has a program that provides funding assistance for workshops, conferences and other events with a maximum reimbursement of $10,000. Michigan’s Energy Office offers a variety of print and online educational materials and workshops that include Fulton (DPV) Vermont (low homes low energy and primary opportunities for air sealing and insulation), Mobile Home Efficiency Improvements unique to mobile homes, with a focus on DIY opportunities.

Soaring Energy In Your Business savings opportunities and resources available to help small and medium business lower energy costs and improve their bottom line. Solar Your Energy Bills [Introduction workshop on reducing energy bills through low-cost energy efficiency projects].

Permit-Based Incentives

Municipalities can inexpensively incentivize energy efficient construction by establishing an energy efficiency standard, through state law and in-use in a few municipalities across the state. In California, the City of San Diego has an expedited permit approval pathway that allows for new and remodeled residential and commercial buildings that meet locally-approved energy efficiency standards. The City of San Diego County also has a local program that reduces building permit and plan check fees for homes and commercial buildings that meet locally-approved energy efficiency standards.

Recommendations

Energy Saving Requirements for Public Schools

A starting point for ensuring that public schools are energy and water efficient is establishing automated monitoring systems and requiring districts to publicly disclose utility usage so that benchmarking goals can be established and improvements implemented. These measures would reduce operating budgets at public schools and educate children and young adults on the benefits of energy efficiency. The San Diego Unified School District has already passed a resolution requiring all new construction public schools and those undergoing substantial renovation to be designed to the highest practical energy efficiency standards available.

State-Funded Capital and Infrastructure Funding

20%’s HB 583 (H583), Pass-As-You-Go Capital and Infrastructure Fund, creates a state fund for new infrastructure projects, repair and renovation projects, public schools and community college projects, and transportation capital improvement projects. This legislation could drastically increase the amount of energy efficiency projects in the state and boost local economic activity through job creation and increased local spending.

Pace Success at Big Boy Restaurant

A Big Boy restaurant in Ann Arbor, Michigan received several energy efficiency and building upgrades through C-PACE. PACE financing in Michigan, improvements included building control systems, high efficiency HVAC systems, lighting system upgrades, energy-efficient solar water heating systems, and weatherization. Results include a 19% reduction in annual utility costs amounting to an annual savings of $3,300.

Enable Commercial Property Assessed Clean Energy (C-PACE) Legislation

C-PACE allows building and property owners to finance upgrades and improvements to their buildings through a C-PACE Program that allows for new and existing multifamily, commercial and other building types. Specific upgrades available include heating and air conditioning systems, windows and roofing, lighting and insulation upgrades, renewable energy installations, weather-resiliency measures, building automation systems and much more. 33 states and Washington D.C. have had enabling legislation resulting in more than 1,000 commercial and 188,000 residential projects valued at more than $4.1B and helping to create more than 37,000 jobs.

Pass into law 2017’s HB 583 (H583), Pass-As-You-Go Capital and Infrastructure Fund.

Pass into law of 2017’s SB493, Commercial Property Assessed Capital Expenditures, “C-PACE Program”.
Create and implement a statewide plan that establishes voluntary and mandatory energy, water, and performance benchmarking in homes and buildings.

Benchmarking is an effective tool to measure and subsequently improve a home or building's energy efficiency, water efficiency, or performance. With benchmarking, a building's performance can be measured against itself year over year or month over month and compared to similar buildings to determine how well, or not well, it’s performing. Energy, water, and other improvements are more impactful through the availability of time-bound performance data and baselines for improvement opportunities and performance-based incentive opportunities. A study by the Environmental Protection Agency found that buildings that use benchmarking reduced energy use by about 2.4% per year. The benefits of benchmarking are seen immediately because merely measuring and gaining awareness of a building’s energy use leads to a modest, but still significant reduction in energy use.

**Recommendations**

**Single Family Residential Benchmarking Programs**

North Carolina would benefit from charting a path towards requiring the Department of Energy’s Home Energy Score or RESNET’s Home Energy Rating System (HERS) Index as a benchmarking program for energy performance of single and multifamily homes in the state. RESNET’s new Water Efficiency Rating System (WERS) Index could be used for water efficiency. Using a unified scoring system will reduce confusion and increase transparency. Homeowners will be able to see how well their home performs and compare it to others in their neighborhood or local area. In December of 2016, the City of Portland, Oregon adopted legislation requiring home energy performance report scores for all home sale transactions and visibility of the data to real estate agents and potential buyers.

**Multifamily, Commercial and Public Building Benchmarking Programs**

The cities of Denver, Orlando, Pittsburgh, and many more have already adopted legislation requiring benchmarking for multifamily buildings, commercial buildings, or both. ENERGY STAR’s Portfolio Manager offers an easy comparison tool for establishing mandatory energy and water benchmarking for all buildings over 50,000 square feet in the state. Many states including Connecticut and Michigan require energy and water benchmarking for public buildings. In Connecticut, a “Benchmarking Help Desk” was established to provide assistance to towns, state agencies and schools regarding benchmarking. Michigan’s Agency for Energy offers grants to benchmark buildings and Michigan’s State Energy Office offers low cost services to owners for energy audits, ENERGY STAR Portfolio Manager account setup and more.

**Envision Charlotte - Voluntary Benchmarking**

Envision Charlotte’s voluntary benchmarking program focuses on measuring the energy, water, air and waste usage in 61 commercial buildings of 10,000 square feet or more in uptown Charlotte. Ending in 2016, the first benchmarking period resulted in a 19% reduction in energy usage through measurement and a 10% reduction short of their 20% goal. Envision Charlotte has become a national model for localized energy efficiency programs through Envision America. Envision Charlotte is a strong example of how voluntary benchmarking can result in energy and water savings that boost local economic development, lower operating costs for owners, improve indoor air quality and occupant comfort, reduce greenhouse gas emissions, and more.

- Make plans to require the Department of Energy’s Home Energy Score, RESNET’s Home Energy Rating System (HERS) Index, RESNET’s Water Efficiency Rating System (WERS) Index or other rating systems to establish benchmarking programs for single and multifamily homes in the state.
- Require the use of ENERGY STAR’s Portfolio Manager for all buildings over 50,000 square feet.
- Fund and implement the state’s proposed North Carolina Water and Wastewater Energy Initiative.
Making Energy and Performance Usage Public Record

Legislative updates to Chapter 47E-4 of the North Carolina General Statutes would enable more energy efficiency participation by requiring that energy and water usage and rating data, installation of solar photovoltaics installs and plug-in electric vehicle (PEV) stations, and useful information on other energy efficiency and renewable energy systems be made available through public records and disclosed during sales transactions. Doing so will transform the state’s real estate market by enabling much greater visibility and transparency to the availability and market value of these features, commonly referred to as “Greening the MLS.” Buyers and their agents will be able to easily identify homes and buildings with energy efficient and high performance features, and sellers and their agents will be able to demand higher sales prices through increased market acknowledgement of the higher value of homes and buildings with these features.

Third Party Access to Utility Usage Data

North Carolina’s utilities highly restrict access to energy and water usage data that would help building owners, private industry and government offices increase energy efficiency investment across the state. Having third party access to this data would allow the industry to identify homes and buildings that are high energy and water users and determine which to target for efficiency upgrades. Improved visibility would empower building owners to determine how their usage compares to other similar building types and invest in energy or water efficiency upgrades to reduce their operating costs. The Utilities Commission should follow through on its request of regulated utilities in the state to provide more information on the dissemination of customer usage data to third parties in its Order Accepting Smart Grid Technology Plans issued March 29, 2017 in Docket No. E-100 Sub 147.

- Pass legislation to update Chapter 47E-4 of the North Carolina General Statutes to mandate that energy and water usage and rating data be made available through public records and disclosed during sales transactions.
- Allow third party access to energy and water usage data currently restricted by utilities.
- Develop statewide guidelines that remove potential barriers to benchmarking and transparency initiatives. Utilities, ratepayer advocates, building owners and managers, and technology companies should be invited to actively participate in these efforts.

Multifamily and Low-Income Financial Barriers

Reduce the financial barriers that prevent builders, owners, occupants and federally-funded programs from participating in energy efficient construction in multifamily and low-income homes and buildings.

State investment in policies, rebates and incentives that reduce the financial and regulatory barriers of multifamily and low-income energy efficiency projects offers a great deal of benefit to tenants and owners. Since approximately one-third of rental units and almost half of all homes built before 1978 are usually older buildings occupied by tenants that often cannot pay for the needed improvements. Duke Energy and the state’s Weatherization Assistance Program (WAP) have demonstrated recent success in combining funding to retrofit homes, but since southeastern utilities spend less on these programs (per residential customer), there is room for improvement.

Success Story
Duke Energy’s Helping Home Fund provides free low-income weatherization, health, and safety repairs and retrofits to renters in the utility’s service territory to help them save energy and improve the health and safety of their homes. Since the program began in 2003, 9,185 homes have received 7326 retrofit projects at a cost of $17,615,186 ($5,020 per home / $2,472 per project) in North Carolina. These projects go beyond energy efficiency improvements to address critical home repair and maintenance factors that not only save energy, but improve the health of children and adults and in some cases can help them get back to work. 29% of those projects were for health and safety repairs, 28% for heating and air conditioning repairs and replacements, 24% for additional appliance needs and 17% for structural repairs (in the Duke Energy Progress territory alone) addressed weatherization needs. By dollars alone, 70% of the funding was spent on heating and air conditioning repairs and replacements.

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LOCALS AND INCOME-FINANCIAL BARRIERS:  

**Recommendations**

- Support municipalities in initiating local education, audit and retrofit program through local ordinances.
- Increase the minimum requirements of the Qualified Action Plan program to ENERGY STAR 3.0.
- Ensure effective coordination between utility and state low-income programs.
- Increase available federal and state funding for HOMEC and CDBG and remove barriers.
- Create programs that incentivize developers, owners and managers to improve the energy efficiency of their low-income multifamily properties.
- Educate Utility Commission and Public Staff on effective low-income programs.
- Support programs that are knowledgeable in energy efficiency to the Utilities Commission and Public Staff.

**Addressing the Split-Incentive Financial Barrier**

The “split-incentive” concept is a common financial barrier in the single and multifamily energy efficiency market that can easily be addressed. This barrier occurs especially when energy upgrades are not paid for by the property owner, but the occupants who pay the utility bills or those responsible for the resulting energy savings and benefits, need to be made. When the upgrades are made owner's utility bills are reduced thereby increasing the occupancy's ability to pay their rent. Tenant benefits from improved comfort and safety, lower energy bills and more disposable income. But, before that can happen, owners need to have clear incentives to set their own energy efficiency requirements, North Carolina could capitalize on using ENERGY STAR 3.0, for new construction and Home Performance with ENERGY STAR (HOMES) for existing.

**Implementing Energy Efficiency Requirements for Rental Units**

A new concept to providing energy efficiency opportunities in multifamily and low-income units is to focus on code requirements for existing rental units. Whereas most of North Carolina’s energy code disclosure is for new construction, there is a major gap to address with code requirements in existing units. The City of Memphis, Tennessee has a program in place that requires, through inspections, the implementation of equipment to weatherize the building. These program requirements are tied to broader energy and environmental goals. The North Carolina Community Development Block Grant (CDBG) and HOME Investment Partnership (HOME) programs funded by the U.S. Housing and Urban Development (HUD) department and administered through North Carolina Housing Finance Agency, are two housing rehabilitation assistance programs available in the state. Because these programs allow states to set their own energy efficiency requirements, North Carolina could capitalize on using ENERGY STAR 3.0 for new construction and Home Performance with ENERGY STAR (HOMES) for existing.

**State Funding Issues Limit Authorized Home Weatherization for Low-Income Families**

State funding issues can make it difficult to weatherize homes and families. The Weatherization Assistance Program (WAP) faces significant challenges due to a highly inefficient funding process going from the federal to state government and down to the agencies themselves. In order to weatherize homes, and make it possible for agencies to be ready for the peak work, funds must be readily available to weatherize homes. North Carolina cities is possible. 

- Support local expedited permit procedures for energy efficient multifamily and low-income homes.
- Support programs that offer cash incentives to owners, developers and property managers for making energy efficiency improvements.
- Reinstate tax credits and rebates for energy efficient retrofits to properly address the split-incentive financial barrier.

**Incentives for Builders and Developers**

A variety of rebate and tax incentive programs are available for builders and developers that build to energy efficiency requirements through programs including LEED, National Green Building Standard and Advanced Energy’s SustainLAUS. These programs require stringent energy efficiency design and installation measures be met during the build process, resulting in more energy efficient, comfortable and healthy homes that will last longer and hold their value better. Residents can also benefit from incentives while living in the units, such as guaranteed heating and cooling bills through subsidized payments from utility and state low-income programs. North Carolina cities is possible.
Reinforce and increase the current low-level of state support for public entities involved with energy efficiency and establish an energy roadmap that prioritizes using less before creating new.

North Carolina faces a rare but enviable opportunity to capitalize on major economic growth, national attention and public benefits to state and local governments, industry and citizens by formalizing strategic support for an already strong industry that quietly contributes billions of dollars and tens of thousands of jobs to state and local economies. North Carolina’s energy efficiency industry is already strong thanks to the thousands of companies that produce goods and deliver services in and out-of-state without the support of our state government. Our industry has historically received little state funding and resources to nurture, protect and promote this industry in the past thirty years. But, that can change.

It is a false narrative to suggest that North Carolina needs to generate more energy to meet believed growth in demand. Why not reduce the demand through low-cost and widespread energy efficiency measures?

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STRATEGIC STATE SUPPORT AND RESOURCES

Adopt Energy Efficiency First Resolution

By adopting an “Energy Efficiency First” resolution at the North Carolina legislature, the Governor’s office, state legislators and the Utilities Commission would officially adopt the least-cost and best-first option available — using less energy — to address the state’s evolving energy needs. In recent years, the North Carolina energy narrative has focused on coal plants and their continued detrimental environmental impacts, wind generation and the necessary ordinances and regulations to allow for it, and the challenges of growing investment in solar generation. Additionally, Duke Energy and other utilities in the southeast are struggling to construct new nuclear plants to meet assumed growth in load capacity in decades to come. A top-down vested state strategy focused on using less energy will boost North Carolina’s economy through utility savings, job creation and industry innovation making our state a national leader in smart, effective and responsible energy management that returns financial value, health and safety, and other benefits to our citizens.

Technical Assistance Available to Municipalities

To assist municipalities in engaging in energy efficiency market growth that benefits their local economies, American Council for an Energy-Efficient Economy (ACEEE) has a Local Technical Assistance opportunity in which ACEEE will work with metro cities to assess, recommend and implement energy efficiency programs, benchmarking, ordinances, and much more. State awareness of programs like these, and advertising to municipal sustainability and economic development managers directly, would help them take hold across the state. According to ACEEE’s annual energy efficiency scorecard, Charlotte ranked 45th and Raleigh 43rd nationally in how they support energy efficiency. This tool and others like it help cities determine where they are lacking regarding energy efficiency so that they can plan to improve in the future.

• Adopt an “Energy Efficiency First” resolution at the North Carolina legislature that mandates the use of energy efficiency first in addressing the state’s current and future energy needs.

• Through the State Energy Office, form a public/private task force to engage industry and the public in efforts to create a State Energy Plan that prioritizes energy efficiency before traditional and renewable generation sources.

• Provide grant funding, supportive resources, and training opportunities to municipalities to engage them in energy efficiency opportunities including energy and performance audits of public buildings.
STRATEGIC STATE SUPPORT AND RESOURCES: RECOMMENDATIONS

Increase State Funding of State Energy Office and Energy Centers

The State Energy Office (SEO) should receive increased committed multi-year funding to allow for the organization to invest in staff, programs and initiatives that support increased and implemented long-term energy and energy efficiency initiatives. Currently, the SEO’s funding is subject to annual reviews and was drastically cut by 84% in 2015 for the SEO to support the state’s energy industry without committed resources. Whereas North Carolina has been reducing funding of its SEO over states are increasing more and receiving positive returns in economic development, job creation and reducing energy costs for citizens. The Database of State Incentives for Renewables and Efficiency (DSIRE), located at NC State University’s Clean Energy Technology Center and funded primarily through the U.S. Department of Energy, is an excellent nationally-recognized resource that the state also continues to reduce funding from. Industry recommends continuing funding for this center and two others at Appalachian State University and North Carolina A&T that receive a small amount of state support – just $400,000 in 2018 amongst the three – to continue their programs that provide incentives to North Carolina’s public buildings and institutions, public citizens, private industries and a greater national audience.

Commit to increased and sustaining state funding of State Energy Office and Energy Centers.

Increase State Funding for Performance Contracting

Energy and water savings projects delivered through the state’s existing Performance Contracting statutes effectively re-purposes state funds presently spent on wasted energy to repay the banks that finance these projects. Additionally, these (guaranteed paid from savings) loans do not require new taxes and do not count against the state’s debt ceiling as determined by the legislature in 2017. It is difficult for the SEO to support the state’s energy industry without committed resources. Whereas North Carolina has been reducing funding of its SEO over states are increasing more and receiving positive returns in economic development, job creation and reducing energy costs for citizens. The Database of State Incentives for Renewables and Efficiency (DSIRE), housed at NC State University’s Clean Energy Technology Center and funded primarily through the U.S. Department of Energy, is an excellent nationally-recognized resource that the state also continues to reduce funding from. Industry recommends continuing funding for this center and two others at Appalachian State University and North Carolina A&T that receive a small amount of state support – just $400,000 in 2018 amongst the three – to continue their programs that provide incentives to North Carolina’s public buildings and institutions, public citizens, private industries and a greater national audience.

With an average budget of $3M per year that has saved the state more than $1.3B in energy and water savings since 2003, NC needs to invest more, not less, funding into USI and DEACS efficiency programs. Performance Contracting works very well and saves NC governmental units significant dollars and helps to reduce the enormous deferred maintenance backlog.

Support the Energy Policy Council’s (EPC) 2016 recommendation to the Governor and the General Assembly to increase our state’s goal to reduce energy and water consumption in state-building utility budgets to 10% as determined by the state Treasury’s annual Debt Affordability Study. As such, these programs savings) loans do not require new taxes and do not count against the state’s debt ceiling as determined by the state Treasury’s annual Debt Affordability Study. As such, these programs do not require new taxes and do not count against the state’s debt ceiling as determined by the state Treasury’s annual Debt Affordability Study.

Mandate that all state agencies and universities that receive a small amount of state funding allocated to the Department of Environmental Quality’s Utility Saving Initiative (USI) and Department of Environmental Assistance and Customer Service (DEACS) programs. These programs that have worked very well alongside private industry and public buildings to save over $1.3 billion in energy and water savings in public buildings since 2003. These initiatives save money for all North Carolina businesses, consumers and government entities whether or not they participate directly in energy-savings efforts. Overall, in 2016, the state government achieved its original targets of 30% electricity and 15% water savings, saving the state and its citizens $1.3 billion in energy and water savings. The state’s utility savings have helped address issues related to infrastructure needs. Despite these successes, the 2017 legislative session resulted in reduced funding by roughly 19% while also eliminating one position from each of their seven regional offices.

The North Carolina Clean Energy Technology Center, located at NC State University, advances a sustainable energy economy by educating, demonstrating and providing support for clean-energy technologies, policies and practices. Funding from the legislature provides for core operations of the Center and is leveraged to acquire additional external funding providing greater benefits for citizens and business owners in NC. Program activity areas include: Energy management, technical assistance to industrial, commercial and agricultural facilities, clean power, renewable energy, clean transportation, workforce development and policy / economic development.

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Workforce development is of critical importance to North Carolina’s energy efficiency industry as the state and national shortage of skilled labor continues to hold back economic development and job growth in the construction industry. Our industry employs construction subcontractors that includes: architects, engineers, insulation contractors, consultants, product suppliers and more. Without a well-trained workforce, all types of construction projects – residential home building, commercial office buildings, multifamily housing and more – run the risk of delays and poor quality. While advancing most energy efficiency construction career opportunities involves promoting existing trade opportunities like insulation installation and architectural design for energy efficiency, in some cases these opportunities require training workers on new construction skills and knowledge. However, these are not skills and knowledge that many students receive in their degree programs, or that most companies focus on through on-the-job training. Therefore, efforts to develop curricula and training programs to meet the industry’s needs can be interwoven into efforts to train NC’s workers as part of the state’s future workforce and economy, which values and requires more collaboration, data sharing and technology to accomplish traditional work, including construction.

Fund State Education and Training Programs

State and local support is needed to inform students, non-college educated workers and recent college graduates about the career opportunities available to them in the state’s energy efficiency trades. A traditional four-year university degree is not needed for many positions in our industry. Non-college educated workers, workers with GEDs and high school education, community college students and displaced workers can find excellent career opportunities in energy efficiency. The state should establish an Energy Efficiency Industry Workforce Development Investment Program that provides community colleges, universities, local career centers and other organizations with educational resources and on-the-job training to increase the number of educated and skilled energy efficiency workers in our state. Incorporating energy efficiency curriculum in schools and universities/colleges would be easily attainable due to the vast resources available nationally to aid in doing so. Increased exposure to these topics will raise awareness and demonstrate the importance of these topics especially when exposed to at a younger age.

- Support programs that inform students, non-college educated workers and recent college graduates about the career opportunities available to them in the state’s energy efficiency trades.
- Incorporate energy efficiency curriculum in schools and universities/colleges with support from Duke Energy’s workforce development efforts funded by recent mergers and acquisitions.
- A virtual career center and jobs board for skilled labor construction jobs available in North Carolina would help recruit industry professionals from other states to relocate to North Carolina, further helping to meet our shortage of available workers.
- Create a construction training center that provides around-the-clock training for a variety of construction trades including heating and air conditioning, plumbing, framing, electrical and energy efficiency.
- Create and support energy efficiency apprenticeship, co-op, internship and on-the-job training programs that are coordinated with high school, community college, university and local workforce training programs.
- Leverage Duke Energy’s 2016 merger settlement fund distribution that provides $5M to a Community College Grant Program to fund apprenticeship programs and four-year grants to community colleges.

Of those, 200,000 are in the construction trades, an increase of 81 percent over the past two years, according to construction trade associations. These unfilled jobs directly affect single-family and multifamily homebuilders at a time when construction in both industries is booming.

“If we are lending money we don’t have to kids who will never be able to pay it back for jobs that aren’t available, I would say we have gone around the bend a bit. Meanwhile, there are five million jobs that pay decent money that remain unfilled.” —Mike Rowe

Expand state and local support for workforce development programs that train students and displaced workers to fill the vital need for more skilled workers in the state’s energy efficiency trades.

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**Recommendations**

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Durham Data Center Saves Energy and Water

The Dell EMC Center is a massive 450,000 square-foot data center located in Durham that earned LEED Gold certification in 2011. This qualification is the second highest certification a building can receive based on its energy efficiency and sustainability. In addition to a variety of elements, 40% of the building’s water usage is provided through rainwater harvesting and mechanical systems and new windows.

Community College Uses Performance Contract to Guarantee Energy Savings

Sandhills Community College completed a “Green” roof restoration offering the visibility energy and water savings while employees benefit from a welcoming green roof space for breaks. The green roof space as added insulation for the building, decreasing heating and cooling costs and providing the roof membrane from long-term sun damage. The $145,000 cost will be recouped through energy savings from the roof and the addition of lighting and windows, a new HVAC system and new windows.

University Requisitions Building to Reduce Energy Usage by 12%

The Marye Anne Fox Science Teaching Laboratory at NC State University in Raleigh built in 2004, was re-commissioned in 2013 through an in-house pilot project. The project placed the building energy scope and improved (short-term) following an energy audit, maintenance staff improved the buildings HVAC controls and repaired malfunctioning equipment at an upfront cost of $131,000 to realize 12% annual energy savings valued at $77,000. The positive results of this pilot resulted in a program being fully funded, which is the data as resulted in seven campus buildings been recommissioned.

Raleigh Transit Facility Beats State Energy Savings Requirements by 50%

Built to LEED Platinum standards in 2011, the Raleigh Transit Operations Facility operates at 50% better than the state’s minimum requirements in 2016 by financing $5M in 2016 from the buildings. This performance contract with Pepco Energy Services includes HVAC controls and repaired malfunctioning equipment at an upfront cost of $500,000 to realize 50% annual energy savings valued at $250,000. The financial payback is estimated at 6.7 years with added benefits to employees that can comfortably work in hot and cold seasons.

North Carolina’s Energy Efficiency Industry Needs Your Help!

Utility and Regulatory Environment

Expand and modernize utility energy efficiency programs and the regulatory environment that regulates them to achieve at least 1% net utility energy efficiency savings by 2023.

Build and Energy Codes

Adopt and provide education on improved building and energy codes, add an energy seal to the NC Building Code Council and promote above-code utility energy efficiency incentive programs.

Reduce Market and Regulatory Barriers to Entry

Support increased consumer education, establish voluntary and mandated energy efficiency programs and private consumer financing programs to enable increased participation in energy efficient construction.

Energy, Water, and Performance Benchmarking

Create and implement a statewide plan that establishes voluntary and mandatory energy, water and performance benchmarking in homes and buildings.

Multifamily and Low-Income Financial Barriers

Reduce the financial barriers that prevent builders, owners, occupants and federally-funded programs from participating in energy efficient construction in multifamily and low-income homes and buildings.

Strategic State Incentives and Resources

Reform and increase the current low-level of state’s support for public utilities investing with energy efficiency and establish an energy roadmap that prioritizes savings less before creating new.

Workforce Development

Expand state and local support for workforce development programs that train students and displaced workers to fill the vital need for more skilled workers in the state’s energy efficiency trades.
North Carolina Building Performance Association (NCBPA) is a 501(c)(6) not-for-profit trade association of building performance professionals and companies seeking to lead high performance construction in the state through quality construction, workforce development, political advocacy, public education and member services. The association works with member companies and partner organizations to promote opportunities that improve the quality of buildings in North Carolina so that all residents and businesses can live and work in healthy, safe, durable, cost-effective and environmentally friendly homes and buildings. Visit www.BuildingNC.org for more information.