THE **POWER** OF ENERGY EFFICIENCY

Expanding Access to Energy Efficiency Improvements for Low and Moderate Income North Carolina Households

By the **South East Energy Efficiency Alliance** and the **North Carolina Justice Center**

north carolina
JUSTICE CENTER

THE **POWER** OF ENERGY EFFICIENCY

Expanding Access to Energy Efficiency Improvements for Low and Moderate Income North Carolina Households

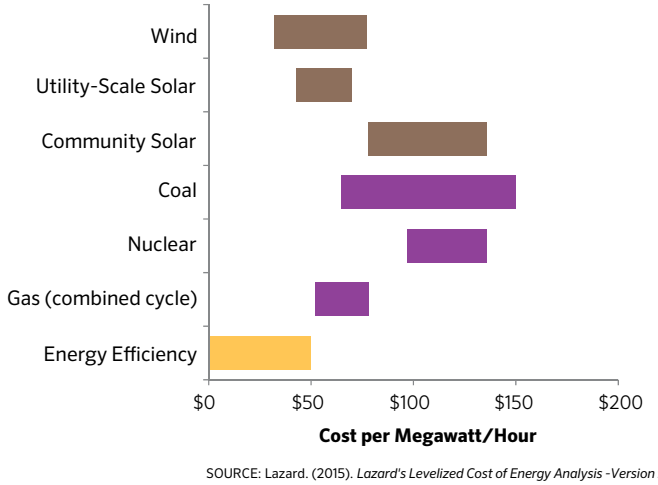
By the **South East Energy Efficiency Alliance** and the **North Carolina Justice Center**

north carolina
JUSTICE CENTER

Introduction

Improving energy efficiency can make energy more affordable,[1] transform unhealthy buildings into comfortable homes, and create thousands of jobs. While there are opportunities across the residential, commercial, and industrial sectors, some of the greatest need and most profound gains can be made in low- and moderate-income housing. This report outlines why focusing on energy efficiency programs to serve North Carolinians of modest means can return benefits to everyone across the state, and discusses many of the steps we can take to increase adoption of energy efficiency in North Carolina.

FIGURE 1: Efficiency Often the Most Cost-Effective Way to Meet Energy Needs



SOURCE: Lazard. (2015). *Lazard's Levelized Cost of Energy Analysis -Version 9.0*

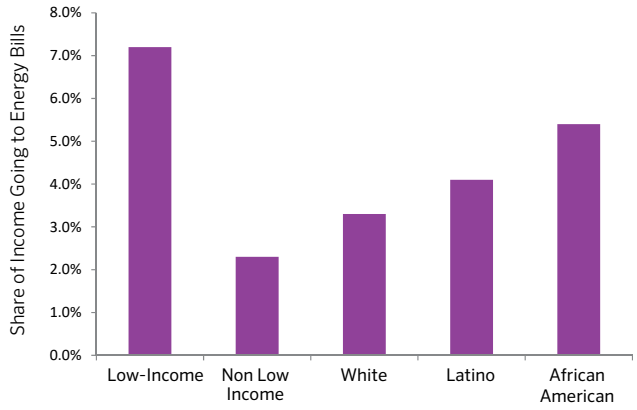
Energy efficiency is one of the most cost-effective ways to meet our energy needs. As shown in Figure 1, saving a kilowatt of electricity through improved efficiency is still generally cheaper than creating a new one from conventional or renewable sources, making many efficiency investments the best use of our energy dollars.[2] The need to build new power plants to meet increasing demand is often a chief driver of increased utility rates, so scaling back the need for new generation capacity can make energy cheaper for everyone. This is particularly important here in North Carolina where family income spent on energy costs is comparatively high. While electricity rates themselves are relatively low in the state, our level of

There is a racial disparity as well – with poverty particularly concentrated in communities of color.

consumption is among the highest in the country. In 2014, residential consumers in North Carolina spent an average of $126.09 per month on energy bills—the 13th highest amount in the nation,[3] supporting the need for additional energy efficiency.

The need for energy efficiency programs is particularly acute for low- and moderate-income households in North Carolina. Nationally, the energy cost burden is more than double for low-income households compared to median households, and low-income residents in the South face some of the highest burdens in the country.[4] There is a racial disparity as well – with poverty particularly concentrated in communities of color, African-American and Latino households also tend to devote a larger share of their income to covering energy bills (Figure 2). Ultimately, the need is further compounded by the unfortunate fact that North Carolina had one of the highest poverty rates in the nation in 2015,[5] leaving an unacceptably high share of the state's households facing crippling energy costs.

FIGURE 2: Energy Costs Weigh Heavily on Low-Income Households and Communities of Color



SOURCE: American Council for an Energy Efficient Economy. (2016). "Lifting the High Energy Burden in America's Largest Cities."

Improving energy efficiency can create much needed jobs. While a great deal of media attention focuses on renewable energy technology firms or installers, energy efficiency actually accounts for the single largest share of jobs and companies in the clean energy space. In 2015, over 700 energy efficiency firms employed more than 13,000 North Carolinians, accounting for roughly one-half of all clean energy jobs in the state.[6] Moreover, many jobs in energy efficiency services pay good wages and are accessible to individuals without extensive higher education credentials.[7] Done right, energy efficiency programs can provide opportunities to secure a long-term career and job security to the populations that need it the most.

Done right, energy efficiency programs can provide opportunities to secure a long-term career and job security to the populations that need it the most.

The economic return on energy efficiency investments extends well beyond the jobs created in repairing and retrofitting homes. Reducing energy costs gives households more disposable income to spend on other goods and services, creating broad economic ripple effects across the North Carolina economy. Recent analysis by the Southeast Energy Efficiency Alliance found that every $1 invested in selected energy efficiency programs in North Carolina generated $3.3 in additional economic activity, a solid economic return on investment.[8]

Boosting energy efficiency can measurably improve the lives of low- and moderate-income North

Boosting energy efficiency can measurably improve the lives of low- and moderate-income North Carolinians in a variety of ways.

Carolinians in a variety of other ways. Making a home more energy efficient often makes it healthier and more comfortable.[9] Far too many families in North Carolina can't afford to heat their homes in the winter or cool them in the summer, leading to illnesses that keep parents out of work, holding children back in school, and straining already struggling families. All of these issues can be measurably addressed by energy efficiency programs that provide more humane and healthy homes for all North Carolinians.

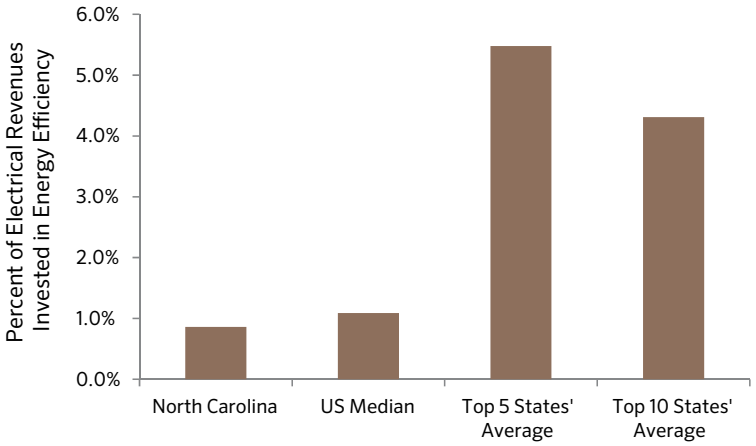
While our state has made important strides to advance energy efficiency, many of the efforts to date have not adequately served the needs of low- and moderate-income North Carolinians. The overwhelming majority of North Carolinians support efforts to improve building energy efficiency,[10] so the real challenge is to translate that support into further action.

Expanding Energy Efficiency Investments for Low- and Moderate-Income North Carolinians

North Carolina has made substantial strides in making our homes and businesses more efficient, but we need to expand efforts to keep pace with national leaders. Moreover, there is significant need for more programs that are explicitly designed to serve low- and moderate-income North Carolinians. A comprehensive energy efficiency policy portfolio could meet more than a quarter of North Carolina's electricity needs by 2025,[11] but it will take concerted effort to get there.

North Carolina's investment in energy efficiency was just shy of 1 percent of all electrical revenues in 2014, roughly in line with the national median but well short of the average investment among the top states in the country.[12] North Carolina's three largest electric utilities—Duke Energy Carolinas, Duke Energy Progress, and Dominion North Carolina Power—have significantly ramped up their programs over the past several years, as have the state's 74 municipal utilities and 31 cooperatives.[13] Several local governments have instituted programs and policies to improve the efficiency of their own operations and encourage the private sector to do likewise.[14]

FIGURE 3: NC Has Room to Expand Energy Efficiency Investments



SOURCE: American Council for an Energy Efficient Economy. (2015). "Energy Efficiency Scorecard."

The actual efficiency savings track record in North Carolina is also middle of the pack compared to other states (Figure 3). One industry standard way of assessing the effectiveness of efficiency investments is to measure the percentage of electrical consumption in a given year that, in turn, is saved during the following year. Nationally, high-performing energy efficiency programs are realizing savings on the order of 1 to 2 percent of annual retail sales. In 2015, North Carolina's electric energy efficiency savings reached 0.64 percent of statewide retail sales – 25th in the nation.[15] In 2014, Duke Energy Carolinas outpaced the state average, achieving savings of approximately 0.72 percent of prior year sales.[16]

Unfortunately, many of the programs and efforts to date have done relatively little to directly help households living on low or moderate incomes. Reasons that existing energy efficiency programs often fail to adequately address the needs of these households include:

- **Lack of upfront capital:** Many utilities rebates reward customers who improve efficiency through better weatherization, more efficient heating/cooling systems, and installing more efficient appliances. However, many low-income households lack the resources needed to purchase new appliances or make other costly improvements to their homes, rendering many rebate programs effectively inaccessible.
- **Landlord/tenant split incentive:** When tenants are responsible for utility bills, there is often limited financial incentive for landlords to invest in energy efficiency measures. On the other side, renters who will not stand to benefit increasing the value of a residence through making it more energy efficient often lack sufficient incentive to invest as well. Many low- and moderate-income North Carolinians are more likely to rent than own and are trapped in residences where no one has sufficient financial reason to invest in efficiency.
- **Multifamily housing:** Investing in energy efficiency can be greatly complicated for multifamily housing, particularly where units are individually owned. Because multifamily structures are often heated, cooled, and supplied with hot water by systems that serve the entire building, no individual residents can unilaterally decide to invest in more efficient systems. Moreover, improving the efficiency of the structure itself (e.g. sealing windows and adding insulation) is often ineffective unless done for the entire building. Finally, the complexity of heating and cooling systems in many multifamily units and differences in design and building materials have hampered efforts to develop cost-effective efficiency solutions that can be deployed at scale.

These and other factors often render existing energy efficiency programs less effective at delivering benefits to low- and moderate-income households.

It is time for North Carolina to take its place as a regional and national leader in using energy efficiency to help the lives and wallets of low- and moderate-income residents. There are a variety of tools being used to drive energy efficiency work; here are some of the ways that these tools can be refined to benefit low- and moderate-income North Carolinians.

Renewable Portfolio Standard

Overview: In 2007, North Carolina became the first state in the southeast to enact a comprehensive renewable energy portfolio standard.[17] North Carolina's renewable energy and energy efficiency portfolio standard (REPS) requires covered utilities to meet a certain percentage of their energy needs through renewable energy and energy efficiency. While

efforts to repeal the REPS standard have occurred in recent years, the overwhelming majority of North Carolinians support the law.[18] North Carolina's REPS has served as a driving force in the state's progress to date, and is a key component in our state's energy strategy going forward.

Even though much of the public attention goes to the growing renewable energy sector, energy efficiency plays a vital role in moving North Carolina toward the carbon reduction targets built into the REPS standard. The share of clean energy capacity that can be achieved through efficiency improvements is capped at 25 percent of targeted reductions through 2020 and climbs to 40 percent thereafter.

TABLE 1: Clean Energy Targets under NC Renewable Energy Portfolio Standard

Investor-Owned	2012	2015	2018	After 2020
Target (portion of prior-year electricity sales)	3%	6%	10%	12.5%

Municipal and Cooperative-Owned	2012	2015	2018	After 2020
Target (portion of prior-year electricity sales)	3%	6%	10%	

Expanding and Enhancing: While performance under the statewide REPS has been strong to date, the tool could be adjusted to permit greater investments in energy efficiency more broadly, particularly to households with modest means. First, North Carolina should maintain a robust REPS standard and potentially explore ways to strengthen the standards. Second, it may prove useful to explore a separate energy efficiency portfolio standard, as has been done in a number of other states.[19]

Utility-Administered, Low-Income Energy Efficiency Programs

Overview: North Carolina's investor-owned utilities administer a variety of low-income programs.[20] Generally, these programs are available to customers who meet a pre-defined income qualification threshold, and may involve an energy assessment, followed by the installation of low- to no-cost weatherization and retrofit measures.

Expanding and Enhancing: Utilities will remain a vital player in developing and deploying programs that enable energy efficiency work in low- and moderate-income households. There are a variety of ways that existing programs can be expanded, augmented, or revised to capture the benefits of making every home in North Carolina healthy and energy efficient.

Partnerships will remain key to making utility-administered programs work on the ground. The state's utilities should continue to partner with nonprofit service providers and other community organizations that have solid relationships with hard-to-reach customers,

expand the reach of established implementation resources, and generate new content for incorporation. Utilities should also explore ways to leverage investments in the energy efficiency of affordable housing as a means of reducing carbon emissions and protecting all ratepayers from the costs of new generation capacity construction.

On-bill financing, as explained in the next section, explores one way to get around this type of problem. But there is still more room for utilities to innovate new programs that allow North Carolinians with limited incomes to access energy efficiency incentive programs.

On-Bill Financing

Overview: On-bill financing (OBF) is a mechanism for avoiding a trap far too common for low-income families. In the long run, energy efficiency improvements often pay for themselves many times over in lower electrical bills, but many families simply can't afford the upfront cost. This problem is compounded for households with limited or marginal credit histories, preventing them from securing traditional loans to pay for efficiency improvements. This is especially relevant in the Southeast, where utility incentives are generally not as robust as those offered in other regions.[21]

OBF can get around both of these problems by providing the upfront capital needed to do the efficiency improvements and using a portion of the resulting energy savings to recover those costs over time. While OBF can be structured in a variety of ways, it essentially acts as a loan to cover the cost of efficiency retrofits, with the loan repayment coming in the form of a charge on a household's utility bill. Instead of needing a traditional loan, some OBF structures allow a utility bill payment history to stand in for a credit check[22], further extending the potential reach of these programs. Done correctly, the savings from reduced energy usage can more than cover the cost of repayment, thereby allowing customers to start realizing savings right away.

Expanding and Enhancing: Care will need to be taken to ensure that OBF programs do not create opportunities for predatory lending practices, savings that do not meet expectations, or other unintended consequences. But, happily, some of the increasingly popular versions of OBF limit potential downsides while opening up the benefits of energy efficiency to people and families that could not otherwise afford it.

One of the most promising versions is generally referred to as "tariffed" OBF. The fundamental distinction is that repayment is tied to a given meter instead of specific inhabitants. The loan stays with the electric meter and is passed on to a new building owner when the building is sold, or new renters move into a property.[23] This tool may help to maximize energy efficiency upgrades, especially those with larger upfront costs and longer payback periods.

Electrical cooperatives are some of the leaders in deploying financing models that work for lower income populations, including OBF programs. While these service providers constitute a much smaller percentage of total sales, they are key players in ensuring access to energy efficiency program offerings to low-income customers. Particularly given the economic distress in communities that electrical cooperatives serve, many of these organizations have

been pioneers in developing and deploying OBF programs so that their low- and moderate-income members can benefit from efficiency improvements. The lessons learned through these early efforts can serve to strengthen and streamline subsequent OBF offerings.

Multifamily Housing

Overview: Multifamily buildings present a largely untapped opportunity for energy efficiency programs across the country.[27] Established residential efficiency programs offered by utility companies generally serve households living in 1- to 4-unit buildings, while commercial programs focus heavily on lighting measures in offices and retail space. Multifamily buildings, especially multifamily buildings that offer subsidized rents, often fall through the cracks for several reasons:[28]

- **Building materials complicate insulation improvements:** Larger multifamily buildings are often masonry clad so that blowing in insulation, one of the more common energy savings measures, is not an option. The efficiency work often focuses on roof insulation, lighting, and complex mechanical systems.
- **More technical systems:** Multifamily buildings have larger, more complex mechanical (e.g., heating and ventilation) systems and vary so widely in size and construction type that efficiency programs need to retain highly skilled staff in order to assist owners interested in efficiency upgrades.
- **Landlord/tenant split incentive:** Tenants usually pay the electric bills, and sometimes the heating and hot water bills. As such, landlords often see little financial incentive to invest in energy-savings measures that reduce tenants' bills.
- **Common areas:** A related problem is that a residential energy efficiency program may meet tenant needs (e.g., offering efficient light bulbs and appliance upgrades) while leaving common area needs untouched; conversely, a commercial

Emerging Practices in On-Bill Financing

Upgrade to $ave

The Roanoke Electrical Cooperative recently rolled out the Upgrade to $ave[24] program to assist its members who want to have energy efficiency work conducted but lack the funds to pay for it up front. Under this program the cooperative will pay for upfront efficiency improvements and recover the capital through a small surcharge on a member's bill. The program is designed such that energy savings more than offset the cost of the repayment surcharge, effectively ensuring that households will start saving on their energy bills right away. The repayment is treated as a surcharge on a particular meter rather than a debt that is held by a specific ratepayer. This is important because it allows households with marginal credit ratings to participate, mitigates the potential for abusive lending practices, and avoids complications when the residents of a specific house change.

The program was seeded with funds from the U.S. Department of Agriculture's Rural Utilities Service (RUS), which helped Roanoke build the capital base needed to cover the upfront costs of conducting efficiency retrofits.[25]

Help My House Program

Just across the state line, the Electric Cooperatives of South Carolina were able to leverage OBF to create one of the most successful cooperative energy efficiency financing programs in the Southeast. During the Help My House program pilot, the average participating home cut electricity use by 34 percent, with an average payback period of just over six-and-a-half years. After these loans are paid off, program administrators predict that annual savings for an average home will increase to more than $1,100 per year, producing a net cumulative savings after 15 years of more than $8,500.[26]

program that assists owners with common area measures may not directly benefit individual tenants.

- **Limitations on access to capital:** Owners of affordable multifamily properties that are subsidized by the Department of Housing and Urban Development or other agencies are restricted by housing program rules in their ability to borrow money for energy-saving improvements, even if those investments pay themselves back very quickly through lower energy bills. Financing efficiency improvements can be challenging.

These challenges are all the more striking given that 25 percent of U.S. households live in multifamily buildings, representing a large potential source of energy and carbon savings. One study estimated that potential savings from the multifamily sector nationwide could "achieve energy savings equivalent to the annual electric output of 20 coal plants AND the entire non-power natural gas usage of California, Oregon, and Washington states."[29]

Improving the efficiency of multifamily housing provides other important societal benefits. Many families living in multifamily housing have much lower incomes than the national average. In North Carolina, 37 percent of renter households earn less than $20,000, a population that could benefit enormously from even modest savings in their energy bills.[30] Reducing energy consumption also makes it less likely the household will experience a termination of utility service. If the owner pays the bills, energy efficiency investments have been shown to help preserve low-income housing as affordable in the long term. There is also increasing evidence that whole-building energy efficiency improvements lead to healthier living for residents, especially among children with respiratory problems.[31]

North Carolinians would be well served by developing targeted energy efficiency programs for multifamily housing. There is a large stock of multifamily housing in the state: out of 4.2 million housing units (2007 data), 11 percent (470,000) are in multi-unit structures of five or more units.[32] Energy efficiency improvements focused on those buildings can help preserve this important housing stock by reducing what is often the owner's largest variable cost (energy) and making tenant-paid utility bills more affordable .

Expanding and Enhancing:

- **One-stop shopping/single point-of-contact:** Most multifamily buildings will have a mix of tenant-paid meters (for electricity and gas supplying loads within the tenant's apartment) and owner-paid meters (for common area lighting/ equipment and central heating/hot water/air conditioning). In order to achieve "whole building" energy efficiency improvements, while minimizing outreach and other administrative costs, a multifamily program should offer a single point of contact through which all of the programs that may be available for owners and tenants – whether in the form of rebates, financing, or direct install measures – can be easily accessed. A one-stop shop can help to overcome the "split-incentive" problem by offering both tenants and owners meaningful savings on their bills. Whenever possible, the one-stop shop should allow owners to access available gas and electric programs, rather than having to deal with two sets of programs and players.

- **Partner with the state housing finance agency and other providers of affordable housing:** Many affordable housing properties go through refinancing roughly every 15 years. This is a unique opportunity to engage owners in investing in energy efficiency since they are already involved in other rehab work. It is important for the efficiency program managers to know which buildings are in the pipeline for refinancing.
  - **Offer high-quality energy audits and benchmarking:** Free (or deeply discounted) and high-quality energy audits can be the key to deep energy savings. While owners who operate multifamily buildings are running a business, they often lack expertise regarding the financial and other benefits of investing in energy efficiency. Similarly, benchmarking tools (e.g. software programs that allow an owner to compare a building's energy usage to average usage of an inventory of similar buildings) can help owners to decide when, and for which buildings, investments in energy efficiency make most sense.
  - **Financing/on-bill repayment:** Many owners are unwilling or unable to invest cash in energy efficiency, either due to restrictions on use of reserves (this is true for many owners of affordable properties) or limited rental income. Offering low-cost financing, or on-bill repayment via the utility bill, can lead to much greater investments in energy efficiency. While on- bill financing can be an important tool to enable low-income households to benefit from energy efficiency improvements, care must be taken that program design does not enable predatory lending practices or projects that do not deliver on promised energy savings.
  - **Deeper incentives for deeper savings:** Programs should offer higher rebates for buildings that achieve higher percentage savings in order to achieve deep energy savings.
  - **Targeted incentives for affordable housing:** Developing programs that serve affordable housing properties is vital given their limited ability to free up capital for energy efficiency investments.[34] Expanding partnerships between the utilities, housing authorities, developers, and tenant organizations can help identify ways to augment existing programs or develop new ones to serve affordable housing properties.

Finding solutions

Massachusetts is a national leader in developing one-stop solutions for multifamily energy efficiency programs. An owner of affordable multifamily housing interested in learning more about utility-funded energy efficiency offerings goes to a single web site, whether the owner is interested in available gas or electric programs and regardless of whether the measures run through the owner's master meter or individual tenant meters.[33] If 50 percent or more of the tenants have incomes at or below 60 percent of median income, all of the measures are provided at no cost by the utility program. The program went through a major revamping around 2010 precisely because owners of affordable housing found the prior system—which required separate applications to the gas and electric companies, and to the utility's commercial program for common area measures and residential programs for tenant measures—impossible to navigate.

Addressing energy efficiency in multifamily housing may carry unique challenges. But given the scale of the potential savings, this is an area ripe for innovation and investment.

State and Local Lead-By-Example Programs

Overview: State lead-by-example energy efficiency programs boost the energy performance of state-owned buildings, saving taxpayer dollars and promoting energy conservation to the broader public. North Carolina has a proud history of extensive lead-by-example initiatives that can be further enhanced and expanded.

In 2001, North Carolina launched its Utility Savings Initiative, a program supporting energy efficiency in public buildings.[35] In 2007, North Carolina passed SB 668 and SB 1946, which require state-owned buildings to be designed, constructed, and certified to achieve advanced energy efficiency targets.[36] The Utility Saving Initiative team also trains public agencies on the use of the ENERGY STAR Portfolio Manager, a building energy usage benchmarking tool.[37]

North Carolina has a highly active Energy Services Performance Contracting program that provides guidance for the state, counties, municipalities, public agencies, and universities on how to procure energy performance contracts with a series of templates and lists of pre-qualified energy service companies. North Carolina also participates in the U.S. Department of Energy's ESPC Accelerator and is a state partner in the Better Buildings Challenge, meaning that it has committed its entire existing building stock – including all agency and UNC buildings – to reducing energy consumption by 20 percent compared to usage in fiscal year 2008-09.[38]

Several localities in North Carolina have also embraced lead-by-example programs:

- Both **Asheville**[39] and **Durham**[40] have implemented local ordinances that require that all new government buildings be LEED Certified, either to the Gold or Silver standard.
- The City of **Charlotte** has put a plan in place to target a 1 percent energy reduction goal for existing city-owned facilities. It requires that all construction on county facilities over $2 million must achieve LEED Silver Certification.[41]
- **Chapel Hill** operates an Energy Bank – bond funding that allows for energy efficiency upgrades in certain existing public buildings.[42]

Expanding and Enhancing: These innovative programs offer an opportunity to achieve significant energy savings and save taxpayer dollars. State policymakers should continue to push for higher levels of savings through such initiatives, and state officials should seek training opportunities that can assist local jurisdictions pursuing similar energy-savings efforts.

Manufactured Housing

Overview: In 2008, North Carolina ranked 5th in the nation for the percent of residents occupying mobile homes,[43] which are often twice as energy-intensive as site-built homes.[44] While manufactured housing programs are not explicitly classified as low-income programs, manufactured housing generally has a lower cost of ownership than site-built homes, making these structures a frequent source of housing for low- and moderate-income North Carolinians.

Manufactured houses can be challenging to retrofit and often do not hold their value well over time. As such, some programs are designed to require or encourage that these structures be manufactured to be more energy efficient in the first place. The Tennessee Valley Authority (TVA) provides an excellent model in its ENERGY STAR Pilot for Manufactured Homes, which encourages the manufactured housing industry to produce ENERGY STAR-qualified homes through an upstream incentive provided to producers.[45] Of all of TVA's energy efficiency programs, the ENERGY STAR Pilot for Manufactured Homes provides the greatest energy savings per installation.[46]

Other effective models include programming that targets high-consumption buildings owned by public housing authorities or non-profits serving low-income populations, or programs that build off of state agency activity, such as the North Carolina Housing Finance Authority. Additionally, funding from the U.S. Department of Agriculture (USDA) is available through a number of programs that support at-risk or fixed-income individuals in rural or outlying areas.

These types of policy innovations are necessary to address the needs of North Carolinians living in manufactured housing and ensure these structures do not disproportionately contribute to driving up electricity rates through the need for additional generation capacity.

Building Energy Codes

Overview: Building energy codes set minimum efficiency requirements for new and renovated homes and buildings. Implementation of these baseline standards can save energy, protect consumers' pocketbooks, prevent sub-standard housing, and create jobs. Rigorous energy codes also can directly translate into a variety of consumer benefits, including energy bill savings, increased comfort, improved health and safety, and higher resale values. Studies also show that homeowners with energy-efficient homes are less likely to default on their mortgages.[47]

Housing codes in effect today will have a long-term impact on the efficiency and comfort of North Carolina's housing stock. Energy code development and compliance is particularly important given the brisk pace of homebuilding in North Carolina, which had the 4th highest number of housing starts in the nation for 2013.[48] As such, it is absolutely vital to make sure the buildings erected today can be efficient and comfortable homes for years to come.

North Carolina has partially adopted some of the nationally-recognized best practices that distinguish a strong energy code. North Carolina's residential energy code was updated in 2012[49] to incorporate elements of the International Energy Conservation Code (IECC).[50] Another notable example is North Carolina's High Efficiency Residential Option (HERO), which can qualify homeowners for credits and reduced energy rates[51], and is the only such "stretch code" in the Southeast. While important steps have been made to strengthen North Carolina's codes, there is still room for innovations that reduce energy costs for all North Carolinians.

Enhancing and Expanding: North Carolina should maintain robust energy efficiency codes currently in place, and explore ways to strengthen building codes in cost-effective

ways. North Carolina should also explore innovative programming options that support energy code compliance, ensuring savings in the adopted code are achieved in the field. Examples of compliance programs include:

- Energy code compliance collaboratives:[52] Groups offer compliance guidance and create mechanisms for diverse stakeholders to offer input on strengthening and implementing codes.
- Easy-to-understand resources for code officials and building professionals.
- Circuit Rider programs to provide one-on-one training with building departments across a given jurisdiction.[53]

Trainings and resource deployment have been ramping up across the Southeast in recent years, as more states adopt up-to-date codes and dedicated, comprehensive compliance initiatives are underway in Alabama, Arkansas, Georgia, Kentucky and North Carolina. In addition, last year, Florida launched the region's first-ever circuit rider program .

Utilities can play a vital role in supporting energy code compliance, potentially making progress toward their REPS requirements. By leveraging their existing networks and resources, utilities can support training, technical assistance, compliance assessment and tracking tools, marketing materials, energy code collaboratives, and stakeholder engagement. Utilities have been taking a more active role in promulgating building efficiency codes, sometimes with cost recovery and incentive mechanisms that reward utility investments in energy code compliance. Additionally, utility-funded code compliance programs are in place in a growing number of states, such as Illinois and Arizona, providing models from which North Carolina can evaluate and learn.

Conclusion

Expanding programs to improve energy efficiency for low- and moderate-income households is an all-around win, for the future of our state and its residents. Efficiency improvements can limit energy costs for all ratepayers, create thousands of jobs, and help lift the energy burden on North Carolinians with even the most modest of incomes.

North Carolina has been a leader on sustainable energy and energy efficiency in the past. It is time to build upon that history and return our state to the cutting edge when it comes to moving our state forward in energy work and, in the process, aiding our most vulnerable residents.

Endnotes

1. Gilleo, A., et al. (2015. *The 2015 State Energy Efficiency Scorecard,* http://aceee.org/sites/default/files/publications/researchreports/u1509.pdf.
2. Lazard. (2015). *Lazard's Levelized Cost of Energy Analysis – Version 9.0*; Molina, Maggie, *The Best Value for America's Energy Dollar: A National Review of the Cost of Utility Energy Efficiency Programs* (2014), http://www.aceee.org/node/3078?id=5189.
3. U.S. Energy Information Agency (2014). "Average Monthly Bill - Residential" https://www.eia.gov/electricity/sales_revenue_price/pdf/table5_a.pdf
4. Drehobl, A., and L. Ross. (2016). "Lifting the High Energy Burden in America's Largest Cities: How Energy Efficiency Can Improve Low Income and Underserved Communities." *American Council for an Energy Efficient Economy*. http://aceee.org/research-report/u1602
5. U.S. Census. *2015 American Community Survey - 1 Year Estimates.*
6. North Carolina Sustainable Energy Association. (2016). "2015 North Carolina Clean Energy Industry Census." https://c.ymcdn.com/sites/energync.site-ym.com/resource/resmgr/Docs/2015_North_Carolina_Clean_En.pdf

7. Mackres, E. (2012). "Energy Efficiency and Economic Opportunity." American Council for an Energy Efficient Economy. http://www.aceee.org/blog/2012/09/energy-efficiency-and-economic-opport.
8. Southeast Energy Efficiency Alliance. (2014). "The Economic Impact of Energy Efficiency Investments in the Southeast." http://www.seealliance.org/wp-content/uploads/SEEA-EPS-EE-Report.pdf.
9. Norton, R. (2014). "Energy Efficiency's Non-Energy Benefits." Green & Healthy Homes Initiative. http://www.greenandhealthyhomes.org/blog/energy-efficiency%E2%80%99s-non-energy-benefits; Heyman, B., et al. (2004). "Keeping Warm and Staying Well: Does Home Energy Efficiency Mediate the Relationship between Socio-Economic Status and Risk of Poorer Health." *Housing Studies. Vol. 20, No. 4*; Kuholski et al. (2010). "Healthy Energy-Efficient Housing: Using a One-Touch Approach to Maximize Public Health, Energy, and Housing Programs and Policies." *Journal of Public Health Management and Practice*.
10. Strategic Partner Solutions. (2016). "North Carolina Statewide Poll for Conservatives for Clean Energy." http://www.cleanenergyconservatives.com/wp-content/uploads/2016/05/cce-poll-2016-results.pdf
11. Eldridge, M., et al. (2010). *North Carolina's Energy Future: Electricity, Water, and Transportation Efficiency.* http://www.aceee.org/research-report/e102.
12. Gilleo, A., et. al. (2015). "The 2015 State Energy Efficiency Scorecard." American Council for an Energy Efficient Economy.
13. North Carolina Utilities Commission. (2013). "Annual Report Regarding Renewable Energy and Energy Efficiency Portfolio Standard in North Carolina." www.ncuc.commerce.state.nc.us/reports/repsreport2013.pdf.
14. See section below on "State and Local Lead by Example Programs"
15. Gilleo et al. (2015).
16. Allred, T. (2015). "Testimony of Taylor Allred on Behalf of Southern Alliance for Clean Energy." Docket No. E-7, Sub 1073. http://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=21fdb788-c837-4950-bfa5-34610d05ba8d.
17. Session Law 2007-397. (2007) http://www.ncleg.net/sessions/2007/bills/senate/pdf/S3v6.pdf.
18. Conservatives for Clean Energy. (2016). "New Poll Finds Strong Bi-Partisan Support for Clean Energy Policies & Energy Sources." http://www.cleanenergyconservatives.com/new-poll-finds-strong-bi-partisan-voter-support-for-clean-energy-policies-energy-sources/
19. American Council for an Energy Efficient Economy. "Energy Efficiency Resource Standard." http://aceee.org/topics/energy-efficiency-resource-standard-eers
20. Fox, A. (2016). "Utility-Administered Low-Income Programs in the Southeast." Southeast Energy Efficiency Alliance. http://seealliance.org/wp-content/uploads/Low-Income-Landscape-Assessment-FINAL.pdf
21. Block, T., et al. (2014). The Opportunity for Innovative Finance in the Southeast. http://southeastfinancenetwork.com/wp-content/uploads/2014/05/White-Paper-The-Opportunity-for-Innovative-Finance-in-the-Southeast-FINAL1.pdf.
22. American Council for an Energy-Efficient Economy. (2012). "On-Bill Financing for Energy Efficiency Improvements" (2012), http://aceee.org/sector/state-policy/toolkit/on-bill-financing.
23. Block, T., et al. (2014). The Opportunity for Innovative Finance in the Southeast. http://southeastfinancenetwork.com/wp-content/uploads/2014/05/White-Paper-The-Opportunity-for-Innovative-Finance-in-the-Southeast-FINAL1.pdf.
24. http://www.roanokeelectric.com/UpgradeToSave
25. Electric Co-op Today. (2014). "USDA Efficiency Program Kicks Off with Two Co-ops." http://www.ect.coop/efficiency-conservation/energy-efficiency/usda-efficiency-program-kicks-off-with-2-co-ops/74681.
26. Keegan, P. (2013). *Help My House Pilot Program Final Summary Report*. http://www.cepci.org/assets/HelpMyHouseFinalSummaryReport_June2013.pdf.
27. The two major funding sources for these programs are the Department of Energy's Weatherization Assistance Program (WAP), authorized by 42 U.S.C. §§ 6861 – 6873 and utility-funded programs. WAP provided $2.1 million to North Carolina in FY 2013 (http://www.waptac.org/data/files/website_docs/government/guidance/2013/wpn-13-2.pdf) and $3.2 million in FY 14 (http://www.waptac.org/data/files/Website_docs/Government/Guidance/2014/WPN-14-2.pdf). Spending by utility company varies widely.
28. McKibbin, A. (2012). "Engaging as Partners in Energy Efficiency: Multifamily Housing and Utilities." American Council for an Energy Efficient Economy.
29. Benningfield Group (2009). "U.S. Multifamily Energy Efficiency Potential By 2020."
30. North Carolina Department of Commerce. (2011). "The State of North Carolina Consolidated Plan 2011-2015."
31. Enterprise Community Partners. (2010). "Case Study: Creating Green Affordable Homes for Families at Viking Terrace Worthington, Minn."
32. "The State of North Carolina Consolidated Plan 2011-2015."
33. leanmultifamily.org
34. Nowak, S. et. al. (2013). "Leaders of the Pack: ACEEE's Third National Review of Exemplary Energy Efficiency Programs." American Council for an Energy Efficient Economy. For example, the Massachusetts Low-income Energy Affordability Network (LEAN) operates a utility-funded multifamily program that offers its measures and services at no cost if at least 50% of the tenants in the building have income at or below 605 of median income. The LEAN program received notice from the American Council for an Energy-Efficient Economy as an "exemplary" multifamily program.
35. North Carolina Department of Environmental Quality. "Utility Savings Initiative (USI)," http://deq.nc.gov/conservation/energy-efficiency-resources/utility-savings-initiative.
36. American Council for an Energy Efficient Economy. "State and Local Policy Database - North Carolina." http://database.aceee.org/state/north-carolina.
37. North Carolina Department of Environmental Quality. "Outreach and Training." http://deq.nc.gov/conservation/utility-savings/outreach-training.
38. U.S. Department of Energy. "Better Buildings Solutions Center – North Carolina." https://betterbuildingssolutioncenter.energy.gov/partners/state-north-carolina.
39. U.S. Department of Energy. "City of Asheville - Efficiency Standards for City Buildings." http://energy.gov/savings/city-asheville-efficiency-standards-city-buildings.
40. U.S. Department of Energy. "Durham County – High-performance Building Policy." http://energy.gov/savings/durham-county-high-performance-building-policy
41. American Council for an Energy Efficient Economy. "State and Local Policy Database - Charlotte, NC." http://database.aceee.org/city/charlotte-nc#sthash.x5MFZw7H.dpuf.
42. Town of Chapel Hill, North Carolina. "Policies and Programs." http://townofchapelhill.org/town-hall/departments-services/planning-and-sustainability/sustainability/policies-programs.
43. U.S. Census Bureau. (2008) "Mobile Homes, Percent of Total Housing Units. https://www.census.gov/compendia/statab/2012/ranks/rank38.html.
44. Eldridge, M., et al. (2010). "North Carolina's Energy Future: Electricity, Water, and Transportation Efficiency." American Council for an Energy Efficient Economy. http://www.aceee.org/research-report/e102.
45. TVA serves only Avery, Burke, Cherokee, Clay, McDowell and Watauga counties in North Carolina, so the reach of its programs within the state is limited.
46. Nowak, S., et al. (2013). "Leaders of the Pack: ACEEE's Third National Review of Exemplary Energy Efficiency Programs." American Council for an Energy Efficient Economy. http://www.aceee.org/sites/default/files/publications/researchreports/u132.pdf.
47. Harney, K. (2013). "Owners of Energy-efficient Homes Less Likely to Default on Loans." Los Angeles Times. http://articles.latimes.com/2013/mar/29/business/la-fi-harney-20130331.
48. National Association of Homebuilders. "Housing Starts," http://www.nahb.org/generic.aspx?genericContentID=45409.
49. North Carolina Department of Insurance. "State Building Codes." http://www.ncdoi.com/OSFM/Engineering_and_Codes/Default.aspx?field1=State_Building_Codes_USER&user=State_Building_Codes
50. International Code Council. "2009 International Energy Conservation Codes." http://codes.iccsafe.org/app/book/toc/2009/I-Codes/2009%20IECC%20HTML/index.html
51. Duke Progress Energy. "Cash-in with Energy Efficient New Construction." https://www.progress-energy.com/carolinas/business/save-energy-money/residential-new-construction-program-for-builders.page
52. Building Code Assistance Project. "Compliance Collaboratives." http://bcapcodes.org/projects/compliance-collaboratives/
53. Westmoreland, S., and A. Fox. (2015). "Florida Circuit Rider Commercial Compliance Needs Assessment." Southeast Energy Efficiency Alliance. http://www.seealliance.org/wp-content/uploads/Florida-Circuit-Rider-Report-FINAL.pdf; Epstein, G., & B. McCowan. (2004). "Advanced Circuit-Rider (Technical Assistance) Programs to Enhance Deployment of New Energy Efficient Technologies,"; Freelove, D. (2016). "Idaho Energy Circuit Rider." https://www.energycodes.gov/sites/default/files/documents/ECodes2016_12_Freelove.pdf.

www.ncjustice.org

contact@ncjustice.org

Phone: (919) 856-2570
Fax: (919) 856-2175

Physical Address: 224 S. Dawson Street
Raleigh, NC 27601

Mailing Address: PO Box 28068
Raleigh, NC 27611

MEDIA CONTACT:
Alfred Ripley
919/856-2573
al@ncjustice.org