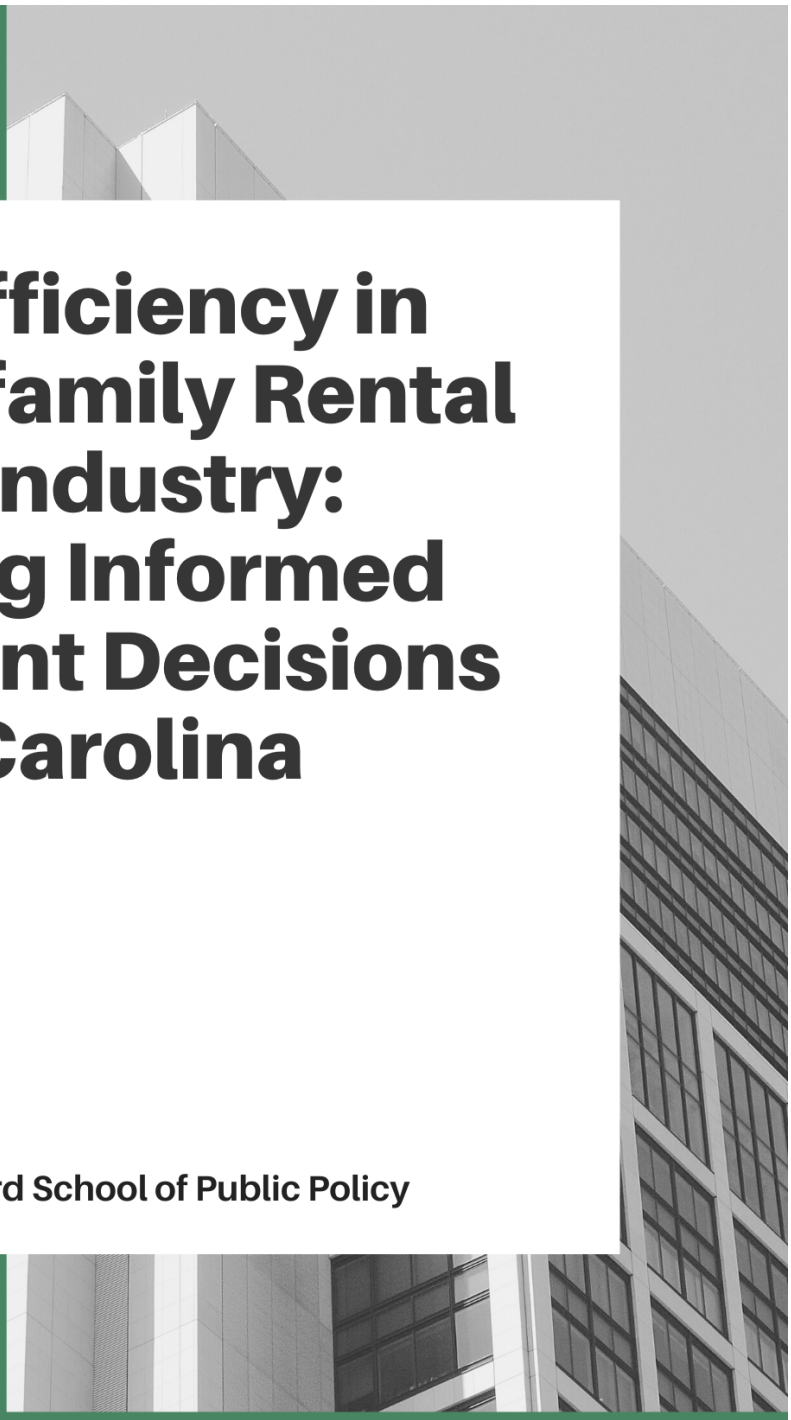

Energy Efficiency in the Multifamily Rental Housing Industry: Promoting Informed Investment Decisions in North Carolina

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I. Executive Summary

To better serve its members' growing interest in energy efficiency (EE), the Triangle Apartment Association (TAA) is looking to identify important factors that multifamily rental housing property owners should consider when deciding to invest in EE. More specifically, TAA seeks to bridge knowledge gaps that exist in the multifamily rental housing industry, particularly those related to available EE technology, the potential for owners to recoup their investments, and policies and programs designed to assist with the investment process. This report summarizes key findings based on research conducted over an eight-month period to answer the following question:

What tools should TAA provide its members to make informed decisions about EE capital investments?

I performed a qualitative study to identify, assess, and suggest relevant EE technology, methods for property owners to recoup their investments, available programs to assist with the investment process, and a checklist to help property owners make an informed investment decision. My approach included three main components: a literature review of the costs and benefits of particular types of EE technology, an analysis of policies and programs designed to facilitate the investment process, and expert interviews. To develop recommendations, I analyzed key themes from my qualitative data through a two-prong framework representative of two features central to TAA's mission: education and advocacy.

My research and analysis conclude with the following recommendations for TAA:

- **Offer trainings and produce educational materials to help property owners assess opportunities for EE improvements and to understand which EE policies and programs will have a meaningful impact on their businesses, and**
- **Collaborate with stakeholders across industries to promote comprehensive policies that are tailored to meet the unique needs of the multifamily industry.**

II. Background

The Issue

Energy consumption impacts three major sectors of society: people, the economy, and the environment. Most notably, energy consumption costs a substantial amount of money, emits significant levels of greenhouse gases (GHGs), and creates unnecessary health risks due to environmental pollution. In 2017, total energy expenditures in the US reached over $1 trillion, which amounted to nearly 6% of US gross domestic product (GDP).[1] However, roughly 68% of all energy produced in the US is wasted due to inefficient technology, transmission, and heat loss.[2] The average building in the US wastes about 30% of the energy it consumes due to structural and technological inefficiencies.[3] This means that multifamily property owners and their residents spend money on energy that they do not benefit from.

Individuals living in multifamily housing units are harmed by the high financial costs of energy consumption. Multifamily housing shelters over 75% of the nation's low-income households, 93% of which are renters.[4] These low-income households typically spend about half (49%) of their income on housing costs, including utilities. Moreover, home energy costs for renters have been surpassing other household expenses. For example, one study found that renters spent 53% more on home energy in 2010 than they did in 2000 but only 22% more on all other goods and services.[5] Studies have also shown that low-income and minority communities will experience substantially more economic harm and exposure to air pollution as a result of GHG emissions compared to other US communities.[6]

In recognizing that low-income, minority households are disproportionately affected by the impacts of energy consumption in the US, national and local organizations have begun advocating for ways in which the multifamily housing industry can increase investment in EE technology, which is designed to eliminate energy

waste. Advocacy efforts include identifying potential barriers to investment and proposing solutions to overcome them. For example, the Energy Programs Consortium (EPC) recommends that multifamily property owners and operators utilize green leases to overcome a common split incentives problem. The problem arises when residential units are submetered, which causes property owners and tenants to have different reasons for wanting, or not wanting, to invest in EE technologies.[7] In addition to advocacy efforts intended to address barriers to EE investment, federal and state government agencies have designed programs to assist property owners throughout the investment process.

Despite these efforts, the multifamily housing industry remains skeptical of policies asserting EE. Property owners face complex challenges that are unique to the rental housing industry, such as intricate financial obstacles and misaligned incentives. Furthermore, the multifamily housing industry receives a remarkably low amount of available EE funding from public sources relative to its share in the rental housing market, perpetuating the problem of inadequate financing opportunities for EE upgrades.[8] For example, in 2010, the Brookings Institution observed that the federal Weatherization Assistance Program funds are used predominantly for weatherizing single-family homes, not multifamily properties.[9]

The Need for Investment

Energy costs place a large financial burden on US households, particularly those that fall under a low-income, minority status. Some households are so encumbered that they have to forgo food or medical attention in order to pay their energy bills.[10] These financial strains disproportionately impact people who rent multifamily units. One study showed that energy expenditures in rented multifamily units are "37% higher per square foot than in owner-occupied multifamily units."[11]

Owners of submetered rental units share some of the financial burden that their renters undertake. According to the American Council for an Energy Efficient Economy (ACEEE), building owners feel the initial pressure of increasing energy prices. Rising energy bills put pressure on rents, "financial institutions become increasingly concerned about risk to their loan portfolios, and residents continue to demand comfortable homes."[12]

The aforementioned economic impacts demonstrate the benefits of EE improvements. Advancing EE can lower resident utility bills, create a healthier living environment, and increase resident comfort.[13] Moreover, researchers point to other socio-economic benefits that extend beyond lower resident energy bills, such as less time taken off from work and school, increased comfort and privacy within the home, and better household relationships. In addition, EE upgrades can improve general, respiratory, and mental health for residents.[14]

EE upgrades also improve the bottom line for property owners. In particular, multifamily buildings have the potential to reduce their energy expenditures by up to 30%, which translates into an energy cost savings of "almost $3.4 billion for the multifamily sector, nationwide."[15] Moreover, energy retrofits can increase property values for owners, decrease their financial risk, reduce pressure on their rents, and decrease their vacancy rates.[16] More efficient multifamily buildings also lead to significant societal benefits, such as "lower wholesale energy costs and a more reliable and sustainable energy system, with reductions in associated air pollution and greenhouse gas emissions."[17]

Although there is persuasive evidence to suggest that multifamily property owners and operators could benefit from investing in EE, they remain hesitant to do so. Owner and operator hesitation largely stems from a lack of knowledge about the costs and benefits of EE technology, uncertainty as to whether they can recoup their investments, and unfamiliarity with available programs and incentives designed to facilitate the investment process. These overarching issues are derived from several common barriers to investment, such as high up-front costs, lack of financing, split incentives for landlords and residents, and lack of knowledge about multifamily energy use and retrofit performance.[18]

III. Methodology

To inform TAA's creation of a toolkit for EE investment, I conducted a qualitative study to identify, assess, and suggest relevant technology, methods to recoup investments, available policies and programs designed to

assist with the investment process, and a checklist to help owners and operators make an informed investment decision. My approach included three main components: secondary research, an analysis of available programs and incentives, and expert interviews.

Secondary Research

My review of secondary research uncovered EE technology that is available and practical for use in the multifamily rental housing industry. Researchers broadly suggest that property owners first benchmark or perform energy audits on their properties to identify areas for EE improvement.[19] The literature also recommends that owners consider the costs and benefits related to specific EE upgrades before investing.[20] Furthermore, the literature revealed that premium rents and green leases are effective ways that property owners can recoup their EE investments. Lastly, the literature uncovered public and private programs that are designed to support property owners through the EE investment process, whether it be financial, administrative, or both. Both the analysis of available policies and programs and the framing of the expert interviews were guided by the common themes found during my review of available literature.

Analysis of Programs and Incentives

There are not many EE programs tailored to the multifamily rental housing industry.[21] Multifamily buildings have unique characteristics that easily get overlooked when EE-specific programs are designed. Thus, a majority of EE programs are either targeted towards single-family or commercial buildings. However, those that are geared towards multifamily properties are generally exclusive to affordable housing providers, excluding market-based multifamily housing providers from EE programs and related benefits.[22]

While there are not many EE programs that are specifically tailored to the multifamily rental housing industry, there are several existing public and private programs that may be available to owners and operators that can help facilitate the EE investment process. I have identified and assessed some current and future EE policies and programs to determine which ones are most relevant and effective for owners and operators. My analysis of these programs focused on program access and assistance. Access refers to eligibility characteristics, such as the number of dwelling units and average income per occupied dwelling unit. Assistance refers to financial or administrative support characteristics, such as tax incentives or referral services.

Stakeholder Interviews

In addition to my analysis of existing and future policies and programs, I facilitated expert discussions in February and March 2021 with four stakeholders who have experience in the multifamily, EE, regulatory, and research industries (**Table 1**). Most experts I interviewed had direct experience working on the ground with EE and/or promoting its adoption in the multifamily rental housing industry. I drafted discussion guides for each interview using a template with core questions and background information about each expert. An example discussion guide is available in **Appendix B**.

Table 1: List of Expert Interviewees

Name	Title	Organization
Marilyn Brown, Ph.D.	Professor of Sustainable Systems	Georgia Institute of Technology
Vivian Loftness, M.S.	University Professor	Carnegie Melon University
Ryan Miller	Executive Director	North Carolina Building Performance Association
Ken Szymanski	Executive Director (Retired)	Greater Charlotte Apartment Association

After completing the expert interviews, I relied on notes and recordings to distill key takeaways from each conversation. I then conducted an analysis across key themes and identified costs and benefits of relevant EE technology and available or forthcoming programs to help owners and operators overcome known barriers to

investment. From there, I was able to develop a checklist to help owners and operators determine if EE investment is appropriate for their portfolios.

IV. Costs and Benefits of EE Technology

Property owners benefit greatly from EE improvements. As a general matter, real property owners of all kinds see lower energy bills, increased property value, and insulation from unpredictable utility rate increases.[23] They also see insurance saving benefits through lower premiums and improved protection against loss as well as access to government incentives and utility rate discounts. Moreover, from a non-pecuniary perspective, property owners also see reduced carbon emissions and improved indoor air quality.[24]

In addition to these benefits, there are also costs associated with EE improvements. High up-front expenses related to purchasing EE technology and paying for its installation are two of the most prominent costs of EE investment.[25] However, property owners also risk energy savings underperformance, degradation of system performance over time, and the need for new specialized service providers, contracts, and design processes.[26]

Although these pros and cons apply to property owners generally, multifamily rental housing property owners experience unique challenges that create a set of particularized costs and benefits. With respect to costs, multifamily rental housing property owners who want to invest in EE may not be able to finance the EE improvements due to a lack of programs specifically tailored to meet the needs of the multifamily industry.[27] They also face uncertainty associated with achieving the increased rent or occupancy levels they would expect from making EE improvements, creating doubt as to whether they can recoup their investments.[28]

With respect to benefits, EE upgrades provide value in revenue dimensions other than charging premium rents. In particular, multifamily rental housing property owners who invest in EE technology reduce the risk of losing tenants and investors due to availability of sustainable buildings in future markets, inaccuracy of projected building performance, and energy consumption volatility.[29] Moreover, multifamily rental housing owners realize "reduced cash flow risk due to a reduction of utility costs" and reduced legislative risk, such as the threats posed by the increased adoption of building performance mandates.[30]

Multifamily rental housing property owners also gain a competitive edge in the market and experience higher resident retention rates, which ultimately lowers vacancy rates. In fact, the National Apartment Association (NAA) has recognized that EE is a way to maximize resident engagement and recently recommended that leasing professionals discuss EE at the first point-of-contact with prospective residents.[31] This recommendation stems from the fact that people who live in apartments are generally more environmentally conscious than homeowners because they tend to be younger and more urban.[32] Moreover, high utility bills are a known and rather prominent factor that leads residents to move or consider moving.[33] Thus, failing to discuss EE could be a missed opportunity when dealing with prospective residents. In addition, NAA encourages owners and operators to promote EE among current residents, claiming that "[o]ffering resources that help residents save money on their monthly expenses, in addition to helping them incorporate environmentally conscious elements into their lifestyle, adds to the value of their apartment community and helps build loyalty," which is key to reducing apartment turnover and related maintenance costs.[34]

While the general costs and benefits of EE technology for multifamily owners and operators are critical to making an informed decision about EE investment, it is important for owners and operators to also understand the costs and benefits specific to each type of available technology. This will allow owners and operators to select what type(s) of EE technology would be most beneficial to the specific properties within their portfolios.

Heating and Cooling

The federal government recommends investing in heating and cooling improvements before any other kind of capital investment because doing so generally: (1) has a rapid payback, (2) helps owners identify and install only the equipment their properties truly need, and (3) the cost savings continue long after owners pay off the initial project cost.[35] Heating and cooling upgrades and maintenance improvements can include enhancements to heating, ventilation, and air conditioning (HVAC) systems, such as replacing chlorofluorocarbon chillers with

more EE ones and installing EE HVAC units to meet a building's reduced cooling load.[36] Aging HVAC equipment often requires frequent maintenance for it to work properly. Thus, while doing so can initially be expensive, replacing an existing HVAC system with a more EE one improves its efficacy, thereby reducing maintenance costs and increasing its expected lifespan.[37] Major HVAC system upgrades typically have a payback period between eight and nine years for multifamily buildings.[38]

Weatherization is another way to improve a building's energy performance and, in turn, reduce energy costs and increase comfort.[39] Weatherization typically involves making improvements to a building's envelope, which generally includes air sealing and insulation improvements that are performed simultaneously.[40] Air sealing is important to reducing the amount of conditioned air that uncontrollably leaks out of a building through cracks and openings.[41] Leaving cracks and openings untouched can lead to poor indoor air quality, moisture issues, drafts, cold spots, and high energy bills.[42] Two simple, effective, and cost-friendly ways to air seal a building are to caulk and weatherstrip cracks and openings.[43]

While air sealing addresses air leakage concerns, insulation addresses heat flow issues.[44] For example, "in winter, heat flows directly from all heated living spaces to adjacent unheated attics, garages, basements, and even to the outdoors. Heat flow can also move indirectly through interior ceilings, walls, and floors--wherever there is a difference in temperature."[45] In the summer, on the other hand, heat flows from outside to building interiors.[46] To maintain comfort and keep energy usage down, a building's heating and cooling systems must replace heat lost in the winter and remove heat gained in the summer. Heat flow issues can be reduced by proper insulation, which provides an effective resistance to the flow of heat.[47]

Although insulation is a great way to address energy waste and improve building performance, it oftentimes can be difficult to gauge what type of insulation will work best. "An insulating material's resistance to conductive heat flow is measured or rated in terms of its thermal resistance or R-value."[48] Higher R-values provide more effective insulation. Determining the amount of insulation or R-value needed and its relative effectiveness depends on the climate where the building is located, the type of heating and cooling system in place, and what part of the building the insulation will be installed.[49]

The cost of air sealing and insulating multifamily buildings depends on the type and amount of materials needed and the physical characteristics of the space needing improvements. For example, to air seal attics in multifamily buildings, costs typically hinge on the type of attic, available access, and the strategies used for air sealing and insulation. One study found that air sealing a confined attic space can cost between $2.00 per square foot and $3.00 per square foot of attic area, while air sealing the larger conditioned area of a multifamily building can cost between $0.10 per square foot to $0.25 per square foot.[50] Although the financial cost of weatherization can be high, research has shown that multifamily weatherization projects have a short payback period of just under six years.[51]

Data Sharing Tools and Energy Audits

Most property owners do not know how much energy the buildings in their portfolios use and are, therefore, unable to make sensible decisions about EE improvements. This is, in part, because consumer privacy protections often prevent utilities from providing building owners with aggregated tenant data. Some data are available through existing tracking efforts, such as the US Department of Energy's (DOE) Residential Energy Consumption Survey, but those efforts historically have not included robust data on multifamily housing.[52] However, data sharing tools are being developed to help property owners address the knowledge gaps related to multifamily energy consumption and retrofit performance.

Software systems are being used to facilitate building data collection efforts by providing building owners with benchmarking tools that can help track a building's energy use over time or compare its performance to other buildings that share some of the same characteristics, such as construction year and number of available and/or occupied units.[53] For example, EPA's ENERGY STAR® Portfolio Manager is a free benchmarking tool that helps property owners and operators track performance across their portfolios and identify areas for improvement.[54] Although these benchmarking tools help property owners better understand how efficient or inefficient their

buildings are, property owners still face issues with gathering tenant data. Since most utilities do not provide aggregated tenant data, property owners and operators usually have to gather the data on their own for the benchmarking tools to be effective.

Energy audits are also useful tools for detecting "areas where building systems have become inefficient over time and bring them back to peak performance."[55] Professional energy audits focus on identifying improvements that can be made to the building envelope, attic space, HVAC systems, and lighting systems. While they can be expensive, some utilities and local governments provide free energy audits to property owners. For example, Duke Energy offers a virtual, no-cost energy assessment to help commercial customers in North Carolina make smart investment decisions about EE capital improvements. The virtual assessment uses energy modeling software to examine the cost-effectiveness of different EE scenarios. To qualify for this free energy audit, commercial customers must opt into Duke Energy's EE rider, have not yet purchased new equipment, and commit to investing in EE.[56]

Lighting, Appliances, and Other Low-Cost Measures

For years, lighting and household appliances have received a lot of recognition in terms of EE investment. Making improvements to light fixtures is probably one of the simplest and most cost-effective ways to reduce energy waste.[57] In fact, EE lightbulbs, such as halogen incandescent bulbs, compact fluorescent lamps (CFLs), and light emitting diodes (LEDs), use up to 80% less energy and last up to twenty-five times longer than traditional incandescent bulbs.[58] More specifically, in comparison to traditional incandescent bulbs, halogen bulbs yield up to 25% more in energy savings, while CFLs yield up to 75% more, and LEDs yield up to 80% more.[59] When compared to other forms of EE investment, efficient lighting is one of the cheapest ways to save energy. As such, property owners and operators should consider switching out all traditional incandescent bulbs with EE ones, installing LED exit signs, using occupancy sensors in common areas, and providing residents with EE bulbs for use in individual units. On average, property owners who invest in EE lighting upgrades spend about $317 per unit and realize a payback period of only two months.[60]

EE appliances are another method of EE investment that has been at the forefront of the EE initiative over the years. In a survey conducted by NAA, ENERGY STAR® appliances were ranked as one of the most appealing features of an apartment community.[61] In fact, studies have shown that property owners and operators can charge a "1.6% average rent premium per ENERGY STAR® product included in a rental unit."[62] Such a premium is supported by evidence that residents are motivated by both private (e.g., energy cost savings) and public (e.g., environmental) factors.[63] On average, property owners who invest in EE appliances spend about $1,700 per unit and recoup their investments in just two years.[64]

There are also ways that property owners and operators can promote EE without spending any money, which is the easiest and least costly way to encourage EE behavior. Some examples include educating on-site staff and residents about how their behaviors can affect energy use and costs, rewarding EE behaviors to engage employees in helping reduce energy costs, and measuring energy performance using publicly available tools, such as EPA's ENERGY STAR® Portfolio Manager.[65]

Case Study: Florida

To assess the impacts of EE upgrades to multifamily buildings in hot-humid regions of the US, one study measured the first-year electricity savings from retrofits to 232 sub-metered units in four apartment communities in Orlando, Florida.[66] The study was based on a utility-sponsored multifamily energy retrofit program in which the treatment units received improvements to the mechanical systems, building envelope, and appliances. Specifically, the retrofits included SEER-15 heat pump HVAC systems, ENERGY STAR® certified refrigerators, solar window film, R-30 attic insulation, duct repair, CFLs, and water saving plumbing fixtures.[67]

To allow for distinct treatment and control groups, no more than half of the units received retrofit packages at each of the participating properties. To measure energy usage and performance, the municipal utility sponsoring the program provided "metered electric consumption data for all of the units in the . . . participating

properties from January 2011 through April 2013."[68] In addition, "property owners provided building and unit-level characteristics" as well as information on upgrades to individual units, which were also confirmed by utility-sponsored on-site inspections.[69] Overall, there were 232 treatment units and 436 control units.[70]

The average up-front, per-unit cost of the retrofits, including equipment and installation, was $4,359. Thus, the total project cost across the 232 treatment units was $1,011,388.[71] The study found that the retrofit packages lead to energy savings per treatment unit that were measurable and statistically significant. In particular, the total annual gross energy savings across the four properties averaged 22%. Moreover, the average annual savings per unit ranged from 18% to 29%. Furthermore, average monthly savings were statistically significant throughout the year, ranging from 9% in December to 31% in August. Finally, tenants saved an average of $272 per year on their electric bills, with a total annual savings of $68,913 across the treatment units. [72] With over $68,000 in energy savings each year, the payback period for the retrofit packages at these properties was less than fifteen years. From these findings, the authors determined that "multifamily retrofits in hot-humid climates can produce measurable and robust (i.e., statistically significant) energy savings."[73] The results suggest that upgrades should be targeted towards properties and units that experience poor energy performance, which, as a result of retrofits, is likely to improve overall program savings and, in turn, cost-effectiveness.[74]

V. Methods to Recoup Investments

One of the most evident barriers multifamily rental housing property owners face when deciding to invest in EE is the split incentives problem. As mentioned before, the split incentives problem exists when residential units are submetered, which causes property owners and tenants to have different reasons for wanting, or not wanting, to invest in EE technologies.[75] Two commonly recommended methods to overcome this barrier and help owners offset the initial costs of EE improvements are for owners to charge premium monthly rents or implement green leases.

Premium Rents

There is evidence to suggest that renters are generally willing to pay more for EE upgrades, which gives multifamily rental property owners and operators a competitive edge in the market. As more renters are motivated by private (e.g., energy cost savings) and public factors (e.g., environmental concerns), greater emphasis is placed on EE.[76] In Ireland, one study showed that residents are willing to pay, on average, €38 per Building Energy Rating (BER) improvement made.[77] Ireland's BER is a building performance rating system that is required for all residential buildings that are offered for sale or rent.[78] The study also found that the ability to charge premium rents significantly reduced the payback period for some heating and cooling improvements, such as attic and cavity wall insulation.[79]

As mentioned previously, studies have also shown that multifamily property owners and operators can charge a "1.6% average rent premium per ENERGY STAR® product included in a rental unit."[80] Moreover, multifamily properties that make other EE upgrades, such as improvements to their HVAC systems, buildings envelopes, and lighting features, generally demand higher rental premiums than properties that do not make such enhancements. One study found that cities across the US can, on average, charge $74 more per month for HVAC retrofits, $51 more per month for improvements made to the building envelope, and $167 more per month for EE light fixtures.[81] Collectively, these studies tend to show that it is relatively easy to charge premium rents to help cover the costs of EE improvements. Premium rents that are coupled with government- and utility-sponsored incentives can further alleviate those costs.

Green Leases

To address the landlord and resident split incentives problem, ACEEE and the EPC suggest that multifamily property owners utilize green leases. Green leases, also known as EE leases, are residential lease agreements that have been amended to realign landlord and resident interests so that they are mutually beneficial for both contracting parties. The provisions included in these types of lease agreements "impose few direct costs on real estate owners, while generating environmental benefits by requiring tenants to engage in sustainable

behaviors such as using public transportation, composting or participating in recycling programs."[82] One way to structure these leases to specifically address EE upgrades is to include a clause that permits the landlord to pass the cost of the improvements to the resident based on projected savings.[83] Apart from the environmental benefits promoted by such a clause, "this can be mutually beneficial to the tenant and owner as the owner can receive a return on his or her investment and the tenant's overall rental expenses can be lowered if the monthly energy savings are higher than the monthly rent increase."[84]

VI. Analysis of Programs and Incentives

Multifamily property owners face a number of challenges that commonly prevent them from investing in EE technology.[85] However, various public and private organizations have developed, or are developing, solutions to overcome these problems and provide property owners with the tools they need to make smart EE investment decisions. Some existing and future programs are analyzed below based on how accessible they are to multifamily property owners and how much assistance they provide, whether it be financial, administrative, or both.

A. Federal Programs

The federal government has launched specialized programs to overcome the financial hurdles EE poses to multifamily property owners. Most federal programs are geared toward low-income, affordable housing, ranking them relatively low in terms of access but reasonably high in terms of assistance. However, there are some highly recommended federal programs that service both affordable and market-rate housing types and promote innovative financing solutions to multifamily housing providers, making them favorable programs in terms of access and assistance. The following discussion analyzes three federal programs, ENERGY STAR®, the Better Buildings Challenge, and the Weatherization Assistance Program, in terms of the access and assistance they provide multifamily rental housing property owners.

i. ENERGY STAR®

The US Environmental Protection Agency (EPA), in partnership with DOE, launched the ENERGY STAR® program in 2011, which encourages property owners to evaluate their property's building performance and compare it to similar properties across the country. This approach, which is also known as benchmarking, is the first step to identifying opportunities where building owners can reduce energy waste and expenditures, while monitoring their carbon footprint.[86] The ENERGY STAR® program is essentially a building rating system that also provides multifamily property owners with the resources they need to reduce operating costs, increase property asset values, and meet resident demands. In terms of access, this program is available to both new and existing multifamily properties and services both affordable and market-rate housing. As far as assistance, this federal program offers owners and operators benchmarking tools, performance evaluations, and nationally recognized certifications to encourage EE investment.[87] ENERGY STAR® helps property owners and operators achieve cost-effective energy savings that can reduce energy expenditures by up to 30%.[88]

To reach these goals, property owners must first benchmark their property in EPA's free ENERGY STAR® Portfolio Manager tool to see how it performs. To do this, property owners and operators need utility bills from the past twelve months and some basic information on the property. Once the information is entered into the Portfolio Manager tool, property owners and operators can track their property's performance metrics over time or compare similar properties within their portfolio. If owners and operators want to receive a 1 – 100 ENERGY STAR® rating that compares their property's energy usage to other similar properties nationwide, their property needs to have at least twenty units and they need to provide twelve months of property-wide energy usage data.[89] Once benchmarking is complete, EPA recommends that property owners look to "low- and no-cost measures to reduce energy usage and then continue improvements with product and building system upgrades."[90]

TIAA-CREF, one of the largest institutional real estate investors in the US, implemented a set of strategic energy management initiatives across a portfolio of more than forty multifamily properties in 2008. The company's

reason for doing so rested on the notion that the green building initiative was gaining traction, pushing the company to position its portfolios "ahead of the curve."[91] These initiatives included, but were not limited to, "replacing incandescent lighting with ENERGY STAR® qualified CFLs, purchasing only ENERGY STAR® qualified appliances and equipment for replacements, installing 7-day programmable thermostats in common areas and amenity areas, reducing pool and hot tub temperatures, [and] training staff to operate model and vacant units more efficiently."[92] Between 2007 and 2009, TIAA-CREF was able to realize energy cost savings of about $500,000 per year by simply focusing its energy conservation efforts on its communities' common areas. Over the two-year period, TIAA-CREF was able to reduce common area energy consumption by 9.1%."[93]

Not only did TIAA-CREF realize energy savings due to the changes it made to its communities' common areas, it also saw positive changes through enhanced employee and resident communications. For example, TIAA-CREF provided EE retrofits to its residents along with instructive materials about EE technology and available ENERGY STAR® resources.[94] The company also educated its on-site management staff on available EE technology to promote "resident attraction, retention, and satisfaction while adding to the bottom line."[95]

ii. Better Buildings Challenge

In 2013, the Department of Housing and Urban Development (HUD) partnered with DOE to support multifamily housing sector partners with EE projects, providing incentives and technical assistance for utility benchmarking and planning portfolio-wide investments. Through this voluntary leadership initiative, known as the Better Buildings Challenge, multifamily housing partners have committed to reducing energy use in their communities by at least 20% in just ten years.[96] Multifamily housing partners comprise of leaders in both market-rate and affordable housing sectors.[97] Thus, the Better Buildings Challenge is accessible to a broad array of property owners and operators.[98]

In terms of assistance, the program connects multifamily housing partners to "financial allies," which are financing companies that have committed to funding EE projects.[99] Financial allies funded $2.3 billion worth of projects in the multifamily industry between 2015 and today, offering a variety of funding solutions ranging from traditional leases and loans to innovative solutions, including Energy Savings Performance Contracts, on-bill financing, and performance-based arrangements.[100] The program also promotes utility benchmarking as a basic asset management activity, pointing multifamily partners to EPA's ENERGY STAR® Portfolio Manager.[101]

Since the program's expansion into the multifamily housing market, 121 multifamily partners, making up 675,000 housing units, have pledged to reduce their energy use by at least 20% in just ten years.[102] These multifamily partners have saved $136 million since 2009. In fact, four NAA member companies have already achieved their Better Buildings Challenge goals.[103] These "challenge partners serve a combined portfolio of more than 35,000 affordable and market-rate apartment homes in 415 communities nationwide."[104] To achieve their goals, these companies utilized innovative financing solutions to pay for EE upgrades, offered EE trainings to on-site staff members, and targeted local and state incentives to support retrofit projects.[105]

iii. Weatherization Assistance Program

The federal Weatherization Assistance Program (WAP) is overseen by DOE and is intended to help reduce energy usage and costs among low-income households across the country.[106] "The Program's primary purpose, established by law, is '. . . to increase the energy efficiency of dwellings owned or occupied by low-income persons, reduce their total residential energy expenditures, and improve their health and safety . . ..'"[107]

The program has strict eligibility requirements, limiting access to households at or below 200% of the federal poverty line.[108] For the multifamily industry, the program is limited to properties offering affordable housing.[109] To be eligible for the program, these properties with buildings that have five or more units must have at least 66% of dwelling units occupied by residents whose income is at or below 200% of the federal poverty line. Buildings with four or fewer units must have at least 50% of the dwelling units occupied by such residents.[110]

While access is limited to multifamily properties that primarily serve low-income residents, eligible properties receive weatherization services free of charge. DOE provides program funding to all fifty states, districts,

territories, and tribes. Once grants are awarded by DOE, states contract with local agencies to provide weatherization services to low-income residents.[111] Through improvements to HVAC systems and building envelopes, WAP has helped over 35,000 households reduce their annual heating consumption by 18% and their annual electric consumption by 7%, amounting to an average annual energy savings of $283 per household.[112]

B. Tax Deductions and Incentives

Like the federal programs mentioned above, there are not many financial incentives that are specifically tailored to the multifamily housing industry. However, among the financial incentives that are available to multifamily property owners, they are generally geared toward both affordable and market-rate housing, ranking them relatively high in terms of access. Corporate tax credits provide property owners with a great deal of financial assistance. However, utility rebate programs oftentimes provide incentives to tenants, not building owners. Employing the same two-prong analysis used above, the following discussion evaluates the usefulness of some tax deductions and utility rebate programs that are available to multifamily rental housing property owners in North Carolina.

i. Energy Efficiency Commercial Buildings Tax Deduction

The Energy Efficiency Commercial Buildings Tax Deduction is a federal financial incentive in the form of a corporate tax deduction. The deduction ranges from $0.30 to $1.80 per square foot, depending on the technology installed and the energy reductions achieved. Building owners are eligible to receive a tax deduction "of $0.60 per square foot . . . [if] individual lighting, building envelope, or heating and cooling systems meet target levels that would reasonably contribute to an overall building savings of 50% if additional systems were installed."[113] Moreover, building owners are eligible for "[a] tax deduction of $1.80 per square foot [if they] install[:] (1) interior lighting; (2) building envelope, or (3) heating, cooling, ventilation, or hot water systems that reduce the building's total energy and power cost by 50% or more in comparison to a building meeting minimum requirements in the most recent ASHRAE[i] Standard 90.1."[114] It is important to note that these deductions are taken during the year in which improvements are complete.[115]

While the tax deduction is widely available to owners of new and existing market-rate and affordable multifamily buildings, the baseline performance requirements laid out in the ASHRAE 90.1 standard can make it difficult for owners to qualify for the incentive, particularly owners of existing buildings. In a 2016 report, NAA noted that "[m]ore than 70 percent of the current apartment stock was constructed before 1990, the era of the modern energy code."[116] Thus, although many older properties could achieve meaningful energy use reductions after making significant financial investments in EE technology, they often fail to meet ASHRAE's prescriptive performance benchmark.[117]

ii. Energy Efficient New Homes Tax Credit

Like the Energy Efficiency Commercial Buildings Tax Deduction, the Energy Efficient New Homes Tax Credit is a federal financial incentive available as a corporate tax credit for multifamily developers amounting up to $2,000 per unit.[118] However, this incentive is only available to developers who construct new multifamily buildings in the US before December 31, 2021, regardless of whether they offer market-rate or affordable housing.[119] Moreover, the newly constructed buildings must meet strict building performance code requirements. For example, in order to qualify for the $2,000 tax credit, site-built multifamily properties must be "certified to reduce heating and cooling energy consumption by 50% relative to the International Energy Conservation Code (IECC) 2006 and meet minimum efficiency standards established by the [DOE]. Building envelope component improvements must account for at least one-fifth of the reduction in energy consumption."[120]

[i] ASHRAE Standard 90.1 is a widely adopted EE building code standard developed by the American Society of Heating, Refrigerating and Air-Conditioning Engineers.

iii. Utility Rebate Programs

A number of utility providers offer rebates to customers who use EE technology, such as high performing heating and cooling systems, appliances, and lighting. Duke Energy, for example, offers its commercial and residential customers rebates through its Smart $aver® program.[121] While these rebates are available to all multifamily properties that have EE technology, property owners will not always receive such benefits. Instead, residents will likely receive the rebates since multifamily properties in North Carolina are required to submeter utilities.[122] Although this is true, property owners can still benefit from rebates for equipment and technology used in common areas.[123]

C. Future Considerations

While it is important for property owners to understand the current landscape of available programs and incentives that can help facilitate the investment process and aid property owners in recouping their investments, it is also important for property owners to know what the future may hold in terms of EE policies. In particular, property owners should be aware of favorable EE legislation that has the potential to pass both the House and the Senate in the 117th Congress. Moreover, property owners should be aware of President Biden's EE plan and the growing adoption of mandatory benchmarking and disclosure policies around the country. Property owners who proactively consider the impact that proposed EE policies will have on them are in a better position to adapt to changes if such policies are implemented.

i. The Energy Efficient Qualified Improvement Property Act

The Energy Efficient Qualified Improvement Property (E-QUIP) Act was introduced in the 116th Congress to stimulate EE improvements for better building infrastructure.[124] The legislation would create an accelerated ten-year depreciation, or cost-recovery, period for qualified EE property improvements targeted at commercial property or multifamily rental housing. In order to be eligible, qualified property improvements must be made to buildings in operation for more than ten years before the bill's enactment. Such improvements must have been made to the lighting system, heating and cooling system, or the building envelope.[125]

Considering that most EE investments are subject to depreciation periods reaching forty years, which disincentivizes property owners from making them, the E-QUIP Act would provide a uniform depreciation period that is related to the actual useful life of the technology used.[126] While a $1,000 investment with a forty-year depreciation period would allow a property owner to write off only $25 per year, a $1,000 investment with the ten-year depreciation period provided by the E-QUIP Act would allow a property owner to write off $100 per year.[ii] In addition to accelerating the depreciation period for EE improvements, the tax incentive created by this bill is estimated to encourage widespread EE adoption among commercial building and multifamily rental housing property owners, with projected energy savings reaching $15 billion between 2020 and 2025.[127] In addition, the incentive would be available to both market-rate and affordable housing providers. NAA is currently working to reintroduce this legislation in the new Congress.[128]

ii. The Biden Plan

President Joe Biden made EE a cornerstone of his 2020 presidential campaign and plans to bolster EE to help reduce carbon emissions, create jobs, and stimulate innovation across the US. More specifically, the President plans to cut the carbon footprint of the US building stock in half by the year 2035, "creating incentives for deep retrofits that combine appliance electrification, efficiency, and on-site clean power generation."[129] In addition, President Biden will pour a significant amount of money into research and development as well as legislation that incentivizes rapid deployment of clean energy innovations.[130] For example, his plan includes funding for direct cash rebates and low cost financing to retrofit residences. The President also plans to hold polluters accountable by requiring "public companies to disclose climate-related financial risks and the greenhouse gas

[ii] For simplicity, this straight-line depreciation calculation assumes no salvage value. Thus, the annual depreciation of a $1,000 investment with a forty-year depreciation period is calculated as follows: $1,000 / 40 years = $25 per year. In addition, the annual depreciation of a $1,000 investment with a ten-year depreciation period is calculated as follows: $1,000 / 10years = $100 per year.

emissions in their operations and supply chains."[131] Companies who fail to comply with these reporting standards could face sanctions, including financial penalties and jail time.[132]

iii. Benchmarking and Disclosure Policies

Benchmarking policies require building owners to measure their building's energy use and compare it to similar buildings. These policies allow building owners to understand how efficient their building is and helps them identify opportunities to reduce energy waste. Disclosure policies, on the other hand, require building owners to share their property's energy use with the public. Together, benchmarking and disclosure policies incentivize EE and "create a continuous cycle of improvement and demand for high-performing buildings."[133]

For years, adoption of benchmarking and disclosure policies has been growing in international markets. Recently, such policies have also been gaining traction across the US, with more than thirty state and local governments having benchmarking and disclosure policies currently in place.[134] A detailed map of these states and local governments is located in **Appendix A**. "[A]s of March 2017, these policies affected more than 10 billion square feet of floor space in major real estate markets—making them powerful catalysts for energy efficiency in the built environment."[135]

Atlanta, Georgia, is a city that currently has an ordinance in place that requires commercial and multifamily buildings larger than 25,000 square feet to benchmark energy and water usage and report the data to the city on an annual basis.[136] The ordinance covers almost all commercial and multifamily buildings within city limits (87% of all commercial and 96% of all multifamily buildings).[137] Building owners who fail to comply with the ordinance are subject to a $1,000 fine per year they fail to comply.[138]

While North Carolina does not currently have benchmarking and disclosure policies in place, it is possible that they may be coming down the line as more studies demonstrate their effectiveness. The Institute for Market Transformation argues that "[c]ollecting, reporting, and sharing benchmarking data on a regular basis allows the market and government agencies to make smarter investment decisions, reward efficiency, and drive widespread, continuous improvement."[139] Although gathering property-wide energy usage data can be cumbersome, the transparency afforded by disclosure policies "improve[s] consumers' awareness of the energy use of homes and buildings, which can have a significant impact on its economic value."[140] Moreover, these policies help reduce vacancy rates and resident turnover, which ultimately saves money spent on maintenance and operating costs associated with turning apartments for new residents.[141]

D. Other Considerations

Private organizations, much like the federal government, have created performance rating systems for commercial and residential buildings to promote EE investment. Two prominent programs are the Leadership in Energy and Environmental Design (LEED) certification and the Passive House Building Standard (PHBS), both of which are available to market-rate and affordable multifamily rental housing providers. While both programs are relatively expensive and offer few financing options, they have demonstrated increased building performance and reduced energy expenditures for building owners and occupants.[142]

LEED is the most widely used green building rating system in the world, and its certification is a globally recognized symbol of achievement and leadership.[143] The program is intended to help create healthy, highly efficient, and cost-saving buildings through design, construction, operations, and performance.[144] Moreover, the program claims that "LEED-certified buildings command the highest rents, while lease-up rates typically range from average to 20% above average; vacancy rates for green buildings are an estimated 4% lower than non-green properties."[145] Between 2015 and 2018, LEED-certified buildings are estimated to have achieved a 25% reduction in energy consumption, leading to $1.2 billion in energy savings and $715.3 million in maintenance savings.[146]

While LEED is a certification program that signifies achievement and leadership, the PHBS is a comprehensive building performance standard that promotes the creation of durable, resilient, and highly efficient buildings through review of building heating and cooling systems and envelopes.[147] Geared towards new construction,

PHBS "targets the sweet spot between investment and payback to present an affordable solution to achieving the most comfortable and cost-effective building possible and the best path for achieving zero energy and carbon."[148] PHBS multifamily buildings use 60-80% less energy than code-compliant buildings.[149]

VII. Recommendations

Below is a summarization of key insights and an outline of a refined set of actionable recommendations to help TAA support its members in making informed EE investment decisions.

Education: Offer trainings and materials to foster awareness and bridge knowledge gaps related to EE

- Aid members in gaining foundational knowledge of their property's energy usage and performance to help identify areas for cost-effective improvement. One way to do this is to provide members with free data sharing tools, such as EPA's ENERGY STAR® Portfolio Manager. Another method is to connect members with organizations that provide free energy audits.
- Offer trainings and seminars on the costs and benefits of EE behaviors and technology to help members understand what types of EE improvements are available and well-suited for their property's specific characteristics. Trainings could cover the average up-front costs of various EE technologies, estimated payback periods for investments, and projected long-term benefits of specific technologies.
- Consider providing policy briefs and opinion pieces that discuss current and forthcoming legislation and programs that may impact the industry and its outlook on EE.

Advocacy: Promote robust policies that are tailored to meet the unique needs of the industry

- Collaborate with other stakeholders to develop policies, programs, and incentives that are tailored to meet the specific needs of the multifamily rental housing industry. Taking a seat at the regulatory discussion table and/or partnering with other advocacy groups can foster valuable, well-designed regulations and legislation. Market-rate housing providers are largely unsupported by current policies and programs. Advocating for more incentive-based legislation, like the E-QUIP Act, will assist multifamily rental housing providers across the board, especially as stricter building codes and disclosure policies gain traction. Moreover, working with utility providers to create rebate programs better suited to address the split incentives problem will likely facilitate broader adoption of EE technologies in the multifamily rental housing industry.
- Encourage policies that require utilities to provide property owners with aggregated tenant energy usage data. Doing so will help simplify benchmarking processes for property owners who want to track their property's energy performance and make more informed EE investment decisions.

VIII. Checklist for EE Investment

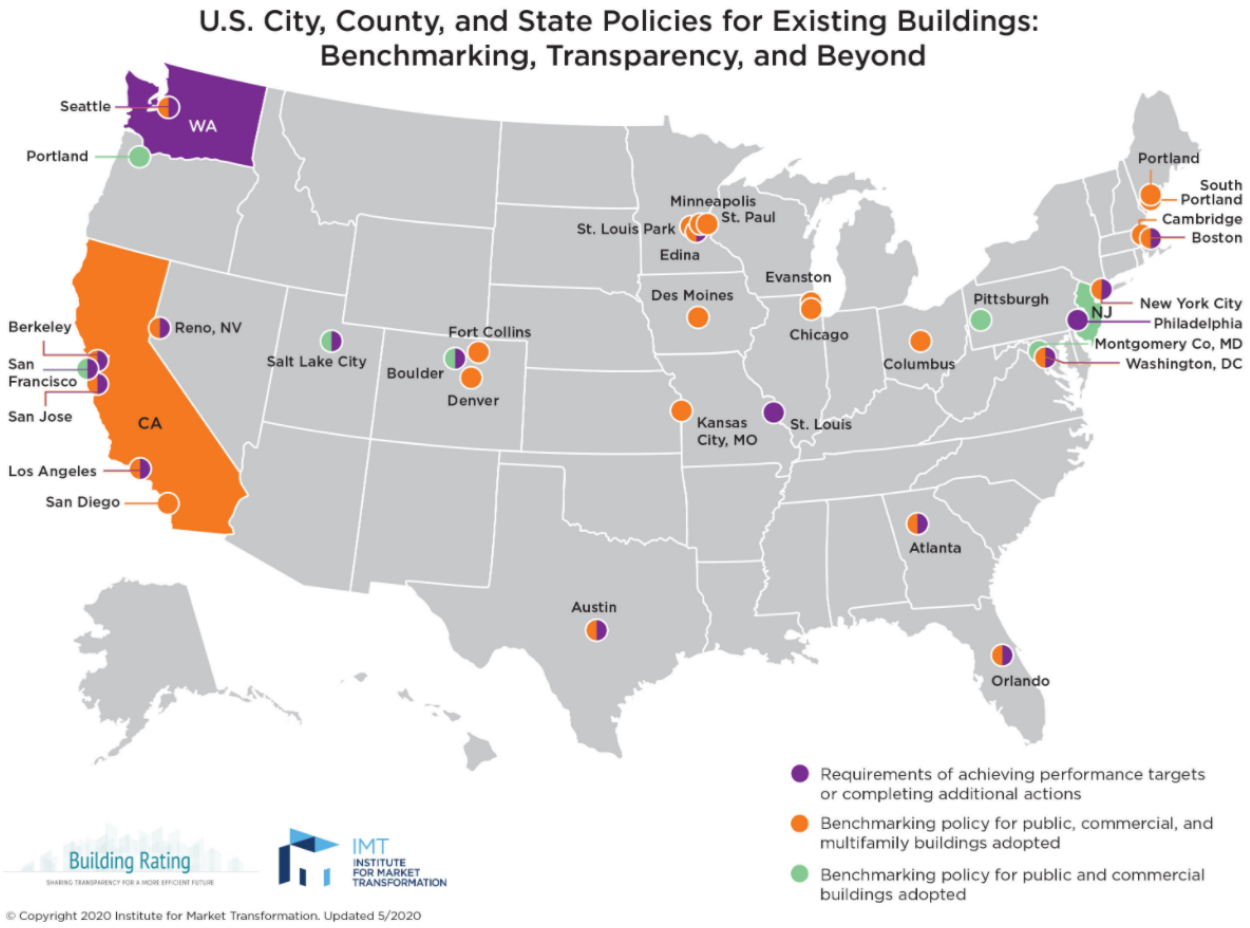
1. **Understand your property's energy use and performance**
    - Gather property-wide energy usage data from resident and owner utility bills to assess the potential for energy savings
    - Benchmark property energy consumption and performance using free tools like EPA's ENERGY STAR® Portfolio Manager
2. **Hire a professional energy auditor or conduct an at-home energy assessment to identify key areas for improvement**
    - Survey light fixtures in units and common spaces for opportunities to replace incandescent light bulbs with CFLs or LEDs
    - Check the age and condition of major appliances, such as refrigerators, washers, and dryers
    - Check for gaps or cracks in insulation around windows and exterior-facing doors
    - Assess the quality of attic and crawlspace insulation

- Evaluate the condition of HVAC equipment and control systems to determine if replacement or retrofits are necessary and/or justified
- Survey water heaters to see if they would benefit from insulation or replacement

3. **Decide which EE improvements would be most cost-effective for your property**
    - No-cost measures
        - Educate employees and residents on energy- and cost-saving behaviors
        - Reward EE behaviors to engage employees in helping reduce energy costs
        - Benchmark energy usage with free tools like EPA's ENERGY STAR® Portfolio Manager
    - Lower-cost measures
        - Swap traditional incandescent light bulbs with CFLs or LEDs
        - Replace old appliances with ones that are ENERGY STAR® certified
        - Apply weatherstripping and/or caulk to insulate windows and exterior-facing doors
    - Higher-cost measures
        - Retrofit HVAC equipment and control systems
        - Air seal and insulate attic and crawlspaces
        - Insulate or replace water heaters
4. **Consider increasing rent prices or using green leases to help offset the costs of EE improvements**
    - Evaluate potential cost-recovery periods to determine reasonable monthly rent premiums
    - Consult with an attorney to draft new leases or amend existing ones
5. **Determine which government- or private-sponsored policies and programs would provide additional financial or administrative support**[iii]
    - Federal programs
        - ENERGY STAR®
        - Better Buildings Challenge
        - Weatherization Assistance Program
    - Tax deductions and incentives
        - Energy Efficiency Commercial Building Tax Deduction
        - Energy Efficient New Homes Tax Credit
        - Utility rebate programs
    - Private building standards and rating systems
        - LEED
        - PHBS

[iii] Consult the NC Clean Energy Technology Center's Database of State Incentives for Renewables & Efficiency® for more information on available tax deductions and incentives in North Carolina.

Appendix A. State and Local Government Benchmarking Policies



Source: Institute for Market Transformation (2020)

Appendix B. Sample Expert Interview Guide

General

- Do you have any questions about my research question, for context, or what TAA is trying to accomplish?
- From your perspective, do you have any general or high-level first reactions to my description of TAA's goal to provide its members with tools to make informed decisions about energy efficiency investments?
- If you could design an energy efficiency investment guide or toolkit from the ground-up, what would it look like? What are the three most important attributes?
- From your perspective, what aspects of energy efficiency should TAA consider as it evaluates and designs an energy efficiency investment guide or toolkit?
- From your perspective, which states have high-performing policies that help the multifamily industry invest in energy efficiency?
- Would you recommend that I interview other experts for this project? If so, who comes to mind?

Energy Efficient Technologies

- What types of technologies would you recommend the multifamily housing industry consider?
- What are some of the costs and benefits of these recommended technologies?
- Do you have any immediate reactions in terms of drawbacks to multifamily housing energy efficiency investment?
- What are the most important factors landlords should consider before making investments?

Programs/Incentives

- What incentives or strategies for investor engagement have you seen in the multifamily housing industry? Are there incentives or strategies for improving the number of investors that you think are particularly effective?
- What are the most pressing challenges landlords face that may hinder their access to financial programs?
- Are there any programs you would recommend over others? If so, why?
- I have seen a few financial programs tailored to affordable housing but not many tailored to market-based housing. Are you aware of any programs that suit the specific needs of market-based housing? If so, what are they?
- Outside of financial programs, how would you recommend landlords overcome the misaligned incentives problem (issue presented when landlords and tenants have different incentives for investment in energy efficient technologies)?

Recouping Investment

- In what ways can landlords recoup their investment?
- Do you recommend one method over another? If so, why

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