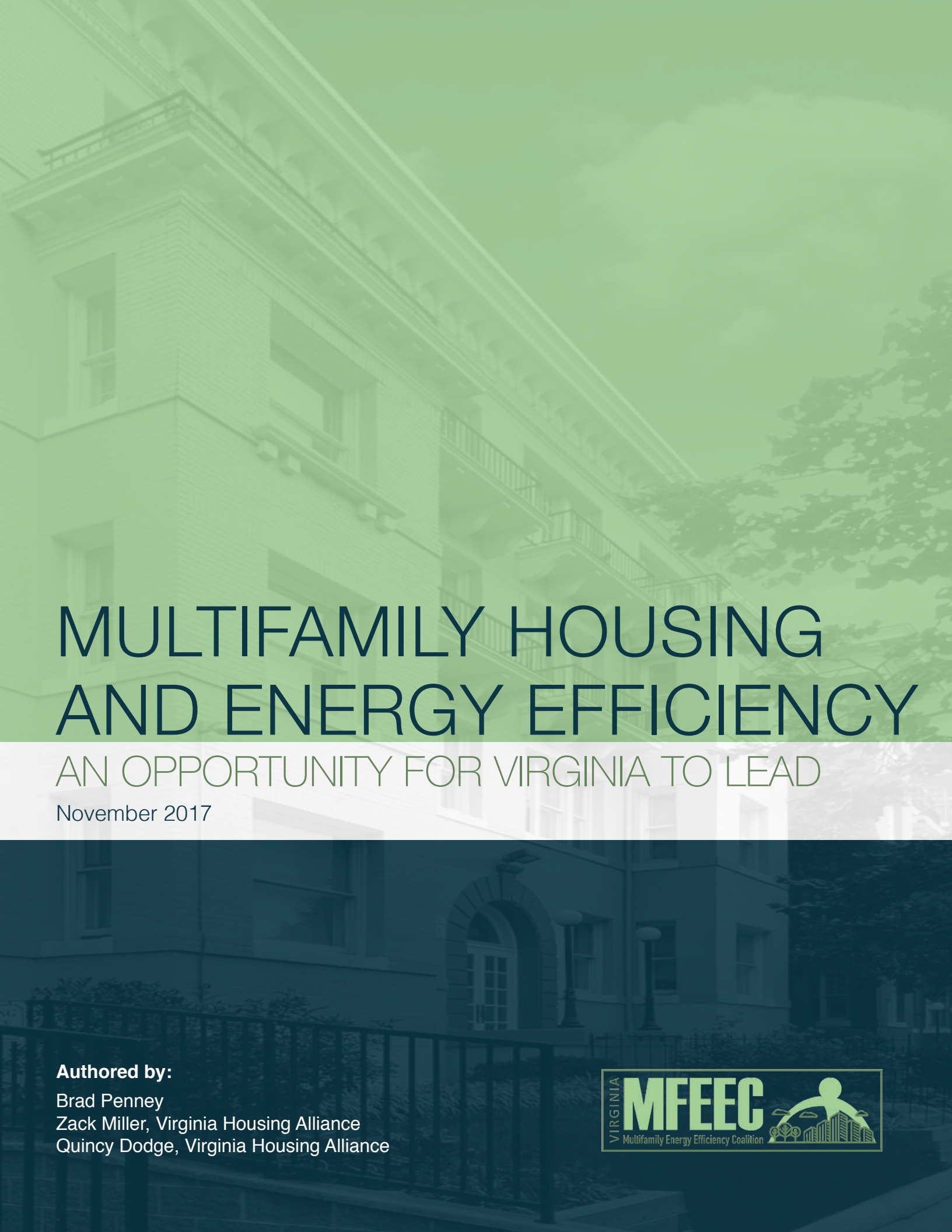

# MULTIFAMILY HOUSING AND ENERGY EFFICIENCY

## AN OPPORTUNITY FOR VIRGINIA TO LEAD

November 2017

**Authored by:**

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VIRGINIA MFEEC Multifamily Energy Efficiency Coalition

*This report is dedicated to Brad Penney, the original author of this report who passed away in April 2017. Brad was a tireless advocate for energy efficiency at the federal level, lobbying to protect the Weatherization Assistance Program and other critical resources that efficiency organizations around the country depend on to continue their work. He also provided critical support to many state-level initiatives including the Virginia Multifamily Energy Efficiency Coalition in his work. Though Brad is no longer with us, we remember him fondly and recognize his significant contributions to making this report possible.*

# Acknowledgements

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# Contents

# Foreword

In winter 2014, just as families throughout the Commonwealth began cranking up their thermostats, a movement toward greater energy efficiency was also heating up. I was working at the Richmond Region Energy Alliance, and we received a pivotal grant that would lead to the creation of the Virginia Multifamily Energy Efficiency Coalition. Elevate Energy funded the Alliance to evaluate and benchmark the energy usage of affordable multifamily properties in Virginia.

Soon after, Dominion Energy committed to fund a first-of-its-kind pilot program focused on weatherization for multifamily properties. Together, the grant and the pilot program inspired us to envision a future where Virginia families living in apartments could enjoy the same access to money-saving energy efficiency as those in single-family homes. Because we wanted to see Virginia utilities make significant, enduring investments in multifamily energy efficiency, we formed the Virginia Multifamily Energy Efficiency Coalition that winter. The Virginia Housing Alliance stepped up to coordinate the coalition, and the rest is history.

The broad coalition includes experts of all stripes, including housing developers, housing authorities, housing advocates, weatherization agencies, environmental advocacy groups, and home energy efficiency professionals. Our main goal is to achieve energy efficiency savings of at least 25 percent in at least 25 percent of Virginia's eligible multifamily homes by 2025.

Early after the coalition launched, we realized the need to make a compelling case for multifamily energy efficiency if we wanted to boost access for all Virginians. We needed evidence and data but also stories about real Virginia communities. This report will fill that void.

As we ensure all Virginia families can reap the rewards of energy efficiency and weatherization, we are also expanding access to high-quality jobs in these growing industries. Statewide, 75,000 Virginians have energy efficiency jobs, and a September 2017 scorecard from the American Council for an Energy-Efficient Economy ranked Virginia as one of the most improved states for energy efficiency.

I know the coalition's work is paying off. I have spent my career working to grow the affordable housing and the clean energy sector through strategic investments. I now run a clean energy lending program at Virginia Community Capital. The range of Virginia businesses making the shift toward solar power and energy efficiency these days speaks volumes about how clean energy can benefit everyone. I've loaned to hair salons, chicken farmers, software companies, car dealerships, veterinary clinics, and a feed and seed store. These savvy business owners see the big picture: they're in it not just to go green but to save green. Through these investments, they are keeping their properties comfortable and their customers happy.

To exclude multifamily households (more than 520,000 Virginia families) from the spoils of energy efficiency is a missed opportunity for everyone. When multifamily residents save energy, we all benefit from the energy bill savings and cleaner air that result from delaying or averting the need to build another costly power plant. Furthermore, we all gain when we support local entrepreneurs and small business and nurture a proven engine of job growth in our communities. Since the clean energy economy is surging, Virginia should position itself as a leader. This report includes specific recommendations for stakeholders to do their part on multifamily energy efficiency. As we bundle up for yet another chilly winter, I hope this report can help keep all Virginia families warm.

**Bill Greenleaf**
Vice President, Clean Energy Loan Officer
Virginia Community Capital

# Executive Summary

Virginia has the 11th largest multifamily housing stock in the country, making up 15.5 percent of the Commonwealth's total housing stock.[1] Most of this housing (47 percent) was built before 1980 (before building codes were widely adopted), presenting both a need and opportunity for investment in energy efficiency.[2] With full deployment of energy efficiency in multifamily housing, Virginia could cost-effectively achieve a reduction of as much as 28 percent in electricity use, saving families money by lowering their electricity bills.[3] This is particularly important in Virginia where almost one-quarter of very low-income households reside in multifamily rental housing, and many are forced to choose between paying their utilities and covering essentials such as groceries or healthcare costs.

States across the country are increasing commitments to energy efficiency to achieve environmental, economic, and health benefits for their residents. But the Commonwealth lags behind several of its peers, ranking 29th in energy efficiency when compared to other states, according to the 2017 scorecard of the American Council for an Energy-Efficient Economy (ACEEE).[4] This report shows that investment in energy efficiency is a cost-effective way to maintain safe and healthy affordable housing, promote local job growth, and build a stronger economy for all Virginians. Increasing energy efficiency could make housing more affordable for thousands of Virginia households by alleviating household energy burden, the measure of a household's energy spending as a percentage of its income. In this metric, low-income households, many of which are renters in multifamily housing, spend two to three times what an average household spends on energy as a percentage of income, a statistic that holds true in two of Virginia's larger cities, Richmond and Virginia Beach.[5]

Though the report focuses on the potential benefits to multifamily renters, it also expounds on the benefits that these improvements carry for building owners, utilities, and Virginia's ratepayers. The report also analyzes what greater multifamily efficiency would mean for Virginia in terms of meeting its energy and other policy goals. While Virginia has made some progress to-date in expanding efficiency opportunities for the multifamily sector, barriers continue to exist. This report provides an in-depth assessment of the current barriers to energy efficiency for this sector while providing solutions that can help address these problems.

## Administrative Recommendations

- **Establish a goal of 25 percent by 2025.** Virginia should establish a statewide goal of 25 percent market penetration for efficiency upgrades in affordable multifamily properties by the year 2025.
- **Establish a multifamily energy efficiency working group.** The Governor's Executive Committee on Energy Efficiency established under Governor McAuliffe should continue its work through the Governor Northam's term, and convene an ongoing working group to develop solutions to increase energy efficiency in the multifamily sector.
- **Environmental justice considerations.** Governor Northam should include considerations of environmental justice in all executive orders and energy policies, as was done with Governor McAuliffe's Executive Order 57.
- **Prioritize multifamily energy efficiency in housing programs.** The Virginia Department of Housing and Community Development should prioritize multifamily efficiency across the range of housing and community development programs it administers, consider establishing a "carve-out" for multifamily under the Weatherization Assistance Program (WAP), and direct additional Low-Income Home Energy Assistance Program (LIHEAP) funding to WAP specifically for weatherization services in the multifamily sector.

## Regulatory Recommendations

- **Account for Non-Energy Benefits.** In evaluating whether new utility demand side management programs are in the public interest, the State Corporation Commission (SCC) should take into account "non-energy benefits" (NEBs) such as public health benefits, participant health and comfort, direct economic impacts to communities, and environmental benefits.

- **Develop robust EM&V protocols.** The SCC should ensure that robust Evaluation, Measurement and Verification (EM&V) protocols to measure the effectiveness of multifamily energy efficiency programs and track energy savings are developed and updated periodically.

## Legislative Recommendations

- **Systems Benefit Charge.** Twenty-four states fund energy efficiency programs through a small charge on electric bills, a policy supported by a sizeable majority of Virginia voters according to a recent poll.[6] Virtually all of the states that have achieved the highest levels of market penetration and energy savings have some form of systems benefit charge paid by customers to support efficiency programs.[7]
- **Benchmarking.** The General Assembly should pass legislation to allow municipalities to adopt benchmarking ordinances. Providing owners with data on energy consumption improves energy performance and helps identify opportunities for efficiency investments.
- **Decoupling.** The General Assembly should pass legislation that decouples utility profits from electric sales to remove the disincentive for utilities to make significant investments in energy efficiency programs.

## Utility Recommendations

- **Make new commitments or increase existing commitments.** Dominion Energy should build on the success of its expanded EnergyShare program and make a permanent commitment to utility-funded residential efficiency programs serving low-income customers. The Commonwealth's other electric and gas utilities should consider commitments to energy efficiency for their most in-need customers.
- **Keep applying.** Continue to apply for new ratepayer-funded demand side management programs available to multifamily housing, and apply for extensions on existing programs that have proven successful.
- **Engage with the SCC on EM&V.** Actively support and engage with the State Corporation Commission on the development, use, and regular update of EM&V protocols to continually improve on demand-side management program design and effectiveness.
- **Move toward whole building data.** Begin to change data systems to provide owners and program implementers access to whole building aggregated usage data. Major utilities in the state have made clear that their systems as currently structured are not readily able to produce this information.

## Building Owner Recommendations

- **Benchmark your building's energy data.** Use EPA's Portfolio Manager or other similar services like WegoWise. Better data will help guide owners on where to make investments in their portfolios.
- **Use energy audits to make key decisions.** Have energy audits performed on buildings where you are considering improvements to identify cost-effective areas of work. Take advantage of Stewards of Affordable Housing for the Future (SAHF) free "EZ Retrofit" self-audit tool.
- **Stay informed.** Remain up-to-date on the latest policies, programs, and financing mechanisms that could be used to improve your buildings and your operating expenses. Appendices I and II contain a number of tools and programs owners should consider.

Multifamily housing is often viewed as a "hard-to-reach" sector due to metering arrangements and financing structure, but many states, municipalities, and utilities have realized success with a combination of policies that mirror the recommendations found in this report. The Commonwealth must work together throughout all levels of government to find solutions to the growing housing affordability challenge facing Virginians. Proper implementation of energy efficiency solutions can assist low-income families, seniors, and residents of color who are hit hardest by the growing energy burden facing the Commonwealth. This report can serve as a useful guide for policymakers in Virginia to help establish the Commonwealth as a leader in multifamily energy efficiency in the Southeast and in the nation.

# Introduction

This report analyzes the many benefits – and barriers – for achieving greater energy efficiency in multifamily housing in Virginia. Low-income working families in the Commonwealth have limited options in terms of affordable housing. Due to their limited incomes, multifamily rental housing is the only realistic option for many Virginia families, a housing type that is typically the least expensive in a community but is also often the least energy-efficient, adding significant financial strain to family budgets. In no Virginia locality can a full-time minimum wage worker find an affordable apartment that does not consume more than 30 percent or even half their income,[8] and in most localities public servants such as teachers, police officers, and nurses face the same challenges.[9] This "housing cost burden"[10] forces households to make painful decisions between paying for necessities such as food, clothing, transportation, medical care, and the cost of heating and cooling their homes.[11] As this report reveals, energy efficiency is one of the most effective means of reducing energy costs, making housing more affordable and improving the overall health and safety of the tenants living in multifamily housing.

**"In no Virginia locality can a full-time minimum wage worker find an affordable apartment that does not consume more than 30 percent or even half their income."**

In this report, we will look at the benefits of investing in multifamily energy efficiency and the existing barriers to implementing improvements from the perspective of tenants, building owners, and all Virginians. The report includes recommendations for regulatory, executive, and administrative actions that will position Virginia as a leading innovator in multifamily energy efficiency in the Southeast and in the nation.

Marcela Gara Photography

## About the Virginia Multifamily Energy Efficiency Coalition (MFEEC)

Mounting interest in addressing the need for multifamily energy efficiency in Virginia brought together numerous housing and energy efficiency groups in 2015.[12] The interest in forming a new coalition was driven by the desire to bring about greater collaboration between the affordable housing and energy efficiency sectors with the goal of fostering greater investment and eliminating barriers to multifamily energy efficiency in Virginia. The result was the formation of the Virginia Multifamily Energy Efficiency Coalition (MFEEC), a diverse, multi-sector group of efficiency advocates, housing developers, housing authorities, Weatherization Assistance Program providers, residential energy professionals, state and national environmental groups, and consumer advocacy groups.

MFEEC decided to focus its initial efforts on utility efficiency programs, specifically the expanded EnergyShare program offered by Dominion Energy, the state's first utility-funded low-income weatherization program (as opposed to ratepayer-funded). Its work has since expanded into regulated utility programs, efficiency financing mechanisms, efficiency in the state building code, and efficiency as a component of climate policy. A key objective of the Coalition is educating policymakers and elected officials about the benefits and barriers to achieving multifamily energy efficiency in Virginia. MFEEC has established the goal of achieving energy savings in 25 percent of the Commonwealth's existing multifamily housing communities by the year 2025 through its advocacy and policy efforts. For more background on the Coalition and its membership, visit the Coalition website, www.vamfeec.org.

As the only organization in the state focused specifically on energy efficiency in the multifamily affordable housing sector, MFEEC offers this report as one step in educating the public, policymakers, and elected officials about the opportunities and complex challenges in reaching multifamily affordable housing. The Coalition hopes this report will both inform and stimulate dialogue to move this issue forward in Virginia.

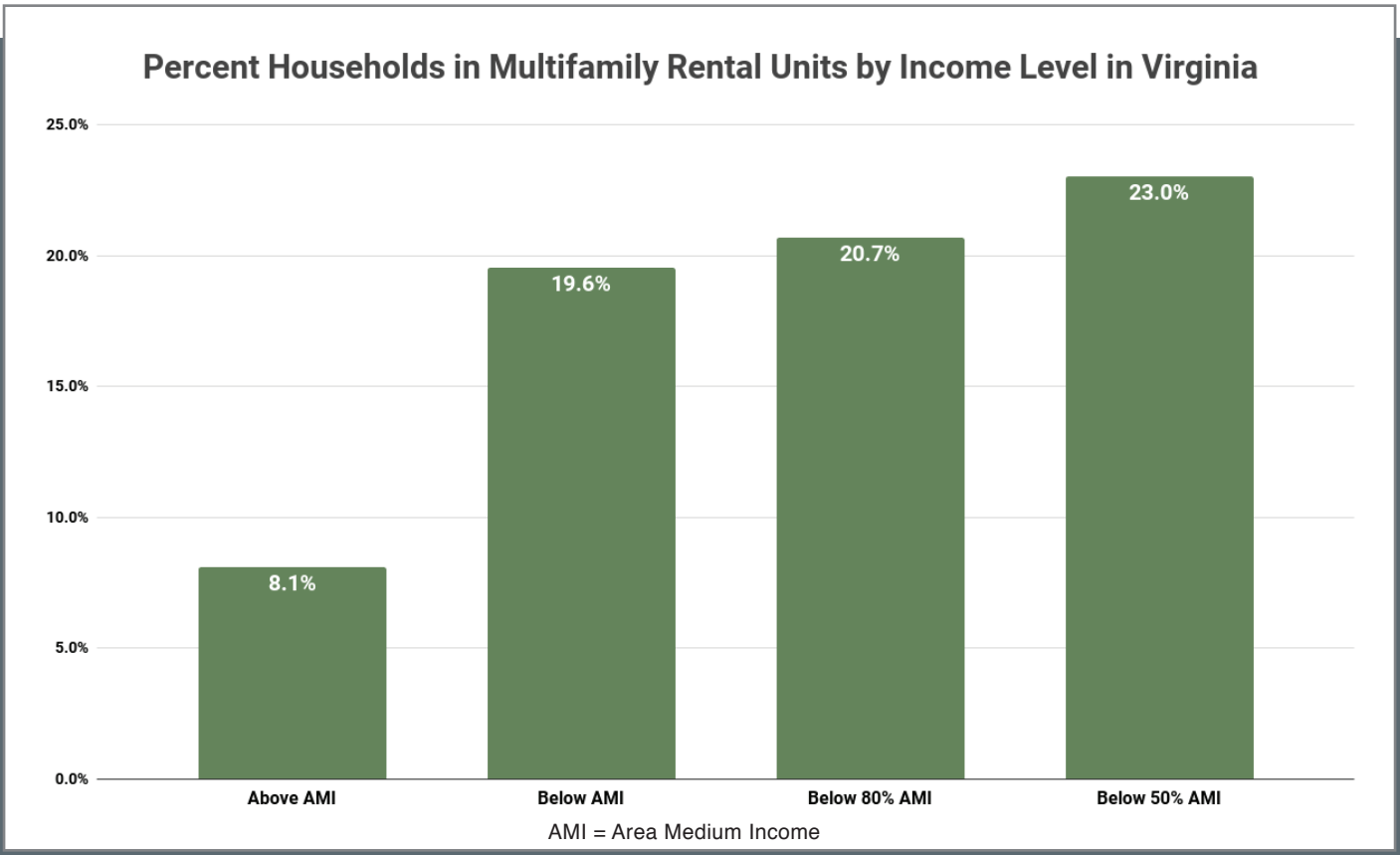
**"I've lived in these apartments four years on the upper floor. This summer was the most comfortable I've been since I came here. I was told they insulated the attics above all the apartments on my floor. I think it helped and I believe I will be better off this winter. Thanks for helping all of us."**

Anita Jefferson
Resident in Henrico County apartment

# I. Why Energy Efficiency in Multifamily Housing Matters

Virginia faces a major challenge in sustaining an affordable housing stock--that is, maintaining the existence of housing units that are affordable for working families in both high-growth urban centers and rural communities with aging or substandard housing stock. Energy costs are a major concern for both the owners of multifamily buildings and the tenants: multifamily property owners spend an average of nine percent of their rent receipts on energy. That percentage is higher for owners who pay all energy and water costs for their properties, making energy a significant component of a building's operating budget.[13]

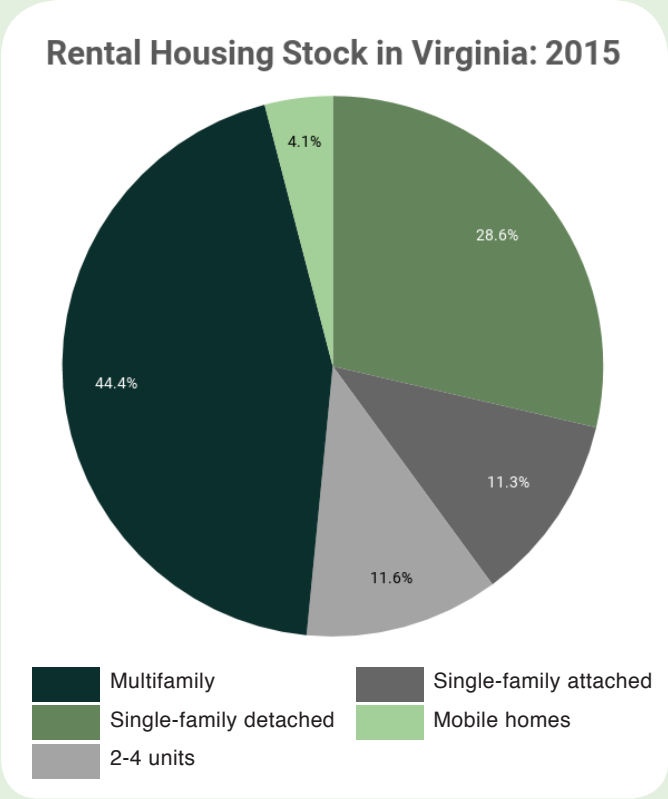
On the tenant side, low-income households residing in multifamily buildings pay a higher proportion of their incomes on energy,[14] and multifamily buildings house about half of very low-income renters nationwide.[15][16]

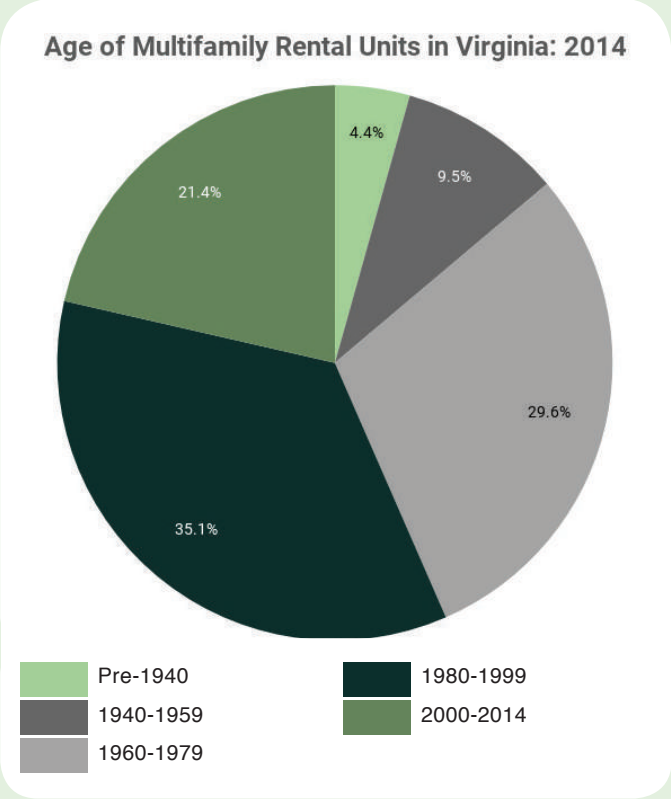


## The Multifamily Housing Stock

Housing affordability is a critical issue in Virginia. According to the National Low Income Housing Coalition, Virginia has the tenth highest rents in the country and the highest rents in the Southeast. Demand for rental housing has increased based on need and changing demographic preferences, while construction has not kept up pace, further straining the multifamily rental stock and driving up rents across the state.[17]

In addition to high rents, multifamily housing is more energy intensive than other housing stock, contributing to a household's energy burden. Energy expenses per square foot in multifamily rental apartments are 38 percent higher on average than in owner-occupied, single-family homes. One study also found fewer energy efficiency features in apartments compared with owner-occupied single-family homes. In 2009, 79 percent of energy efficiency features were less common in multifamily rentals than in any other housing type in the report.[18]



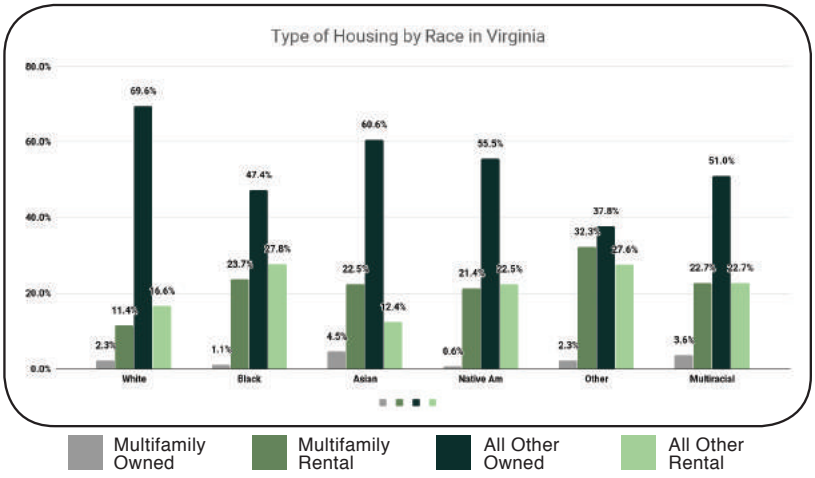




The size and age of Virginia's stock also show why this is such an important issue for Virginia's policymakers to consider. According to the National Multifamily Housing Council, Virginia has the eleventh largest multifamily housing stock in the country with 520,248 multifamily units and is one of only nine states with more than one million renters living in multifamily housing.[19] In Virginia, 15.5 percent of the housing stock is multifamily rental, and almost half of this housing (47 percent) was built prior to 1980, before modern building codes were widely adopted.[20] Energy efficiency can play a role in alleviating these pressures by lowering overall housing costs for renters and by lowering operating costs and improving building durability for owners, aiding in the preservation of at-risk, aging buildings.

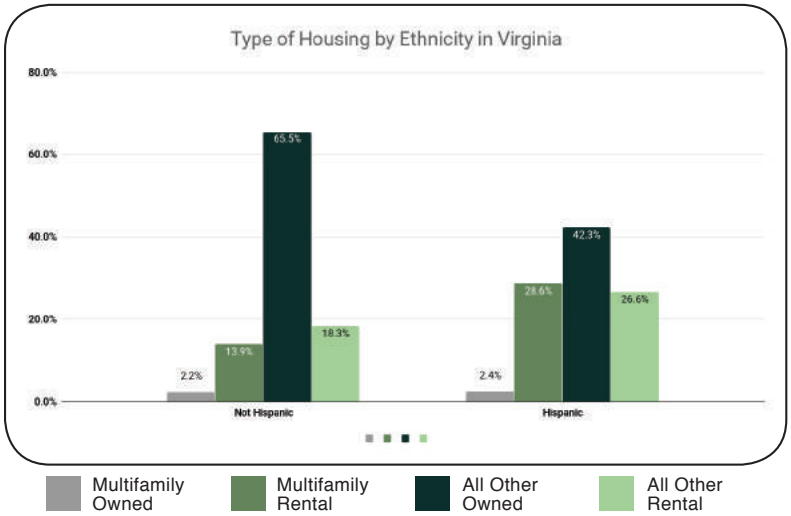
## Changing Pressures: Shifts in the Rental Market

Housing affordability has long been a challenge in Virginia, but recent trends in the rental market have exerted additional pressure on the affordable multifamily stock. In the wake of the 2008 housing crisis, many families lost their homes and subsequently became renters.[21] At the same time, due in part to the crisis and in part to changing preferences, many younger millennial households now question the benefits and safety of homeownership. Additionally, older households desiring to age in place have chosen to stay in the rental market longer. Consequently, the share of renters in the US population has risen from 31 percent in 2004 to 35 percent in 2012 while homeownership levels are at their lowest point in 50 years.[22] Demand for rental housing based on need or changing demographic preferences has increased, and construction has not kept up with increased demand for rental housing, which has further strained the multifamily rental stock, driving up rents across the state. Additionally, while the supply of affordable units is decreasing across the nation as buildings become obsolete or age out of affordability requirements, the market is replacing many of the aged units with new apartments at the high end of the market. The Harvard Joint Center for Housing Studies found that nearly half (46 percent) of the multifamily rental units built in 2010 or later were in the top quartile of area rents, while more than two-thirds fell into the top half.[23] All of these pressures are felt in Virginia, which has the tenth highest rents in the country and the highest in the Southeast.[24]

## Demographics and Disproportionate Energy Cost Burden




Recent studies show that the burden of high energy costs in multifamily housing falls disproportionately on low-income families, people of color, and renter households. According to a recent study by the American Council for an Energy-Efficient Economy (ACEEE), one-quarter of low-income multifamily households in Richmond and Virginia Beach spend roughly 10 percent or more of their income on utilities--three times the energy burden of each city's average household.[25] Additionally, the report found higher energy cost burdens for households of color (African-American and Latino) and renter households than the general population. Rising home energy costs outpace income gains for low-income Americans. Utility bills force trade-offs between heating and cooling a home and other basic necessities.[26] [27]




The ACEEE study finds that in the Commonwealth, African-American households are twice as likely to live in multifamily rental housing as white households.[28] The NAACP reports that low-income communities are more likely to face electricity shut-offs, which can result in dangerous conditions for residents through use of space heaters and other improvised arrangements.

Marcela Gara Photography

## The Potential for Multifamily Energy Efficiency

Multifamily housing presents a significant opportunity: Virginia ranks in eleventh place for residential energy consumption.[29] Indeed, a study by Optimal Energy found that Virginia could achieve as much as a 28 percent reduction in electricity use and as much as a 19 percent decrease in natural gas use with full deployment of energy efficiency in multifamily housing.[30] The projected return on investment is between $2.90 and $3.50 for every dollar invested in multifamily energy efficiency.[31] Likewise, ACEEE estimates that energy upgrades in multifamily buildings can improve efficiency by as much as 30 percent with annual sector-wide savings of almost $3.4 billion.[32]

In light of its significant energy savings potential, multifamily energy efficiency is a tool that can help Virginia meet its energy goals. Virginia has adopted a voluntary goal to reduce retail electricity consumption for commercial and residential buildings by an amount equal to 10 percent of 2006 consumption by 2020.[33] Currently, according to estimates by the Department of Mines, Minerals, and Energy, the Commonwealth is only on track to meet 36 percent of this goal, even if the agency's efficiency "roadmap" recommendations to the Governor's Executive Committee on Energy Efficiency were to be fully adopted.[34]

Additionally, energy efficiency in multifamily buildings can play a role in limiting the carbon emissions from Virginia's power plants, whether through state or federal action. In May 2017, citing concern with threats to Virginia's coast and military infrastructure from climate change, Governor McAuliffe issued Executive Order 11 directing the Department of Environmental Quality to draft a proposed regulation limiting carbon dioxide emissions from electric power facilities.[35] In order to meet these ambitious goals, policymakers should consider the legislative recommendations included later in the report.

# II. Multifamily Housing, Energy, Health, and Environmental Justice

Housing-related health and safety risks are a serious problem for those living in multifamily housing, especially low-income Virginians and households of color. Some of these hazards, such as the prevalence of asthma and severe respiratory illness, and the presence of carbon monoxide or toxic chemicals, can be life-threatening. Other risks include indoor air pollutants including high-moisture levels, mold, radon, exposure to lead, and health risks associated with the presence of household pests. Mitigation of these health and safety hazards for vulnerable communities should be a core element of efforts to increase energy efficiency in multifamily housing. These "non-energy benefits" (NEBs) of energy upgrades discussed below will improve indoor air quality and the overall health of the residents.

Recent studies have shown substantial reductions of these hazards through interventions by programs such as the Weatherization Assistance Program.[36] Weatherization makes apartments healthier principally through air sealing measures, equipment upgrades, and assessments of air quality risks related to combustion equipment, moisture, and sometimes fall prevention in the case of senior housing. In its 2014 National Evaluation of the Weatherization Program, the Department of Energy's National Laboratory at Oak Ridge (ORNL) found a 12 percent reduction in asthma after homes were weatherized, and occupants of weatherized homes were six times less likely to visit the emergency room for asthma symptoms.[37] Studies of energy efficiency upgrades also show improvements from 13 percent to 48 percent in overall physical health,[38] a 14 percent decrease in hypertension, and improvements in mental health outcomes.[39] The suite of studies from the ORNL evaluation demonstrate there are indeed important non-energy benefits associated with these upgrades that will not show up on a utility bill or cost-effectiveness test but will have significant impacts on Virginia's families all the same.

These health benefits are particularly important when considering the racial demographics in multifamily housing. Asthma rates are higher in African-American populations.[40] The City of Richmond ranked second in the country in 2015 for the incidence of asthma.[41] Households of color are more likely to face lead poisoning; asthma worsened by moisture, mold, and pests; exposure to radon and other toxic chemicals; air pollution from industrial neighborhoods; and injuries caused by living in dilapidated housing.[42][43] Recognizing this issue, the City of Richmond has taken steps towards addressing the health risks associated with its housing stock by electing to bring the Green and Healthy Homes Initiative to Richmond and successfully applying for a $1.5 million EPA grant for lead abatement.[44]

Because of the higher prevalence of low-income families living in multifamily housing, policymakers in Virginia should consider environmental risks when shaping Virginia's housing policy and its energy policy. The burdens of environmental pollution are disproportionately borne by low-income communities of color, leading the NAACP to assert that "race is the number one indicator for the placement of toxic facilities in this country."[45] In 2000, nearly 40 percent of Americans living within three miles of a coal power plant were African-American or Latino, even though these racial groups accounted for just 25 percent of the whole population.[46] Just as poor indoor air quality in substandard housing can trigger asthma, environmental pollutants contribute to disparities in risks and effects of asthma. Astonishingly, African-American and Latino people are three to five times more likely than white people to die from asthma in the US.[47]

Solving these issues relating to environmental justice in Virginia not only requires increasing energy efficiency investments in the housing stock for affected populations living in multifamily housing but also requires a transition toward an energy system that does not continue to put these communities at risk.

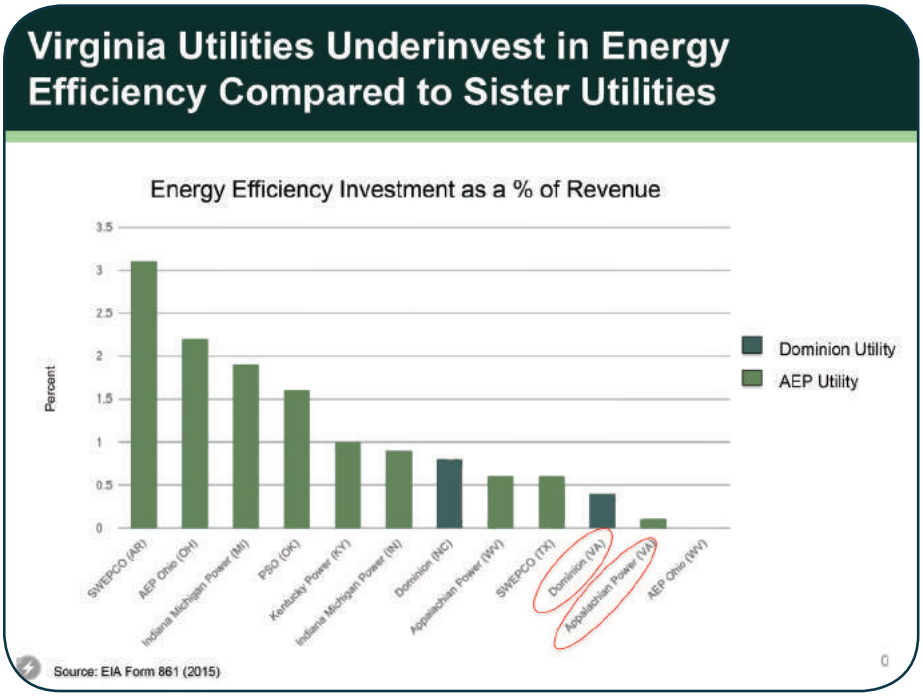
# III. Virginia's Role to Date in Addressing Multifamily Housing

Residential efficiency has seen recent advances in Virginia in response to greater consumer demand, proactive federal and state policies, the availability of new technologies, and newly developed financing solutions. According to Virginia Energy Efficiency Council's 2017 Industry Census Report, energy efficiency is now a $1.5 billion industry in Virginia that supports more than 75,000 sustainable jobs.[48] Even with these advances however, Virginia currently ranks 29th in energy efficiency when compared to other states according to the ACEEE in their most recent annual scorecard.[49] The scorecard ranks a state's efforts in a number of energy policy categories, but what is particularly striking and primarily responsible for Virginia's overall poor score is the lack of spending and energy savings from utility energy efficiency programs in the state. Existing residential and commercial programs in Virginia report very small budgets in comparison to other states and have some of the lowest energy savings in the country. This lack of investment in well-designed programs serving multifamily housing, as well as other building types, is an unrealized opportunity for Virginia.

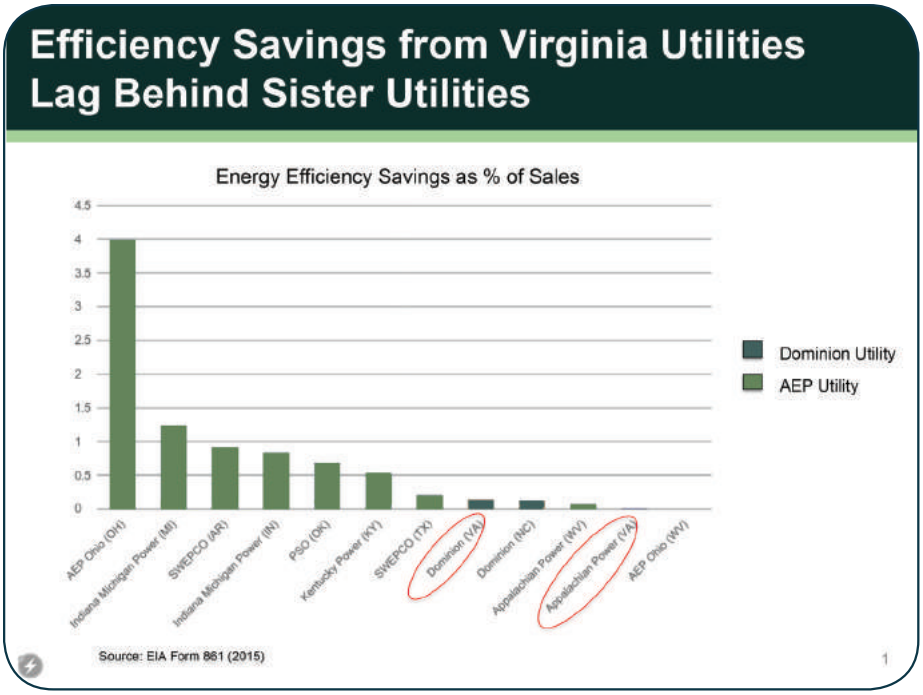
One standout success in multifamily energy efficiency is the Low-Income Housing Tax Credit program, which strongly incentivizes building to the EarthCraft green building standard. In 2015, Housing Virginia and the Center for Housing Research at Virginia Tech released a study showing that the average resident of an energy-efficient tax credit apartment in Virginia will save an average of $54 a month on their electricity bill, which amounts to $648 annually. The study examined and certified savings in 13,500 units, amounting to an aggregate savings of $9 million in 2015 alone.[50] Phase II of this study, released in 2017, has found sustained and slightly increased energy savings with three years of tenant usage data now analyzed.[51]

Copeland Manor, Washington D.C
Rudy Matthews Photography

The impact of energy cost reduction for low-income tenants is substantial; for extremely low-income Virginians, $54 a month can represent ten percent of total housing costs. If the monthly gross rental costs for all households in Virginia were reduced by $54,[52] the total number of cost-burdened households would drop by more than eight percent from 477,700 to 436,800, making housing affordable for almost 41,000 additional Virginia households.



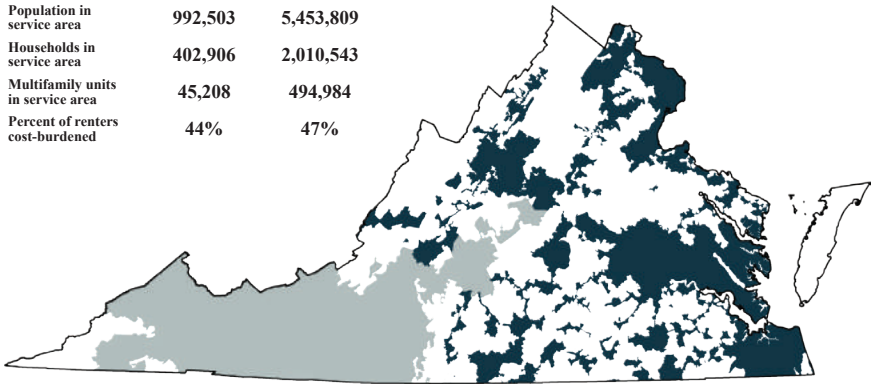

The EarthCraft Virginia standard, a program administered by Viridiant in the state, is a proven example of an effective program for improving the efficiency of the existing multifamily stock in Virginia. However, it is important that Virginia continue to develop a range of programs available for energy improvements to serve this housing stock. Low-Income Housing Tax Credit projects are typically full-scale renovation projects or used for new construction, and the tax credits are highly competitive. Much of the aging and substandard multifamily stock in Virginia could benefit from energy efficiency investment, especially unsubsidized, "naturally occurring" affordable housing. Multifamily housing may be better served by utility efficiency programs, the Weatherization Assistance Program, or PACE financing once it is more established in Virginia.



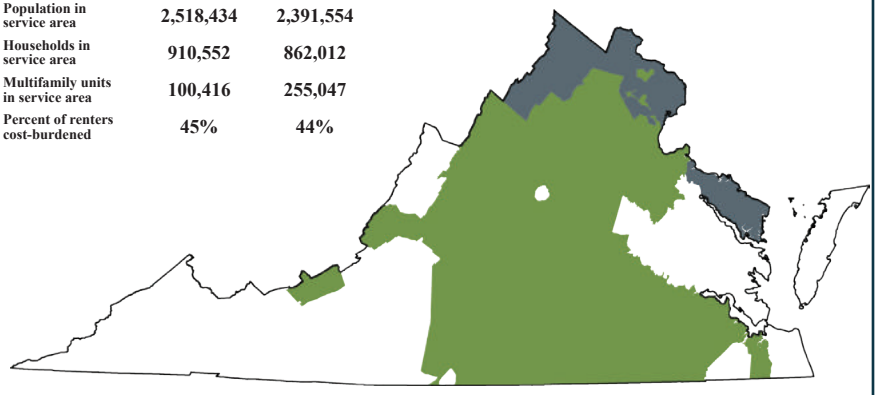

An exception that demonstrates the potential of serving multifamily in Virginia is the Weatherization Assistance Program (WAP) and LIHEAP under the American Recovery and Reinvestment Act (ARRA).[53] Between 2009 and 2013, Virginia received $94 million in ARRA funding and weatherized more than 3,000 multifamily units. Concurrent with ARRA, Sustainable Energy Resources for Consumers (SERC) provided $4.5 million in funding which impacted 557 additional multifamily units. Since ARRA, Virginia's Federal allocations in both WAP and LIHEAP (for weatherization) have fallen to under $10 million annually, and

## Virginia Utility Coverage

| Electricity | Appalachian Power | Dominion Power |
|---|---|---|
| Population in service area | 992,503 | 5,453,809 |
| Households in service area | 402,906 | 2,010,543 |
| Multifamily units in service area | 45,208 | 494,984 |
| Percent of renters cost-burdened | 44% | 47% |



| Natural Gas | Columbia Gas | Washington Gas |
|---|---|---|
| Population in service area | 2,518,434 | 2,391,554 |
| Households in service area | 910,552 | 862,012 |
| Multifamily units in service area | 100,416 | 255,047 |
| Percent of renters cost-burdened | 45% | 44% |



*Sources: 2014 American Community Survey 5-year estimates, Virginia SCC*

service to multifamily housing has almost disappeared completely. Since 2013, fewer than 200 multifamily units have been weatherized with these programs, according to program numbers provided by the Virginia Department of Housing and Community Development.

During its first year, the Virginia Multifamily Energy Efficiency Coalition (MFEEC) worked with Dominion Energy to develop a five-year, $57 million expansion of the "EnergyShare" program, Dominion's flagship consumer efficiency program. The Dominion funding covered two initiatives: expanded bill assistance for low-income families and a new $13 million, utility-funded weatherization pilot program, serving low-income, disabled and senior single-family and multifamily projects.[54] In the implementation of the pilot, Dominion has engaged with housing authorities and non-profit housing organizations to identify and fund multifamily pilot projects. The $13 million pilot offers a constructive, flexible pathway toward addressing the need for multifamily efficiency in Virginia. In its first year, the pilot program served 7,000 households with weatherization services, and 87 percent of households served were multifamily units. MFEEC continues to work with Dominion Energy and other stakeholders in improving program delivery and distilling lessons learned through its Weatherization Advisory Board.

As the examples above demonstrate, Virginia has had some success in bringing greater energy efficiency to multifamily housing in the past that offer promise for the future. While Virginia has made strides in energy efficiency, barriers remain that must be overcome before Virginia can reach its full potential for cost-effective energy savings in this sector.

# IV. Barriers to Multifamily Efficiency

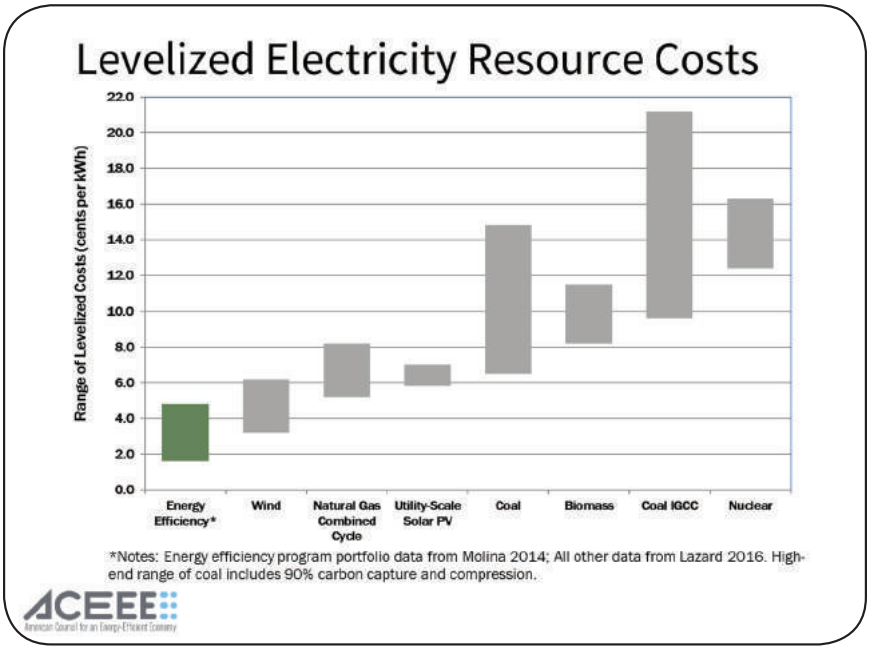
## Cost-effectiveness Tests, EM&V, and Decoupling

As more policymakers, advocates, and consumer groups have come to recognize the value of energy efficiency to both consumers and utilities, it has increasingly been referred to as the "first fuel" for being the cheapest and cleanest choice for meeting growing energy demand while advancing a low-carbon future.[55] This term is based on the premise that meeting energy needs through efficiency saves a utility from making additional investments in grid capacity and infrastructure, thereby keeping rates lower than they would be otherwise. Additionally, investments in efficiency are lower cost per kilowatt hour when compared to creating additional power capacity from common fuel sources, making efficiency the most cost-effective investment as well. Customers cover the costs of a utility's investments on their monthly bills in the form of rate adjustment clauses (RACs), also called bill "riders," and fuel adjustment clauses.

According to the Virginia Poverty Law Center, RACs and fuel adjustment clauses comprise about 40 percent of a Dominion Energy customer's bill and RACs are responsible for 42 percent of Dominion's bill increases between 2007 and 2012. These numbers demonstrate that Dominion Energy's investments in new capacity have significantly and directly impacted the bills of all its Virginia customers in recent years.[56]

Traditionally, regulators in Virginia have viewed residential efficiency programs as a cross-subsidy, where all ratepayers are paying for a program that only benefits those who are directly served by those programs. The State Corporation Commission (SCC) has frequently denied Dominion Energy's Demand Side Management (DSM) efficiency programs or approved only a portion of the requested amount, claiming these programs are not in the public interest.[57]

1. **The Ratepayer Impact Measure Test (RIM Test).** In assessing DSM programs, the SCC uses the four cost-effectiveness tests from the California Standard Practice Manual, which are widely recognized as the classic cost effectiveness tests for utility efficiency programs.[58] The four tests include the Total Resource Cost (TRC), Utility/Programs Administrator Cost (UCT), Participant (PCT), and the Ratepayer Impact Measure (RIM).[59] The key determining factor in SCC rulings is often the Ratepayer Impact Measure (RIM) test, a test which principally measures the program's impact on rates for program non-participants. Some argue the RIM test is the best measure for protecting all utility customers, a primary concern of the SCC. However, many argue that the RIM test is not the most accurate nor comprehensive method to assess the true rate impacts of efficiency programs. Many states no longer rely on the RIM test, or use it only as a secondary measure.[60]



Environmental benefits, deferred capital investments, other resource savings, and various non-energy benefits are not taken into consideration in the RIM test. The test fails to measure the significant, cost-saving benefits for participants in comparison to the cost of the program. In states where the RIM test is still used, many utility efficiency programs do not make it past the application process because the test fails to adequately assess the impact and timing of these programs.[61] In Virginia, recent rulings on DSM programs that cite the low RIM test score when rejecting programs show the extent to which the test is still used by the SCC in its program evaluation.[62]

2. **Evaluation, Measurement, and Verification (EM&V).** An essential tool that is missing in the assessment of efficiency programs in Virginia are standardized EM&V protocols that reliably and accurately capture the benefit of efficiency improvements. EM&V would not only improve the accuracy of the cost effectiveness tests used by the SCC in ruling on new programs, but it would also allow for the comparison of the cost-effectiveness of specific measures as well as identify areas where implementation could be improved by providing a consistent metric upon which all savings can be measured.[63] Recognizing the value of EM&V, the Virginia General Assembly passed legislation in 2016 requiring the state to adopt EM&V protocols for utility efficiency programs, and the SCC is currently in the process of a docketed proceeding to finalize the rules.

3. **Decoupling.** While it is evident that utilities in Virginia face considerable barriers in having their Demand Side Management (DSM) programs approved, the way that a company's revenue is structured in Virginia also plays an important role in how much utilities are willing to invest in efficiency programs for their customers. For electric utilities in Virginia, revenues are tied to the amount of electricity they sell. This means that efficiency programs that cut customer use can also result in lost revenue.

   Additionally, utilities are guaranteed a fixed rate of return on infrastructure investments that are funded by rate adjustment clauses and paid for by customers, so utilities do not have a financial incentive to avoid building additional capacity even if efficiency also helps with managing peak demand.

   Two mechanisms to overcome these disincentives to invest in efficiency are effective lost revenue recovery and decoupling. Right now, utilities are only able to charge customers for the cost of implementing efficiency programs and measure costs, not any of the revenue they would have received had the saved energy been used. Lost revenue recovery would allow utilities to recoup those lost revenues, making efficiency investment as financially attractive as selling more energy.

   Virginia law does currently allow for revenue recovery, but it has never been successfully claimed by a utility. Nationally, 19 states have lost revenue adjustment mechanisms, and 14 states have electric decoupling mechanisms.[64] Here again, EM&V protocols would prove useful in documenting energy saved and therefore revenues lost for utilities making their case to the SCC. Indeed, the 2016 legislation that directs the SCC to adopt EM&V protocols for efficiency programs began as a bill to make changes to the state's existing and ineffective lost revenue recovery mechanism.

   Decoupling can occur in a number of ways, but the main idea is to restructure the rate so that revenues are no longer tied to the amount of energy that is sold, thereby allowing utilities to potentially increase revenue while investing in and increasing customer efficiency. In Virginia, gas utility rates are decoupled, allowing for greater efficiency investment by the gas utilities.

Marcela Gara Photography

ACEEE estimates that more than $7 billion is currently spent nationally on utility ratepayer-funded programs, a number that is expected to increase over the next decade.[65] Yet Virginia's major electric utilities currently lag behind their peer utilities in the Southeast in both efficiency investment and resulting energy savings (see graphs 6 and 7). Though the regulatory regime governing rates and how programs are assessed in Virginia can be complex, it is not difficult to see how many of these factors intersect to limit and discourage greater investment in utility programs even when those programs would ultimately benefit everyone, including both utilities and their customers.

It is also important to note that cross-subsidy cuts both ways when thinking about multifamily housing. While all utility customers pay the cost of energy efficiency programs on their monthly bills and all Virginians save money from reduced statewide energy consumption, utility programs traditionally only reach single-family, owner-occupied homes. As recommended later in this report, policymakers and regulators in the state should take action to overcome these regulatory barriers so that all Virginians have the opportunity to benefit from robust utility efficiency programs.

## Barriers Unique to Multifamily Housing

Energy efficiency in multifamily housing has traditionally been neglected for many reasons, starting with the split incentive problem.[66] In individually metered properties, owners don't benefit from efficiency upgrades because residents pay the energy bills, and residents don't have as much of an incentive to make investments in a property they don't own and may not live in long-term. As a result, rental properties often waste energy and have higher utility costs.[67] Options for overcoming the split incentive problem, such as on-bill financing, where the costs of energy upgrades are paid over time through a tenant's utility bill, or green leasing, where owners and tenants negotiate a cost-sharing arrangement for efficiency upgrades, are just emerging in the marketplace and not yet widely implemented. A survey of developing and existing tools and programs that can potentially overcome these barriers are included in Appendices I and II.

There are many other unique barriers for energy efficiency for multifamily homes that are not encountered in single-family homes, including the following:

1. **Dispersed and complex ownership of multifamily buildings complicates decision-making.** Individual investors own almost 70 percent of multifamily buildings, with real estate investment groups, partnerships, and joint ventures owning the rest.[68] The need to obtain permission from the building owner (or unit owner) before upgrades can begin is a barrier in many programs that could otherwise serve multifamily properties. Despite the benefits for tenants and building owners, most utility efficiency programs in Virginia are not made available to renters due to the complicated ownership and because they view the building owner as ultimately responsible for how efficiently the building operates.

2. **Multiple sources of subsidy for affordable housing create complex legal and regulatory barriers.** Much of the affordable housing in Virginia, especially projects targeted at the lowest income renters, use multiple sources of subsidy in their capital stack that increases the number of program requirements and regulations that must be met.

3. **Building owners with individually metered units cannot access usage data.** Access to usage data for buildings with submetered utilities is out of reach for most owners who do not have the resources to collect releases from all their tenants. This gap in data carries disadvantages that are twofold. Without the usage data, owners have trouble assessing and deciding where to make energy improvements in their portfolio. This lack of data about energy usage is also a barrier for owners to access the full range of financing available; notably, the Fannie Mae Green Rewards and Freddie Mac Green Up programs along with the "green" lowered mortgage insurance premium.

4. **Multifamily buildings face funding constraints in existing utility and federal programs.** The small pool of resources for efficiency favors single family housing, a sector that is simpler to serve. Additionally, larger multifamily buildings require an economy of scale to be feasible, which generally requires more robust funding than current levels in many programs, such as the Weatherization Assistance Program (WAP). This assertion is borne out in the comparison of multifamily units served by WAP in years of higher funding vs. lower funding discussed in section III.

5. **Addressing common areas.** "Common areas" present challenges by adding a layer of complexity in how to address areas you do not find in single-family housing like elevator shafts or inefficient central heating and cooling systems. The results of a multifamily building intervention depend on whether common areas are upgraded. If common areas and units aren't both upgraded, the effectiveness and savings to a resident will be diminished.

6. **Upfront costs for improvements.** Owners of affordable housing often lack the capital or sufficient incentive to make upfront investments in energy efficiency. Financing mechanisms that overcome the need for a large, direct, upfront investment are needed for both single and multifamily housing; however, the need is greatest in multifamily due to the larger scale of investments as well as the split incentive the owners will always face on some level.

By addressing and solving these barriers, Virginia can increase its competitiveness in energy efficiency development, while residents in multifamily units benefit from healthier, more affordable homes and reduced energy costs.

## Why Utility Data is So Important

Access to energy usage data carries benefits for owners, renters, program implementers, and regulators.

**Owners:** Access to building energy usage data and energy benchmarking provide essential energy usage information to help owners evaluate the performance of their properties and make targeted, data-driven energy efficiency upgrades.

**Residents:** Monthly utility costs are a significant determinant of housing affordability for low-income renters. The introduction of energy and performance measures into the rental market enables renters to improve their own energy consumption habits in their apartments.

**Implementers and Regulators:** Data access can be useful for program implementers to improve efficiency programs, and when combined with proper EM&V protocols can provide regulators at the State Corporation Commission the information they need to make informed decisions on whether to approve or renew existing ratepayer funder efficiency programs.

**Benchmarking data** provides performance history for a building and can be used to document the energy savings from energy efficiency programs that have already been implemented. The statewide implementation of benchmarking will bring demand and competition around energy efficiency into the real estate market.


Hazel Hill Apartments in Fredricksburg, VA
Rudy Matthews Photography

Many states have provisions for allowing utility companies to provide anonymized whole-building aggregated energy usage data to building owners or other third parties to ease burdens of implementing benchmarking and other energy savings evaluations and alleviate privacy concerns. Currently, due to lack of guidance in Virginia's code, utilities in Virginia require individually signed releases from tenants in sub-metered buildings ostensibly to protect customers privacy. These requirements constitute a significant administrative and logistical burden for owners wishing to benchmark their buildings.

In 2014, EPA's ENERGY STAR Portfolio Manager started providing benchmark scores for multifamily properties. Benchmarking demonstrates the power that good data alone can have on an owner's decisions.[69] A 2012 EPA analysis of 35,000 benchmarked buildings using Portfolio Manager found average energy savings of 2.4 percent per year.[70]

In addition, access to energy usage data can help owners meet HUD benchmarking requirements[71] and provides owners with opportunities to take advantage of a suite of financing programs for building energy upgrades that are available only to building owners who benchmark their buildings.

**Fannie Mae Green Rewards:** A financing program with a required commitment to install capital investments targeted to reduce 20 percent of annual energy and water use. The borrower must report the property's annual energy performance metrics in addition to the ENERGY STAR score.

**Freddie Mac Multifamily Green Advantage:** Financing that requires a reduction in energy and water use by 15 percent based off of their Freddie Mac Green Assessment. All participating properties are required to benchmark their annual energy usage information in the EPA's Portfolio Manager until two years after the project's completion.

**Green Lowered Mortgage Insurance Premium:** The Federal Housing Administration issues mortgage premiums with rates that are reduced by up to 35 basis points for affordable, mixed-income multifamily housing. The property must achieve an ENERGY STAR score of 75 or better, with documentation provided by Portfolio Manager.

**Low-Income Housing Tax Credit:** The Virginia Housing and Development Authority offers incentives for utility benchmarking in the Qualified Allocation Plan (QAP), the scoring system for allocating credits to developers.

These tools are explained in greater detail in Appendices I and II.

Several localities in Virginia have begun benchmarking energy usage in public buildings. For example, Virginia Beach benchmarks local government buildings and reviews energy usage to identify high energy users and make targeted investments; Arlington County benchmarks local government buildings; and the City of Richmond benchmarks 80 percent of municipal facilities, enabling the City to target worst-performing buildings in its portfolio for full energy audits.[72] Even though some localities in Virginia have begun to see the benefits of benchmarking in their buildings, municipalities do not have the power to require private owners to benchmark their buildings. The General Assembly would need to grant localities this power by passing enabling legislation to allow them to implement mandatory benchmarking. A stakeholder retreat hosted by the National Governor's Association (NGA) was held in September 2016 in Richmond to explore making a recommendation to the McAuliffe administration on benchmarking legislation. In 2017, the Department of Mines, Minerals and Energy (DMME) has continued the process initiated at the NGA retreat by convening an ongoing stakeholder group to explore the issue of utility data access and consider actions that could be taken to address these issues.

## Energy Efficiency Benefits Utilities

Multifamily housing is a growing source of sales, customer counts, and peak load demand for most utilities[73], providing the business case for utilities to invest more heavily in multifamily energy efficiency. In fact, there are many reasons why multifamily energy efficiency can be an important asset for Virginia utilities:

1. Energy efficiency is less costly for utilities than new generation facilities.[74]
2. Investment in energy efficiency increases the reliability of the grid and reduces peak load demand.
3. Efficiency promotes increased health and safety of utility customers and promotes customer satisfaction.
4. By reducing customer energy costs, efficiency helps customers to meet monthly obligations and reduces arrearages and the frequency of bad debts.
5. Multifamily energy efficiency better enables utilities to meet their statewide efficiency goals, such as Virginia's 10 percent reduction in electricity usage by 2020 relative to base sales.
6. Efficiency allows for improved long-term planning for demand on transmission lines and peak load management (load shedding programs) in energy-inefficient multifamily buildings.

These business-oriented reasons for utilities to invest ratepayer funds in multifamily energy efficiency and the related non-energy benefits are only the beginning of the story. Deployment of efficiency in affordable housing yields numerous energy and non-energy benefits that indirectly help utilities, and ultimately, all Virginians.

## Energy Efficiency Benefits Tenants

1. Lower expenses on monthly energy bills for affordable housing
2. This enables tenants to redirect spending to non-energy needs such as education and health care.
3. Better health and safety in their residence and greater comfort and satisfaction.
4. Reduction in nonpayment and collection problems.

## Energy Efficiency Benefits Building Owners

1. Lower energy costs lead to increased net operating income. Savings from energy upgrades free up capital for deferred maintenance and other building improvement projects.
2. Energy efficiency saves money for owners. Multifamily property owners spend an average of nine percent of rent receipts on energy; multifamily owners spent $22 billion on energy bills in 2009, according to Fannie Mae.[75]
3. With access to whole-building energy usage data, building owners can improve operations and maintenance and identify opportunities to invest in energy upgrades.
4. Reduced tenant turnover: turnover in affordable properties can be significantly higher in comparison to market-rate housing, and lost rent and screening of new tenants are a significant cost to owners.
5. A reduction in the number safety-related emergency calls.
6. Improved multifamily property values, leading to community revitalization.

# V. Next Steps for Virginia: A Call to Action

In this report, we looked back on the progress Virginia has made to date and identified barriers that still need to be overcome for multifamily energy efficiency. In this concluding section of the report, we will present a series of recommendations and strategies for overcoming those obstacles. These recommendations encompass regulatory, legislative, and executive or administrative policies that will help spur greater efficiency in multifamily housing.

It is important to note that public opinion strongly favors greater action by the state and utilities towards greater residential energy efficiency in Virginia. A 2017 statewide poll of registered voters in Virginia conducted by the Wason Center at Christopher Newport University found that 84 percent of respondents support the Commonwealth using incentives and financial support to encourage Virginia utilities to increase their support and offerings for energy efficiency programs to their customers. Almost 90 percent of those polled support requiring Virginia utility companies to achieve greater energy savings for their customers. Regarding the legislative recommendation found below to establish a ratepayer-funded public benefit fund, 61 percent of voters said they would be willing to pay a 50-cent surcharge on their monthly utility bill to support energy efficiency upgrades for low-income Virginians.[76]

If adopted, these policies will enable the Commonwealth to maintain safe and healthy affordable housing for low-income families while simultaneously providing lower turnover and higher property values for property owners, promoting local job growth, and building a stronger economy for the benefit of all Virginians. Multifamily housing in Virginia is an untapped area of energy savings, and the opportunity to make a difference awaits the Commonwealth's regulators, state officials, utilities, stakeholder organizations, and service providers.

## Executive/Administrative Recommendations

As a state with the 11th largest multifamily rental housing stock in the country,[77] Virginia should be on the vanguard of states when it comes to increasing utility investments of ratepayer funds in multifamily housing. The Commonwealth has established a goal of 10 percent electricity savings by 2020 relative to 2006 base sales;[78] utility investments in multifamily energy efficiency can help achieve the electricity savings in the statewide goal.

1. Governor Ralph Northam should establish a statewide goal of 25 percent market penetration for efficiency upgrades in affordable multifamily properties by 2025. Northam's Executive Committee on Energy Efficiency, if continued into the next administration, should work through Northam's term and should convene a stakeholder engagement process and recommend policy strategies and innovative solutions specifically for multifamily energy efficiency.
2. On May 16, 2017, Governor McAuliffe issued Executive Directive 11 to reduce carbon emissions from power plants and grow Virginia's clean energy economy.[79] Governor Ralph Northam should issue an executive order amending current policy to include multifamily energy efficiency as an element of the Commonwealth's current and future energy policy, or take some alternate action to meet this goal.
3. The Virginia State Division of Energy (within the Department of Mines, Minerals, and Energy) should establish a "one-stop shop" program within the Energy Office for multifamily building owners so owners can go to a single source of information and resources in choosing which building upgrades to implement instead of dealing with multiple programs and agencies; the program can "piggy-back" nicely on the existing Virginia Energy Sense program to educate Virginia energy consumers under the direction of the State Corporation Commission.
4. The Department of Mines, Minerals, and Energy should establish a database for tracking information on innovation and building technology in Virginia. The compilation of this data will provide developers with information about multifamily properties in the Commonwealth as well as best practices for achieving energy efficiency objectives, and will facilitate the development of annual goals.
5. The Department of Mines, Minerals, and Energy should expand programs that educate and create awareness among building owners and management companies about the importance of energy efficiency in multifamily housing in the Commonwealth and the resources available to make building upgrades as well as best practices in tenant education around energy usage. The Commonwealth should work in collaboration with the members of the Virginia Multifamily Energy Efficiency Coalition, the Virginia Energy Efficiency Council, Housing Virginia, and other relevant stakeholders to expand education and awareness.
6. Governor Ralph Northam should include considerations of environmental justice in all executive orders and energy policies, as was done in the scope of Executive Order 57 issued in June 2016 by Gov. McAuliffe, which directed consideration of "the impact of reducing carbon pollution on low-income and vulnerable communities"[80] as part of carbon reduction strategies for electric power generation facilities.
7. The Virginia Department of Housing and Community Development should prioritize efforts to devote more resources towards multifamily efficiency across the range of housing and community development programs it administers. Multifamily housing should become a much larger segment of the WAP program, and – if sufficient federal funding is available – a "carve-out" for multifamily WAP should be established for Virginia LIHEAP funds that are redirected to the WAP program.

## Regulatory Recommendations

The State Corporation Commission is responsible for oversight of Virginia's investor-owned utilities. In addition to protecting ratepayers from being overcharged and approving any new generating capacity, the SCC passes rulings on whether efficiency programs are in the public interest and may therefore be supported by all ratepayers. We recommend the following regulatory strategies be adopted in addition to increasing the current allocation of ratepayer funds for multifamily housing:

1. In evaluating whether new utility demand-side management programs are in the public interest, the SCC should take into account "non-energy benefits" (NEBs) such as public health benefits, participant health and comfort, direct economic impacts to communities, and environmental benefits. The General Assembly could provide further guidance around how to account for NEBs, but the SCC currently has the discretion to consider "other factors" in addition to the four traditional cost-effectiveness tests.[81]
2. If a DSM program is found to be in the public interest, it should be approved at the requested funding amount unless there is a specific, justifiable reason to approve a program at a lower amount (as frequently happens with DSM program rulings currently). There is great need for additional efficiency programs across the Commonwealth as demonstrated by the long pipeline of projects providers in the multifamily sector have in need of energy improvements. If a program passes muster under the cost-effectiveness regime and other factors, it should be scaled up to the greatest extent possible.
3. The SCC should ensure that improved EM&V measures are included in all Virginia multifamily energy programs to improve accountability and facilitate data collection on verified energy savings. The Commission should improve information collection on energy usage pre-and post-efficiency interventions, building on process that began when the DMME held a stakeholder retreat related to EM&V in fall 2016, a process being continued through the data access stakeholder group that will be meeting through 2017. EM&V will also assist with meeting the criteria that a program serving low-income and elderly customers have measurable and verifiable energy savings.[82]

## Legislative Recommendations

In Virginia, the General Assembly has oversight powers for the State Corporation Commission and can take a number of measures to change the way utility programs are evaluated as well as change the rate structure that currently disincentivizes utilities from making major investments in energy efficiency. With their broad power in the state, there are many measures the General Assembly could take to move Virginia towards having a more efficient multifamily housing stock.

1. Seek support in the General Assembly to establish a ratepayer funded public benefit fund (i.e. system benefits charge) through a small charge on all electricity customers, or by specified contributions from utilities, as presently exists in a total of 24 states plus Washington, DC.[83] This step will make a significant and positive impact on vulnerable, low-income customers and has been critical to other leading states scaling up their programs.
2. Pass enabling legislation that will allow localities to establish commercial benchmarking ordinances (to include multifamily buildings). Experience from citywide programs in Washington, DC and Atlanta shows building owners are more likely to make improvements when they have better access to information on their building's energy performance compared with similar buildings or other buildings in a portfolio.[84]

3. Pass legislation that allows the profits of electric utilities to be decoupled from electric sales in order to remove the disincentive for utilities to significantly invest in energy efficiency programs. If they are successful, energy efficiency programs result in less electricity sold which discourages utilities from applying for additional programs of scale because they would ultimately cut into company revenue even as they provided other benefits to the grid such as lower peak loads. The lost revenue recovery mechanism for electric utilities can be redesigned to more effectively enable a utility to continue to receive a fair rate of return and enough to recoup costs as it increases investments in energy efficiency as was attempted in the 2015 General Assembly session. In Virginia, natural gas sales have been decoupled from revenue since 2008.
4. The General Assembly should issue further guidance to the SCC on what is in the public interest in its evaluation of demand-side management programs to include not only the four cost effectiveness tests currently used (along with the low-income and elderly provision) but also include direct economic impacts to communities served by the programs and the host of other "non-energy benefits" (NEBs) discussed in this report. Many states currently consider these NEBs in the evaluation of their programs.[85]
5. The General Assembly should hold a more robust process around appointment or reappointment of commissioners to the SCC. This process should include ample opportunity for public input and discussion of each Commissioner's position on the value of energy efficiency.

## Utility Recommendations

Utilities have a lot to gain by investing in improved energy efficiency and better delivery systems in multifamily housing. They should leverage this opportunity to expand opportunities for multifamily to help their customers save money and be more energy efficient.

1. Dominion Energy should build on the success of its expanded EnergyShare program and make a permanent commitment to utility-funded residential efficiency programs serving low-income customers. The Commonwealth's other electric and gas utilities should consider making or expanding their commitments to energy efficiency for their most in-need customers.
2. Utilities should continue to apply for new ratepayer-funded demand-side management programs available to multifamily housing and apply for extensions on existing programs that have proven successful.
3. Utilities should actively support and engage with the SCC on the development, use, and regular updates of EM&V protocols to continually improve upon demand-side management program design and effectiveness. Measured and verified program results will also help utilities make the case to the SCC for additional efficiency programs.
4. Utilities should begin to take steps in changing their data systems in a way that will eventually allow for them to provide owners and program implementers access to whole-building aggregated usage data. Even though the General Assembly and SCC must provide permission and additional guidance to utilities on the release of this information, major utilities in the state have made clear that their systems as currently structured are not readily able to produce this information.
5. Utilities should create advisory groups or provide other opportunities for program implementers and industry professionals to provide input and feedback on their energy efficiency programs. Dominion Energy currently has both a Weatherization Advisory Board and a provider roundtable for this purpose.

## Building Owner Recommendations

Building owners can improve the health and wellbeing of their tenants, while saving them money, lowering operating costs, improving building durability, and reducing tenant turnover through efficiency improvements. There are a number of steps owners in Virginia can take right now along with many developing opportunities.

1. Owners should benchmark their building's energy data using EPA's Portfolio Manager, or other similar services like WegoWise. Better data will help guide owners on where to make investments in their portfolios.
2. In addition to benchmarking their buildings, owners should also consider having energy audits performed on buildings where they are considering improvements to identify cost-effective areas of work. Owners can also take advantage of Stewards of Affordable Housing for the Future (SAHF) free "EZ Retrofit" self-audit tool.[86]
3. Owners should do their best to stay current on policies, programs, and financing mechanisms that could be used to improve their buildings and their operating expenses. Appendices I and II contain a number of tools and programs that owners should consider. There are many consulting and energy services firms that can help owners navigate the suite of options available to them. Similarly, owners should contact their local utilities to see what types of programs are available to them.
4. For programs that are still developing in Virginia like PACE financing, owners who are interested in utilizing these programs can take an active role act as catalysts in their communities to get localities to adopt the necessary ordinances and set up programs as allowed by the General Assembly.

Policymakers should focus on policies with proven track records in other states, such as utility "on-bill repayment" programs, green leases, PACE, and "pay for performance" programs. A list of successful policies and programs implemented in other states are summarized in Appendix III. Coordination is critical to effectively delivering energy efficiency to the multifamily affordable housing sector. To achieve these goals in Virginia, housing and energy efficiency stakeholders should come together to develop a blueprint for implementing cost-effective energy efficiency in the Commonwealth's multifamily housing, using many of the ideas laid out in this report. The Virginia Multifamily Energy Efficiency Coalition stands ready to work with Virginia policymakers to convene relevant stakeholders and jointly develop a blueprint.

**"I appreciate the work your agency did and the workmen. Everyone was so polite and professional. My electric bill is already lower. I am thankful for the savings because it helps to offset the increasing cost of food, gasoline, and other necessary expenses."**

Margaret Wood
Resident in Hanover County senior apartment complex

# Conclusion

Energy efficiency upgrades in multifamily housing are a cost-effective means of lowering operating expenses, maintaining affordable housing for low-income tenants, and creating healthy and comfortable living environments for tenants while creating quality jobs and boosting Virginia's economy. Overcoming the barriers identified in this report will produce a positive impact for all Virginians, especially vulnerable populations for whom energy costs have a disproportionate effect.

If decision-makers adopt the recommendations in this report, Virginia's leadership in implementing energy efficiency in multifamily buildings will help to preserve affordable housing for the Commonwealth's most vulnerable families. The Commonwealth should commit to strategies that will enable the goal of achieving cost-effective energy efficiency in our multifamily housing stock. Investments in multifamily efficiency will strongly benefit Virginia's low-income families and building owners as well as utilities and ultimately, all Virginia energy consumers. The Commonwealth should include multifamily energy efficiency in all statewide energy strategies and executive orders.

Energy upgrades in multifamily housing foster healthy communities and benefit all Virginians. The Commonwealth should seize the opportunity to take a leadership role on multifamily energy efficiency in the Southeast and in the nation.

Vintage Gardens, Baltimore, MD
Rudy Matthews Photography

# APPENDIX I: Existing Programs to Leverage for Additional Funding

Many existing programs can be leveraged to support investment in multifamily efficiency programs. Among these programs are the following:

1. Based on figures supplied by the Virginia Department of Housing and Community Development (DHCD), during the Low-Income **Weatherization Assistance Program (WAP)** Program Year for 2016, Virginia received a total of $3,761,099 in WAP funds from the Department of Energy, enabling completion of a total of 686 weatherization jobs in Virginia, but none were completed in multifamily housing. Since 2013, fewer than 200 multifamily units have been weatherized through WAP. Subject to the availability of federal funding, we recommend the Northam Administration work with DHCD to increase significantly the number of units weatherized in multifamily housing.

2. The **Virginia Low-Income Heating and Energy Assistance Program (LIHEAP)**, administered at the federal level by the Department of Health and Human Services, has four components: fuel assistance, crisis assistance, cooling assistance and weatherization. According to the Department of Housing and Community Development, the Virginia weatherization program received $12,541,134 from Program Year 2015 LIHEAP funds. The program assists low-income households, particularly those with the lowest incomes that pay a high proportion of household income for home energy. For a family of four, the income limit for eligibility is $31,590. Unlike the WAP program, LIHEAP is entirely an energy assistance program that allocates substantial funding to WAP. One of the recommendations of this report is for the allocation of additional LIHEAP funds to the WAP program in Virginia, subject to the availability of adequate appropriations to meet the needs of the heating assistance program in Virginia.

3. **Community Development Financial Institutions (CDFIs)** are institutions that combine private and public funding to enable economic revitalization and community development in low-income communities where access to financing is less prevalent.[87] CDFIs can be a significant source of funding for both new multifamily buildings and upgrades of existing buildings, and they have been used by Bank of America in recent ventures to fund multifamily buildings. Virginia Community Capital, a CDFI in Virginia, has made loans with the use of Qualified Energy Conservation Bonds (see item 7).

4. As mentioned earlier in the report, the Virginia Housing Development Authority administers the **Low-Income Housing Tax Credit (LIHTC)**, which is the largest source of capital promoting low-income affordable rental housing and has made adherence to the EarthCraft Virginia green building standard a central determinant in choosing which projects receive the highly competitive credits. Other state and federal housing resources such as the Virginia Housing Trust Fund, HOME investment partnerships and the Community Development Block Grant should take energy efficiency into account in its scoring and evaluation process to further incentivize investment in efficiency.

5. Collaborations between Virginia's utilities and stakeholder organizations can be a major source of increasing investment in multifamily energy efficiency. During its first year, the Virginia Multifamily Energy Efficiency Coalition worked as a stakeholder with Dominion Energy in the development of a five-year, $57 million investment in "**EnergyShare**," Dominion Energy's flagship consumer efficiency program.

6. In 2013, the Department of Energy (DOE) partnered with Housing and Urban Development (HUD) to expand the **DOE Better Buildings Challenge** to the multifamily housing sector. The Better Buildings Challenge asks multifamily building owners and managers to make a public commitment to energy efficiency, committing to reduce energy consumption by at least 20 percent over ten years. Multifamily property owners are eligible for accelerated financing and lower interest rates. DOE provides building owners support for energy data collection and improved management tools, and HUD trains owners in energy management technologies. To date, 55 developers and multifamily owners have become partners in the Better Buildings Challenge.[88]

7. The **HUD Community Development Loan Guarantee Program** (Section 108) provides communities with a source of financing for economic development and housing rehabilitation, including energy efficiency improvement. As a public investment tool, this program enables state and local governments to convert a portion of their Community Development Block Grant (CDBG) funds into federally guaranteed loans starting at $500,000 to economic revitalization projects, which include commitments by multifamily housing providers to increase the efficiency of their buildings. For-profit developers and building owners are eligible. Project costs can be spread over time with flexible repayment terms at lower interest rates than private sources would require. HUD's Section 241(a) program provides mortgage insurance for the purchase or refinancing of existing multifamily buildings.[89]

8. Virginia's authority to issue **Qualified Energy Conservation Bonds (QECBs)** – credit bonds bearing a federal interest subsidy – can be used to provide loans to multifamily building owners to make energy improvements. QECBs are one of the cheapest financing tools and are made available to tribal, state, and local government issuers and can be used for reducing energy consumption in public buildings, implementing green community programs, and supporting energy related research facilities.

Marcela Gara Photography

# APPENDIX II. Developing and Underutilized Programs to Increase Access to Capital

Historically, the lack of upfront capital to fund energy upgrades has been the cardinal barrier to multifamily efficiency, assuming the split incentive problem can be overcome. In the last few years, several new programs have emerged that make the upfront funding problem more manageable. These emerging programs make multifamily energy efficiency a more attractive proposition for utilities.

1. The first of these programs is "**On-Bill Financing" (OBF)**, which can be implemented through utilities or "on-bill payment," with payments handled by third-party entities such as banks. This is an attractive option because it provides a source of financing for energy upgrades, with repayment built into the utility customer's bill. Because many utilities may be reluctant to assume a creditor position in relation to customers, the second of these options – "on-bill payment" – may be more feasible. Both options require a great deal of customer education and, in the case of on-bill payment, local banks willing to assume the creditor role for repayment of the cost of the upgrades. This option also requires a source for the initial capital, which can be a utility, lending institution, a grant-making organization, or a state revolving fund for energy efficiency. In some cases, federal grants have provided the initial financing. On-bill financing is happening in at least 20 states and can supplement the investment of ratepayer efficiency funds by utilities.[90]

2. Innovative practices such as "**Green Leases**," in which multifamily owners and tenants agree on cost-sharing of energy upgrades, are emerging in the marketplace and should be encouraged by utilities as another means of supplementing ratepayer funds. Green Leases enable building owners and tenants to share the costs of energy upgrades thereby addressing the split incentive issue. Tenants contribute to the cost of the energy upgrades over the useful life of the upgrade.

3. HUD has developed a model pilot "**Pay for Success**" based on successful "pay for performance" models that have been implemented in other states, and this model is particularly successful for performance contracting/ESCO energy retrofits of multifamily public housing. Pay for Success utilizes public and private funds and repayment is based off the savings that come from energy retrofits. This program encourages innovation because the highest rate of return is achieved through retrofits that provide the most savings. States where the model has been successfully deployed include New York, California, New Jersey, Colorado, and New Hampshire. An experimental program in low-income housing and performance contractors originated with Pacific Gas & Electric in the 1990s.[91]

4. HUD and the Federal Housing Administration will underwrite utility cost savings anticipated for existing properties where energy conservation measures are proposed, even if no "green" certification from EPA is obtained. In this program, **HUD-FHA's Office of Multifamily Housing** requires benchmarking of utility consumption by use of EPA's Portfolio Manager to produce a report in a form specified by HUD.[92] Certain ENERGY STAR scores are minimum thresholds, and for existing properties, projected utility consumption savings must be documented by an American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) approved energy audit.

5. Another emerging tool is the 2015 **Virginia Property-Assessed Clean Energy (PACE)** bonds law. PACE is a voluntary financing program for energy efficiency upgrades or renewable energy installations

that is paid back through the property tax bill. Rather than the repayment obligation being attached to an individual, PACE loans are attached to a property and are transferrable upon the property's sale. The statute is limited to commercial properties, which are defined in the law as including multifamily properties. PACE can be an effective tool for multifamily building owners and public housing authorities to leverage the upfront costs of energy upgrades. Arlington County has been the first municipality to move toward implementing a commercial PACE program, and its program should be active by the end of 2017.

6. As recommended in the concluding section of this report, the Virginia General Assembly should consider authorizing the establishment of a **Public Benefit Fund** through a small charge on the bills of all electric customers or by a specified contribution from utilities. Presently, 24 states and the District of Columbia have public benefit funds, some that support both renewable energy and energy efficiency.[93]

7. **EPA ENERGY STAR Score** is available for multifamily housing (with 20 units or more); this tool can be used to leverage reduced mortgage insurance premiums for "green" multifamily properties through HUD. An industry recognized "green" building certification and an ENERGY STAR score above 75 is necessary to obtain the reduced premiums. This program can be used by property owners for new construction of multifamily properties or energy retrofits in combination with traditional ratepayer efficiency dollars. Owners must maintain energy performance in future years. Attaining ENERGY STAR score certification can be facilitated by the ENERGY STAR Portfolio Manager tool, which is an online, interactive tool to measure and manage the energy usage in any building. This leading benchmarking tool can be used to manage energy usage across an entire portfolio of buildings.[94]

8. By generating both heat and electricity from a single fuel source, **Combined Heat and Power (CHP)** dramatically lowers emissions and increases overall fuel efficiency – allowing utilities and companies to effectively "get more with less." CHP can operate using more than 70 percent of fuel inputs, and as a consequence, CHP can produce electricity with roughly one-quarter the emissions of an existing coal power plant. Because CHP projects can operate independently of the grid, they can build resiliency for both critical infrastructure and other property types, including multifamily housing. In residential properties, the heat can be used for domestic hot water, space heating, absorption cooling, or dehumidifying, at the building where it is produced.[95] For example, the 75kW CHP system installed at the Boa Vista Apartments, a multifamily building in New Bedford, Massachusetts, provides electricity, hot water, and space heating and has reduced the building's annual energy costs by 43 percent.[96] The simple payback for the system was less than four years, which exceeded initial project estimates.

   There are several programs that assist multifamily building owners assess whether their property is a good fit for CHP and/or access funds to help with installation of a CHP system. The EPA-DOE CHP Partnership offers advice on project development, determines favorable policies and incentives available, and assists property owners in choosing CHP technologies.[97] DOE's CHP Technical Assistance Partnerships (TAPs) provide information on CHP market opportunities, education and outreach, and technical assistance for property owners considering CHP.[98] In Virginia, the Renewable Energy Machinery and Tools Property Tax Exemption provides options for local governing body of any county, city, or town to impose a different property tax on renewable energy generating machinery and tools, including CHP.[99]

# THE WARWICK

The Warwick is a historic, four-story brick facade structure originally constructed in 1883. Fire destroyed most of the original structure in 1960. The Warwick has been continuously occupied by 88 formerly homeless individuals since 1995 and was sorely in need of renovation and energy efficiency upgrades. High utility bills were problematic for the owner due to the rental subsidy restrictions, which limited operating funds.

The renovation of the Warwick included measures required to obtain EarthCraft multifamily certification of the building. Not only did Community Housing Partners (CHP) prioritize measures that reduce energy consumption, indoor air quality was also given significant attention to improve the health and safety of residents. The full retrofit took more than a year and included the following upgrades and additions: high efficiency water heaters; new ENERGY STAR windows, ENERGY STAR refrigerators, dishwashers, light fixtures, and Energy Recovery Ventilator and Variable Refrigerant Flow (VRF) heating and cooling systems.
As the Warwick serves formerly homeless individuals, providing a clean, modern, comfortable, and secure space is an extraordinarily meaningful improvement for the residents. Since the property is master-metered, the residents see no direct reduction in living costs from utility savings, but CHP is able to reinvest the money saved on utilities into resident services programs ranging from employment assistance to substance abuse counseling.

# THE WILLIAM BYRD SENIOR APARTMENTS

The William Byrd, which has operated as affordable senior apartments for the past 18 years, underwent a year-long renovation and was completed in March 2017. The building is owned and operated by William Byrd Hotel Associates, which consists of two investors: Project:HOMES, the managing partner, and Virginia Community Development Corporation.[100] Renovations were funded by the Virginia Housing and Development Authority and Virginia Community Capital. The Byrd has 104 units, including units that have been upgraded for accessibility. Additionally, the building is located in a highly convenient area within the City of Richmond. All residents of The Byrd must be at least 55 years old and cannot exceed the yearly income limit of $31,800 dollars.

The 11-story building was built in 1925 and was originally a prominent Richmond hotel; it is also currently listed on the National Register of Historic Places. Improvements to the building included renovated kitchens, air sealing (with a special focus on the top floor), LED lighting (hallway lighting included), low-flow toilets, faucet aerators, ENERGY STAR A/C units, ENERGY STAR refrigerators, new windows, and a new energy efficient boiler system. The project total investment was $5 million, and the building is certified EarthCraft.

# APPENDIX III

## Best Practices from Other States: Model Programs for Virginia

### ARKANSAS

Arkansas has been a leader in the Southeast for developing EM&V protocols and decoupling utility revenues from power sales. Arkansas utility customers are saving money through energy efficiency, and utilities are able to recoup revenues lost from selling less electricity.

A key feature of Arkansas' success is the Parties Working Collaborative (PWC) established by the Arkansas Public Service Commission in 2006. The PWC includes a wide range of stakeholders including technical and non-technical stakeholders. The PWC is responsible for a range of tasks including program design, policy issues, and updating the Technical Reference Manual. The Technical Reference Manual is updated and approved annually to incorporate new technologies, savings estimates and data gathered during the EM&V process.[101] Arkansas' TRM describes EM&V protocols and includes four separate cost effectiveness tests.[102] Arkansas uses the same four cost effectiveness tests as Virginia; however, the Total Resource Cost (TRC) test is used as the primary cost effectiveness test in Arkansas.

A separate "formula rate plan" is used to determine lost revenues that the utility provider would have otherwise received without energy efficiency. Arkansas has had an energy efficiency resource standard for a decade, which requires utilities to have a certain level of energy savings over a specified period of time. To date, all customer classes have benefited from the efficiency savings.

### MISSOURI

Missouri has made major advances in energy efficiency recently despite not having any energy efficiency programs sponsored by the state government. ACEEE's 2016 Energy Efficiency Scorecard for states concluded that Missouri, along with Maine and Michigan, made the greatest improvements in energy efficiency over the past year.

Missouri offers a personal tax deduction for home energy audits and energy efficiency improvements as well as Property-Assessed Clean Energy (PACE) financing. The State has led by example by establishing energy requirements for state buildings and fleets as well as encouraging the use of energy service performance contractors. Missouri utilities have led the way. Kansas City Power and Light offers an Income-Eligible Multifamily program, which offers free energy efficiency products, like LED light bulbs, installed at no-cost. In addition, KCP&L can perform a free energy assessment to identify opportunities for additional savings and incentives.[103]

## NORTH CAROLINA

In North Carolina, the Weatherization Assistance Program (WAP), housed in the North Carolina Energy Office, conducted a Multifamily Pilot Program from 2011 to 2012, targeting residents with an annual income at or below 200 percent of the federal poverty level. In conjunction with weatherization service providers in the Eastern, Central, and Western regions of the state, the Energy Office weatherized an estimated 4,500 multifamily units with approximately $9 million in federal funds. Meanwhile, Duke Energy, which estimates that 20 percent of its customers are multifamily residents, initiated a multifamily program for landlords that provides free equipment like LED lighting and low-flow shower heads.

## MARYLAND

Maryland stands as a leader in multifamily energy efficiency. The Maryland Department of Housing and Community Development (DHCD) administers the Multifamily Energy Efficiency and Housing Affordability-EmPOWER program (MEEHA-EmPOWER) funded by the state's investor-owned utilities and regulated by the Maryland Public Service Commission. DHCD and housing finance agencies generally are uniquely positioned to deliver utility-funded programs targeted to the affordable housing sector because of their ability to streamline project execution.

Through the MEEHA-EmPOWER program, DHCD provides grants or low-cost loans with flexible terms for conservation measures, with an emphasis on properties eligible for rehabilitation or measures that result in electric consumption savings of 15 percent or more. Funds are made available based on identification by a Building Performance Institute (BPI) qualified energy audit providing an estimate of utility use reductions for both the tenant and the multifamily building owner. Funds are available to two types of projects. "Pipeline Projects," those seeking DHCD rental housing financing and MEEHA-EmPOWER funding, can submit one application to DHCD for all of their financing requests. "Non-Pipeline" projects seeking funding only for energy efficiency improvements are also eligible to participate.[104]

In an assessment of the first phase of the program, ACEEE found that through these investments, Maryland's utilities were able to meet the statewide goal of reducing per-capita electricity consumption by 10 percent below 2007 levels by 2015 (similar to Virginia's voluntary electric consumption goal).

Additionally, in meeting this target, Maryland utilities saved their customers more than 51 million megawatt-hours, which equates to more than $4 billion in energy costs over the lifetime of the measures installed through the program.[105]

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Galen Terrace, Washington, DC
Rudy Matthews Photography

VIRGINIA MFEEC
Multifamily Energy Efficiency Coalition