VAEEC

VIRGINIA ENERGY EFFICIENCY COUNCIL

WHY ENERGY EFFICIENCY IS A SMART INVESTMENT FOR VIRGINIA

MAKING THE BUSINESS CASE FOR ENERGY EFFICIENCY

ABOUT VAEEC

The Virginia Energy Efficiency Council is the voice for the energy efficiency industry in the Commonwealth. Our members include Fortune 500 companies, small businesses, universities, nonprofits, local governments, state agencies, utilities, and individuals. The Council's goal is to ensure energy efficiency is recognized as an integral part of Virginia's economy and clean energy future. As a 501c3 organization based in Richmond, the VAEEC provides a platform for stakeholder engagement while assessing and supporting programs, innovation, best practices, and policies that advance energy efficiency in Virginia. Together we are creating, implementing, and sharing energy efficiency solutions that keep costs down for residents and businesses, while improving the quality of life in our work and home environments.

A NOTE FROM THE EXECUTIVE DIRECTOR

The data, stories, and testimonials in this report bear out what VAEEC members experience every day: Energy efficiency is a powerful job creator, economic driver, and money saver.

Prior to the establishment of the VAEEC in 2011, there was no collective voice for the energy efficiency industry in the Commonwealth -- and certainly no accounting of the industry's breadth and depth. We undertook the 2013 census to obtain the first-ever snapshot of this important industry in Virginia. We now have the opportunity to revisit our original findings and do a pulse-check.

With uncertainty about the future of energy efficiency policies and resources at the federal level, it is more important than ever for states to recognize the enormous potential to advance smart energy solutions.

Since our last census report in 2013, revenue generated from the energy efficiency sector has grown from nearly $300 million to $1.5 billion. This, in spite of the fact that the American Council on an Energy-Efficient Economy (ACEEE) ranks Virginia 33rd nationally for energy efficiency in its 2016 State Energy Efficiency Scorecard.[1]

Clearly, Virginia has made important strides in pursuing energy savings opportunities across many different sectors in the Commonwealth since 2013. However, more can definitely be done, which is why we are including policy recommendations for the next Governor to tackle in order to help our industry continue along our prominent growth trajectory.

The VAEEC is making five policy recommendations that we believe are the smartest, fastest, most effective routes we can take to put Virginia on the path toward a clean energy future and stronger economy. We arrived at these recommendations by taking into consideration the data presented in this report, data from the 2013 census, our ongoing work with our 80+ members and other stakeholders, as well as other relevant research.

Over the years, all of this has given us a much clearer understanding of the vast potential of energy efficiency as well as the necessity of swift, ambitious efforts to tap that potential. Indeed, the data from our 2016 census survey and research from the Department of Energy (DOE) indicate that our industry in Virginia continues to expand, showcasing the importance of this sector for future policy considerations.

Our members know energy efficiency has tremendous potential to drive economic growth, create jobs, shrink utility bills, conserve natural resources, and reduce pollution. We believe this report will be key to raising awareness with decision-makers about the important role energy efficiency can play in the Virginia economy.

Chelsea Harnish
Executive Director, VAEEC

INTRODUCTION

Energy efficiency is a $1.5B industry in Virginia that supports more than 75,000 jobs. And it's all around us. Yet for too long it has largely been invisible and underutilized.

Lying in your bed you don't necessarily know the insulation level in your attic. Walking around your neighborhood you might miss the houses built above code. Eating at your favorite restaurant you wouldn't know that they just did a lighting retrofit. Sitting at your desk you might not have heard that the building recently installed a high efficiency heating and cooling system.

Nor would you know that all of those things were enabled by a policy or program: a rebate on an energy efficiency appliance, utility financial support for weatherizing homes, a program to engage commercial property owners, legislation that enabled regulations, or the state building code.

In the same vein, energy efficiency is not generally valued by policymakers as a true resource because they do not believe that it can be measured, documented, and ultimately factored into our energy portfolio. As a consequence, many of its economic benefits often go overlooked as well. These benefits include reduced energy bills, increased productivity, higher quality of life due to better ventilation and reduced pollution, local economic development, and downward pressure on utility rates.

Here in Virginia that is beginning to change. The progress we've made in recent years includes the work of Governor McAuliffe's Executive Committee on Energy Efficiency – the result of our 2013 report recommendation – that has worked to: track progress toward meeting the state's 10% energy efficiency goal; conduct outreach to local governments about the value in reducing energy consumption; develop a single-brand strategy for the marketing and outreach of energy efficiency programs; showcase champions of energy efficiency (which we accomplished with the VAEEC's Virginia Energy Efficiency Leadership Awards); support legislation allowing localities to require the reporting of commercial energy benchmarking data; and develop special curriculum for schools to educate students about energy efficiency.

The VAEEC's recommendations in this report reflect and build on that work (see text box for list of recommendations). What kind of impact could we see in Virginia if these recommendations were implemented?

The Department of Mines, Minerals and Energy estimates that, with these programs and policies in place, Virginia would be 36% of the way toward our energy efficiency goal of 10% electricity savings by 2022.

That tells us that we've made some progress, we still have a long way to go, and – most importantly – that the recommendations in this report are absolutely critical for Virginia to meet its goal.

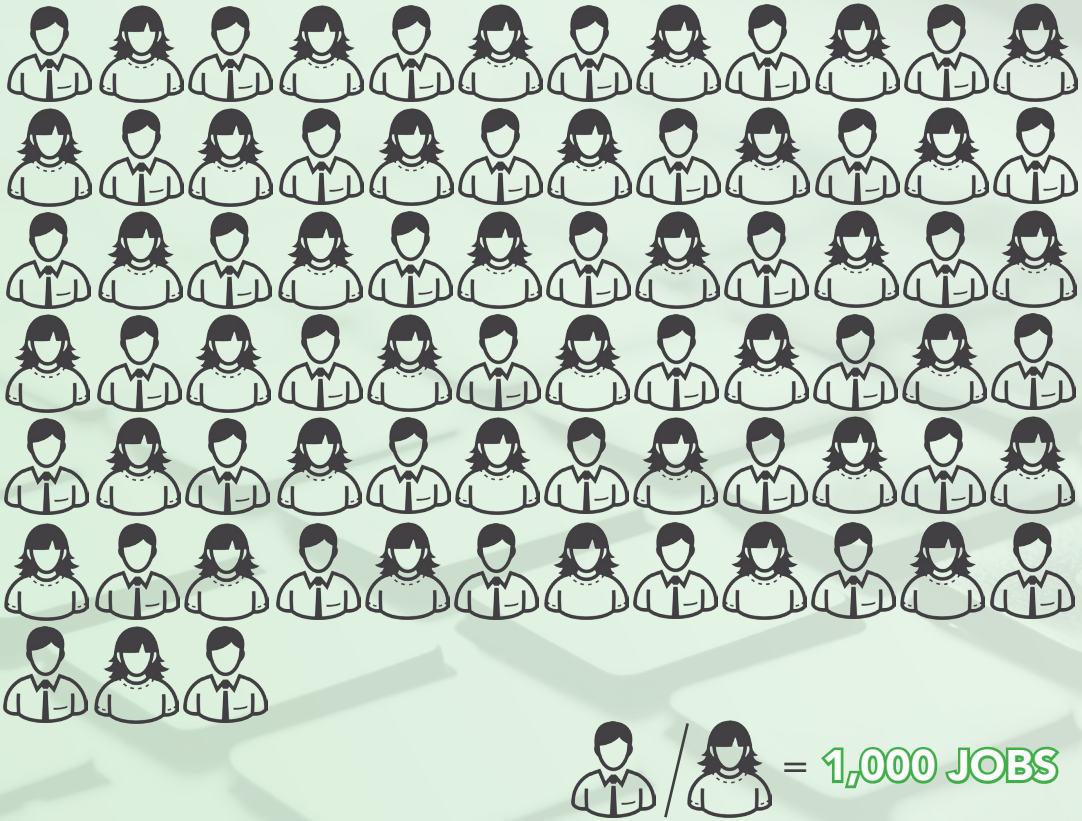
This report identifies opportunities for all stakeholders, policymakers, regulators, businesses, and local and state government agencies to engage in open dialogue about how best to augment the implementation of energy efficient technologies and services. The many benefits to consumers, property owners, ratepayers, local and state governments, and industry warrant aggressive adoption of best practices to implement energy efficiency throughout the Commonwealth, from the kitchen electrical outlet to the power grid.[2]

The VAEEC's recommendations in this report reflect and build on the work of our members and other stakeholders across the Commonwealth. We believe that Virginia can and should immediately embrace the following five concrete steps to hasten the advancement of energy efficiency and a smart, clean energy future:

1. Expand utility energy efficiency program opportunities in Virginia
2. Support the adoption of Commercial Property Assessed Clean Energy (C-PACE) financing across the Commonwealth
3. Adopt rigorous energy building codes for new home construction without weakening amendments
4. Expand performance-based contracting for state-owned buildings and public institutions of higher education
5. Provide and support opportunities for benchmarking of state, local, and commercial buildings

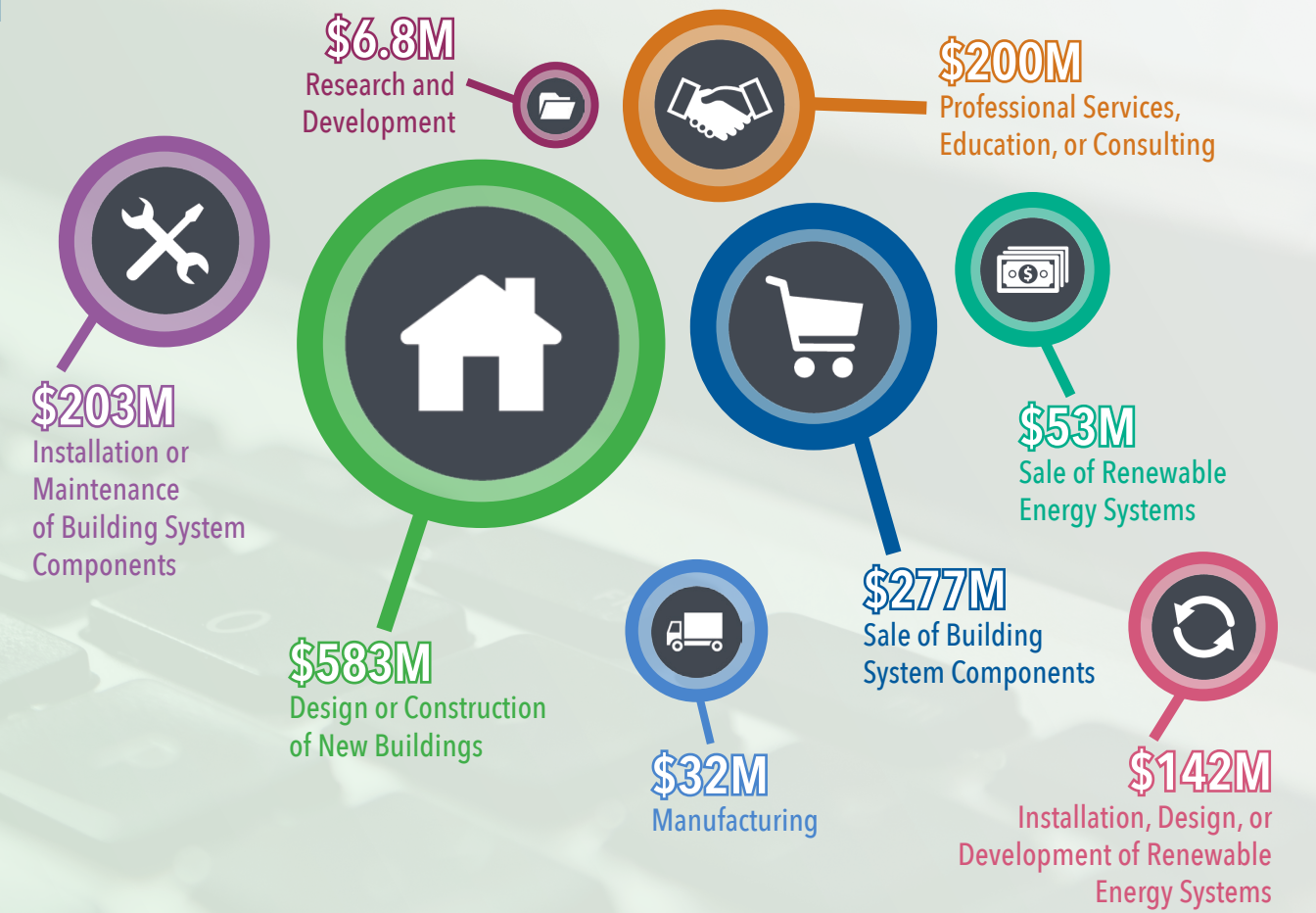
ENERGY EFFICIENCY IS RESPONSIBLE FOR 75,000 JOBS IN VIRGINIA.

Energy efficiency creates and sustains jobs right here in our local communities. From architects and contractors designing, building, and renovating more efficient buildings, energy auditors testing a building's performance, HVAC contractors installing high-performance systems, to energy managers for cities and counties trying to find ways to save their residents money, and weatherization providers helping low-income residents save money on their own energy bills, the list goes on.



ENERGY EFFICIENCY GENERATES MORE THAN $1.5B IN REVENUE IN VIRGINIA.

Companies based or with operations in Virginia manufacture and sell energy efficient products. They make money, advise on, and install those products. And they design, construct, and sell high-performing buildings. With all of these revenue streams and more, energy efficiency contributes a robust and growing piece of Virginia's economic pie. An added bonus is the money – not included in this report – that stays in our pocketbooks and our local communities thanks to savings on our energy bills.



1. UTILITY PROGRAMS

Expand utility energy efficiency program opportunities in Virginia.

Utility energy efficiency programs are an integral part of the energy efficiency landscape in Virginia. In the 2016 Virginia Energy Plan update, 98% of the programs measured toward the voluntary 10% energy reduction goal were utility-sponsored programs, highlighting the critically important role they play.[3]

According to Dominion's 2017 Integrated Resource Plan, energy efficiency programs "are an important part of the company's portfolio."[4]

We recommend the following policies to expand utility programs:

- Establish uniform protocols for Evaluation, Measurement, and Verification (EM&V)
- Include the economic benefits of energy efficiency when evaluating programs
- Maintain an effective, data-driven process for evaluating programs

Robust EM&V protocols assure that customers receive the benefits that energy-efficiency programs are designed to deliver, which is why we support, and plan to participate in, the State Corporation Commission's stakeholder process to establish uniform protocols for evaluating and verifying the impacts of energy efficiency measures later this year.

One of the most common methodologies for EM&V relies on deemed savings. While a relatively inexpensive approach, these savings do not always represent the actual impact of the energy efficiency measures.

New "automated M&V" or "EM&V 2.0" tools allow for actual data analysis. Using cloud computing software, monthly energy use data can be analyzed to determine savings without the need for smart meters. This software can provide faster program analysis, enabling better, longer-term program performance. Establishing EM&V protocols for Virginia utilities will enable them to develop energy efficiency programs with a strong, data-driven foundation from which to expand their offerings to customers.

During the 2017 Dominion Demand Side Management (DSM) proceeding before the Commission (PUE-2016-00111), the VAEEC made two arguments: that economic benefits should be considered when evaluating DSM programs, and that decisions made in these proceedings should be data-driven.

Virginia Code § 56-576 requires consideration of "other factors" outside of the traditional cost-benefit analyses when evaluating if a DSM program is in the public interest. The definition of "other factors" is left up to the Commission's well-considered discretion. We strongly recommend that this analysis include the direct economic benefits that would be realized by the communities served by these programs.

The Consumer Council of the Attorney General's Office agrees. In their closing statement, they stated that "it is within the Commission's discretion" to include economic benefits in the analysis.[5]

There is also precedence for this inclusion since the Commission routinely analyzes, and gives consideration to, these same types of local economic benefits when evaluating new power generation facilities.

We also argued that any process to improve utility DSM programs should be data driven. There must be evidence to show that proposed changes to a program - whether a change in total program funding or a reduced rebate amount for a single measure- will increase energy savings and reduce the total kilowatt-hours consumed.

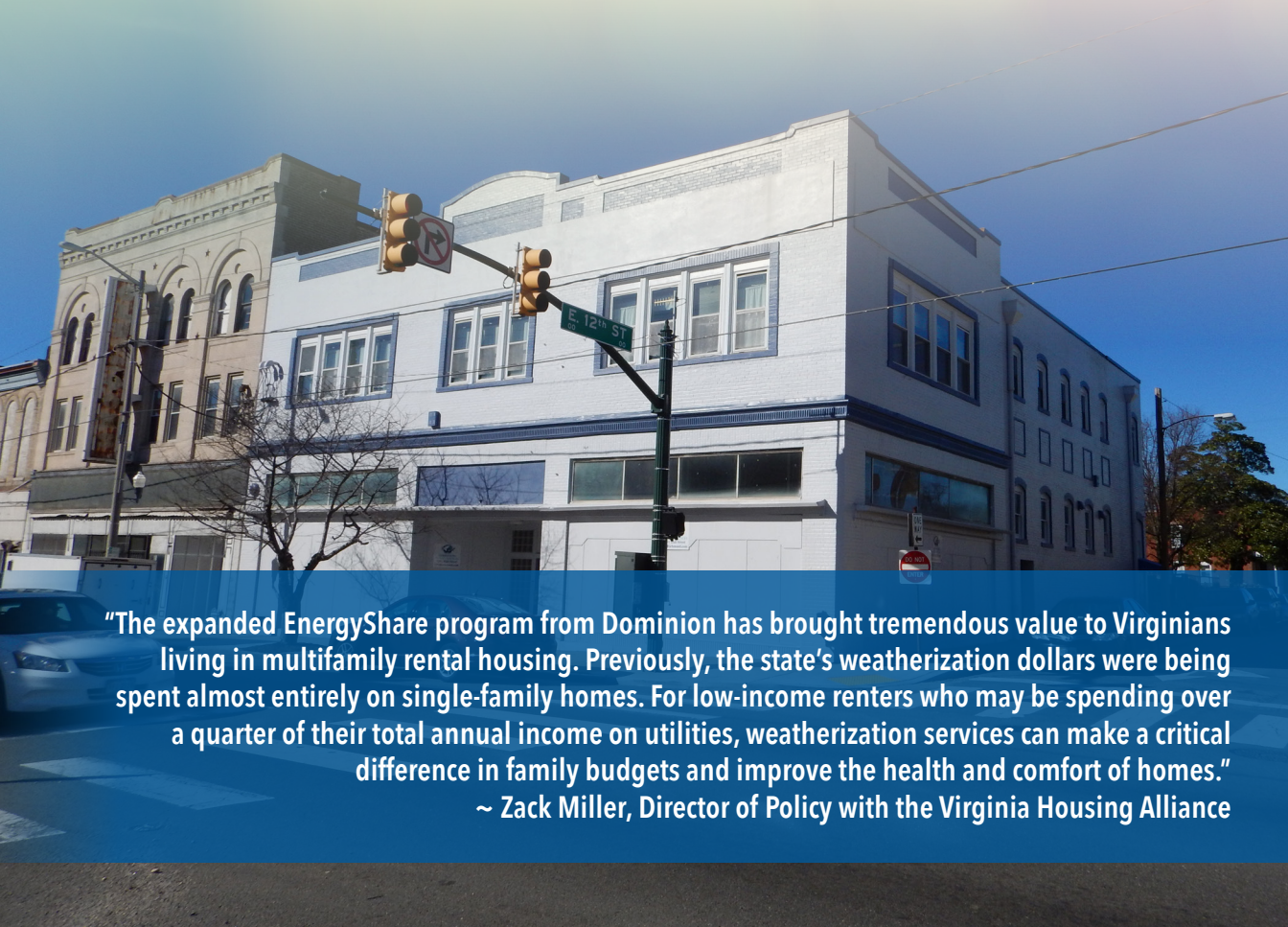
During the proceeding, Dominion staff testified that they modernize and improve programs based on data gathered in EM&V reports, a stakeholder review process, and feedback from market participants. This iterative process ensures that there is an opportunity to continually make corrections with each new generation of programs, and cost-benefit scores have generally trended upward over time as a result.

CASE STUDY

Veteran Housing in Richmond

Project:HOMES, a Richmond-based nonprofit who participates in the Dominion Virginia Power's EnergyShare program, recently provided weatherization upgrades to Liberation Family Services 38-bed-facility, which serves as a crisis housing center for homeless military veterans. This project was the largest commercial weatherization project Project:HOMES has completed to date and they were able to finish in about four weeks. In partnership with their sub-contractors, they were able to: seal air leaks throughout the historic building while maintaining the historic character; convert 364 lightbulbs to LED equivalents; and install ventilation fans in the bathrooms.

"It made a world of difference to us," said Fletcher Johnson, case manager at Liberation Family Services. "Our biggest expense has always been our winter heating bills. Our last bill was nearly cut in half from the previous time last year! We had no idea that we would see these kinds of results. It's been a godsend."



"The expanded EnergyShare program from Dominion has brought tremendous value to Virginians living in multifamily rental housing. Previously, the state's weatherization dollars were being spent almost entirely on single-family homes. For low-income renters who may be spending over a quarter of their total annual income on utilities, weatherization services can make a critical difference in family budgets and improve the health and comfort of homes."
~ Zack Miller, Director of Policy with the Virginia Housing Alliance

2. PACE

Support the adoption of Commercial Property Assessed Clean Energy (C-PACE) financing across the Commonwealth.

The VAEEC recommends that state policymakers and energy efficiency stakeholders work with local governments to support the adoption and implementation of commercial PACE programs. The establishment of commercial PACE, or C-PACE, programs will grant building owners the opportunity to rehabilitate their property with energy efficiency, renewable energy, and water conservation improvements.

C-PACE financing provides building owners with low-cost, long-term capital to fund energy efficiency, renewable energy, and water conservation measures for new and existing commercial buildings. C-PACE typically allows for a wide variety of eligible measures such as: insulation, solar panels, lighting, roofing, low flow fixtures, and HVAC system replacements. C-PACE loans are repaid through the property's real estate tax bill.

C-PACE is gaining more attention around the Commonwealth and the nation. Nationally, thirty-three states and Washington, D.C. have passed legislation at the state level to enable PACE financing, of which nineteen have active PACE programs. In Virginia, a C-PACE enabling law was originally enacted in 2009. However, that original 2009 law was not aligned with national best practices for enabling legislation, program structure, and implementation. In 2015, the VAEEC, Richmond Region Energy Alliance, Abacus Property Solutions, Trane, and other VAEEC members spearheaded a campaign to advance the C-PACE legislation that amended the original, flawed law.

In Virginia, localities are authorized to develop C-PACE programs for new and existing privately-owned commercial, nonprofit, and multifamily buildings (except condos and dwellings under 5 units) within their jurisdiction. Arlington County is developing their own C-PACE program, and several other localities are exploring the feasibility of creating a program.

Governor McAuliffe and his administration have recognized C-PACE as a viable means to create more jobs, save energy, and lower electricity bills.[6]

The VAEEC is working with stakeholders to advance PACE throughout Virginia. As a member of the Mid-Atlantic PACE Alliance (MAPA), an initiative funded by the U.S. Department of Energy and led by DMME, the VAEEC is working with key public and private stakeholders to support the development, implementation, and growth of C-PACE programs throughout Virginia, Maryland, and Washington, D.C.

Implementation of C-PACE programs in Virginia is projected to result in approximately 400,000 MWh cumulative electric savings, $180 million in loans issued and 400 buildings retrofitted by 2020.[2] In addition to those macro-level benefits, a robust C-PACE program would be valuable to a variety of stakeholders including building owners, contractors, consultants and engineers, localities, and lenders. Benefits include 100% financing, long term loans, improved building stock, and increased economic development.

The VAEEC recommends working with stakeholders to build a broad coalition of support and provide guidance and resources to localities in order to facilitate the implementation of commercial PACE throughout the Commonwealth. Robust C-PACE programs reduce energy consumption, spur renewable energy installation, and promote economic development. It is time for localities to take advantage of this program so Virginians can begin to reap the benefits.

CASE STUDY

PACE Success in Neighboring Kentucky

The Ivy Knoll Senior Retirement Community in Covington, Kentucky, received a suite of energy upgrades thanks to PACE financing. The building – which was outdated and extremely energy inefficient – now has a smaller energy and carbon footprint and offers its senior residents more comfort and convenience.

When approved in 2015, the project marked the first time in Kentucky that a City had authorized a private property owner to utilize PACE financing after the state passed enabling legislation earlier that year.

The financing option allowed them to select those improvements with the best return on investment in terms of energy savings, but that also had the higher upfront costs. Upgrades totaled $750,000 and included solar panels, LED lighting, elevator modernization, and HVAC upgrades. The estimated energy savings is 37%, and the LED lighting alone is expected to save $12,000 a year.

With PACE, the building owner received a 100% fixed-rate, 20-year loan; the City enjoys higher property values without any municipal funding; the contractor gets better deal flow and a new financing product to offer; and the mortgage holder benefits from increased property value and less loan risk.

"PACE financing provides an important tool for our local governments to reduce energy consumption and upgrade commercial property within their jurisdictions. It can also drive an increase in clean energy jobs that are critical to building a new Virginia economy."
~ Hayes Framme, Virginia's Deputy Secretary of Commerce and Trade

3. BUILDING CODES

Adopt rigorous energy building codes for new home construction without weakening amendments.

Our 2013 report called for the adoption of the 2012 International Energy Conservation Code (IECC), the national model energy code for residential construction, without weakening amendments. The 2012 IECC model code included substantial efficiency measures for new homes and existing renovations.

In 2014, Virginia adopted the 2012 IECC model code with many weakening amendments. In the case of the residential codes section, Virginia's amendments created a code that looked more like the 2009 IECC model code rather than the 2012 IECC model. While a few efficiency proposals were included – insulation on some hot water pipes and lowering the allowable limits for duct leakage and home envelope air-tightness – the option for visual inspection for both home air-tightness and duct leakage remains today.

The VAEEC recommends that Virginia adopt the 2015 International Energy Conservation Code (IECC) building codes without alteration. Advanced energy codes are among the most cost-effective methods of saving energy, lowering the total cost of housing, improving health and comfort in homes, and improving quality throughout the homebuilding industry.

Not to mention, people want it. In an Energy Pulse survey by The Shelton Group, homebuyers prioritized costs associated with added comfort and energy efficiency over other expenditures.[7]

A 2013 survey by the National Association of Homebuilders reported that 9 out of 10 homebuyers are willing to pay 2-3% more for a home that includes permanent energy efficiency features.[8]

Per Virginia custom, amendments made in previous years stand until they are expressly removed or altered by the board. Given that the 2015 IECC residential requirements largely mirror the 2012 IECC in terms of overall efficiency, if Virginia does not adopt these new 2015 standards, we will remain woefully behind our neighbors who have already adopted the latest model code.

While the VAEEC continues to advocate for the adoption of the IECC model code without revision, we are specifically seeking the inclusion of the following requirements:

- Blower door tests for whole home air-tightness
- Pressure testing for air duct tightness
- Improved wall and ceiling insulation values

According to the Building Codes Assistance Project (BCAP): "For the average new home [in Virginia], the 2012 IECC will only increase construction costs by $2,197." Amortized over a 30-year mortgage at today's rates, that is less than $11 a month on the monthly mortgage bill.[9] Couple that cost with the estimated energy bill savings of nearly $31 a month, and homeowners would actually begin saving nearly $270 annually, before their second anniversary of home ownership.[10]

Building more efficient homes is also good for the environment. If Virginia adopted the 2015 model code as is, with no alterations, Virginia homeowners would save $2.5 billion between 2010-2040 and avoid nearly 16 million metric tons of carbon emissions,[11] which is equivalent to saving the amount of energy consumed by 1.6 million homes in a single year.[12]

VAEEC believes it is time for the Commonwealth's building codes to catch up with the national model code's minimum requirements for safety, efficiency, and reliability when it comes to building construction. Virginia homeowners and homebuyers deserve a modern-day code that reflects our desire for high-performing homes and forward-thinking energy policies.

CASE STUDY

EarthCraft Homes Proven to Save Consumers Money
The 2015 Virginia Center for Housing Research at Virginia Tech report, "The Impact of Energy Efficiency Design and Construction on LIHTC Housing in Virginia," found that families living in the average multifamily apartment certified as EarthCraft would save an average of $54/month on electricity, which amounts to annual savings of $648.[13]

The Virginia Tech study was the first in the nation that evaluated unit-level electricity consumption in affordable housing units that were built to exceed current building efficiency standards. The results showed the units used about 30% less energy than standard construction.

There are an estimated 16,000 EarthCraft multifamily units in Virginia, with the potential to save residents more than $10M this year alone. Beyond those incredible cost savings, a sample of residents in the study said they were more satisfied and more comfortable living in their above-code units.

"By building and certifying high performance homes through the EarthCraft program, we have always been able to talk to our clients about things we do that other builders can't. The whole-house-as-a-system approach means I can guarantee that my clients' new home will be cleaner, quieter, healthier and more comfortable than a new home built to code."
~ Mark Waring, Vice President of Bain-Waring Builders

4. PERFORMANCE CONTRACTING

Expand performance-based contracting for state-owned buildings and public institutions of higher education.

Several months after the release of the 2013 industry census, Governor McAuliffe signed Executive Order 31, identifying energy efficiency in state government as a priority for his administration and establishing a goal of reducing state government electricity consumption by 15% by the end of 2017. According to the 2016 Virginia Energy Plan update, Virginia has achieved 38% of this goal through Energy Performance Contracting (EPC), totaling $700 million in a portfolio representing state agencies, higher education, K-12 schools, regional jails, and local governments. The 200+ projects have resulted in the annual reduction of nearly 43 million kilowatt hours (KWh) of electricity and offsetting 31,219 metric tons of carbon dioxide (CO2) emissions.[3]

Our new recommendation for performance contracting is to expand the state's energy efficiency program for state and higher education facilities. Much like federal legislation requiring justification for inaction on performance contracting, state agencies and departments could be required to provide to the Governor's office their rationale for not implementing energy performance contracts that guarantee savings and could lower the tax burden on the Commonwealth's citizens. Even though Virginia has made significant progress with performance contracting in recent years, it remains a largely untapped source of cost savings.

According to Trane, a leading energy performance contracting company in Virginia, they have been able to save their public-sector clients 20-40% on their energy bills through Energy Performance Contracts. These expenses are recovered through energy upgrades, at no additional cost to taxpayers, through work that pays for itself. Over the next 10-15 years, Trane estimates that there is more than $1B in untapped self-paying energy efficiency projects in public buildings still left to do in Virginia.

Over $3 billion in deferred maintenance has built up across state agencies and higher education institutions over the last several years due to the recession.[14] These budget constraints have caused increased competition for capital dollars, wherein deferred maintenance is usually the last to be addressed. Typically, at least half of all deferred maintenance is energy-related and could be reduced through performance contracting. Performance contracting can help divert needed capital dollars away from buying replacement chillers, lighting, etc, and instead funnel those dollars to mission-critical activities – all while upgrading the performance, functionality and comfort of the facilities. Operating budgets will also be reduced through both lower energy costs as well as reduced maintenance costs.

Performance contracting can help address the most urgent needs and significantly reduce deferred maintenance in the Commonwealth.

"The guaranteed savings of an EPC is a great way to fund facility improvements, especially when budgets are tight. In many cases, it's the only way these kinds of projects can get done. Through an energy savings performance contract, Page County Public Schools in Luray were able to add air conditioning to classrooms funded entirely by cost savings from energy improvements."
~ Whit Blake, Account Executive with Johnson Controls

CASE STUDY

Virginia Department of Corrections

In 2016, the Virginia Department of Corrections (VADOC) took top prize at the VAEEC Energy Efficiency Leadership Awards in the state government category for their work to integrate Energy Performance Contracting into their building operations. VADOC has completed four ESCO projects; two more are in progress, and one is in development. These seven projects total approximately $100 million.

VADOC tied energy efficiency to its public safety mission by creating an inmate training program in energy sector skills. In partnership with Johnson Controls, Inc., VADOC established the Green Learning Lab at Indian Creek Correctional Center to provide practical training on mechanical equipment and offer industry certification. Since its inception, more than 50 inmates have graduated, with more than 35 employed upon release from prison, to become productive, tax-paying citizens.

5. BENCHMARKING

Provide and support opportunities for benchmarking of state, local, and commercial buildings.

It's one of the most common phrases you hear in energy efficiency circles: "What gets measured gets managed." And one of the most popular and effective measurement tools is benchmarking, designed to measure the energy performance of a building over time – compared to itself, a norm or similar buildings.

Benchmarking has become a hot topic in Virginia lately and for good reason.

According to an Energy Star report on data savings trends, benchmarked buildings achieve an annual energy savings of approximately 2.4% per year. Buildings with lower-than-average energy savings have the most to gain through benchmarking. According to the Energy Star report, buildings with the lowest ratings saved twice as much as those starting above average.[15]

That's right. Simply measuring and creating awareness of a building's energy use can lead to significant reductions in energy use. That's an immediate win.[16]

However, in Virginia, energy use for state facilities is not being measured. The Department of Mines, Minerals and Energy (DMME) is attempting to change that by integrating facility information from the Department of General Services and Dominion for the 200 highest energy-consuming state facilities in Dominion's service territory. Once they do the initial tedious work of data clean-up and integration, DMME will develop reports for these facilities managers alerting them to low- to no-cost measures they can take, or projects and programs they can participate in, such as Energy Performance Contracting (see previous recommendation), to reduce energy use at their facilities. They hope to have this completed by mid-2018. By mid-2019, they plan to include water and natural gas usage and track data at all state facilities in Virginia.

We recommend continuing the funding for this project to help the Commonwealth identify ways to save money on energy, gas, and water usage at all state facilities. Having this information available will help decision-makers make more informed decisions on state policies and goals for the Commonwealth.

We also recommend granting localities the authority to enact mandatory benchmarking programs for commercial buildings if they wish to do so. DMME should continue to advance this concept through a consensus-building effort with stakeholders.

In 2016, DMME convened a workshop to address this issue. Stakeholders included VAEEC staff, several of our members, and other interested parties – such as property managers, legislators, utility executives, and homebuilders. The DMME stakeholder group will meet throughout 2017 in order to achieve consensus on drafting enabling legislation for localities to implement commercial benchmarking programs. We look forward to participating in these ongoing conversations and working to draft the necessary enabling legislation for localities.

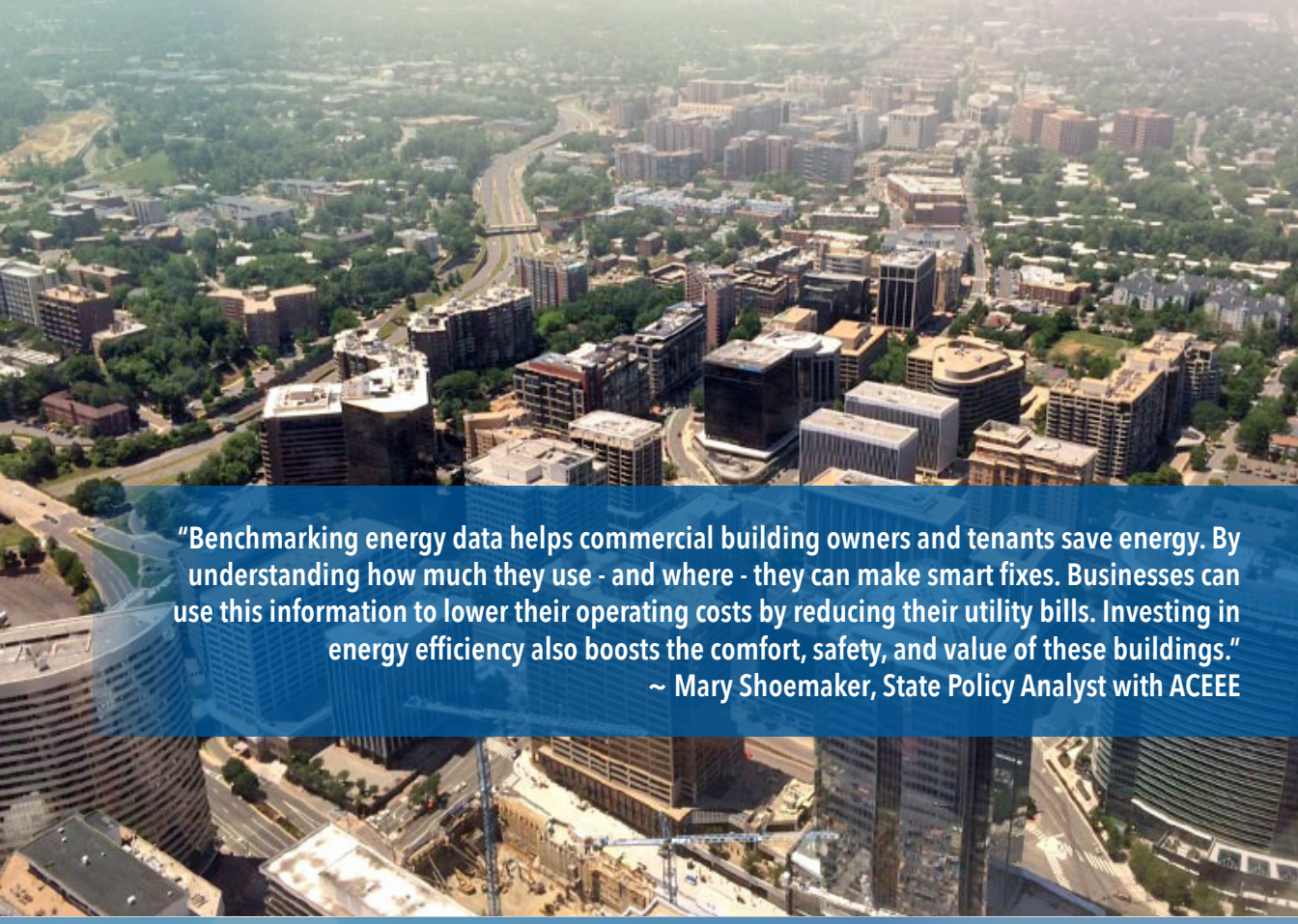
Benchmarking building energy data is a critical first step for a building owner or facilities manager to improve energy performance over time. Tracking this data not only results in operational changes, which spur immediate no-cost/low-cost reductions in energy consumption, but can also be a conduit to increased government efficiency, economic growth, job creation, and comfortable work environments.

CASE STUDY

Benchmarking in Arlington County

Arlington County has benchmarked its own 70+ government buildings in the Energy Star's Portfolio Manager system for over a decade, with data back to 2000 for some properties. In 2008 the County began making this data publicly available on its website, highlighting both the high efficiency performers and those that could be doing more. Building this awareness on energy performance data has engaged staff from other programs in finding ways to cut energy waste and costs.

In 2010 Arlington County launched the Green Games, a voluntary competition for commercial office properties to see who could save the most energy and water. During the two-year program, property managers used the Portfolio Manager tool to benchmark their building energy and water use, and share the data with County staff. Commercial tenants were also encouraged to participate, with a separate scorecard for resource-friendly practices and policies. By the end of the program, over 14 million square feet of commercial property was benchmarked with over $2 million in energy and water savings documented by participants and awards given to the top savers.



"Benchmarking energy data helps commercial building owners and tenants save energy. By understanding how much they use - and where - they can make smart fixes. Businesses can use this information to lower their operating costs by reducing their utility bills. Investing in energy efficiency also boosts the comfort, safety, and value of these buildings."
~ Mary Shoemaker, State Policy Analyst with ACEEE

REFERENCES

1. "The State Energy Efficiency Scorecard," American Council for an Energy-Efficient Economy. http://aceee.org/state-policy/scorecard
2. "Virginia Energy Efficiency Roadmap," Governor's Executive Committee. https://www.dmme.virginia.gov/DE/LinkDocuments/GEC/4%20-%20Virginia%20Energy%20Efficiency%20Roadmap.pdf
3. "Energy in the New Virginia Economy," Commonwealth of Virginia. https://commerce.virginia.gov/media/7935/energy-in-the-new-virginia-economy-update-to-the-2014-energy-plan.pdf
4. "Virginia Electric and Power Company's Report of Its Integrated Resource Plan," Dominion. https://www.dom.com/library/domcom/pdfs/corporate/2017-irp.pdf
5. "Post-Hearing Brief of the Division of Consumer Council," Commonwealth of Virginia: Office of the Attorney General. http://www.scc.virginia.gov/docketsearch/DOCS/3%23rg01!.PDF
6. "Governor McAuliffe Announces New Program to Create More Clean Energy Jobs in the Commonwealth," Virginia.gov. https://governor.virginia.gov/newsroom/newsarticle?articleId=19381)
7. "Four Reasons Buyer Choose Energy-Efficient Homes," Builderonline.com. http://www.builderonline.com/builder-100/marketing-sales/four-reasons-buyers-choose-energy-efficient-homes_o
8. "What Home Buyers Really Want," HousingEconomics.com. https://www.nahb.org/~/media/Sites/NAHB/Supporting-Files/8/Wha/WhatHomeBuyersWant_20130430023250.ashx?la=en
9. Amortization Schedule Calculator, Bankrate.com. http://www.bankrate.com/calculators/mortgages/amortization-calculator.aspx
10. "True Cost of the 2012 International Energy Conservation Code," Bcapcodes.org. http://bcapcodes.org/wp-content/uploads/2015/11/Virginia-2012-IECC-True-Cost.pdf
11. "Impacts of Model Building Energy Codes," U.S. Department of Energy. https://www.energycodes.gov/sites/default/files/documents/Impacts_Of_Model_Energy_Codes.pdf
12. "Greenhouse Gas Equivalencies Calculator," United States Environmental Protection Agency. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
13. "The Impact of Energy Efficient Design and Construction on LIHTC Housing in Virginia," Virginia Center for Housing Research at Virginia Tech. http://www.vchr.vt.edu/wp-content/uploads/2015/02/Housing-VA-LIHTC-Study-Full-Report.pdf
14. "Addressing the Cost of Public Higher Education in Virginia," Joint Legislative Audit and Review Commission. http://jlarc.virginia.gov/higher-ed-cost.asp
15. "Benchmarking and Energy Savings," Energy Star. https://www.energystar.gov/sites/default/files/buildings/tools/DataTrends_Savings_20121002.pdf
16. "The Benefits of Benchmarking Building Performance," Institute for Market Transformation. http://www.imt.org/uploads/resources/files/PCC_Benefits_of_Benchmarking.pdf

To access an online version of this report, view the report methodology, or to find the 2013 census report and other supporting materials, please visit:

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ACKNOWLEDGEMENTS

Thank you to: Kelsey Galantich for managing the data collection and analysis phase of the project as well as proofreading and editing the final draft; Diana McDermott for helping to build the survey list; Shan Arora with Southface and Robin Aldina with NCSEA for guiding our analysis; NC State for completing the survey work; VAEEC board members David Steiner, David Koogler, Bill Greenleaf, John Morrill, Cynthia Adams, Andrew Grigsby and Larry Cummings for providing guidance and content analysis; VAEEC members Abby Johnson, Al Christopher, Chris MacDonald, Eric Lacey and Tim Bernadowski for reviewing our recommendations; representatives of Project:HOMES, Virginia Department of Corrections, and Arlington County for their help with the case studies; Kelley Galownia for designing the report; and of course to the entire VAEEC staff (Annie Suttle, Jessica Greene, Chelsea Harnish) for getting us to the finish line.

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Report published May 2017