

# Virginia Energy Efficiency Roadmap

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VIRGINIA DEPARTMENT OF MINES, MINERALS AND ENERGY

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## EXECUTIVE SUMMARY

### BACKGROUND

Virginia’s population has been steadily growing since 2010, reaching an estimated 8.4 million residents in July, 2016. As the Commonwealth continues to attract new residents, small businesses, and industries, utility companies and regulators must plan for increased electricity demand. To meet this demand and maintain reliable, affordable electric delivery for all Virginians while balancing the Commonwealth’s commitment to reduce carbon emissions,<sup>1</sup> the Commonwealth must consider a diverse energy mix that includes low-cost and low-carbon options. Energy efficiency (EE)--in the form of policies and programs that seek to limit energy consumption by end users--is a critical resource for maintaining reliability, affordability, and sustainability of the electric grid.

The Virginia Department of Mines, Minerals and Energy (DMME) is responsible for drafting the Virginia Energy Plan (VEP), a strategic document intended to provide guidance for the Commonwealth’s energy future. DMME also provides support to the Governor’s Executive Committee on Energy Efficiency (GEC), established by Governor McAuliffe in 2014. In 2015, DMME obtained funding from the U.S. Department of Energy to develop an “Energy Efficiency Roadmap” for the Commonwealth that would present strategic pathways for increasing the utilization of energy efficiency as a resource. The principal metric for success was established by 2007 statute, and 2014 update of the VEP, as a measurable decrease of electricity consumption by end-users, with a target of 10% less consumption in 2020 than in 2006.

The Virginia Energy Efficiency Roadmap (Roadmap) is the product of nearly two years of engagement among energy efficiency experts, Virginia policymakers, state agency representatives, local governments, business owners and residents. An immediate challenge was narrowing the broad list of potentially effective energy efficiency policies

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<sup>1</sup> Virginia has demonstrated a commitment to reducing carbon emissions through the establishment of a working group under [Executive Order 57](#), which directed the Secretary of Natural Resources to convene a workgroup and recommend actions to reduce carbon pollution from the state’s electric sector.

and programs to those that could be recommended with confidence to the GEC. The recommendations presented in this Roadmap were selected for the capacity to achieve significant energy savings and qualified by the feasibility of implementation in Virginia's current and near-term regulatory environment. Some build on previous recommendations made by the GEC, and some are new. In either case, if implemented, the recommendations in this document would position the Commonwealth as an emerging leader in energy efficiency policy, provide substantial and long-term benefits to ratepayers, and may help attract new businesses and investment in the state.

#### PURPOSE

The purpose of this Roadmap is to inform, educate, and provide actionable steps for policymakers, regulators, utilities, and utility customers to achieve the state's statutory goal of conserving 10% of retail electric consumption in 2020. Some progress has been made, despite Virginia's growing population and demand for power. Energy efficiency—achieving the same or greater benefit from reduced expenditure of energy resources—is often the most cost-effective means of meeting this demand with grid reliability and resilience. While achievement of the 10% target by 2020 may be unlikely in the current regulatory and policy framework, the policies and programs discussed in this Roadmap would put the Commonwealth on a path towards significantly advancing energy efficiency programming, and optimizing the use of energy resources. This Roadmap identifies six key policies or programs that could deliver cost-effective energy savings for the Commonwealth, outlines key action steps in the near-term and foundational steps for long-term implementation, and recommends key stakeholders critical for successful implementation.

#### USE AND AUDIENCE

This document may inform newly elected officials and other policymakers in Virginia's state and local governments about the role of energy efficiency as a low-cost component of Virginia's energy strategy and diverse energy mix. As energy demand is expected to continue growing in the Commonwealth, energy efficiency can be deployed as a first-choice, often lowest-cost resource to ensure reliable, quality delivery of electricity to the residents and businesses that rely on the grid every day. Virginia has made notable progress in recent years in prioritizing energy efficiency as an affordable, sustainable resource, through the Virginia Energy Plan and support from the executive branch.

Implementation of the key policies and programs described in this Roadmap would build on that progress and foster a better balance of resources in a diversified energy economy.

#### SUMMARY OF RECOMMENDATIONS

This Roadmap recommends six key policies and programs to enable and expand the use of energy efficiency as a low-cost, first-choice option for meeting the growing energy demand of the Commonwealth. The team determined these policies and programs through a series of comparison matrices, based on factors such as: cost, ease of implementation, public or policymaker support, and potential energy and cost savings impacts. Four policies were put forward primarily for their potential to make a large impact in terms of long-term energy savings, while two programs were selected on the basis that they demonstrate high feasibility and have prior support from state and local decision makers.

<b>POLICIES</b>	<ul style="list-style-type: none"><li>• Adopt national best practices for new building codes.</li><li>• Utilize best practices for the Evaluation, Measurement, and Verification (EM&amp;V) of ratepayer funded utility energy efficiency programs.</li><li>• Set mandatory, long-term, incrementally increasing energy savings targets for utilities.</li><li>• Enable localities to implement mandatory benchmarking programs for large commercial and industrial users and encourage utilities to adopt national best practices for enabling customer and third-party data access.</li></ul>
<b>PROGRAMS</b>	<ul style="list-style-type: none"><li>• Support the development of Commercial Property Assessed Clean Energy (PACE) programs across the Commonwealth and consider the benefits of enabling Residential PACE programs.</li><li>• Maintain and expand the state Energy Savings Performance Contracting (ESPC) program to achieve savings in properties owned by state agencies, local governments, and public schools, and continue to support the development of an energy information management system for state agency properties.</li></ul>

## CONCLUSION

While Virginia has made progress towards achieving energy savings as a result of existing voluntary energy efficiency policies and programs, substantial opportunity exists to accelerate the development and growth of this resource and achieve more cost-effective savings. Although the state may not reach its goal of reducing electricity consumption by 10% by 2020, the adoption of these foundational policies, and the continued support and expansion of existing programs, can put Virginia further up the development curve toward optimizing its balance of energy resources in support of continued economic growth.

## ABOUT THE VIRGINIA ENERGY EFFICIENCY ROADMAP

The Virginia Energy Efficiency Roadmap and Roadmap team engagement was funded by the U.S. Department of Energy to support the development of a plan and actionable policies for meeting Virginia's standing, voluntary goal of a 10% reduction in retail electricity use through efficiency and conservation. This team, led by the Virginia Department of Mines, Minerals and Energy, was created in response to the acceleration of the target date by two years to 2020 via the 2014 Virginia Energy Plan update, and Executive Order 31, which identified energy efficiency as a priority for Virginia's new energy economy. The team includes energy policy and program experts from the Virginia Energy Efficiency Council, Clean Energy Solutions, Inc., the Southeast Energy Efficiency Alliance, the American Council for an Energy Efficient Economy, Synapse Energy Economics, and World View Solutions.

Virginia's first Energy Plan after re-regulation, published in 2007, established a voluntary goal of reducing 2022 retail electric use by 10% relative to a baseline of 2006 retail consumption, through efficiency and conservation. This voluntary goal was later added to the Virginia State Code and was determined by the State Corporation Commission to be achievable. In 2014, the goal was accelerated to achieve 10% retail electricity conservation by 2020. The same year, Executive Order 31 established a goal of reducing state government electricity consumption by 15% by the end of 2017 from a 2010 baseline.

Based on the statutory language related to the statewide 10% conservation goal, the achievement of that goal will be measured as the total avoided 2020 electricity consumption that can be verifiably attributed to energy efficiency initiatives over the period of 2007-2020. Achievement of the goal represents verified consumption reductions equal to 10% of the overall retail electricity consumption in the baseline year of 2006, which according to the Energy Information Administration, was equal to 106,700 GWh. This number includes retail electricity

sales to the residential, commercial, industrial and transportation sectors, and 10% equates to the goal of verified savings of 10.67 million MWh in 2020.

The Roadmap team considered excluding the industrial and transportation sectors from these calculations, on the basis that large industrial customers are often exempt from participating in electric energy efficiency programs, and that transportation use of electricity is currently a negligible component of that sector's total energy use. If going forward, the Commonwealth elected to define the goal on the basis of residential and commercial consumption only, the new target goal would be savings of 8.76 million MWh in 2020.

The net economic benefit to achieving the 10% goal is not insignificant: According to the 2007 VEP, the achievement of a 10.67 million MWh reduction in 2022 would “defer or postpone the need for approximately 3,900 MW of new electric generation capacity by 2022, equivalent to four or five large generation stations. Virginia consumers would save in the range of \$200 to \$700 million (net savings after costs) through 2022 (average \$15 to \$50 million per year). Total savings over the lives of the measures would range from \$300 to \$590 million for each yearly investment in energy efficiency measures.”

#### ENERGY EFFICIENCY AS A LEAST-RISK, LOWEST-COST RESOURCE

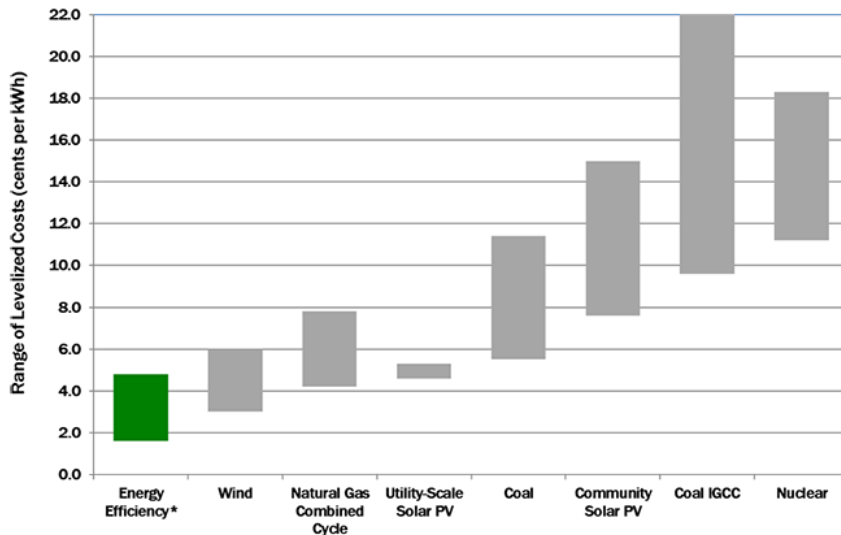
Commercial and residential buildings account for approximately 40% of all energy consumption and 70% of electricity usage in the United States. (DOE, 2017) The costs of generating, transmitting, and distributing electricity to these buildings is borne by ratepayers in the form of high utility bills and the adverse impacts of extractive and combusive practices that result in pollution to air, water, and soil. Stakeholders in the energy industry (including investor owned utilities) generally agree that one of the least expensive, cleanest ways to meet electricity demand is to reduce end-use demand through cost-effective energy efficiency measures that eliminate unnecessary waste. In fact, energy efficiency was identified as the “most cost-effective and most readily deployable method to manage [the Commonwealth’s] energy future” in the 2007 Virginia Energy Plan (VEP). Also noted in the 2007 VEP were several benefits of energy efficiency that continue to hold true today:

***Energy efficiency is much cheaper for utilities to implement than building new generating capacity.***

- Recent (2016) research from ACEEE found that even among utilities achieving the highest levels of electricity savings from efficiency, the cost of saved energy



has [remained consistently low](#). ACEEE's analysis found that utility energy efficiency programs cost about 2 to 5 cents per kilowatt-hour, which is one-half to one-quarter the cost of other new electricity resource options.<sup>2</sup> Lawrence Berkeley National Laboratory (LBNL) has found [similar results](#).<sup>3</sup>



\*Notes: Energy efficiency program portfolio data from Molina 2014; All other data from Lazard 2017. High-end range of coal includes 90% carbon capture and compression.

*As demonstrated by the chart to the left, ACEEE found in a study of 20 states running efficiency programs from 2009-2012 that energy efficiency had the lowest levelized cost of energy (cents per kWh) among all other new resource options.*

***Energy efficiency has the potential to greatly contribute to the Commonwealth's achievement of greenhouse gas reductions.***

- If the Commonwealth placed a cap on CO2 emissions to reduce pollution 30% by 2030, Virginia could realize 100% of pollution reductions through a suite of energy efficiency policies and programs (Nadel, 2017).

<sup>2</sup> For a longer discussion on the results of ACEEE and Lazard's data, see <http://aceee.org/blog/2017/12/new-data-same-results-saving-energy>.

<sup>3</sup> <https://emp.lbl.gov/projects/what-it-costs-save-energy>  
<https://emp.lbl.gov/publications/total-cost-saving-electricity-through>

***Energy efficiency measures can be used to shave peak demand, often less expensively than deploying supply-side production to meet demand.***

- Most EE measures are “on” full-time, reducing load on the electric grid during peak-demand hours, as well as other times. This increases their cost-effectiveness in the aggregate, by reducing or delaying the need for supply-side investment. In a 2017 study, ACEEE found that “for each 1% reduction in electric sales for a utility, on a median basis, peak demand reductions from efficiency programs are 0.66% of peak demand for that utility.”

***Energy efficiency can defer the need for utility investments in new supply side resources and the associated environmental impacts to land, water, and air.***

- Without the energy efficiency investments we have made since 1990, the United States would need the equivalent of 313 additional large power plants today to meet the country’s energy needs (Molina, Kiker, and Nowak, 2016).

***Energy efficiency measures can contribute to increased comfort, health, and productivity, as well as higher property values.***

- A 2016 U.S. Department of Energy study on the health effects of home performance projects found that basic energy efficiency work can create healthier living environments, while enhanced energy efficiency improvements can result in reduced indoor air contaminants linked to chronic illness, and help mitigate environmental contaminants that are linked to respiratory conditions such as asthma (Wilson, et al., 2016).

***Energy efficiency enables local economic development and creates high-value, full-time jobs.***

- According to the Virginia Energy Efficiency Council, since 2013, “revenue generated from the energy efficiency sector has grown from nearly \$300 million to \$1.5 billion” and the energy efficiency industry supports more than 75,000 jobs in Virginia (VAEEC, 2017).
- In 2016, DMME estimated that enhanced energy efficiency initiatives had the potential to employ an additional 38,000 people in Virginia and contribute almost \$300 million to state domestic product by 2030 (DMME, 2016).

## BARRIERS TO ENERGY EFFICIENCY IN VIRGINIA

Virginia has made recent gains in energy efficiency through a statutory 10% energy savings target, passed in 2007, and a requirement for utilities to submit integrated resource plans that lay out demand-side resources, passed in 2008. Other regulatory and market factors, such as the increase in efficiency requirements and performance of lighting, also contribute. Virginia's statewide energy savings goal is voluntary, however, and not underpinned by regulatory or statutory requirements for energy efficiency.

Even with the renewed emphasis on furthering energy efficiency policy and programs in the Commonwealth, Virginia remains “middle of the pack” relative to other states in terms of energy efficiency policies and investments, currently ranking 29 out of 51 states and the District of Columbia in the American Council for an Energy Efficient Economy [State Scorecards](#). The State Scorecards assign points in six categories, with the three most pertinent to retail electric energy conservation and efficiency summarized below: 1) utility programs and investments; 2) state government policies, and; 3) building codes and incentives for building energy conservation.

CATEGORY	POINTS	JUSTIFICATION
Utilities	0 out of 20	<ul style="list-style-type: none"> <li>× VA below national average on EE program spending and savings.</li> <li>× No mandatory EE goals and resource standards.</li> <li>× Revenue decoupling is not permissible for electric utilities.</li> <li>× Rate recovery is limited by offsetting sales and subject to industry standard M&amp;V.</li> <li>× RIM is used to evaluate cost-effectiveness; no deemed savings database.</li> <li>× Large customers may opt-out of EE programs.</li> <li>× No data access policies in place.</li> <li>✓ Utility pilot programs for energy assistance and weatherization for low-income, elderly, and disabled households required through SB 1349.</li> </ul>
State Government Policies	5.5 out of 6	<ul style="list-style-type: none"> <li>✓ PACE enabled.</li> <li>✓ Lead-by-example policies (benchmarking and EPC in state facilities).</li> <li>✓ Financing and incentive programs in place (CEDS, CEF).</li> <li>✓ EO 19- New state buildings conform to LEED.</li> <li>✓ EO 31- Achieve 15% savings in state buildings by 2017.</li> <li>✓ Piloting energy management software for all state agencies.</li> </ul>

Building Sector	5 out of 8	<ul style="list-style-type: none"> <li>✓ Has taken steps to adopt the 2015 IECC in full for commercial buildings.</li> <li>✓ Reviewing a weakened version of the 2015 IECC for residential buildings that is closer to the 2012 IECC in stringency.</li> <li>✓ Completed baseline compliance study and established stakeholder advisory group.</li> <li>✓ Partnered with the Southeast Energy Efficiency Alliance to conduct a residential energy code field study.</li> </ul>
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As demonstrated above, Virginia stands to benefit the most from improvements to utility-sector energy efficiency programs, followed by building-sector and state government policies and programs. Accordingly, the Roadmap team chose to focus primarily on policies and programs that would encourage energy efficiency adoption in those three key areas with special emphasis on the commercial and residential building sectors.

## UTILITY BARRIERS

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As summarized above, Virginia faces several barriers that limit utility investments in energy efficiency. As a state with relatively low energy costs, proposed energy efficiency programs may have difficulty passing cost-effectiveness tests. The State Corporation Commission (SCC) has been working through a stakeholder process to determine uniform protocols for the evaluation, measurement, and verification (EM&V) of utility-sponsored energy efficiency programs, which may provide a clearer path forward for additional cost-effective utility energy efficiency investments.

## EVALUATION, MEASUREMENT, AND VERIFICATION (EM&V)

EM&V demonstrates the value of energy efficiency programs by providing accurate, transparent, and consistent assessments of implementation and performance of energy efficiency projects, programs and portfolios of programs. In Virginia, utilities are required to submit EM&V reports on approved programs annually. According to a report by ACEEE, EM&V should serve three critical objectives: accountability of the impacts, risk management, and continuous improvement of the approved programs (ACEEE, 2017). Currently in Virginia, regulators have proposed a set of protocols for utilities to use in their EM&V reports, so there is consistency across programs or across utilities operating these programs in Virginia. Following legislation passed by the General Assembly, the SCC issued a set of [draft EM&V requirements](#), which it opened for public comment. Several organizations involved in the Roadmap project

submitted comments, which can be found [here](#). On September 8, 2017, the SCC held a public hearing on the protocols, and at the time of writing, had yet to issue a final ruling on the matter.

## UTILITY BUSINESS MODELS

Revenue decoupling separates utility revenue from energy (kWh) volumetric sales by allowing utilities to periodically adjust rates to ensure fixed costs are recovered, even if energy consumption decreases. Electric utilities are not allowed to decouple revenues from kWh sales in Virginia, which creates a perverse incentive whereby increasing kWh sales leads to profits above authorized cost recovery and improved efficiency leads to loss of profit. The SCC does not offer either electric or gas utilities performance incentives for meeting energy efficiency program goals. (Performance incentives are a regulatory action designed to address the financial disincentive of lost revenues (kWh sales) as a result of successful energy efficiency programs).

## OPT-OUT POLICY

In Virginia, certain large customers are exempt from paying for the costs of new energy efficiency programs. Once customers opt out, they cannot take advantage of existing programming nor be charged for it. Failure to include these customers in an energy efficiency portfolio can artificially limit the cost-effectiveness of the total program portfolio, since large customers often represent a large, source of low-cost energy savings.<sup>4</sup> Excluding these low-cost savings opportunities can increase the cost of energy efficiency programs for those that do pay and reduce the benefits of programs for *all* customers (Baatz, Relf, and Kelley, 2017). Allowing large customers to opt out of the programs will reduce total savings, unless they spontaneously undertake efficiency measures with equal or greater cost-effectiveness than the programs would support.

In addition, many large industrial companies are deriving real value that improves profitability by participating in their utility's efficiency program offerings. See case studies provided in the link in the footnote below from General Motors, General Mills, Intel, and JR Simplot for examples.<sup>5</sup>

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<sup>4</sup> ACEEE estimates that programs serving businesses are historically the lowest cost, averaging 2.7 cents per kWh vs. 3.5 cents per kWh for residential programs.

<sup>5</sup> <https://www4.eere.energy.gov/seeaction/publication/saving-energy-industrial-companies-case-studies-energy-efficiency-programs-large-us>

See also US DOE Better Plants program partners, who voluntarily set a specific goal, typically to reduce energy intensity by 25% over a 10-year period across all their U.S. operations.<sup>6</sup>

Other programmatic barriers may persist in the absence of adequate funding and collaboration among regulatory and administrative agencies.

## BUILDING SECTOR BARRIERS

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### BUILDING ENERGY CODES FOR NEW CONSTRUCTION

New residential buildings in Virginia must comply with the 2012 International Residential Code (IRC). Amendments to the 2012 International Energy Conservation Code (IECC) by the state's codes officials, however, render it essentially equivalent to the 2009 version. Commercial buildings must conform to the commercial provisions of the 2012 IECC, with reference to ASHRAE 90.1-2010. Virginia is currently reviewing the 2015 IECC and expects to adopt a new code in 2018. To date, Virginia's code officials have determined that they will not adopt the 2015 IECC without weakening amendments. Several major barriers impede the adoption of improved energy codes, including: uncertainty around cost implications for builders, homeowners and commercial property owners;<sup>7</sup> lack of understanding of the energy savings potential of increasing efficient codes;<sup>8</sup> and poor understanding of the connection between the built environment and societal benefits, such as improved health and productivity.

## STATE GOVERNMENT POLICY BARRIERS

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### ENERGY EFFICIENCY RESOURCE STANDARDS

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<sup>6</sup> <https://betterbuildingssolutioncenter.energy.gov/better-plants/partner-list>

<sup>7</sup> U.S. DOE found that incremental costs of building homes to the 2012 IECC in VA would be quickly repaid by energy cost savings. For the typical Virginia home, the increase in mortgage costs is less than the utility bill savings. Codes improvements start paying back within the first year and homes with updated codes would produce net savings of \$5,836 over 30 years ([RECA](#)).

<sup>8</sup> Pacific Northwest National Laboratory recently published [a report](#) on the potential impacts of building energy codes adoption. They estimated that adopted codes would save consumers \$126 billion on energy bills and cut carbon emissions by more than 840 million metric tons from 2010-2040. For Virginia, PNNL calculated that updated building energy codes could reduce electricity consumption in Virginia by 1.37% in 2020, compared to a 2006 baseline.

Mandatory Energy Efficiency Resource Standards (EERS) are established by a legislative or regulatory body and require utilities to meet a certain amount of their future demand through customer energy efficiency programs, usually a percentage of energy sales. A 2015 review of state EERS policies, determined that states with an EERS were achieving average annual savings of 1.2% of retail sales vs. 0.3% for states without an EERS (Berg, 2017). Though Virginia has established a statutory 10% savings goal, Virginia does not mandate that utilities save a certain amount of retail sales annually. There are no penalties for utilities, state agencies, or regulators that fail to meet this goal, and so the goal is considered voluntary rather than a state resource standard (Code of Virginia, 2007).

## BENCHMARKING & UTILITY DATA ACCESS

Benchmarking is a foundational policy that stimulates demand for energy efficiency equipment and services through increased energy awareness. Benchmarking programs are typically implemented by local governments, who require large energy users (often buildings over 25-50,000 ft<sup>2</sup>) to submit an annual or semiannual report of monthly energy consumption. Because Virginia operates under Dillon Rule, local governments may not implement this kind of statutory program without express authorization by the state legislature. As of the writing of this report, Virginia state statute does not allow localities to implement mandatory benchmarking and disclosure policies for commercial and/or residential buildings, nor is there a policy in place that requires utilities to release energy data to customers or third parties.

### UTILITY DATA ACCESS: WHAT IS IT AND WHY IS IT IMPORTANT?

Data is changing the way that all industries operate, and utilities are no exception. Increased automation and granularity in customer usage data, customer demand for understanding their consumption patterns, and the emerging prevalence of third party services that seek to help customers manage and reduce energy use are all changing the way that utilities collect, manage and transmit data. Benchmarking programs, which require large commercial and industrial properties to submit annual energy use data to a local jurisdiction, rely on the availability of that data to be obtained by the property owner. Particularly for properties with more than one tenant, utilities have expressed a concern that the release of utility data for tenants may infringe upon customer privacy. In the case that a local jurisdiction contracts with a third-party for the analysis and management of data received, there is an additional concern of keeping customer data secure and private. Regulators, utilities, and local governments must work together to establish solutions that protect customer privacy, while allowing access to data for local governments and verified third parties to identify energy savings opportunities.

## OVERCOMING BARRIERS

### GOVERNOR'S EXECUTIVE COMMITTEE ON ENERGY EFFICIENCY

To address barriers to energy efficiency in the Commonwealth and develop a strategic path towards reaching the 10% energy conservation goal, Governor Terry McAuliffe created the Governor's Executive Committee on Energy Efficiency (GEC). This body was directed to determine the appropriate metric to track progress towards the goal, monitor Virginia's progress towards the goal, and develop recommendations to move Virginia closer to achieving a 10% reduction in retail electricity consumption. The GEC consists of stakeholders from state and local government, utilities, academia, and the energy services sector, including energy efficiency advocates and practitioners. The Virginia Energy Efficiency Roadmap team supports this group by providing technical and administrative assistance.

In October 2015, the GEC developed a set of six recommendations to further the state of energy efficiency in the Commonwealth. The chart below details those recommendations and provides an update on how those recommendations have been implemented to date. The GEC recommendations remain in place and constitute a portion of the "roadmap" for future implementation.

GEC RECOMMENDATION	PROGRESS AS OF DECEMBER 2017
1. Develop a process to compile detailed data identifying electric consumption reductions realized from energy efficiency programs, both utility and non-utility.	The Roadmap team developed a process of mapping energy consumption and changes against particular facilities. The current state of utility metering and consumer data collection, however, has so far limited the ability to attribute energy consumption to uses below the level of metered "accounts," which do not correlate closely to buildings or end-uses.
2. Conduct outreach to local governments about the value of replacing lighting to reduce consumption. (This GEC recommendation has been interpreted broadly to extend to efficiency measures in addition to lighting.)	VAEEC has been actively looking for solutions that serve its local government members and educate them about many energy efficiency topics, including lighting replacements. In 2017, VAEEC was instrumental in assisting with the formation of the new Virginia Energy and Sustainability Peer Network, a local government led affiliate group of the Urban Sustainability Director's Network. VAEEC continues to administer outreach to local



	governments, with assistance from DMME, on energy efficiency topics. Most recently, VAEEC and DMME have been working together to reach out to local governments on the value of PACE through the Mid-Atlantic PACE Alliance.
3. Develop a single-brand strategy for the marketing, education, and outreach of all energy efficiency programs and information, both utility and non-utility.	The SCC launched <a href="#">Virginia Energy Sense</a> , a campaign aimed to get residents, businesses, local governments, schools, and industrial customers to “take the 10% challenge” and pledge to reduce their energy consumption by 2020. Virginia Energy Sense also seeks to help utility customers understand their power bill, take easy steps to reduce energy use, and find out about utility rebates and other programs that provide incentives for energy use reduction.
4. Recognize champions of energy efficiency and showcase successful energy efficiency projects.	VAEEC has hosted two annual award ceremonies for energy efficiency champions, which recognize outstanding projects and programs in six categories: academic, commercial, local government, low-income, residential, and state government. VAEEC received more than 45 nominations for its last award ceremony, in November 2017. <sup>9</sup>
5. Support enabling legislation to allow localities the option of requiring the commercial sector to report energy benchmarking data.	In September 2016, DMME hosted a “Retreat on Fostering a Market for Energy Efficiency by Disclosing Commercial Energy Use.” This retreat was sponsored through funding awarded by the National Governors Association, and was intended to provide information and resources for key decision makers about national best practices for utility data access and benchmarking programs. In 2017, DMME led a stakeholder working group to work through key concerns regarding utility data access and to assist in drafting legislation that would allow localities to implement mandatory commercial benchmarking programs.
6. Develop special curriculum to be used in schools to educate students about energy efficiency.	The Virginia Energy Sense (VES) program sponsored by the SCC is developing or revamping 3 <sup>rd</sup> / 4 <sup>th</sup> grade material that will correspond to the

<sup>9</sup> For more information and to learn about 2017’s winners, visit <http://vaeec.org/vaeec-honors-leaders-innovators-including-governor-mcauliffe-virginia-energy-efficiency-leadership-awards/>

	4 <sup>th</sup> grade SOL. VES plans to complete this work by the beginning of the 2018 school year. Curricula and other education materials developed by VES are available to investor owned utilities and cooperatives, which respond to frequent requests for classroom presentations.
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## VIRGINIA ENERGY PLAN

The first Virginia Energy Plan after re-regulation was published in 2007. The 2007 VEP was a comprehensive 10-year plan developed by DMME to outline pathways forward to ensure the reliable delivery of energy to a growing number of consumers, maintain reasonable rates, and encourage the use of energy efficiency and conservation. As required by legislation, the VEP has been updated incrementally, most recently in 2016.

VIRGINIA ENERGY PLAN (2007)	
Goals	<ul style="list-style-type: none"> <li>• Reduce by 40%the rate of growth in energy use that it would see without the Plan’s recommended efficiency and conservation actions.</li> <li>• Increase consumer education about energy use and conservation.</li> </ul>
Recommendations	<ul style="list-style-type: none"> <li>• Virginia should increase incentives for consumer energy efficiency by expanding tax benefits for consumer investments.</li> <li>• Virginia’s utilities should sponsor or offer efficiency and conservation programs for their customers.</li> <li>• Virginia should expand support for programs that help low-income Virginians reduce their energy use.</li> <li>• Virginia should implement an expanded energy education program.</li> <li>• Virginia should implement policies to improve the energy efficiency of its building stock.</li> <li>• Virginia should support efforts by its industrial and commercial sectors to improve the efficiency of their operations.</li> <li>• Virginia should support deployment of new energy-conservation technologies.</li> <li>• Local governments should establish policies to increase the energy efficiency of their citizens.</li> <li>• Government should lead by example and implement all cost-effective conservation opportunities.</li> <li>• Individual consumers should make day-to-day and long-term lifestyle choices that save energy.</li> <li>• Commercial businesses, manufacturers, and agricultural and forestry operations should give priority to energy-efficiency and conservation actions.</li> </ul>

	<ul style="list-style-type: none"> <li>• Virginians should increase the energy efficiency of fleets and transportation systems.</li> <li>• Virginia's higher education institutions should expand efforts to use energy wisely and train the next generation of leaders about energy.</li> </ul>
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The 2014 Virginia Energy Plan established the Governor's Executive Committee on Energy Efficiency (GEC) and the first-ever Chief Energy Efficiency Officer, a new position in the Administration that focused on furthering public agency energy efficiency.

VIRGINIA ENERGY PLAN (2014)	
Goals	<ul style="list-style-type: none"> <li>• Establish the Governor's Executive Committee on Energy Efficiency (GEC).</li> <li>• Establish the Chief Energy Efficiency Officer.</li> <li>• Streamline and standardize the Energy Performance Contracting (EPC) process by developing a comprehensive guide for all stakeholders.</li> </ul>
Recommendations	<ul style="list-style-type: none"> <li>• Creation of Virginia Energy Sense, an informational resource where consumers can learn how to save energy and lower bills.</li> <li>• An Energy Star appliance sales tax holiday over the Columbus Day weekend in October.</li> <li>• \$600 million in energy efficiency improvements made to State government facilities.</li> <li>• Authorization for local governments to provide property tax and other incentives for Energy Star buildings; buildings with green roofs and solar energy systems.</li> <li>• Property Assessed Clean Energy (PACE) or support for Home Performance with Energy Star programs.</li> <li>• The passing of S. 1416, in 2007, which allows utilities to recover the projected and actual costs of designing, implementing, and operating efficiency programs, subject to SCC approval (if found to be in the public interest).</li> </ul>

The 2016 Update to the Virginia Energy Plan highlighted areas of achievement, as well as areas still in need of improvement. As of the writing of the 2016 Update, Virginia had achieved 38% of the 15% public agency energy savings goal through energy performance contracting and was significantly behind the pace needed to achieve the 10% statewide goal by 2020. The 2016 Update noted that there are likely substantial savings from non-utility programs that have not

yet been identified and quantified, which may contribute to greater energy savings achievement though not sufficient to reach the stated goal of saving 10.67 million MWh.

VIRGINIA ENERGY PLAN (2016)	
Updates	<ul style="list-style-type: none"> <li>• DMME awarded \$300,000 grant from U.S. Department of Energy to develop a Roadmap to achieve the 10% goal.</li> <li>• DMME awarded \$500,000 to advance energy efficiency financing for private sector clean energy investments through Commercial Property Assessed Clean Energy (C-PACE).</li> <li>• Establishment of a statewide Green Communities Program, funded by Qualified Energy Conservation Bonds (QECBs); \$28.9 million allocated or reserved in 2016, another \$65.9 million in project pipeline.</li> <li>• Dominion pilot programs to expand EnergyShare weatherization program to help multifamily and veterans.</li> <li>• Appalachian Power piloted one multi-family project to understand impacts and cost-effectiveness for future programs.</li> </ul>

#### THE VIRGINIA ENERGY EFFICIENCY ROADMAP

The Virginia Energy Efficiency Roadmap team was established in January 2015, when DMME was awarded \$300,000 from the U.S. Department of Energy to support the GEC and develop a strategic plan for the Commonwealth to meet the 10% goal.

One of the first questions addressed by the team was exactly how the “10% goal” should be defined and measured, since a number of ambiguities can creep into what gets counted and how. Given a Goal to “reduce FY 2020 electricity consumption in Virginia commercial and residential buildings by an amount equal to 10% of 2006 consumption,” several terms had to be first defined:

#### DEFINITIONS

*“Reduce”* – actions taken by administrative, legislative, regulatory, utility, and program managers, through energy efficiency (EE) implementation, to minimize the consumption of electrical energy required to meet consumer needs. The impact of such actions cannot be measured by metering 2020 consumption, because of the many variables beyond the EE managers’ control. The level of economic activity and other exogenous factors “swamp” the

measurement of whether the target has been met. Metered totals in 2020 may be much higher than in 2006 despite proven reductions of 10% or more; or may be much lower despite failure to achieve 10% reductions. Therefore the determination of performance against the Target is defined as the total avoided 2020 electricity consumption that can be verifiably attributed to EE programs over the 2007-2020 period.

*“Electricity consumption”* -- total kWh sales to Virginia residential, commercial, industrial and transportation end-use consumers by all distribution utilities allowed to make retail electricity sales in VA (IOUs, municipal, and cooperatives), regardless of the source of generation, and whether sold on the basis of tariffs or contracts.

*Eligibility of measurable reductions (proven savings):*

- All proven avoided consumption from EE actions, using M&V protocols approved by DMME and/or the SCC, will be eligible, based on those actions’ cumulative impact on target-year consumption. (See “Computing cumulative impact” section below.) The impacts of ESPC-funded and ratepayer-funded (utility) programs are regularly measured using well-established M&V protocols. Substantial customer- or contractor-initiated projects may be included if they can prove their savings. The results of other programs, such as public education, new financing or incentives, may be included if well-credentialed data on their proven impacts can be shown applicable to the Virginia case. Care must be taken to avoid double-counting.
- No credit will be given for Combined Heat and Power (which reduces total emissions but not electric consumption), demand reductions (which reduce peak load but not total consumption), or fuel switching.

*Computing cumulative energy efficiency impact:*

- *Single-accumulation.* EE programs implemented by utilities, performance contractors, and others who measure and verify their savings have a cumulative effect on total consumption for the weighted-average lifetimes of the included projects. Lighting or HVAC retrofits/replacements, for example, typically reduce consumption for 10 to 20 years. Thus the avoided consumption (“savings”) for the year 2009, for example, would be the sum of the annual incremental impacts of projects implemented in 2007, 2008, and 2009, since they all produce savings beyond their date of installation. That will be the calculation for the Roadmap Project at the end of 2020, starting with 2007 projects. This is not the same as summing all the cumulative savings over all past years, as described in the “double-accumulation” case below.

- *Double-accumulation.* When computing avoided emissions over a period of years, one must sum the cumulative impacts of each year as described above, rather than taking just the final cumulative number. In the above example, *total* emission reductions by the end of 2009 would include the impact of 2007 projects plus the cumulative impacts of projects still in effect in 2008, plus the cumulative impacts of projects still in effect in 2009. That is because one is looking for the total reduction in atmospheric pollution from all extant emission reductions, not just the reductions during the final year. The “double accumulation” computation would give a valid answer to the question “what is the total of all savings over all the past years?” – but it is not valid when computing any single year’s avoided energy consumption (as in the Roadmap case).
- *Zero-accumulation.* Some interventions have only an immediate impact and their savings are not cumulative at all. This would be true of short-lifetime measures, or behavioral changes that last only a season, or a temporary absence of an energy-consuming tenant, for example.

#### DEVELOPING RECOMMENDATIONS

The Roadmap Team next developed a set of recommendations across six policy categories that will achieve significant energy savings across the Commonwealth (although they are unlikely to achieve the 10% goal by 2020, due to persistent policy barriers and the foundational nature of many recommendations, which will enable long-term energy savings but assume a number of years for program ramp-up.)

To identify these recommendations and help set an agenda for future gains, the team developed a matrix of policy and program criteria likely to influence the efficacy and feasibility of each recommendation. A summary of criteria is presented below. This exercise led the Roadmap team to develop a diverse mix of recommendations which incorporate varying degrees of government involvement, cost, and time needed to achieve savings. These recommendations are organized into two broad categories: near-term recommendations, which will affect significant savings by 2020, and long-term recommendations, which would be likely to achieve the 10% goal within five to ten years if implemented.

## SUMMARY OF POLICY AND PROGRAM CRITERIA

<b>Basic Information</b>	<ul style="list-style-type: none"><li>• What is the lead implementing organization?</li><li>• Does this already exist in some form? Is it an expansion of an existing policy or program or is it a new creation?</li><li>• How is it funded?</li><li>• What is the target sector? (Residential, Commercial, Industrial)</li><li>• What is the status of this in the state or locality? Is it supported by elected officials and other decision makers?</li></ul>
<b>Barriers &amp; Prerequisites</b>	<ul style="list-style-type: none"><li>• Is legislative action required?</li><li>• Is State Corporation Commission action required?</li><li>• How is cost-effectiveness determined?</li><li>• What are the costs and who pays those costs?</li><li>• What is a reasonable timeline for implementation?</li></ul>
<b>Impact &amp; Criteria</b>	<ul style="list-style-type: none"><li>• What is the potential impact? (High, Medium, Low)</li><li>• What are the MWh savings potential in 2020? How do those stack up to the target goal?</li></ul>

## THE ROADMAP: RECOMMENDATIONS TO ACHIEVE SIGNIFICANT ENERGY SAVINGS IN THE COMMONWEALTH

### RECOMMENDATION #1: UPDATE STATEWIDE BUILDING ENERGY CODES TO REFLECT CURRENT TECHNOLOGY AND NATIONAL STANDARDS.

#### BACKGROUND

Energy codes set the “floor” for efficiency in new construction and renovations in both residential and commercial buildings. Strong energy codes have been adopted across the Southeast and throughout the country as a consistent baseline that puts control in the hands of local industry and businesses, helps create inherently local jobs and frees up ratepayer dollars for reinvestment in the local economy.

Energy codes are also an important tool for accessing federal resources. Both the U.S. Department of Housing and Urban Development (HUD) and Department of Agriculture (USDA) are currently enforcing the 2009 IECC and ASHRAE 90.1-2007 as the minimum standards for new construction of certain single-family and multi-family HOME and FHA-insured properties, and USDA-guaranteed single-family homes. However, indications are

that both agencies are considering moving to a more recent code as a threshold, which could impact the availability of federal financing in states that do not meet this standard.<sup>10</sup>

Studies completed in Georgia and Arkansas, among other states, indicate that on average homebuilders are performing well against current energy codes, due in part to effective training and technical assistance offered within those states.

If Virginia adopted the current energy codes (2015 IECC and ASHRAE 90.1-2013) without weakening amendments in this code change cycle, Virginia could expect to save 1.458 million MWh in 2020, equal to 1.37% of the 10% goal. Cost savings are estimated to be at least \$5,500 per home over the lifetime of measures installed under the 2012 and 2015 energy codes.<sup>11</sup>

#### CURRENT STATUS IN VIRGINIA

The current building energy code in Virginia is the 2012 IECC with state-specific amendments: Residential buildings must comply with the residential provisions of the 2012 IECC, however, technical amendments were made to the residential energy code requirements (e.g. removing required performance testing) and no significant improvements were adopted, rendering the residential code equivalent to the 2009 IECC.

#### SPECIFIC RECOMMENDATIONS

- 1) *Virginia should update its residential and commercial energy codes to the 2015 IECC and ASHRAE 90.1-2013*** to bring them closer to other statewide code standards and allow residents and businesses to tap into the savings from more efficient homes and buildings.
  
- 2) *Virginia should consider the development of a state code collaborative***, or an expanded stakeholder process to inform the future adoption and implementation of

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<sup>10</sup> HUD and USDA are statutorily required to jointly adopt the most recently-published energy codes subject to a cost-benefit housing test. See [http://portal.hud.gov/hudportal/documents/huddoc?id=Backgrnd\\_HUDUSDA\\_EESt.pdf](http://portal.hud.gov/hudportal/documents/huddoc?id=Backgrnd_HUDUSDA_EESt.pdf)

<sup>11</sup> The 2020 energy savings estimate is partially based on a state-by-state study performed by Pacific Northwest National Laboratory (PNNL). Our estimate assumes adoption of the 2015 IECC without amendments and a 67% compliance rate.



energy codes in Virginia. This could be accomplished through legislation or informally through a state agency.

#### EXAMPLES

Numerous southeastern states have recently adopted, or are in the process of adopting, new codes that exceed the 2009 IECC and ASHRAE Standard 90.1-2007. Currently, Alabama, Florida and Kentucky have adopted codes that exceed this threshold, while Georgia and North Carolina are in the process of updating their codes to levels at or beyond the 2012 code.

In addition, a number of southeastern states have robust and diverse stakeholder groups to assist in the energy code adoption process. Leaders in this space include both Georgia and North Carolina.

#### FEASIBILITY FOR VIRGINIA

Feasibility is low for the current code change cycle. As it stands, it is unlikely that the Board of Housing and Community Development will adopt the full 2015 energy codes without weakening amendments. There is strong opposition to the model energy codes from building contractors, who are unsure of how new requirements will impact costs. The next code change cycle may present opportunities for stakeholder education and collaboration to move Virginia closer to model codes.

**RECOMMENDATION #2: ESTABLISH STRONG EVALUATION, MEASUREMENT, AND VERIFICATION (EM&V) PROTOCOLS THAT ACCURATELY VALUE ENERGY EFFICIENCY.**

#### BACKGROUND

In Virginia, there are no established regulatory protocols for gas and electric utilities to perform EM&V. Evaluation, Measurement and Verification demonstrates the value of energy efficiency programs by providing accurate, transparent and consistent assessments of their methods and performance.

While EM&V protocols do not result in directly attributable savings, EM&V does directly affect the perceived viability and reach of utility energy efficiency programs, which do result in quantifiable energy and cost savings for consumers.

## CURRENT STATUS IN VIRGINIA

Pursuant to [Chapters 255](#) and [517](#) of the 2016 Acts of the Virginia General Assembly, the SCC was charged with conducting a proceeding to evaluate the establishment of uniform protocols for EM&V, a methodology for estimating annual kilowatt savings, and a formula to calculate the levelized cost of saved energy (LCOSE) for utility energy efficiency measures. The SCC was also required to hold a docketed proceeding and to submit findings and recommendations to the Governor and General Assembly by December 2016. Many groups, including several Roadmap members, submitted comments on how to proceed with documenting and measuring the impacts of an energy efficiency program.

In December 2016, SCC directed staff to “draft proposed EM&V regulations of general applicability to both electric and natural gas utilities, incorporating Virginia-specific data where possible.” The SCC declined to adopt a Virginia-specific Technical Resource Manual (TRM), a database or report that contains information on the typical energy savings associated with energy efficiency measures for an entire state or region, and helps regulators consistently and efficaciously perform EM&V. Additionally, as of summer 2017, the SCC declined to establish a separate formula to calculate a LCOSE for energy efficiency measures, nor were they inclined to further standardize the application of cost-benefit tests. They did note, however, that “Utilities are encouraged to consider use of emerging technologies, including, but not limited to, ‘advanced measurement and verification’ or ‘evaluation, measurement and verification 2.0’ when appropriate and cost effective,” which had been urged in comments by several Team members.

## SPECIFIC RECOMMENDATIONS

### ***#1) Establish a stakeholder collaborative process to provide guidance and technical assistance around the establishment of EM&V protocols.***

The SCC is currently considering, in a docketed proceeding, “EM&V regulations of general applicability... incorporating Virginia-specific data where possible.” Convening a stakeholder group would encourage enhancements to the proposed EM&V regulations, while simultaneously aligning the protocols with the current and future energy objectives and goals of the Commonwealth. Poorly developed EM&V regulations run the risk of imposing duplicative and burdensome requirements on utilities, which would add unnecessarily to administrative program costs, frustrate program development, and

make it more difficult for good programs to make it through to implementation. A stakeholder group of interested technical experts from the utilities and other stakeholders should meet regularly under this recommendation to address these potential problems and to consider the establishment of best practices of EM&V in the State.

***#2) Adopt national best practices for EM&V to enable more results-oriented and wider-reaching utility energy efficiency programs.***

EM&V national best practices are iterative and ever evolving. Many states have adopted stakeholder groups that are dedicated to reviewing well-established or trending national best practices of EM&V, and recommending changes to a state's adopted protocols. In Virginia, a stakeholder group could discuss the impacts of adopting nationally recognized best practices of EM&V, such as the U.S. Department of Energy's Uniform Methods Project<sup>12</sup> or the Efficiency Valuation Organization's International Performance Measurement and Verification Protocol. In addition, this stakeholder group could discuss and potentially develop a Technical Resource Manual, which has benefited many states. While this effort might be considered by some as costly or time consuming, the results can produce increased transparency and improved results, while also reducing costs from energy efficiency program evaluation for both ratepayers and utilities. Some states have also empowered their stakeholder groups to explore how EM&V fits into newly conceptualized energy efficiency programs. For example, efficiency investments in underserved sectors like low-income households and multifamily buildings have been gaining national traction. A stakeholder group could discuss national best practices for energy efficiency programs to serve these communities and its impact on ratepayers and utilities, such as those collected by the State and Local Energy Efficiency Action Network in its EM&V Resource Portal.

***#3) Adopt nationally recognized cost-effectiveness testing for energy efficiency programs.***

Utility energy efficiency programs in Virginia are evaluated on both an individual and portfolio basis, using four out of five California Standards Practice Manual tests that screen programs for costs and benefits: Total Resource Cost (TRC), Utility Cost Test (UCT), Participant Cost Test (PCT), and the Ratepayer Impact Measure (RIM). In 2012, Virginia adopted a policy that prohibits any program from being rejected on the basis of one cost-effectiveness test alone; however the primary test used in Virginia has historically been the RIM test, which is the only test that takes into account lost utility revenues as a program cost. The Societal Cost Test (SCT) is the only test not used in

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<sup>12</sup> <https://www4.eere.energy.gov/seeaction/evaluation-measurement-and-verification-resource-portal>

Virginia and is also the only test that includes non-energy benefits (NEBs) for participants and society. If a stakeholder group is established in Virginia, this group should discuss national best practices for cost-effectiveness testing, such as the new National Standard Practice Manual (NSPM), which is published by the National Efficiency Screening Project. The NSPM provides a comprehensive framework for cost-effectiveness assessment of energy resources, with a focus on energy efficiency.

#### EXAMPLES

Arkansas Public Service Commission (APSC) convened a stakeholder working group consisting of APSC staff, utilities, the Arkansas Attorney General, the Arkansas Community Action Agencies Association, the Arkansas Advanced Energy Association, Inc., Walmart, consumer advocacy groups, and environmental organizations. Similarly, the state of Illinois has maintained a similar group since 2008, titled the Illinois Energy Efficiency Stakeholder Advisory Group. South Carolina also has an advisory group, which was established by Commission order to review and improve EM&V plans for South Carolina Electric and Gas.

#### FEASIBILITY FOR VIRGINIA

Medium difficulty. The renewed interest in assessing the uniformity and efficacy of EM&V protocols in the Commonwealth represents an opportunity for increased stakeholder involvement. Many members of the Roadmap team have submitted comments in support of adopting national best practices in EM&V. Some recommendations were well received, such as data-driven EM&V (or EM&V 2.0), but others were rejected, such as the recommendation to establish a Virginia Technical Resource Manual (TRM). The Roadmap team hopes that further stakeholder collaboration will be possible.

**RECOMMENDATION #3: ESTABLISH MANDATORY LONG-TERM AND STEADILY INCREASING UTILITY ENERGY SAVINGS TARGETS BEGINNING IN 2018.**

#### BACKGROUND

Often called an energy efficiency resource standard, mandatory long-term, steadily increasing utility energy savings targets are in place in twenty-six states for electric utilities and in sixteen states for natural gas utilities (ACEEE, 2017b). These targets

require utilities and some non-utility program administrators to meet specific energy savings goals through customer energy efficiency programs. These policies lay the groundwork and establish a regulatory requirement for sustained and large-scale investment in energy efficiency, thus providing for a least-cost and least-risk electricity system capable of meeting growing energy needs. Utility energy savings targets, established alongside cost recovery mechanisms, provide a transparent policy structure and regulatory certainty for utilities to deliver cost-effective energy efficiency resources to their customers.

If Virginia were to adopt an EERS as described in specific recommendation 2 (below), ACEEE estimates that the state could expect to achieve annual savings of 561,000 MWh in 2020. By 2030, the state could expect to reach annual savings of 1.745 million MWh and cumulative savings of 10.937 million MWh. The State and Local Energy Efficiency Action Network has published a guide for states on setting energy savings targets.<sup>13</sup>

#### CURRENT STATUS IN VIRGINIA

Virginia currently has a voluntary energy savings target in place, however, due to a variety of factors, this has not driven all cost-effective energy efficiency.

#### SPECIFIC RECOMMENDATIONS

- 1) ***Draft and move legislation through the General Assembly that establishes long-term, steadily increasing energy savings targets. Alternatively, promote legislation that both grants the SCC authority and directs the SCC to establish such targets by a set date.***

The legislation would either lay out specific targets and required dates to meet those targets or it would lay out a timetable for the SCC to request stakeholder input on the establishment of energy efficiency targets and related topics, including but not limited to: utility cost recovery and performance EM&V; cost-effectiveness; and program planning and design. The legislation would also lay out a timeline and deadline by which the commission must implement the targets (as described next).

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<sup>13</sup> <https://www4.eere.energy.gov/seeaction//publication/setting-energy-savings-targets-utilities>

- 1) ***Enact the first mandatory targets in 2018 and 2019 for 0.25% incremental annual savings per year,<sup>14</sup> increasing to 0.5% per year in 2020 and 2021, 0.75% per year in 2022 and 2023, 1% per year in 2024, 2025, and 2026, 1.25% in 2027, 2028, and 2029, and 1.5% in 2030, 2031 and 2032.***

This schedule is a practical and reasonable timetable for utility energy savings targets in Virginia. Research demonstrates that ramping up to 1.5% over several years is feasible and has been accomplished by utilities in many jurisdictions (Baatz and Barigye, 2016). Average energy savings target ramp rates (the change in savings as a percentage of retail sales from one year to another) of 0.25%-0.5% per year are feasible.<sup>15</sup> The schedule set out here is more conservative, allowing two-year time periods to ramp up 0.25% to a higher savings target.

- 2) ***Establish stakeholder forums to assist in strategic planning and address ongoing evolution of energy efficiency programs, and work with investor-owned utilities to develop effective ratepayer programs under new EM&V protocols.***

Stakeholder forums or collaboratives are a common and best practice approach to work through the numerous topics related to implementation and evaluation of utility energy efficiency programs (Li and Bryson, 2015).

## EXAMPLES

**Maryland.** In 2008, the Maryland legislature enacted the EmPOWER Maryland Energy Efficiency Act, creating an EERS that set a statewide goal of reducing per capita electricity use by 15% by 2015 (Order No. 82344). On a per capita basis, the Maryland electric utilities and cooperatives as a whole met the 10% reduction goal for energy use. Since then, electric utilities have significantly expanded their energy efficiency program portfolios. The PSC issued new EmPOWER targets with Order 87082 in July 2015. The order required utilities to achieve savings of 2% per year by ramping up incremental savings at a rate of 0.2% per year beginning in 2016. In 2017, the legislature passed SB 184, which codified the 2% energy savings goal into law through 2023. Utilities must file their energy efficiency program plans with the Public Service Commission, which then

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<sup>14</sup> Calculated as a percent of the rolling average estimated consumption of all sectors for the three years prior to each estimate.

<sup>15</sup> In Arkansas, for example, IOUs have been ramping up at 0.25% annual under its targets (as shown in <http://seealliance.org/wp-content/uploads/Resource-Paper-2-Ramp-up-Rates-FINAL.pdf>). Also, Baatz et al. 2016 reviewed the results of 14 EE program administrators over several years and found an average annual ramp rate of about 0.2% each year, and that in almost 20% of the program years, savings as a percentage of sales increased by 0.5% from one year to the next.

must approve the plans. These plans are filed every three years for three-year program cycles.

**Arkansas.** In December 2010, the Arkansas Public Service Commission (PSC) adopted an [energy efficiency resource standard](#) (see [Docket No. 08-144-U](#)). The targets set by the PSC were moderate, rising from a yearly reduction of 0.25% of total electric [kilowatt](#) hour ([kwh](#)) sales in 2011, to 0.5% in 2012, and 0.75% in 2013. Natural gas targets were 0.2% in 2011, 0.3% in 2012, and 0.4% in 2013. For 2014, the PSC directed program administrators to use the energy savings targets, budgets, and the incentive structure previously approved for Program Year 2013 (unless program administrators seek to make modifications to program plans for approval by the PSC). In September 2013, the PSC issued an [order](#) setting an electricity savings target of 0.9% and a natural gas savings target of 0.6% for 2015. These targets were extended through 2016. In December 2015, the PSC issued an [order](#) extending the 0.9% electricity savings target through 2018, ramping up to 1.00% in 2019, with a natural gas savings target of 0.5% for 2017-2019.

#### FEASIBILITY FOR VIRGINIA

Low. Legislation to establish a Virginia Energy Efficiency Resource Standard has failed repeatedly in recent years. The State Corporation Commission has been reluctant to approve utility efficiency programs at anywhere near the scale and scope required to achieve 1.5% annual savings.

RECOMMENDATION #4: ACCELERATE DEVELOPMENT OF COMMERCIAL PROPERTY ASSESSED CLEAN ENERGY (C-PACE) PROGRAMS IN VIRGINIA AND CONSIDER THE FEASIBILITY OF RESIDENTIAL PACE (R-PACE).

#### BACKGROUND

Property Assessed Clean Energy financing provides affordable, long-term capital for commercial and residential property owners to pay for energy efficiency, renewable energy, and water conservation improvements on their properties. Other benefits include: no upfront costs -- 100% of project costs can be financed -- and the assessment is attached to the property -- not the building owner—when it is sold.

PACE allows property owners to finance these improvements over longer terms (up to 30 years), which provides for deeper energy savings and lower payments than typical

property improvement loans. Repayments are made through property tax bills, which assures lenders that payments will be collected. PACE is enabled at the state level through legislation, then codified at the local level by ordinance and subsequent establishment of a program. PACE programs are typically operated by private or non-profit third party program administrators (exceptions are “green banks” such as in Connecticut). PACE financing is primarily provided by private lenders and programs can be structured to be relatively low-cost to local governments. For example, program administrators may be compensated through origination and servicing fees.

#### CURRENT STATUS IN VIRGINIA

Commercial PACE (C-PACE) was enabled in Virginia pursuant to [Chapter 389](#) of the 2015 Acts of Assembly. In 2016, DMME received a \$500,000 grant from the U.S. Department of Energy’s State Energy Program to advance C-PACE financing in Virginia, Maryland, and the District of Columbia through formation of the [Mid-Atlantic PACE Alliance](#) (MAPA). The Alliance focuses on coordination between program sponsors, administrators and other stakeholders to promote a harmonized regional market. Another key element of MAPA is to facilitate consistent program practices among existing C-PACE programs to provide for a larger, seamless regional market that will attract property owners and lenders at scale.

Arlington County has procured a third party C-PACE program administrator and expects to launch the first C-PACE program in Virginia in early 2018. Several jurisdictions in Virginia are considering C-PACE programs and one possible mechanism for these localities is to “ride” Arlington’s contract through cooperative procurement. Local governments could also decide to competitively procure an administrator and establish a program structure more suited to the needs of the local market.

A key policy question in supporting C-PACE program development in Virginia is whether a jurisdiction-by-jurisdiction (competitive free market) approach or some other model is optimal. In Maryland, for example, the legislature authorized the Maryland Clean Energy Center (MCEC) to act as a statewide C-PACE program sponsor in 2014. MCEC subsequently procured the services of a statewide PACE program administrator (PACE Financial Servicing). Counties in Maryland may now voluntarily “opt-in” to the standardized MD-PACE program, which greatly reduces the time and cost of enabling PACE. Other advantages of a statewide approach include: consistency in program administration and eligible measures from locality to locality, assistance to local governments in establishing a legal framework for PACE in their jurisdiction, and a single point of contact to assist with directing PACE loan repayments back to lenders. To date,



PACE is enabled in 13 of the 25 counties in MD, with active negotiations taking place in five additional counties.

Residential PACE (R-PACE), serving primarily single family homes, condominiums, and buildings with up to four dwelling units, is not currently enabled in Virginia. R-PACE would take a large effort to scale in Virginia, including new legislative authority, and education and outreach to residential contractors, lenders and owners, but could have a significant impact on energy efficiency investments, energy savings, and job creation in the Commonwealth. Based upon its growth in the past two years in two large R-PACE enabled states (California and Florida) investment and savings in the R-PACE market could be ten times that of C-PACE. The R-PACE market is expected to surpass \$1 billion per year in 2018 in annual financing nationally. (Lawson, 2017)

#### SPECIFIC RECOMMENDATIONS

##### ***#1) Continue to build statewide support for C-PACE.***

Legislative context, and preliminary legal advice from the Virginia Office of the Attorney General, strongly support the contention that neither statewide program sponsorship nor administration were considered or authorized by the enabling statute in Virginia C-PACE programs. Consequently, new legislative authority might be necessary if it is determined that a statewide program is preferable to the free-market locality-by-locality approach. In the interim, while the optimal approach is evaluated and the C-PACE market matures, there are some low-cost options, such as continuation of the MAPA project after grant funding expires in 2019.

##### ***#2) DMME will continue to consider the potential impacts of Residential PACE.***

Analyze closely the ongoing experience in CA, FL, and Missouri. The District of Columbia may include R-PACE eligibility in the DC-PACE program in 2018. Because R-PACE projects are smaller in scope and can be developed and implemented more quickly than C-PACE projects, and customers are homeowners, strong consumer protection provisions are increasingly recognized as important components of R-PACE programs. The U.S. Department of Energy has published best practice guidelines<sup>16</sup> for residential PACE financing programs.

#### EXAMPLES

**Washington, D.C.** The [DC Commercial PACE](#) program has financed 16 projects worth \$34 million. DC has used PACE financing to fund energy saving improvements for small

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<sup>16</sup> <https://energy.gov/eere/slsc/downloads/updated-guidelines-residential-pace-financing-programs>

businesses, charter schools, non-profits, affordable and market rate multifamily housing, and recently, a new construction project for the D.C. United Audi Field stadium.

According to PACENation, 1,110 Commercial PACE projects worth \$510 million have been completed nationwide. These investments are expected to have created 7,650 jobs.

#### FEASIBILITY

High. The development of C-PACE programs is already in motion and the well-designed programs across the nation are seeing success in terms of cost-effective energy savings and job-creation. PACE is a locally-driven initiative that delivers multiple benefits to property owners and policy makers, and primarily utilizes private capital.

**RECOMMENDATION #5: ENABLE LOCALITIES TO REQUIRE MANDATORY COMMERCIAL BENCHMARKING AND PROMOTE POLICIES THAT ALLOW UTILITY DATA ACCESS FOR THIRD PARTIES.**

#### BACKGROUND

Benchmarking is a foundational policy that allows localities to require annual energy use reports from commercial buildings within their jurisdiction. The underlying purpose of commercial benchmarking programs is to raise awareness about energy consumption and to encourage investments in energy efficient upgrades. A study by the US Environmental Protection Agency showed that benchmarking energy use led to a 7% decrease in consumption across a sample of more than 35,000 buildings. (Energy Star, 2007) A Lawrence Berkeley National Lab (LBNL) review of state and local benchmarking and transparency studies found these requirements to correlate with a 3–8% reduction in gross energy consumption or energy use intensity over a two- to four-year period of policy implementation (Mims, et al., 2017).

#### CURRENT STATUS IN VIRGINIA

Localities are not currently authorized to enact mandatory commercial benchmarking policies. In September 2016, DMME secured funding and technical assistance from the National Governors Association to host a policy retreat focused on commercial benchmarking and utility data access and privacy.

## SPECIFIC RECOMMENDATIONS

***#1) Maintain support for a Data Access and Benchmarking work group to examine best practices of data access and privacy, and the potential impact of commercial benchmarking.***

DMME has recently established and is leading a working group to examine best practices of data access and privacy.<sup>17</sup> It consists of stakeholders from investor-owned utilities, electric cooperatives, commercial property owners, local and state government representatives, and energy efficiency groups. This working group met several times in 2017 in order to determine the best path forward for commercial benchmarking policies. The State and Local Energy Efficiency Action Network has published guides for states on data access and privacy considerations.<sup>18</sup>

***#2) Work with the Stakeholder Group and the Governor's office to draft legislation for consideration by the General Assembly in 2018 that would enable localities to establish mandatory benchmarking programs.***

This first meeting of the established working group was held on July 31, 2017. The working group learned about best practices on data access and privacy accomplished in other states and localities. The meetings included presentations from technical and industry experts on benchmarking, and addressed common concerns in order to develop a consensus on legislation. Once the important components are captured, DMME and the working group will make recommendations to the Governor's office, with one key end goal being legislation that can be introduced by the Governor of Virginia in 2018. The State and Local Energy Efficiency Action Network has published a policy design guide for benchmarking and disclosure.<sup>19</sup>

***#3) Maintain state funded technical assistance to assist localities in launching and operating commercial benchmarking programs.***

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<sup>17</sup> ACEEE maintains a toolkit on utility data access. It can be accessed at <http://aceee.org/sector/local-policy/toolkit/utility-data-access>.

<sup>18</sup> <https://www4.eere.energy.gov/seeaction//topic-category/energy-use-data-access>

<sup>19</sup> <https://www4.eere.energy.gov/seeaction//publication/benchmarking-and-disclosure-state-and-local-policy-design-guide-and-sample-policy>

## EXAMPLES

A number of cities have recently adopted commercial building energy benchmarking requirements in order to track energy performance and identify energy efficiency opportunities, including Atlanta, Orlando, and Kansas City.<sup>20</sup> In 2015 the City of Atlanta passed the Commercial Buildings Energy Efficiency Ordinance to require commercial buildings over 25,000 square feet to benchmark energy use. In 2020, the city expects this policy to save Atlanta businesses over \$100 million and create over 1,000 full-time jobs (Atlanta, 2015). More recently, in 2016, Orlando passed the Building Energy and Water Efficiency Strategy, requiring commercial and multifamily buildings over 50,000 square feet to disclose whole-building energy use to the city and real estate marketplace. Through another program called the Kilowatt Crackdown, Orlando also offers a voluntary energy and water benchmarking program to buildings excluded from this ordinance (Orlando, 2015). Additionally, Kansas City's 2015 Energy Empowerment Ordinance requires the owners of large municipal, commercial, and residential buildings (50,000 square feet and above) to annually report energy and water usage data to the city (Kansas City, 2015). By enabling cities to require commercial energy benchmarking, the Commonwealth will help businesses identify energy efficiency opportunities, reduce energy usage, and improve their bottom line.

## FEASIBILITY

Medium. There is extensive interest among Virginia's energy efficiency community and by several localities. However, barriers include antiquated utility energy data information management systems and concerns about protecting customer privacy.

**RECOMMENDATION #6: PROMOTE ENERGY SAVINGS PERFORMANCE CONTRACTS (ESPC) IN THE PUBLIC AND PRIVATE SECTORS.**

## BACKGROUND

Energy savings performance contracts (ESPCs)<sup>21</sup> are a special type of design-build construction in which an energy services company (ESCO) develops, designs, installs, and often operates and maintains energy and water conservation improvements for a

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<sup>20</sup> For a description of city-led benchmarking efforts, see ACEEE's State and Local Policy Database: [database.aceee.org/city/benchmarking-disclosure](https://database.aceee.org/city/benchmarking-disclosure)

<sup>21</sup> [https://energy.gov/sites/prod/files/2018/01/f46/FL1709\\_WIP\\_ESPC.PDF](https://energy.gov/sites/prod/files/2018/01/f46/FL1709_WIP_ESPC.PDF)

customer. The customer uses future avoided utility costs to pay off the original investment, plus financing and maintenance costs over the term of a contract. ESCOs provide a corporate guarantee that savings will be equal to or greater than the costs of financing. ESPCs allow state agencies and publicly owned facilities to make energy efficiency upgrades without affecting their capital budgets. Successful energy efficiency efforts in public buildings will not only save energy and preserve taxpayer dollars, but they may attract private-sector efficiency investment by demonstrating the feasibility of energy efficiency technologies and practices.

#### CURRENT STATUS IN VIRGINIA

DMME provides robust technical assistance to localities and state agencies that consider or implement ESPCs. The cumulative ESPC investment under the DMME program since 2001 through December 31, 2017 totals \$860 million, including about \$245 million in cash contributions by the public bodies that implemented the projects. Of that amount, about \$615 million was financed through avoided utility costs. Improved cash flow to agencies (and taxpayers), i.e., the net present value of avoided costs that exceeded debt service during and after repayment of loans, totals \$206 million.

Executive Order 31 (2014) directed all executive branch agencies, authorities, departments, and all institutions of higher education to reduce electricity consumption 15% by 2017, from a 2009-2010 baseline (approximately 156 million kWh) , and encouraged agencies that had not done so to implement energy savings performance contracts by 2016. About one-third of the 15% conservation goal (56.4 million kWh) was achieved, not in annual savings, but in projected total lifetime avoided consumption.

A promising path to expand ESPC financing to the private sector suffered a serious setback when federal tax reform legislation passed in December 2017 eliminated certain private activity tax advantaged bonds. The [VirginiaSAVES Green Community Program](#) used Qualified Energy Conservation Bond (QECB) allocation to provide \$58 million in low-interest financing to energy conservation projects in 2016 and 2017. Most of the projects were ESPCs in public and private schools. The federal tax reform legislation eliminated QECBs but preserved other private activity bonds.

#### SPECIFIC RECOMMENDATION

***Continue to expand and improve the DMME ESPC technical support program through development of an Energy Management Information System (EMIS), creation of new***

*tools to market and promote ESPC to public bodies and, through leadership by example, to spotlight the value of ESPC to private businesses.*

- *The low-cost EMIS that DMME began developing in 2017 will provide actionable data to inform a better understanding of current energy consumption patterns and trends. This will enable better targeting of ESPC resources to the highest energy consuming state agency properties, provide a tool to verify and publicly recognize the benefits of the ESPC program, and provide insights into best practices and benchmarking. Development of the EMIS will require continuing work with Virginia utilities to provide more accurate, timely and consistent energy usage data for state agency facilities. The U.S. Department of Energy’s recently completed Energy Data Management Guide (release expected in April 2018) could be a resource.*
- *DMME should maintain or expand ESPC staff (now about 2.5 FTE) and develop fact sheets, case studies, performance metrics and other web-accessible tools to raise awareness and promote ESPC to potential customers and key stakeholders, including elected and executive branch officials and other decision makers who can provide policy support and program funding. DOE’s ESPC Toolkit is a useful resource.<sup>22</sup>*
- *An incentive or recognition program for public facilities and ESPC “champions” would lead by example to spotlight the value of ESPC and energy conservation in general to private businesses. This program also could be leveraged by the C-PACE program. (See Page 40.)*

## EXAMPLES

### Virginia Department of Forensic Science

The Virginia Department of Forensic Science (DFS) completed an \$11,063,199 Phase I ESPC in November 2017. DFS maintains a laboratory system that serves all state and local law enforcement agencies, as well as medical examiners and attorneys. State budget reductions, Executive Order 31, and the energy intensive nature of operating a laboratory system factored into DFS’ decision to go forward with an ESPC. The contract included cooling and heating plant upgrades, air system upgrades, and water retrofit systems that resulted in verified annual electricity savings of 7,228,807 kWh as well as

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<sup>22</sup> <https://betterbuildingssolutioncenter.energy.gov/bbsc-redesign/energy-savings-performance-contracting-espc-toolkit>

natural gas and water savings. These energy savings translate into approximately \$1,000,000 in annual energy cost savings for the department.

DFS implemented a second phase ESPC in May 2014, which is expected to yield additional annual cost savings of approximately \$202,255. Overall, the project is expected to reduce energy consumption by 40% and result in annual cost savings of \$1.03 million.

### **Virginia Department of Motor Vehicles**

The Virginia Department of Motor Vehicles (DMV) entered into a \$6,909,076 ESPC in August 2012. Over the 17-year contract, which ends in January 2029, the agency expects to reduce energy consumption by 36% and achieve verified annual energy savings of 3,728,000 kWh, as well as natural gas and water savings equal to approximately \$339,000 in annual cost savings. The Virginia DMV used the ESPC to address aging infrastructure, better serve customers, improve working conditions, and enhance employee productivity. The project included boiler plant modifications, chilled water upgrades, controls, window improvements, and lighting retrofits.

#### **FEASIBILITY**

High. The ESPC program is in its 14th year with a proven record of success and there is greater potential for more ESPC projects as state agency facilities continue to age.

## **CONCLUSION AND NEXT STEPS**

### **BUILDING CODES**

Virginia is in the process of reviewing the 2015 IECC and expects to adopt a new Uniform Statewide Building Code (USBC) in early 2018. It is unlikely that Virginia will adopt the 2015 IECC without significant weakening amendments in the current cycle. The most likely outcome for the adopted codes will leave the energy codes in Virginia roughly two cycles behind the model codes (2018 IECC).

The current national building code development cycle will end in early 2018. After that, the three-year cycle begins again. For the next code evaluation and adoption cycle in Virginia, there will be opportunities for advocacy and stakeholder collaboration. Several major barriers impede the adoption of energy efficient codes: consistent and unified opposition from the homebuilder's associations, uncertainty around cost implications for builders; lack of understanding of the energy savings potential, and a poor understanding of the connection between the built environment and societal benefits, such as improved health and productivity. Advocacy and stakeholder engagement in the next cycle will provide opportunities to address these barriers.

To support the adoption, without amendment, of national model codes, Virginia could establish a task force that includes energy and construction industry representatives. In Massachusetts, one of the key drivers of change is the "Green Communities" program, established under the Green Communities Act. Any jurisdiction seeking to be a "Green Community" must adopt the 'stretch code'. A number of incentive programs are available to encourage the state's developers to go beyond minimum energy efficiency requirements, primarily through utility rebate and loan programs, and state incentives for renewable energy.

#### EVALUATION, MEASUREMENT, AND VERIFICATION (EM&V)

Evaluation, Measurement, and Verification are protocols that determine if investments into energy efficiency are performing as predicted by providing accurate, transparent, and consistent assessments of implementation and performance of energy efficiency projects, programs and portfolios of programs. In Virginia, utilities are required to annually submit EM&V reports on approved programs. However, the State Corporation Commission had not developed a set of protocols for utilities, so there was no consistency across programs or utilities.

The lack of consistency meant no threshold for determining if programs will be approved or not approved at the SCC, which arguably prevents utilities from seeking more aggressive energy efficiency programs. In 2016, the General Assembly encouraged the SCC through legislation to establish consistent EM&V protocols, and several organizations involved in the Roadmap project submitted comments in support of that. In a 2017 follow-up proceeding, the SCC adopted EM&V protocols of general applicability. Unfortunately, based on the public comments, additional effort is still needed by the General Assembly and the SCC to establish a clearer path for energy efficiency investments and programs by utilities, such as developing a Technical Resource Manual, re-evaluating cost-effectiveness testing, or including the U.S. Department of Energy's Uniform Methods Project as an appropriate resource for EM&V testing.



With greater consistency and perceived accuracy of energy savings results, any energy efficiency program or energy conservation measure installation that demonstrates least cost, either for utility or retail consumer, is more likely to be implemented. Financial attributes (carbon credits, etc.) are more likely to be monetized if savings estimates are credible and verifiable.

#### UTILITY SAVINGS TARGETS

Utility savings targets are a policy initiative for encouraging more investments by utilities into energy efficiency programs. By establishing mandatory long-term, steadily increasing utility energy savings targets, utilities are more aggressive with designing and implementing customer energy efficiency programs, thus providing for a least-cost and least-risk electricity system capable of meeting growing energy needs. Not only that, utility savings targets would lower energy costs for customers, reduce air pollution, create jobs, and improve energy reliability.

To support the establishment of utility savings targets, Virginia could consider creating a task force to facilitate discussions between Virginia regulators and their counterparts in other states that have successfully implemented savings targets to review successful program details, evaluate their applicability to Virginia's market, and establish performance incentives for utilities to encourage investment that leads to reduced energy consumption.

#### COMMERCIAL PACE

Commercial PACE will be a valuable tool in the Commonwealth's energy efficiency and renewable energy toolbox. DMME should continue to evaluate whether a jurisdiction-by-jurisdiction (competitive free market) approach or a centralized model is optimal and continue to promote its value to private businesses who can use C-PACE to finance whole building energy conservation measures and renewable energy systems.

While there is interest in Residential PACE in Virginia, DMME and other stakeholders are carefully watching developments in the most active R-PACE markets (California, Florida and Missouri). California recently passed stronger consumer protection regulations for R-PACE programs, and federal legislation is proposed to regulate PACE loans under the Truth In Lending Act (TILA). At this time, DMME suggests that success of C-PACE will serve as the "proof of concept" for PACE in general in Virginia, and that strong consumer protection measures would need to be put in place for R-PACE in Virginia.

At this time, it appears that Arlington County will launch the first C-PACE program in Virginia in early 2018 (the Arlington County Board voted on November 18, 2017 to approve an enabling

ordinance authorizing launch of Arlington’s program). This would be the first active C-PACE program in the Commonwealth. Other local governments in Virginia may now negotiate (with permission from Arlington County’s Procurement Officer) with Arlington County’s program administrator, Sustainable Real Estate Solutions (SRS), for services through cooperative procurement per Chapter 43 of the Virginia Public Procurement Act.

There are several other jurisdictions in Virginia actively considering a C-PACE programs, most notably Loudoun County, Fairfax County, Norfolk and Charlottesville. DMME, the VA Energy Efficiency Council, and other stakeholders are actively educating local government staff, building owners, lenders and contractors about the potential of C-PACE to grow the market for energy efficiency retrofits through the Mid-Atlantic PACE Alliance, funded through a \$500,000 Department of Energy grant.

#### COMMERCIAL BENCHMARKING & DATA ACCESS

Data Access and Benchmarking is a policy foundation for measuring and reporting a building's energy and water usage. Benchmarking provides owners with valuable data and identifies opportunities to improve their building's energy performance. By comparing a building's performance to similar buildings, existing standards, or best practices, benchmarking empowers owners to better prioritize capital upgrades and uncover ways to achieve operational savings. Benchmarking can also help an owner make a case for recommissioning projects to investors and senior managers. An EPA analysis of roughly 35,000 buildings utilizing the ENERGY STAR Portfolio Manager benchmarking tool showed a 7% average energy savings over three years, with the initial lowest-performing buildings making the greatest improvements. A Lawrence Berkeley National Lab (LBNL) review of state and local benchmarking and transparency studies found these requirements to correlate with a 3–8% reduction in gross energy consumption or energy use intensity over a two- to four-year period of policy implementation.

Currently, a commercial building owner cannot efficiently access the energy and water usage data of their buildings, due to privacy concerns from tenants and technical problems from utilities, and thus cannot make targeted energy efficiency investments into their building stock. However, with recent developments in best practices of benchmarking policies, and software developments by utilities and ENERGY STAR Portfolio Manager, the process is becoming more streamlined while addressing the privacy concerns of tenants.

DMME recently led a work group that consisted of stakeholders from investor-owned utilities, electric cooperatives, commercial property owners, local and state government representatives, and energy efficiency groups. The group discussed recommendations for best practices on benchmarking in Virginia. The final policy recommendation allows localities to require annual

aggregated energy use reports from commercial buildings within their jurisdiction of 50,000 square feet or greater. This allows commercial building owners to make targeted investments into energy efficiency while protecting the privacy of tenants.

## ENERGY SAVINGS PERFORMANCE CONTRACTING

Energy Savings Performance Contracting has been a highly successful program to enable significant progress in energy efficiency while saving state agencies and public localities hundreds of millions of dollars over the past decade. The ESPC projects target electricity, water, natural gas and other energy savings that responsibly preserve the natural resources of Virginia and protect the environment and public health and safety. The program has established strong partnerships with numerous energy services companies that create and employ thousands of jobs in the Commonwealth. The economic growth includes SWAM businesses in Virginia's procurement opportunities.

With a new contract in place, ESPC is poised to continue its success in promoting energy efficiency. Along with improved energy consumption data, benchmarking and best practices can be leveraged to identify additional potential opportunities for ESPC.

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