

# **ANNUAL REPORT TO THE GOVERNOR AND GENERAL ASSEMBLY**



## **ENERGY CONSERVATION EFFORTS OF VIRGINIA'S INVESTOR-OWNED PUBLIC UTILITIES IN 2019**



**Submitted by the Department of Mines, Minerals and  
Energy**

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## Introduction

The Code of Virginia (§ 67-202.1) requires each investor-owned public utility (IOU) that provides electricity service in the Commonwealth to prepare an annual report to the Department of Mines, Minerals and Energy (DMME) delineating its efforts to conserve energy. In the report, each IOU is required to disclose its implementation of demand-side management (DSM) programs serving its customers, and its efforts to improve energy efficiency and conservation relating to its internal operations. These annual reports are to be submitted by November 1 of each year to the Division of Energy of DMME. The Division is required to compile the utilities' reports and submit the compilation to the Governor and the General Assembly.

For the year 2019, reports were received from Virginia Electric and Power Company (Dominion Energy, or Dominion), Appalachian Power Company (APCo), and Kentucky Utilities Company d/b/a Old Dominion Power Company (ODP) on or by November 1. The following is a summary of reported energy conservation efforts during the past year. An electronic copy of each utility's full report is available from DMME. This report also includes an analysis of the progress toward the Commonwealth's goal of reducing retail customers' electric energy consumption by ten percent by the year 2020.

## Dominion Energy

Dominion Energy continues to report that it has invested significant resources in DSM programs that provide customers the information and supporting technology needed to manage and reduce energy consumption.

### DSM Tariffs

Dominion previously offered one DSM tariff, the Standby Generation (SG) rate schedule. The SG service tariff provided load reduction during peak periods by transferring load normally served by the company to a participant's standby generator. The customers received a bill credit based on providing either a contracted amount of standby generation, or by average power generated during a billing month where standby generation was requested. Schedule SG closed to new customers in January 2014 and there was one remaining customer on the schedule in 2018. They exited the tariff in 2019, therefore it is now closed.

### DSM and Demand Response (DR) Programs

#### Ongoing Programs

<b>Residential Air Conditioner Cycling</b>	Installation of cycling switches on air conditioning units that allow the units to be remotely cycled off for brief intervals during periods of peak load demand.
<b>Residential Income and Age Qualifying Home Improvement</b>	Provides qualifying participants with energy assessments and direct install measures at no cost.
<b>Non-residential Distributed Generation</b>	Allows participating customers to receive reduced-cost backup generation service in exchange for reducing electrical load on Dominion's system.

<b>Non-residential Lighting Systems &amp; Controls</b>	Promoted the installation of energy efficient lighting and controls.
<b>Non-residential Heating &amp; Cooling Efficiency</b>	Promoted the installation of high efficiency HVAC equipment.
<b>Non-residential Window Film</b>	Provided incentives for installing solar reduction window film.
<b>Small Business Improvement</b>	Provides an energy assessment and recommendations for customers with monthly demand of less than 100kW.
<b>Non-Residential Prescriptive</b>	Provides rebates for energy efficiency improvements.

Three of the ongoing programs (Non-residential Lighting Systems & Controls, Non-residential Heating & Cooling Efficiency and Non-residential Window Film) concluded in late 2018/early 2019 and were replaced with updated versions in the PUR-2018-00168 filing detailed below. Per the Company’s 2018 EMV Report, the Non-residential Lighting Systems & Controls Program provided incentives for efficient lighting technologies to approximately 4,079 customers, the Non-residential Heating and Cooling Efficiency Program provided incentives for efficient HVAC equipment to approximately 389 customers, and the Non-residential Window Film Program provided incentives to 245 customers.

DSM Pilot Programs

Dominion has one ongoing demonstration program and one recently concluded pilot program. The Electric Vehicle (“EV”) Pilot offered customers two alternatives (a whole house rate plus EV and an EV only rate) to electricity pricing intended to encourage customers to charge electric vehicles during times of low usage. For both the whole house plus EV and the EV-only programs, supply service charges were significantly lower for Off-Peak hours (generally between 10 pm and 5 am). The program closed to new customers on September 1, 2016 and concluded on November 30, 2018. Dominion reports that as of August 31, 2018, 383 customers were enrolled on the whole-house EV rate and 155 in the EV-only rate, for a total of 538 customers across both options.

Dominion is also continuing to upgrade individual customer meters to smart meters via the advanced metering infrastructure demonstration program. As of August 31, 2019, Dominion reports having installed over 445,000 smart meters throughout its service territory in the Commonwealth, an increase of 18,000 over the last year. Dominion notes that smart meters and Advanced Metering Infrastructure (AMI) may provide benefits by allowing for remote meter reads and service connects/disconnects and better voltage regulation and integration of distributed and renewable energy resources. A plan for the full deployment of AMI meters has been presented to the State Corporation Commission (SCC) for approval in the Company’s current filing pursuant to the Grid Transformation and Security Act, in case number PUR-2019-00154.

New Programs

In October 2018, the Company filed with the SCC for approval of Phase VII of its DSM Portfolio. All programs are classified as energy efficiency programs under Va. Code § 56-576 except for the Residential Smart Thermostat Program, which is classified as a DR program. On May 1, 2019, the SCC approved all 11 Phase VII DSM programs.

<b>Residential Appliance Recycling Program</b>	Provides incentives to recycle freezers and refrigerators that are of a specific age and size.
<b>Residential Customer Engagement Program</b>	Provides educational insights into the customer's energy consumption via a Home Energy Report with periodic suggestions on how to save on energy based upon an analysis of the customer's energy usage.
<b>Residential Efficient Products Marketplace Program</b>	Provides an incentive to purchase specific energy efficient products with a rebate through an online marketplace and through stores.
<b>Residential Home Energy Assessment Program</b>	Provides an incentive to install a variety of energy saving measures following completion of a walk-through home energy assessment.
<b>Residential Smart Thermostat Management Program (Demand Response Component)</b>	All customers who are not already participating in the Company's DSM Phase I Smart Cooling Rewards Program and who have a qualifying smart thermostat are offered the opportunity to enroll in a peak demand response Program.
<b>Residential Smart Thermostat Management Program (Energy Efficiency Component)</b>	Provides an incentive to customers to either purchase a qualifying smart thermostat and/or enroll in an energy efficiency program.
<b>Non-residential Lighting Systems &amp; Controls Program</b>	Provides qualifying customers with an incentive to implement more efficient lighting technologies that can produce verifiable savings.
<b>Non-residential Heating and Cooling Efficiency Program</b>	Provides qualifying customers with incentives to implement new and upgrade existing high efficiency heating and cooling system equipment to more efficient HVAC technologies that can produce verifiable savings.
<b>Non-residential Window Film Program</b>	Provides qualifying non-residential customers with an incentive to install solar reduction window film
<b>Non-residential Small Manufacturing Program</b>	Provides qualifying customers incentives for the installation of energy efficiency improvements, consisting of primarily compressed air systems measures for small manufacturing facilities.
<b>Non-residential Office Program</b>	Provides qualifying customers incentives for the installation of energy efficiency improvements, consisting of recommissioning measures at smaller office facilities.

### Future DSM Programs

As part of the Grid Transformation and Security Act passed in 2018, the Company continues to meet with stakeholders to discuss and plan for new DSM programs. The Company reports that competitive Requests for Proposals (RFP) will be issued for the fulfillment of new programs to be filed before the SCC for areas that appear to be fully developed from a program design perspective and pass 3 of the 4 cost benefit tests as defined under Virginia law.

### Evaluation, Measurement and Verification

In order to continue to quantify the level of energy and demand savings from its programs, Dominion has implemented Evaluation, Measurement, and Verification (EM&V) plans for the approved DSM programs. These plans are developed, executed, and reported by a third party vendor, DNV GL. The most recent EM&V report was filed with the SCC on May 1, 2019. This report concludes that across Dominion's portfolio of residential and non-residential programs in Virginia, cumulative actual participants were 98 percent of planned, while Net Energy Savings was 72 percent of planned through the 2018 program year.

### Consumer Education and Outreach

Dominion has several consumer education initiatives that include providing demand and energy usage information, educational opportunities, and online customer support options to assist customers in managing their energy consumption. Through consumer awareness and education, Dominion is working to encourage the adoption of energy-efficient technologies in residences and businesses. Dominion's education programs include television, digital, print, radio and outdoor advertising on energy conservation, news releases regarding its DSM programs, online energy calculators, a dedicated section of its website on energy conservation, and the use of social media.

In addition, Dominion's EnergyShare provides energy assistance and weatherization services to low-income, elderly, disabled, and military veteran customers. On July 1, 2018, Dominion expanded the EnergyShare program through 2028 by committing \$130 million (\$13M per year) to the program's core components. Over 31,000 homes have received weatherization improvements and 4,800 military veterans and 4,500 individuals living with disabilities have been assisted through the program during its 37 year history.

### Company Operations and Reporting

Dominion reports it continues initiatives to conserve energy and save money in its internal operations. Some examples are maintaining and improving the energy efficiency of Dominion's facilities, utilizing Building Automation Systems (BAS) in most of its facilities, forming Workplace Sustainability Teams, green information technology (IT) incorporating ENERGY STAR compliant or certified components such as computers and servers, the Night Watchman program that shuts down inactive desktops at night, and an investment recovery program that disposes of surplus assets in a way that both maximizes return on investment and minimizes the environmental impact.

Dominion's report provides an overview of the suite of programs available to the company's internal and external stakeholders. Dominion states it supports the Commonwealth's goals regarding energy conservation and renewable energy and will continuously evaluate energy

savings and environmental programs for itself and its customers in support of the overall goals in the Virginia Energy Plan.

### **Appalachian Power Company**

Appalachian Power Company (“APCo’s”) parent company, American Electric Power (AEP) continues to express a commitment to energy efficiency and demand side management measures. APCo reports that it seeks to limit the growth in the amount of power consumed at peak through several methods including demand response tariffs, direct load control programs, time-differentiated rates, energy efficiency programs, and certain grid transformation investments. APCo reports its suite of programs realized approximately 32,507 megawatt hours (MWh) of electric savings during 2018. The 2018 calendar year savings are provided, rather than 2019, in order to ensure that verified and evaluated data are reported.

APCo reports that it has a total of seven DSM programs currently available to customers in Virginia, including six residential programs and one commercial program. Two of these, the Residential Low Income Program and Residential Direct Load Control program, were approved by the SCC in November 2014. On July 7, 2017 APCo filed to extend the Residential Low Income Program and Residential Direct Load Control programs for an additional three year period (2018-2020) and received SCC approval for the extension on February 15, 2018. On June 24, 2015, the SCC approved five programs, including four residential programs and one commercial and industrial customer programs. These programs became available for customers in 2016, and are currently approved for implementation through 2018.

#### Residential Programs

APCo’s six currently available residential programs currently include: Low Income, Direct Load Control, eScore, Appliance Recycling, Manufactured Housing ENERGY STAR®, and Bring Your Own Thermostat.

The Low Income Program uses weatherization agencies in APCo’s service territory to implement cost-effective energy saving measures in residential households with low incomes. Through December 2018, 975 customers have participated in the program.

The Direct Load Control Program offers participating residential customers \$8 per month during the summer season for each controlled central air conditioning unit or heat pump unit. APCo installs a switch on these units, and the switch has communication capability such that a signal can be sent from the utility to cycle the air conditioner or heat pump unit off during times of high system demand. Through December 2018, 6,163 load control switches have been installed under the program.

The Home Performance Program offered a free online energy checkup, access to a home energy assessment, and rebates for larger upgrades to the customer’s home. Through December 2018, 13,249 customers participated in the program online, in-home, or through rebates. For the in-home energy audit portion of the program, APCo utilized local contractors. This program ended at the end of 2018 and was replaced by the eScore Program.

The Residential Appliance Recycling Program helps customers reduce their energy consumption by removing old, working refrigerators and freezers from customers' homes for recycling. Properly capturing and recycling refrigerants helps to reduce their release into the atmosphere. Through December 2018, the program has recycled 3,394 freezers and refrigerators. On May 16, 2018, the SCC approved an extension of the Residential Appliance Recycling program through calendar year 2019.

The Manufactured Housing ENERGY STAR® Program provides manufacturers with incentives for improving building envelopes, utilizing efficient HVAC systems, and providing other heating and water heating efficiencies for new manufactured homes. A total of 217 manufactured homes were incentivized through December 2018. Due to concerns with low participation (only 24 homes had been incentivized by December 2017) APCo previously elected not to file an extension on this program. However, participation greatly increased in the latter half of 2018 and the company is now seeking an extension from the SCC through a filing in PUR-2019-00122.

The Residential Efficient Products program provided markdown incentives to retailers for the sale of light emitting diodes (LEDs) and mail-in rebates for certain ENERGY STAR® appliances. Through December 2018, the program provided markdown incentives on 733,579 LEDs and rebates for 2,934 ENERGY STAR® appliances. The program ended December 31, 2018.

On September 29, 2017, APCo filed for approval of three new residential programs; two were approved by the SCC in case PUR-2017-00126 on May 16, 2018 for a three-year period, beginning January 1, 2019: Bring Your Own Thermostat (BYOT) program and eScore program.

The Bring Our Own Thermostat Program allows customers to enroll a qualifying Wi-Fi-enabled thermostat in a demand response program, during a load management event, APCo will either cycle the customer's HVAC equipment or raise the set point of the thermostat.

The eScore Program engages participants over time to lower energy costs through online assessments, in-home assessments, and rebates for larger upgrades.

#### Commercial and Industrial Programs

The Commercial and Industrial (C&I) Prescriptive program launched in January 2016, and has experienced steady growth. Through December 2018, 736 energy efficiency projects were completed. The program ended in December 2018 and was replaced by two new programs that were approved by the SCC in case PUR-2017-00126 on May 16, 2018: the C&I Lighting Program and the C&I Standard Program. A third program, the Small Business Direct Install Program, was also approved at that time.

The C&I Lighting Program promotes high efficiency lighting upgrades by covering a portion of the cost of energy efficient lighting technology.

The C&I Standard Program promotes high efficiency non-lighting measures, including variable frequency drives (VFDs), kitchen equipment, HVAC units and efficiency improvements related to industrial processes.

The Small Business Direct Install Program offers on-site energy assessments, direct install of certain energy efficiency measures and financial incentives for other cost-effective measures. A customized Energy Report is provided to each participant that sets out recommended improvements and their respective returns on investment. The program targets the harder to reach small business customers with a peak demand of 200kW or less.

### Proposed Programs

On September 30, 2019 APCo filed for approval of two new DSM programs in Case No. PUR-2019-00122: the Residential Low-Income Single Family Weatherization Program and the Residential Low-Income Multi-Family Weatherization Program. Subject to SCC approval, the company plans to launch these programs in January 2021.

The Residential Low-Income Single Family Weatherization Program is designed to generate savings through the evaluation of energy improvement opportunities, the installation of weatherization upgrades and other energy savings for dwellings. It would replace APCo's existing Residential Low Income Program upon that program's conclusion.

The Residential Low-Income Multi-Family Weatherization Program will provide and install energy efficiency measures to income-qualified multifamily properties. It will include an education component for participants on ways to effectively manage their energy use.

### Pilot Programs

The Energy Assistance Pilot provides energy assistance for homeless veterans who are receiving support from the Virginia Veterans and Family Support Program or the Total Action for Progress (TAP) program. The goal of the program is to provide utility grant assistance through \$500 energy vouchers to low-income homeless veterans to assist them with getting back into permanent housing. APCo allocated \$100,000 to the program. Through December 2018, 167 grants had been given totaling \$83,500. Under the provisions of the Grid Transformation and Security Act, APCo plans to continue the Veteran Energy Voucher Pilot Program in its Virginia service territory.

APCo also provides an energy efficiency pilot for low income elderly and disabled individuals, which includes two initiatives. The first, the Multifamily Residential Energy Efficiency pilot, aims to weatherize and improve the overall efficiency of selected multifamily properties. APCo intends to move this program out of the pilot stage and has proposed to do so in Case No. PUR-2019-00122 filed with the SCC. The second, the Energy Efficiency Education Pilot, provides direct mailings to customers receiving financial assistance through different agencies to help pay their electric bills. Customers receive direct mail with information about measures they can take to save energy and reduce their electric bills along with a postcard the customer can return in order to receive a free energy conservation kit. Each kit includes six energy efficient light bulbs, two LED nightlights, two faucet aerators, and a refrigerator thermometer. Under the provisions of the Grid Transformation and Security Act, the Company has contracted with Dollar General to continue this program.



### Tariffs

APCo offers time-of-day tariff options that allow customers to shift usage to lower cost periods. Tariff options for commercial and industrial customers include: Small General Service load management water heating, Medium General Service and Large General Service Off-peak excess demand provisions, General Service and Large General Service time-of-day and an Advanced Time-of-Day Schedule.

APCo's voluntary demand response tariffs, the optional rider demand response services (DRS) – RTO capacity and Optional Rider DRS, became effective June 1, 2017. Under the optional rider DRS-RTO capacity, APCo will contract with customers for capacity that is consistent with updated requirements for DR in PJM. As curtailments under this rider would be mandatory interruptions of load when PJM declares an emergency or pre-emergency event, capacity under this rider qualifies as capacity within PJM. This capacity can then be included in APCo's Fixed Resource Requirement plan. APCo reports there is currently one participant on the DRS-RTO Rider.

Optional Rider DRS is a peak shaving rider that is designed to save system costs when energy prices in PJM are high. It is not subject to PJM emergency conditions and does not count as PJM capacity. APCo did not report any participants in the Optional Rider DRS program. This rider is also open to DRS-RTO capacity participants.

### Consumer Education

For several years, APCo has implemented a consumer education program on energy conservation entitled "Watt, Why, & How," which has continued through 2018. The program is geared toward educating community leaders and citizens on what APCo is doing to meet the growing demand for electricity, changes in electric rates, and how people can save money on their electric bills. In addition, APCo mails a monthly e-newsletter containing energy saving tips to more than 250,000 customers in Virginia. APCo employees continue to make presentations to community groups about the benefits of energy efficiency. APCo also partnered with Virginia Energy Sense to distribute the 3<sup>rd</sup> Grade curriculum booklet "Value Your Power: Energy Conservation and Resource Renewal" to schools in its Virginia service territory.

### Internal Operations

APCo advised it is continuing to look for opportunities to improve internal efficiencies. The company is continuing to explore emerging cost effective LED lighting technologies both inside and outside of their facilities. The company continues to conduct lighting retrofit projects, install ENERGY STAR® rated white roofs, implement energy management controls, and replace inefficient HVAC equipment. APCo reports that for its Virginia facilities, weather-normalized energy use for the 12-month period ending December 2018 (compared to a baseline year of 2007) has decreased approximately 12.6 million kWh, or 37 percent.

## **Old Dominion Power Company**

Old Dominion Power Company ("ODP") does not report any major changes to its energy conservation efforts. ODP does not currently deploy DSM programs in its Virginia service territory. However, it reports that its subsidiaries Kentucky Utilities Company (KU) and Louisville

Gas and Electric Company (LG&E) have had significant demand-side management and energy efficiency programs in place in Kentucky for a number of years. ODP customers in Virginia have benefited indirectly from these programs through avoided capacity savings.

ODP continues to encourage customers to conserve energy by providing energy efficiency and conservation tips in the Power Source newsletters that are included in the monthly bills. The newsletter contains practical and proactive ways in which customers can implement energy and conservation measures. In 2018, the Company has also offered additional energy-savings tips in separate bill inserts. Energy efficiency/smart saver tips are made available to customers at various public gatherings and community festivals as well as the company's website.

ODP reports its website also contains tools which allow its customers to identify potential areas for energy savings. ODP offers Smart Saver ideas which offer low cost and no cost ways to save on lighting, heating and cooling, appliances and electronics, insulation and water usage. Additionally, a Watt Finder Guide is available which educates customers on how appliance choices and usage impacts energy consumption.

ODP advises its billing options such as paperless billing and auto pay continue to enable customers to view and pay bills on-line using a mobile device, tablet or computer instead of receiving a paper copy through regular mail. Lastly, ODP, KU, and LG&E have continued the "Environmental Champions Program," which encourages employees to conserve energy and recycle waste at work.

### **IOU Contributions to Virginia's Electric Energy Consumption Reduction Goal**

The third enactment clause of Chapter 888 of the 2007 Acts of Assembly provides that "the Commonwealth shall have the stated goal of reducing the consumption of electric energy by retail customers through the implementation of [demand side management and energy efficiency] programs by the year 2022 by an amount equal to ten percent of the amount of electric consumed by retail customers in 2006." This goal was reflected in the 2007 Virginia Energy Plan, the first energy plan developed after utility re-regulation, and the 2018 Virginia Energy Plan reiterated the imperative to achieve the ten percent goal. The utility-sponsored DSM programs described in this report represent the primary contributions to Virginia's electric energy reductions in furtherance of the ten percent goal.

To evaluate the progress the Commonwealth has made towards the stated electric energy reduction goal, DMME utilizes a baseline reduction total of 10,700,000 MWh, which represents ten percent of the 2006 retail electric energy sales in Virginia. Neither statute nor the Virginia Energy Plan provides a specific methodology for measuring progress towards this goal. There are two primary methodologies for measuring avoided energy consumption in megawatt hours (MWh) for DSM programs that DMME has analyzed: total annual savings and cumulative savings. Below is a brief discussion of each methodology and how progress towards the goal under each approach is measured. Both approaches have value in measuring energy efficiency program impact, but differences in accounting methodology leads to a significant variation in outcomes, as shown in the figure on the following page from the American Council for an Energy Efficient Economy's (ACEEE) 2019 report, "Energy Efficiency Over Time." These figures are based on the best

available data at this time. However, they may change from year to year, depending on level of investment in DSM programs and actual and projected effectiveness of these programs.

Cumulative savings is the sum of total annual electric savings in a particular period. In this case, program operating between the base year of 2006 through the goal year of 2022. **An accurate tabulation of cumulative savings should take into account persistence and decay of earlier efficiency measures such that savings are only included for those measures still within their expected useful lives and should not include savings from measures that have exceeded their useful lives.** The current projection using this approach, based on information from state and utility-sponsored programs and updated modeling data included in this year's report on expected savings due to energy code changes and private market energy performance contracts is that the Commonwealth will achieve 11,012,050 MWh in cumulative electric savings by 2022. This projection represents approximately 103 percent of the ten percent goal. While cumulative savings are a useful measure of program effects, DMME considers the annual savings approach, detailed below, to be a more accurate reflection of the Commonwealth's progress towards its goal.

Total annual savings measures avoided electric energy consumption for a given year plus prior program year's incremental annual savings produced by installed measures still within their expected useful lifetimes. Using an annual savings approach **guides program administrators and regulators with a metric providing the actual impact of energy efficiency programs on the system in a given year**, and is a more accurate reflection of savings achieved by a specific year, in this case 2022. The current projection under this approach based on current information from state and utility-sponsored programs and updated modeling data included in this year's report on expected savings due to energy code changes and private market energy performance contracts is that total annual electric savings in the Commonwealth will be 6,578,933 MWh by 2022. This projection represents approximately 62 percent of the ten percent goal.

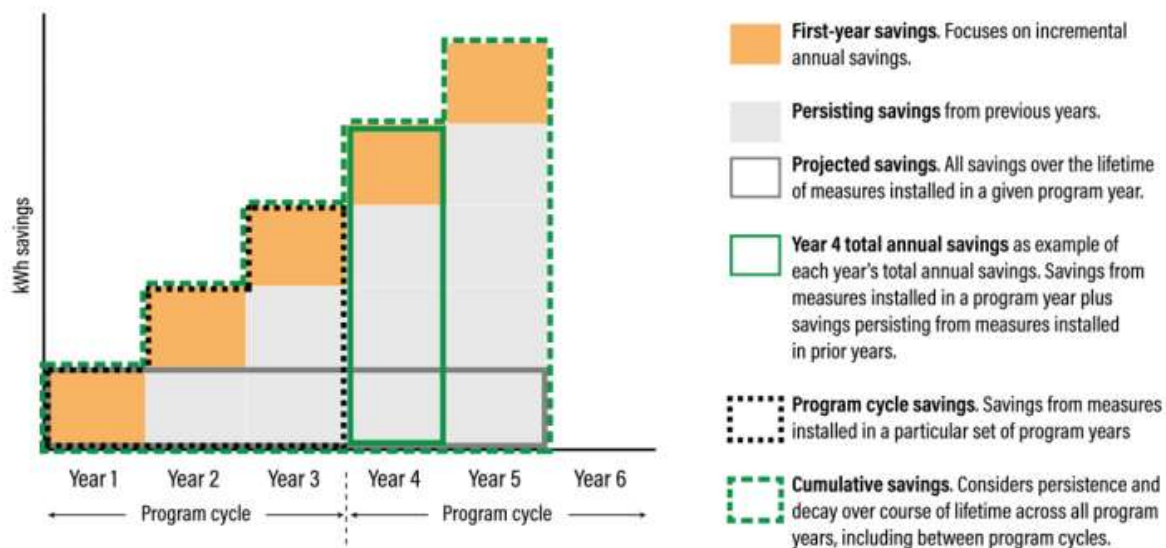


Figure 4. Goal accounting methods for energy efficiency goals

It is clear that the Commonwealth has continuing work to do to achieve its energy efficiency goal by 2022 and that utility-sponsored programs will be an important component of this effort. To reach this ten percent goal, utilities must develop new program proposals and make the increased investments in DSM programs set forth in the Grid Transformation and Security Act.