ANNUAL REPORT TO THE GOVERNOR AND GENERAL ASSEMBLY

ENERGY CONSERVATION EFFORTS OF VIRGINIA'S INVESTOR-OWNED PUBLIC UTILITIES IN 2021

Submitted by the Virginia Department of Energy

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Introduction

The Code of Virginia (§ 45.2-1712) requires each investor-owned public utility (IOU) that provides electricity service in the Commonwealth to prepare an annual report to the Department of Energy (Virginia Energy) 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 Renewable Energy and Energy Efficiency of Virginia Energy. The Division is required to compile the utilities' reports and submit the compilation to the Governor and the General Assembly.

For the year 2021, 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 Virginia Energy. 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 2022.

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 and Demand Response (DR) Programs

Ongoing Programs

Residential Air Conditioner Cycling	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.
Residential Income and Age Qualifying Home Improvement	Provides qualifying participants with energy assessments and direct install measures at no cost.
Non-residential Distributed Generation	Allows participating customers to receive reduced-cost backup generation service in exchange for reducing electrical load on Dominion's system.
Residential Appliance Recycling Program	Provides incentives to recycle freezers and refrigerators that are of a specific age and size.
Residential Efficient Products Marketplace Program	Provides an incentive to purchase specific energy efficient products with a rebate through an online marketplace and through stores.

Residential Home Energy Assessment Program	Provides an incentive to install a variety of energy saving measures following completion of a walk-through home energy assessment.
Non-residential Lighting Systems & Controls Program	Provides qualifying customers with an incentive to implement more efficient lighting technologies that can produce verifiable savings.
Non-residential Heating and Cooling Efficiency Program	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.
Non-residential Window Film Program	Provides qualifying non-residential customers with an incentive to install solar reduction window film
Non-residential Small Manufacturing Program	Provides qualifying customers incentives for the installation of energy efficiency improvements, consisting of primarily compressed air systems measures for small manufacturing facilities.
Non-residential Office Program	Provides qualifying customers incentives for the installation of energy efficiency improvements, consisting of recommissioning measures at smaller office facilities.
Residential Electric Vehicle Program	Provides an incentive to customers who purchase a qualifying charger for their electric vehicle and agree to enroll in a demand response program.
Residential Electric Vehicle Program (Peak Shaving)	For customers who already have a qualifying Level 2 charger and wish to participate in the EV demand response program (see above).
Residential Energy Efficiency Kits Program	Provides welcome kits to residential customers with newly connected homes. The kit include a Tier I advanced power strip and an educational insert about opportunities to manage energy use and how to opt into receiving additional free measures.
Residential Home Retrofit Program	Provides an incentive for high volume electricity users to conduct a comprehensive whole house diagnostic home energy assessment.
Residential Manufactured Housing Program	Provides residential customers in manufactured housing with educational assistance and an incentive to install energy efficiency measures.

Residential New Construction Program	Provides incentives to home builders for the construction of new homes that are ENERGY STAR certified.
Residential/Non-Residential Multifamily Program	Provides a whole building approach that will identify as many cost-effective measures as possible in the entire building (inc. residential units and common spaces) and encourage property owners to address the measures as a bundle.
Non-Residential Midstream Energy Efficient Products	In exchange for point-of-sale data, distributors will discount the rebate-eligible items sold to end customers.
Non-Residential New Construction	Provides qualifying facility owners with incentives to install energy efficient measures in their new construction project.
Small Business Improvement Enhanced Program	Provides small businesses an energy use assessment and tune-up or re-commissioning of electric heating and cooling systems, along with incentives for the installation of specific energy efficiency measures.
HB 2789 Program (Heating and Cooling/Health and Safety)	Provides incentives for the installation of measures that reduce residential heating and cooling costs and enhance the health and safety of elderly and disabled residents.
Residential Smart Thermostat Management Program (Demand Response Component)	Residential customers who have a qualifying smart thermostat are offered the opportunity to enroll in a peak demand response (DR) program.
Residential Smart Thermostat Management Program (Energy Efficiency Component)	Provides an incentive to customers to either purchase a qualifying smart thermostat and/or enroll in an energy efficiency program that allows remote optimization of their thermostat.

DSM Pilot Programs

Dominion has been upgrading 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. 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 was rejected by the State Corporation Commission (SCC) in the Company's filing pursuant to the Grid Transformation and Security Act, in case number PUR-2019-00154. The company has reapplied for full AMI deployment in case number PUR-2021-00127 and is awaiting a final order.

New Programs

In December 2020, the Company filed with the SCC for approval of Phase IX of its DSM Portfolio. All programs are classified as energy efficiency programs under Va. Code § 56-576 except for the Residential Water Savings Program, which is classified as a DR program. On September 7, 2021, the SCC approved all 11 Phase IX DSM programs.

Residential Income and Age Qualifying Program	Provides income and age qualifying residential customers with in-home energy assessments and installation of select energy-saving measures.
Residential Water Savings Program (Energy Efficiency/Demand Response)	Provides incentives to residential customers for the installation of smart communicating water heating and pool pump technologies. Those customers would then be offered the opportunity to enroll in the demand response ("DR") component of the Program
Residential Smart Home Program	Provides incentives to residential customers who purchase smart control technologies.
Residential Virtual Audit Program	Customers may participate in an online, self-directed home energy assessment
Non-residential Agricultural EE Program	Provides financial incentives for the installation of specific high-efficiency equipment for qualifying agribusiness operations.
Non-residential Building Automation Program	Supports the installation of new building automation systems in facilities that do not have centralized controls or that have an antiquated system that requires full replacement.
Non-residential Building Optimization Program	Supports implementation of control system audits and tune-up measures in facilities with building energy management systems.
Non-residential Engagement Program	Engage commercial buildings in energy management best practices that increase awareness of operational and behavioral energy savings opportunities.
Non-residential Enhanced Prescriptive Program	Provides qualifying non-residential customers with financial incentives for the installation of refrigeration, commercial kitchen equipment, HVAC improvements and maintenance, and installation of other program specific, energy efficiency measures.
HB 2789 Program (Solar Component)	Offers incentives for the installation of equipment to generate electricity from sunlight. The Program's eligibility is limited

	based on income, age, veteran, and disability status, and requires previous participation in the Heating and Cooling compenent.

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

The Company is required to implement EM&V plans to quantify the level of energy and demand savings for approved DSM programs in Virginia and North Carolina. These reports are filed annually with the SCC and provide information through the prior calendar year. DNV GL, a third-party vendor, continues to be responsible for developing, executing, and reporting the EM&V results. By order entered in PUR-2020-00156, the Virginia SCC established a new and additional proceeding to evaluate baselines and protocols for the evaluation and verification process for the Company's DSM programs. The Company filed its proposed baselines and protocols, as required, on November 6, 2020. The Commission issued its final order on October 27, 2021, accepting new reporting requirements proposed by the Company, adopted a new framework for EMV processes and instructed the Company to work through the stakeholder process to identify best practices on a case-by-case basis.

This report concludes that across Dominion's portfolio of residential and non-residential programs in Virginia, participation was 75 percent of planned, while Net Energy Savings was 93 percent of planned through the 2019 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. Dominion allows customers to receive their bills electronically and is also involved in the Green Button Download My Data program that allows electric customers to download their household or building energy-use data in a consumer- and computer-friendly format.

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. Through 2020, nearly 17,100 homes received weatherization improvements and 7,300 military veterans and 7,200 individuals living with disabilities have been assisted.

Company Operations and Reporting

Dominion reports it continues initiatives to conserve energy and save money in its internal operations. Dominion Energy targets Leadership in Energy & Environmental Design (LEED) Silver-level certification in new office construction. Other examples are maintaining and improving the energy efficiency of Dominion's facilities, utilizing Building Automation Systems (BAS) in most of its facilities, maintaining a Workplace Sustainability network, green information technology (IT) incorporating ENERGY STAR compliant or certified components such as computers and servers, 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 20,818,793 kilowatt hours (MWh) of electric savings during 2020. The 2020 calendar year savings are provided, rather than 2021, in order to ensure that verified and evaluated data are reported.

APCo reports that it has a total of thirteen DSM programs currently available to customers in Virginia, including nine residential programs and four commercial program. On February 15, 2018 approved the extension of the Residential Low Income Program and Residential Direct Load Control programs for an additional three year period (2018-2020). 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. On May 21, 2020, the SCC approval three new DSM programs: the Residential Low-Income Single Family Weatherization program, the Residential Low-Income Multi-Family Weatherization program, and the ENERGY STAR® Manufactured Housing program. On November 30, 2020, Appalachian Power filed for approval to implement five new EE/DR programs and one new EE pilot program and to continue two existing programs. These programs were approved on July 29, 2021 with certain modifications. The new programs are the Residential Home Energy Report program, the Residential Efficient Products program, the Residential Energy Efficiency Kit program, the Residential Home Performance program, and the Business Energy Solutions program.

Residential Programs

APCo's nine currently available residential programs currently include: eScore, Manufactured Housing ENERGY STAR®, Low Income Single Family Weatherization Program, Low Income Multi-Family Weatherization Program, Bring Your Own Thermostat, Home Energy Report Program, Residential Efficient Products Program, Residential Energy Efficiency Kit Program and Residential Home Performance 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.

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 replaced APCo's existing Residential Low Income Program upon that program's conclusion on December 31, 2020.

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.

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 sought an extension.

The **Residential Home Energy Report Program** provides reports that compare the participant's energy usage with similar homes, which will, ideally, motivate the customer to take action to save energy and maintain those savings.

The **Residential Efficient Products Program** promotes the adoption of high efficiency lighting and appliances. This program was previously included in Appalachian's EE portfolio and ended in December 2018. Based on discussions and recommendations in the stakeholder process, the Company sought approval to relaunch the program.

The **Residential Energy Efficiency Kit Program** provides energy efficiency kits to residential customers that include cost-effective energy saving measures while promoting other programs in the Company's EE portfolio. The kits include products with verified electric energy savings that customers can self-install.

The **Residential Home Performance Program** provides customers with a comprehensive home energy audit to identify immediate and larger-scale measures that the customer can implement to reduce energy usage.

Commercial and Industrial Programs

The initial Commercial and Industrial (C&I) Prescriptive program launched in January 2016 and experienced steady growth. 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 Business Energy Solutions program was approved in July 2021.

The **C&I Lighting Program** promotes high efficiency lighting upgrades by covering a portion of the cost of energy efficient lighting technology. Through December 2019, 173 energy efficiency projects have been completed.

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. Through December 2019, 21 energy efficiency projects have been completed.

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. Through December 2019, 224 energy efficiency projects have been completed.

The **Business Energy Solutions (Bes) Program** promotes high efficiency lighting and non-lighting upgrades. The BES Program will accelerate energy efficiency by incorporating both lighting and non-lighting measures under one program.

Pilot Programs

The **Veteran Energy Voucher Pilot Program** (formerly 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 2019, 201 grants were given for a total amount of $100,500 granted. 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.

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. Up to 2,500 kits are available to qualifying customers annually.

The **Volt VAR Optimization Pilot Program** will allow the Company to regulate more closely the voltage of the electricity that it delivers to its customers so that customers receive a lower, but still acceptable, voltage that allows them to use less energy. Some electrical equipment operates more efficiently when voltages are closer to the equipment's design voltage. Thus, the program will result in energy and demand savings with no individual customer investment, and will reach a large group of customers, including low-income and rural customers.

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: Commercial Load Management Time-of-Day Provision, off-peak excess demand provisions for Medium General Service, General Service, and Large General Service Schedules, a General Service Time-of-Day Schedule and an Advance Time-of-Day Schedule.

In addition, on September 12, 2019, the SCC approved a voluntary and experimental rate schedule, for a four-year period, for APCo customers who own electric vehicles. This optional tariff, called Schedule PEV – Experimental (Residential Plug-In Electric Vehicle Charging), allows residential customers, who are receiving standard service, to separately charge their electric vehicles on a time-of-day rate schedule On November 24, 2020, the SCC approved two rate schedules, Residential Smart Demand and Smart Time of Use, that use Advanced Metering Infrastructure (AMI) to provide residential customers with options to reduce consumption during peak hours (PUR-2020-00015).

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. On November 24, 2020, the SCC approved a modification to the rider to allow the Company to reduce peaks for the purpose of reducing transmission costs.

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. On November 24, 2020, the SCC approved the closure of the rider to new participants.

Consumer Education

For several years, APCo has implemented a consumer education program on energy conservation entitled "Watt, Why, & How," which has continued through 2020. 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 280,000 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 3rd 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 2020 (compared to a baseline year of 2007) has decreased approximately 13m kWh, representing a decrease of about 42%.

Old Dominion Power Company

Old Dominion Power Company ("ODP") does not currently deploy DSM programs in its Virginia service territory. In August 2021, ODP filed an application with the SCC to begin a pilot program that would provide energy efficiency measures, such as weatherization, to its customers with a 15% carve-out specifically for low-income, elderly, disabled individuals or veterans. ODP 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 2019, 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. Also available are "how to" videos on 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.

ODP, KU, and LG&E have continued the "Environmental Champions Program," which encourages employees to conserve energy and recycle waste at work. They have also installed LED lighting and high efficiency HVAC at a new operations center in Norton during 2019 and new high efficiency HVAC systems have been installed at two material storage facilities to replace existing heating and cooling systems.

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, Virginia Energy utilizes a baseline reduction total of 10,700,000 MWh, which represents ten percent of the 2006 retail electric energy sales in Virginia. Progress is calculated using the total annual savings method. 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 5,866,057 MWh by 2022. This projection represents approximately 55 percent of the ten percent goal.

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.