ANNUAL REPORT TO THE GOVERNOR AND GENERAL ASSEMBLY

ENERGY CONSERVATION EFFORTS OF VIRGINIA'S INVESTOR-OWNED PUBLIC UTILITIES IN 2016

Submitted by the Department of Mines, Minerals and Energy

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Introduction

§ 67-202.1 of the Code of Virginia 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 customer demand-side management (DSM) programs and its efforts to improve energy efficiency and conservation within its internal operations. The annual reports are to be submitted by November 1 of each year to the Division of Energy of DMME. The Division is charged with compiling the utilities' reports and submitting the compilation to the Governor and the General Assembly.

For the year 2016, reports were received from Dominion Virginia Power (Dominion), Appalachian Power Company (APCo), and Kentucky Utilities Company d/b/a Old Dominion Power Company (ODP). The following is a summary of their energy conservation efforts during the past year. A copy of each utility's full report is available from DMME. Additionally, this report will briefly highlight progress toward the Commonwealth's goal of reducing retail customers' electric energy consumption by ten percent by the year 2020.

Dominion Virginia Power (Dominion)

Dominion continues to report that it has invested significant resources in conservation and efficiency programs that provide customers the information and supporting technology needed to manage and reduce energy consumption. Dominion also offers one DSM tariff, the Standby Generation (SG) rate schedule. The SG service tariff provides a direct means of implementing load reduction during peak periods by transferring load normally served by the company to a participant's standby generator. The Curtailable Service tariff, which requires participants to reduce their electric demand upon request by Dominion in return for a rate reduction credit, was closed to new participants effective January 25, 2014.

Dominion continues to offer a number of programs to residential customers, including a residential appliance recycling program, the residential heat pump upgrade program, the residential air conditioner cycling program and the residential income and age qualifying home improvement program. The residential air conditioning cycling program, extended through April 2016, involves the installation of cycling switches on residential air conditioning units that allows the units to be remotely cycled off for brief intervals during periods of peak load demand.

Additional programs available to non-residential customers include the distributed generation program and the duct testing and sealing program. The distributed generation program allows participating customers to receive reduced-cost backup generation service in exchange for reducing electrical load on Dominion's system. The duct testing and sealing program provides cash incentives for qualifying customers to have ducts tested and sealed according to program-approved methods in order to increase efficiency.

Dominion reports it is also administering several ongoing DSM pilot programs. These programs include dynamic pricing tariffs, an electric vehicle pilot, and an advanced metering infrastructure demonstration. Approved by the SCC on April 8, 2011, a dynamic pricing schedule allows Dominion to charge different prices as the costs of electricity production change in response to demand. This means that electricity usage during periods of higher usage will be charged more per kWh than usage during periods of lower electricity usage. Currently, the pilot is limited to 3,000 voluntary participants, 2,000 of whom are residential customers and 1,000 of whom are commercial/general customers. The program closed to new enrollment November 30, 2014 and has an enrollment of 525 customers as of August 31, 2016. The pilot is scheduled to end on July 31, 2017.

The electric vehicle pilot offers customers two alternatives to electricity pricing with the intent to encourage customers to charge their electric vehicles during times of low usage. Dominion is filing with the SCC a petition to extend enrollment in this pilot through September 1, 2016 and implementation through November 30, 2018 within the existing cost cap set by the SCC in its initial approval order. As of August 31, 2016, 584 were enrolled in the pilot across both options. Dominion is also continuing to upgrade individual customer meters to smart meters. As of September 2016, Dominion reports having installed over 370,000 smart meters throughout the state.

In October 2016, Dominion filed with the SCC for approval of two new DSM Phase VI programs, the non-residential prescriptive program and the residential home energy assessment program. Both programs are classified as energy efficiency programs, as that classification is defined under Va. Code § 56-576. Dominion expects a decision on the two proposed DSM Phase VI programs by early June 2017. The non-residential prescriptive program would provide incentives for non-residential customers not otherwise eligible or who chose not to participate in the small business improvement program for the installation of energy efficiency measures such as refrigerator evaporator fans, commercial Energy Star® ice maker, advanced power strip, cooler/freezer strip curtain, HVAC tune-up, vending machine controls, kitchen fan variable speed drivers, and commercial duct testing and sealing. The residential home energy assessment program would provide residential customers an incentive to install a variety of energy savings measures following completion of a home energy assessment. The energy savings measures would include the replacement of existing lighting with LEDs, heat pump tune-up, door weatherization, heat pump and central air conditioner filter replacement, installation of efficient faucet aerators and showerheads, and water heater and pipe installation.

In order to continue to quantify the level of energy and demand savings, Dominion has implemented evaluation, measurement, and verification (EM&V) plans to quantify the level of savings for the approved DSM programs. These plans are developed, executed and reported by a third party vendor, DNV GL. The most recent report was filed with the SCC on April 1, 2016.

Dominion has numerous consumer education initiatives that include providing demand and energy usage information, opportunities to meet with Dominion representatives, and online customer support options to assist customers in managing their energy consumption. Dominion's website has a section dedicated to energy conservation. Through consumer education, Dominion is working to encourage the adoption of energy-efficient technologies in

residences and businesses. Dominion's education programs continue to include a customer connection newsletter, an energy conservation blog, online energy calculators, community outreach events, and utilization of social media.

Dominion reports it has also taken steps to conserve energy in its internal operations. Some examples are maintaining and improving the energy efficiency of Dominion's facilities, retrofitting new lighting to replace old florescent fixtures with electromagnetic ballasts, enhancing the irrigation system at its Richmond office to save water, green information technology incorporating ENERGY STAR compliant or certified components in the IT department, 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 reports receiving recognition for being among the top 100 green utilities based on carbon emissions and renewable energy capacity. Specifically, in 2015, Dominion ranked 36 among the top 100 global electric utilities based on carbon emissions and renewable energy capacity, up from number 37 in 2014.

Dominion's report provides a snapshot of the current plans and programs available to the company's internal and external stakeholders. Dominion reports that in March 2012, the Company and eight other utilities joined the Green Button Initiative to provide households access to data related to their energy use. Dominion states it supports the Commonwealth's goals regarding energy conservation and renewables 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 (APCo)

APCo's parent company, American Electric Power (AEP) continues to express a commitment to energy efficiency and demand-side management measures. APCo also reports, in order to delay the need to procure supply resources, APCo 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, EE programs, and Volt VAR Optimization.

APCo reported that it has seven DSM programs available to customers in Virginia. Two of these programs, the residential low income program and residential direct load control program, were approved by the SCC in November 2014. The SCC approved the additional five programs on June 24, 2015.

The residential 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 August 2016, 313 customers have participated in the program. Residential customers participating in APCo's direct load control program are offered $8 per month during the summer season for each controlled central air conditioning unit. The switch has communication capability such that a signal can be sent from the utility to operate the switch and cycle the air conditioner or heat pump unit during times of high system demand. Through August 2016, 3,305 load control switches have been installed under the program.

On October 24, 2014 APCo filed with the SCC a petition for approval of a portfolio of six energy efficiency programs as well as a rate adjustment clause to recover costs. The portfolio included four residential programs and two commercial and industrial programs. These programs were designed to improve energy consumption in residential structures by offering online and in-person energy checkups, removing and recycling used appliances, recruiting manufacturers to design and build Energy Star qualified homes, and offer instant rebates for energy efficient appliances and lighting equipment. For commercial and industrial customers, APCo proposed programs that offer financial incentives for various energy saving projects. In early 2015, the SCC approved five of the six programs, keeping all four residential programs and approving only one of the commercial and industrial customer programs. These programs became available for customers in 2016.

The residential home performance program was launched in January 2016. Promotion of the program began several months prior to the official launch. After the launch, marketing and promotional activities continued to raise trade ally and customer awareness of the program, the eligible energy efficiency measures, and the associated requirements, processes, and procedures. The program offers a free online energy checkup, access to a home energy assessment, and rebates for larger upgrades to the customer's home. Through August 2016, more than 2,700 customers have participated in the program. For the assessment portion of the program APCo utilizes local contractors. There are currently 12 contractors engaged in the program and APCo reports they are looking to additional contractors.

The residential appliance recycling program is designed to help customers reduce their energy consumption by removing old, working refrigerators and freezers from customers' homes for recycling. The program launch was delayed when the original vendor abruptly went into receivership in November 2015; however, the program was ultimately launched in June 2016 with a new vendor.

The manufactured housing Energy Star® program provides manufacturers with incentives for increasing building envelope, HVAC system, heating and water heating efficiency for new residential homes. APCo reports an interest ramp-up after the initial marketing push and expects to begin incentive fulfillment in the near future.

The residential efficient products program provides markdown incentives to retailers for the sale of light emitting diodes (LEDs) and mail-in rebates for certain Energy Star® appliances. The program was launched in January 2016, with pre and post-launch marketing efforts. Through August 2016, the program has provided markdown incentives on 69,455 LEDs and rebates for 1,122 Energy Star® appliances.

The commercial and industrial (C&I) prescriptive program was launched in January 2016. Through August 2016, 114 customers have participated in the program representing 132 different efficiency projects. There is a strong trade ally network (lighting distributors, electrical contractors, and consultants) of approximately 40 trade allies that are registered to participate in the program.

APCo has two pilot programs to comply with Senate Bill 1349 (2015). The energy assistance pilot provides energy assistance for homeless veterans who are receiving support from the Virginia House Development for Veterans through the Virginia Wounded Warrior Program. The goal of the program is to provide utility grant assistance, through $500 energy vouchers, to low-income homeless veterans to assist them getting back into housing. Through August 2016, 48 applications had been submitted and 47 grants had been given totaling $23,500. The energy efficiency pilot for low income elderly and disabled includes two initiatives. The first, the multifamily residential energy efficiency pilot aims to weatherize and improve the overall efficiency of selected multifamily properties. The second, the energy efficiency education pilot, which provides direct mailings to customers receiving financial assistance through different agencies with information regarding measures they can take to save energy and reduce their electric bills.

APCo continues to offer various time-of-day tariff options that allow customers to shift usage to lower cost periods. Based on a change of lifestyle or, in the case of a non-residential customer, a change or shift in mode of operation, these tariff schedules provide the customer with an opportunity to shift or reduce peak demand on the Company's system, save money and encourage additional efficiencies. The tariff options for residential customers include a load management water heating provision and time-of-day rate schedules. Tariff options for commercial and industrial 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 Advanced time-of-day tariffs. A voluntary wind service tariff and an economic development rider are also offered.

Due to the termination of AEP's Interconnection Agreement and changes to PJM's rules governing demand response, APCo closed the voluntary demand response rider programs to new customers effective April 1, 2014. APCo reports that customers already enrolled in the program will be allowed to continue to participate until June 1, 2017. Eligible retail customers can still enroll in PJM's emergency demand response program through a curtailment service provider. On June 17, 2016 the SCC approved APCo's applications to implement two new voluntary demand response programs, a capacity rider and a peak shaving rider.

In 2008, APCo implemented a consumer education program on energy conservation entitled "Watt Why & How" which has continued through 2016, and will be ongoing in the future. 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 215,000 customers in Virginia.

During 2015, APCo advised it continued 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 has also completed lighting retrofit projects, the installation of ENERGY STAR rated white roofs, and has replaced various HVAC equipment. APCo reports that since the baseline year of 2007, energy use in its Virginia facilities has decreased approximately 43%.

Old Dominion Power Company (ODP)

ODP does not report any major changes to its energy conservation efforts. 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. During 2015, each issue contained practical and proactive ways in which customers can implement energy and conservation measures. 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.

Although ODP does not currently deploy demand-side management portfolios, it reports 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 in which ODP customers have benefited from indirectly through avoided cost capacity savings. KU/LG&E estimates these programs along with additional programs, pending approval of KU and LG&E's proposed 2015-2018 DSM/EE plan, are expected to achieve 500 megawatts of demand reduction and a cumulative energy savings of 1.6 million MWh by 2018. To achieve these benefits, KU and LG&E project a total DSM/EE portfolio of $179 million from 2015-2018, of which the amount approved by the DPSC in Case No. 2011-00134 for the same years is $155 million.

ODP reports that on February 3, 2015, KU and LG&E hired a consultant, The Cadmus Group, to perform an industrial demand-side management and energy efficiency potential study. The study is in accordance with a Kentucky Public Service Commission final order that required KU and LG&E to "commission a study that examines the potential benefits of industrial DMS/EE [demand-side management and energy efficiency] programs."

ODP advises its billing options such as paperless billing and auto pay continue to enable customers to view and pay bills on-line instead of receiving a paper copy through regular mail. Lastly, ODP, KU, and LG&E have initiated 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 and accelerated by Governor McAuliffe in the 2014 Virginia Energy Plan, which set 2020 as the new target date for this goal. The DSM/EE programs of IOUs described in this report represent the primary contributions to Virginia's electric energy reductions.

In order to evaluate the progress the Commonwealth has made towards the stated electric energy reduction goal, DMME has established a baseline reduction total of 10,700,000 MWh, which represents ten percent of the 2006 retail electric energy consumption in Virginia. Neither the Code of Virginia nor the Virginia Energy Plan provide a specific methodology for measuring progress towards this goal; however, there are two primary methodologies measuring avoided energy in megawatt hours (MWh) that DMME has analyzed: annual savings and cumulative savings. Below is a brief discussion of each methodology along with how to measure progress towards the goal under each approach.

Annual savings measures the savings in avoided energy consumption for a given year plus prior year savings that are still within their useful life. Using an annual savings approach encourages increased program implementation in years leading up to the target by rewarding programs that are still providing energy conservation benefits in that year. Current projections under this approach, based on information from state and IOU programs, are for savings of 887,076 MWh in 2020. This projection represents 8.29% of the target reductions.

Cumulative savings measures the sum of all incremental savings for each year in a particular period, in this case between the base year of 2006 to the goal year of 2020, including programs that are beyond their useful life. Using a cumulative savings approach encourages program implementation within the given period regardless of useful life by crediting savings for programs that may no longer be having a measurable impact by the target year. Current projections under this approach, based on information from state and IOU programs, are for savings of 6,830,758 MWh in 2020. This projection represents 63.84% of the target reductions.

These measures are based on the best available data at this point in time; however, they are likely to change from year to year. In fact, projected avoided energy consumption has decreased since last year, despite the launch of new programs. This is due in large part to Dominion's removal of a voltage conservation program from the company's long-term projections. This decrease shows how even a single large project can impact progress towards the Commonwealth's goal.

DMME is not the only state agency analyzing IOU energy efficiency programs. Chapter 255 of the 2016 Acts of Assembly directs the State Corporation Commission to "evaluate the establishment of uniform protocols for measuring, verifying, validating, and reporting the impacts of energy efficiency measures implemented by investor-owned electric utilities providing retail electric utility service in the Commonwealth and the establishment of a methodology for estimating annual kilowatt savings and a formula to calculate the levelized cost of saved energy for such energy efficiency measures." A provision of the Act stipulates that the SCC "shall receive input from interested parties and the Department of Mines, Minerals and Energy" and "submit to the Governor and the General Assembly a report of its findings." Accordingly, DMME provided comments on May 25, 2016.

The SCC published its report on November 30, 2016, which concluded, among other things, "the Commission finds it appropriate to promulgate formal regulations related to the [evaluation, measurement and verification] of utility sponsored energy efficiency programs" that include "Virginia-specific data where possible." The Commission "anticipates commencing a formal rulemaking proceeding during the first quarter of 2017." DMME will participate in the rulemaking proceeding as appropriate. Outcomes of this rulemaking may enable improved metrics in future energy efficiency measurement reporting.