

PUBLIC SERVICE COMMISSION
OF MARYLAND

The EmPOWER Maryland Energy Efficiency Act
REPORT OF 2019

With Data for Compliance Year 2018

In compliance with Section 7-211 of
the Public Utilities Article,
Annotated Code of Maryland

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Report Contents

This document constitutes the 2019 annual report of the Public Service Commission of Maryland regarding the EmPOWER Maryland Energy Efficiency Act (“EmPOWER Maryland” or “EmPOWER”). This Report is submitted in compliance with §7-211 of the Public Utilities Article, *Annotated Code of Maryland* (“PUA”). PUA §7-211 requires that, on or before March 1 of each year, the Commission, in consultation with the Maryland Energy Administration (“MEA”), shall report to the General Assembly on the following:

1. the status of programs and services to encourage and promote the efficient use and conservation of energy, including an evaluation of the impacts of the programs and services that are directed to low-income communities, low-to moderate-income communities to the extent possible, and other particular classes of ratepayers;
2. a recommendation for the appropriate funding level to adequately fund these programs and services; and
3. in accordance with subsection (c) of this section, the per capita electricity consumption and the peak demand for the previous calendar year.

In compliance with PUA §7-211, topics addressed in this report include a summary of the Energy Efficiency & Conservation (“EE&C”) and Demand Response (“DR”) program achievements, and information regarding forthcoming milestones.

Executive Summary

The Commission reviews the progress of EmPOWER programs on a semi-annual basis, typically in May to review the results of the third and fourth quarters of the previous year, and again in October to review the results of the first and second quarters of the current year. As part of these semi-annual hearings, parties may also request program modifications and budget adjustments. As needed, the Commission also holds *ad hoc* proceedings to address specific EmPOWER elements.

The Commission held a legislative-style hearing on May 3 and 4, 2018 to review the semi-annual EmPOWER reports filed by the EmPOWER Maryland Utilities¹ (hereinafter “Utilities”), Washington Gas (“WGL”), and the Maryland Department of Housing and Community Development (“DHCD”), with data from the third and fourth quarters of 2017. Following these hearings, on July 27, 2018, the Commission issued Order No. 88783 which addressed program design and marketing issues. Specifically, the Commission approved the design of the new EmPOWER Maryland logo and directed the Utilities to use the new logo by the end of the third quarter of 2018. Further, the Commission directed the Behavior Work Group

¹ The “EmPOWER Maryland Utilities” (electric) are The Potomac Edison Company (“PE”), Baltimore Gas and Electric Company (“BGE”), Delmarva Power & Light Company (“Delmarva” or “DPL”), Potomac Electric Power Company (“Pepco”), and Southern Maryland Electric Cooperative, Inc. (“SMECO”).

and Finance Work Group to file reports by December 31, 2018 and October 15, 2018, respectively.

The Commission held its second legislative-style hearing on October 25 and 26, 2018, to consider the semi-annual EmPOWER reports filed by the Utilities, WGL, and DHCD for the first and second quarters of 2018. On December 31, 2018, the Commission issued Order No. 88964 which provided direction on programmatic improvements and modifications. Specifically the Order approved Utility requests to increase incentive caps in the Commercial and Industrial (“C&I”) Building Tune-Up programs and to offer the full range of products in the Residential ENERGY STAR Retail Product Platform program. The Order also directed several Work Groups, including the Midstream Program, Limited Income and Electric and Natural Gas Coordination Work Groups, to develop reports to be filed throughout 2019 for the Commission’s review.

Initiative Highlights

- Program-to-date, the Utilities’ EmPOWER Maryland programs have saved a total of 8,092,181 megawatt-hours (“MWh”) and 2,335 megawatt (“MW”). The expected savings associated with EmPOWER Maryland programs is approximately \$9.0 billion over the life of the installed measures for the EE&C programs.
- Across all Utilities, the lifecycle cost per kWh for the EE&C programs in 2018 is \$0.023 per kWh²—significantly lower than the current cost of Standard Offer Service (“SOS”), which ranges from \$0.074 to \$0.081 per kWh.
- Program-to-date, the Utilities have spent over \$2.5 billion on the EmPOWER Maryland programs, including approximately \$1.7 billion on EE&C programs and \$749 million on DR programs.
- EmPOWER EE&C programs continue to be cost effective on a statewide basis in 2018, with a statewide Total Resource Cost (“TRC”) score of 2.07 verified for program year 2017. For every dollar of reported utility or participant cost, the EmPOWER EE&C programs generate approximately \$2.07 in benefits.
- Program-to-date, 34,012 limited-income customers participated in EmPOWER Maryland through the Residential Limited-Income Programs. Of the program-to-date participants, 1,655 limited-income households participated in 2018. The average savings per participant in 2018 was 1,296 kWh. Program-to-date spending on limited-income energy efficiency programs is approximately \$170.6 million.

² The lifecycle cost per kilowatt-hours (“kWh”) is calculated by dividing the total EE&C expenditures by the total lifecycle energy savings of the Utilities.

- The average monthly residential surcharge bill impacts³ for 2018 were as follows:

Table 1: Average Monthly Residential Bill Impacts from EmPOWER Maryland Surcharge in 2018

	EE&C	DR	Dynamic Pricing ⁴	Total
BGE	\$4.34	\$2.87	(\$0.11)	\$7.10
DPL	\$5.87	\$1.56	(\$1.06)	\$6.37
PE	\$6.93	N/A	N/A	\$6.93
Pepco	\$5.85	\$2.90	(\$0.48)	\$8.27
SMECO	\$5.91	\$3.79	N/A	\$9.70

- The reported energy savings for 2018 and program-to-date are as follows:

Table 2 EE&C Reported Achievements^{5,6}

	Incremental 2018 Reported Energy Savings (MWh) ⁷	2018 Energy Savings as a % of 2016 Retail Sales Baseline	2018 Target Energy Savings %	Program-to-Date Reduction (MWh) ⁸
BGE	738,589	2.31%	2.00%	3,987,977
DPL	91,414	2.17%	1.87%	524,689
PE	99,445	1.34%	1.40%	843,508
Pepco	441,771	3.04%	1.92%	2,396,960
SMECO	65,564	1.93%	1.93%	339,047

³ Bill impacts are calculated assuming an average residential monthly usage of 1,000 kWh. The calculated bill impact does not reflect savings produced by EmPOWER Maryland programs through reduced customer usage or energy rate reductions due to reduced system demand.

⁴ The difference between rebates paid to participants and revenues received from PJM markets are trued-up in the subsequent calendar year review of the EmPOWER Maryland surcharge. Therefore, the 2018 dynamic pricing bill impacts include trued-up costs associated with the Peak Time Rebate program offered by BGE, DPL, and Pepco in the summer of 2017. The dynamic pricing surcharges for BGE, DPL, and Pepco were negative in 2018 (i.e. resulted in a credit) because the PJM Capacity payments received by the utilities exceeded the rebate credits paid to customers.

⁵ “Reported savings” constitute unverified energy savings and demand reductions based on the Utilities’ quarterly programmatic reports. An independent, third-party verification of reported savings is conducted annually.

⁶ EmPOWER Maryland 2018 Annual Target was defined in the *2018-2020 Program Cycle EmPOWER Maryland Annual Electric Energy Efficiency Targets* in Order No. 87402 (Sept. 26, 2017) at 11.

⁷ Based on preliminary energy savings from semi-annual programmatic reports. These savings will be verified through an EM&V process.

⁸ Program-to-date reported reductions include savings contributions from Fast Track Programs, which were Lighting and Appliance Rebate programs that began before the EmPOWER Maryland Law was enacted.

EmPOWER Maryland Portfolios

For the 2018-2020 program cycle, the Commission directed the Utilities to meet the EmPOWER Maryland goals through a diverse array of cost-effective solutions for Maryland ratepayers, which can include EE&C, DR, and Advanced Metering Infrastructure (“AMI”) or Smart Grid-enabled opportunities.⁹ While the EmPOWER Maryland Act mandates that the Commission require each gas and electric utility to establish energy efficiency programs, the directive is limited to those programs that the Commission deems appropriate and cost effective. Furthermore, the Commission must consider the impact on rates of each ratepayer class in determining whether to approve an energy efficiency program. Other statutory factors that the Commission must consider in determining whether an energy efficiency program is appropriate include the impact on jobs and on the environment.¹⁰

In order to verify the Utilities’ energy and peak demand savings resulting from individual EE&C and DR programs, the Commission has developed an independent, third-party Evaluation, Measurement & Verification (“EM&V”) process for the EmPOWER programs, consistent with national best practices. See the “Evaluation, Measurement & Verification” section herein for further information. Beginning with the 2016 program year, the Utilities were evaluated against the post-2015 electric energy efficiency goals established by Order No. 87082,¹¹ which are designed to achieve an annual incremental gross energy savings equivalent to 2.0 percent of the individual utility’s weather normalized gross retail sales baseline, with a ramp-up rate of 0.20 percent per year.

Energy Efficiency & Conservation Programs

In Order No. 88514, issued on December 22, 2017, the Commission approved plans for the 2018-2020 program cycle. The Utilities’ EmPOWER Maryland core EE&C program offerings are similarly designed with standardized customer incentives across the State, albeit with some variation in program implementation based on service territory demographics. Residential EE&C programs include discounted light-emitting diodes (“LEDs”) and appliances; heating, ventilation, and air conditioning (“HVAC”) rebates; home energy audits; weatherization; and limited-income programs.¹² Commercial and Industrial EE&C programs are designed to encourage businesses to upgrade to more efficient equipment, such as lighting or HVAC retrofits, or to improve overall building performance through weatherization or building

⁹ Beginning in 2015, the Commission also directed WGL to implement natural gas energy efficiency and conservation programs. See Case No. 9362, *In the Matter of Washington Gas Light Company’s Energy Efficiency, Conservation and Demand Response Programs Pursuant to the EmPOWER Maryland Energy Efficiency Act of 2008*.

¹⁰ PUA §7-211(i)(1). In its evaluation of a program or service, the Commission must consider the following four factors: cost effectiveness; impact on rates of each ratepayer class; impact on jobs; and impact on the environment.

¹¹ The electric energy efficiency goals are codified in statute for the duration of the 2018-2020 and 2021-2023 program cycles as a result of legislation enacted during the 2017 legislative session. See Md. Laws Ch. 014 (2017); PUA § 7-211(g).

¹² Other than the volumetric surcharge collected from all ratepayers, limited-income programs are offered at no additional cost for those who qualify.

shell upgrades. For larger commercial buildings or industrial facilities, a utility can customize its program offerings for cost-effective improvements.

As the 2018-2020 EmPOWER Maryland program cycle begins, there are several changes to evaluation parameters, building codes, and efficiency standards that have reduced the *incremental* energy and demand savings derived from the installation of efficient lighting, appliances, and equipment incentivized by EmPOWER programs or will in the future. Table 3 provides some examples of changes to federal codes and standards, although it does not represent an exhaustive compilation. For products to qualify under EmPOWER, they must be Energy Star qualified. The increases in standards impact the types and quantities of measures that qualify for the EmPOWER programs. Some of these baseline changes result in reduced savings potential available from the EmPOWER programs. The largest uncertainty facing the programs is whether or not the Backstop Requirement in the Energy Independence and Security Act of 2007 (“EISA”) will go into effect in 2020, increasing federal lighting efficiency standards to 45 lumens per watt.

Table 3 Energy Star Standard Changes Occurring in 2018

Measure	New Standard	Effective Date
Clothes Washers	Version 8.0	February 2018
Computers	Version 7.1	November 2018
Commercial Water Heaters	Version 2.0	October 2018
Light Commercial Heating and Cooling	Version 3.1	January 2018
Ceiling Fans	Version 4.0	June 2018

Baltimore Gas and Electric Company (“BGE”)

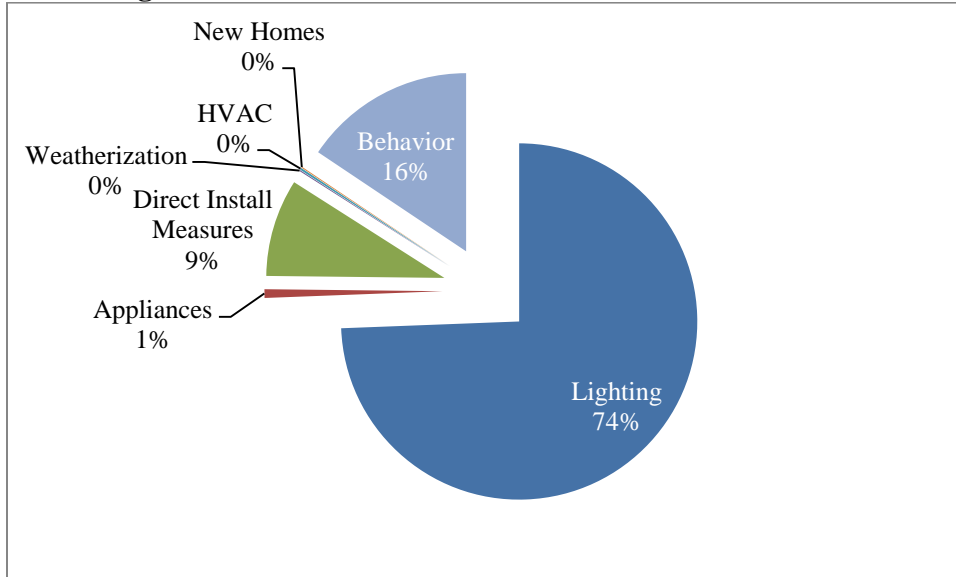
BGE EmPOWER Programs	
Residential Program	Commercial Programs
Appliance Rebates	Combined Heat and Power
Appliance Recycling	Custom
Behavior Based	Midstream Products
Dynamic Pricing	Prescriptive
Home Performance with Energy Star	Retrocommissioning
HVAC	Small Business
Lighting	
Quick Home Energy Checkup	
Residential New Construction	
Smart Thermostats	

BGE realized 113 percent of its 2018 annual energy savings target (or 738,589 MWh) and 68 percent of its forecasted 2018 annual demand reduction target (or 585 MW). BGE’s programs reached nearly 2.4 million participants and installed over 8.1 million measures in homes and businesses in the BGE service territory for approximately \$160.7 million.

Table 4 BGE Reported Savings vs Targets for 2018

	Incremental 2018 Reported Savings	2018 Target Savings ^{13,14}	% of Target Achieved
MWh	738,589	654,808	113%
MW	585	858	68%

Figure 1 Residential Measures Installed in BGE in 2018



Potomac Electric Power Company (“Pepco”)

Pepco EmPOWER Programs	
Residential Program	Commercial Programs
Appliance Rebates	Combined Heat and Power
Appliance Recycling	Custom
Behavior Based	Energy Efficient Communities
Home Performance with Energy Star	Midstream Products
HVAC	Prescriptive
Lighting	Retrocommissioning
Quick Home Energy Checkup	Small Business
Residential New Construction	
Smart Thermostats	

Pepco realized 150 percent of its 2018 annual energy savings target (or 441,771 MWh) and 158 percent of its forecasted 2018 annual demand reduction target (or 458 MW). Pepco’s programs reached nearly 513,000 participants and installed over 4.7 million measures in homes and businesses in the Pepco service territory for approximately \$78.0 million.

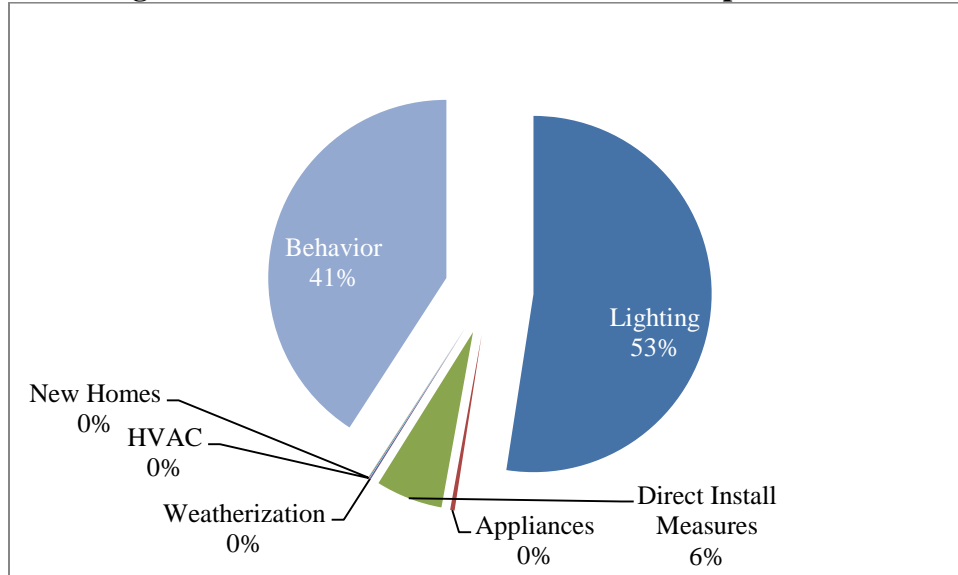
¹³ EmPOWER Maryland reduction targets are based upon the individual EmPOWER Maryland filings of each utility.

¹⁴ The demand reduction targets and reported achievements include peak demand reductions generated by both EE&C and DR programs, as both components are part of the total portfolio.

Table 5 Pepco Reported Savings vs Targets for 2018

	Incremental 2018 Reported Savings	2018 Target Savings ^{15,16}	% of Target Achieved
MWh	441,771	294,109	150%
MW	458	290	158%

Figure 2 Residential Measures Installed in Pepco in 2018



The Potomac Edison Company (“PE”)

PE EmPOWER Programs	
Residential Program	Commercial Programs
Appliance Rebates	Custom
Appliance Recycling	Prescriptive
Behavior Based	Small Business
Consumer Electronics	
Energy Efficiency Kits	
Home Performance with Energy Star	
HVAC	
Lighting	
Quick Home Energy Checkup	
Residential New Construction	
Schools	

¹⁵ EmPOWER Maryland reduction targets are based upon the individual EmPOWER Maryland filings of each utility.

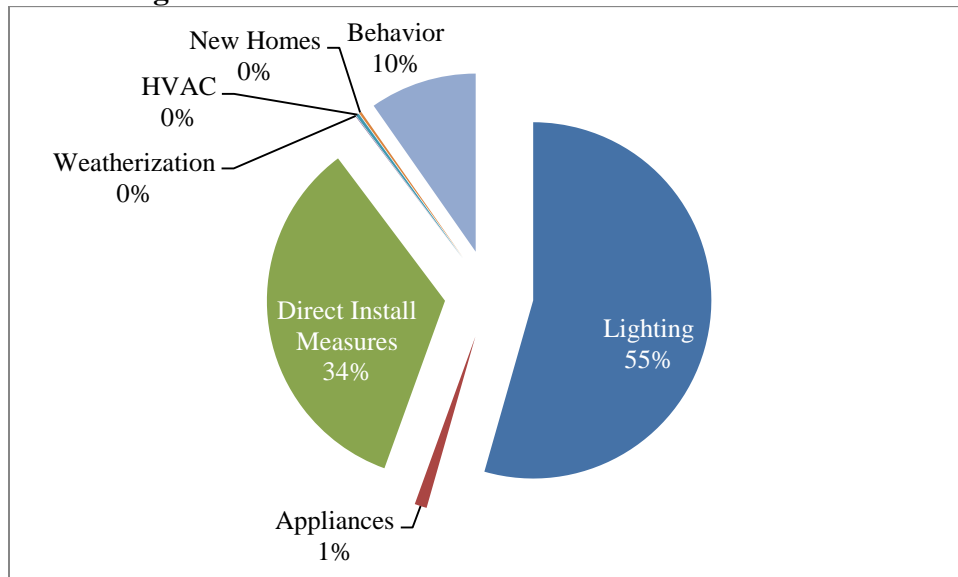
¹⁶ The demand reduction targets and reported achievements include peak demand reductions generated by both EE&C and DR programs, as both components are part of the total portfolio.

PE realized 96 percent of its 2018 annual energy savings target (or 99,445 MWh) and 94 percent of its forecasted 2018 annual demand reduction target (or 16 MW). The main reason behind PE not making its energy savings target for the program year was the underperformance of the C&I programs. PE’s programs reached over 313,000 participants and installed nearly 1.3 million measures in homes and businesses in the PE service territory for approximately \$24.6 million.

Table 6 PE Reported Savings vs Targets for 2018

	Incremental 2018 Reported Savings	2018 Target Savings ¹⁷	% of Target Achieved
MWh	99,445	104,086	96%
MW	16	17	94%

Figure 3 Residential Measures Installed in PE in 2018



¹⁷ EmPOWER Maryland reduction targets are based upon the individual EmPOWER Maryland filings of each utility.

Delmarva Power & Light Company (“DPL”)

DPL EmPOWER Programs	
Residential Program	Commercial Programs
Appliance Rebates	Combined Heat and Power
Appliance Recycling	Custom
Behavior Based	Energy Efficient Communities
Family Farms	Midstream Products
Home Performance with Energy Star	Prescriptive
HVAC	Retrocommissioning
Lighting	Small Business
Quick Home Energy Checkup	
Residential New Construction	
Schools	
Smart Thermostats	

DPL realized 93 percent of its 2018 annual energy savings target (or 91,414 MWh) and 88 percent of its forecasted 2018 annual demand reduction target (or 106 MW). The main reason behind DPL not making its energy savings target for the program year was the underperformance of the C&I programs. DPL’s programs reached over 141,000 participants and installed over 1.3 million measures in homes and businesses in the DPL service territory for approximately \$29.2 million.

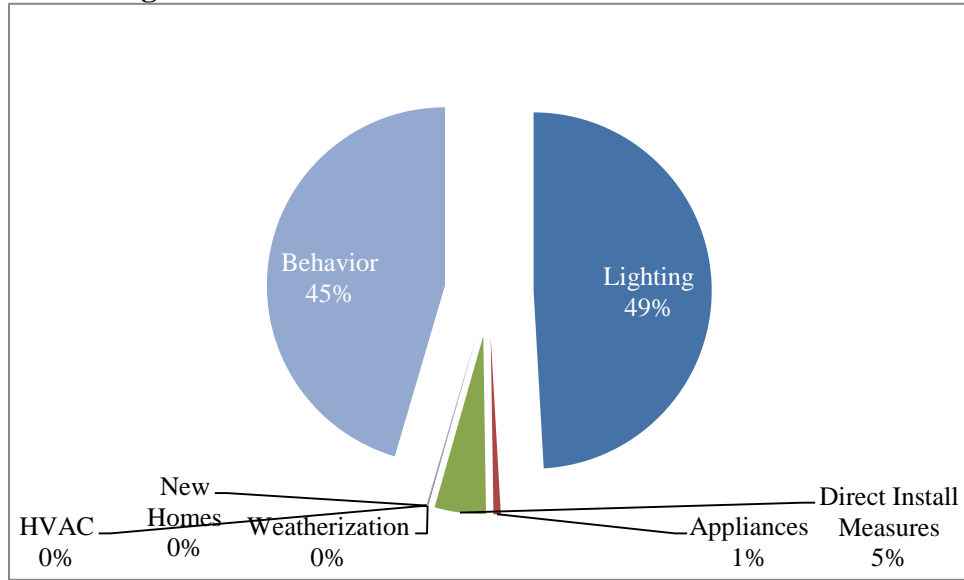
Table 7 DPL Reported Savings vs Targets for 2018

	Incremental 2018 Reported Savings	2018 Target Savings^{18,19}	% of Target Achieved
MWh	91,414	98,716	93%
MW	106	121	88%

¹⁸ EmPOWER Maryland reduction targets are based upon the individual EmPOWER Maryland filings of each utility.

¹⁹ The demand reduction targets and reported achievements include peak demand reductions generated by both EE&C and DR programs, as both components are part of the total portfolio.

Figure 4 Residential Measures Installed in DPL in 2018



Southern Maryland Electric Cooperative, Inc. (“SMECO”)

SMECO EmPOWER Programs	
Residential Program	Commercial Programs
Appliance Rebates	Combined Heat and Power
Appliance Recycling	Custom
Behavior Based	Midstream Products
Energy Efficiency Kits	Prescriptive
Home Energy Improvements	Retrocommissioning
HVAC	Small Business
Lighting	
Residential New Construction	
Smart Thermostats	

SMECO realized 100 percent of its 2018 annual energy savings target (or 65,564 MWh) and 93 percent of its forecasted 2018 annual demand reduction target (or 66 MW). SMECO’s programs reached over 270,000 participants and installed over 1.0 million measures in homes and businesses in the SMECO service territory for approximately \$22.8 million.

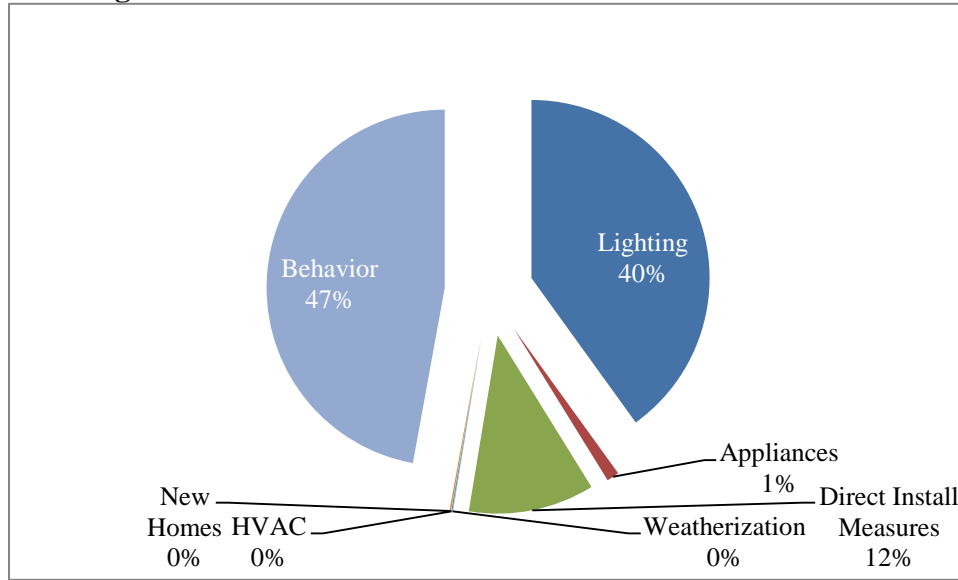
Table 8 SMECO Reported Savings vs Targets for 2018

	Incremental 2018 Reported Savings	2018 Target Savings ^{20,21}	% of Target Achieved
MWh	65,564	65,289	100%
MW	66	71	93%

²⁰ EmPOWER Maryland reduction targets are based upon the individual EmPOWER Maryland filings of each utility.

²¹ The demand reduction targets and reported achievements include peak demand reductions generated by both EE&C and DR programs, as both components are part of the total portfolio.

Figure 5 Residential Measures Installed in SMECO in 2018



Washington Gas and Light Company (“WGL”)

WGL EmPOWER Programs	
Residential Program	Commercial Programs
Residential Prescriptive	C&I Prescriptive
Residential New Construction	C&I New Construction
Behavior Based	Custom

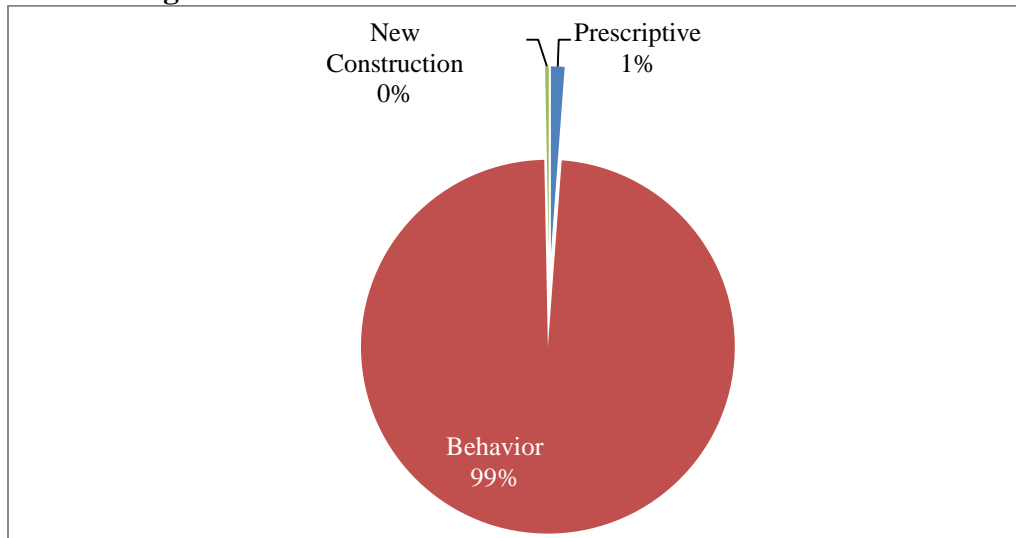
WGL realized 24 percent of its 2018 annual energy savings target (or 248,972 Therms). WGL completely redesigned its programs for the 2018-2020 program cycle. This program overhaul took longer to complete than anticipated, resulting in WGL missing its energy savings target for 2018. WGL’s programs reached over 50,000 participants and installed over 50,000 measures in homes and businesses in the WGL service territory for approximately \$1.4 million.

Table 9 WGL Reported Savings vs Targets for 2018

	Incremental 2018 Reported Savings	2018 Target Savings ²²	% of Target Achieved
Therms	248,972	1,036,840	24%

²² EmPOWER Maryland reduction targets are based upon the individual EmPOWER Maryland filings of each utility.

Figure 6 Residential Measures Installed in WGL in 2018



Limited-Income Programs

On December 22, 2011, the Commission, in Order No. 84569, designated DHCD as the sole implementer of Limited-Income programs for the EmPOWER Maryland Utilities. In April 2012, DHCD accepted control of the residential limited-income programs of BGE, PE, and SMECO. In July 2012, the transition was completed with DHCD accepting control of the Pepco and DPL limited-income programs.

In Order No. 86785, issued on December 23, 2014, the Commission authorized DHCD to continue its implementation of the Limited-Income programs in Maryland during calendar year 2015, subject to certain specified structural enhancements such as spending guidelines per household. DHCD was approved as the implementer of the Limited-Income programs for the remainder of the 2015-2017 program cycle in Order No. 86995. In Order No. 88514, DHCD's 2018-2020 program cycle plan was approved.

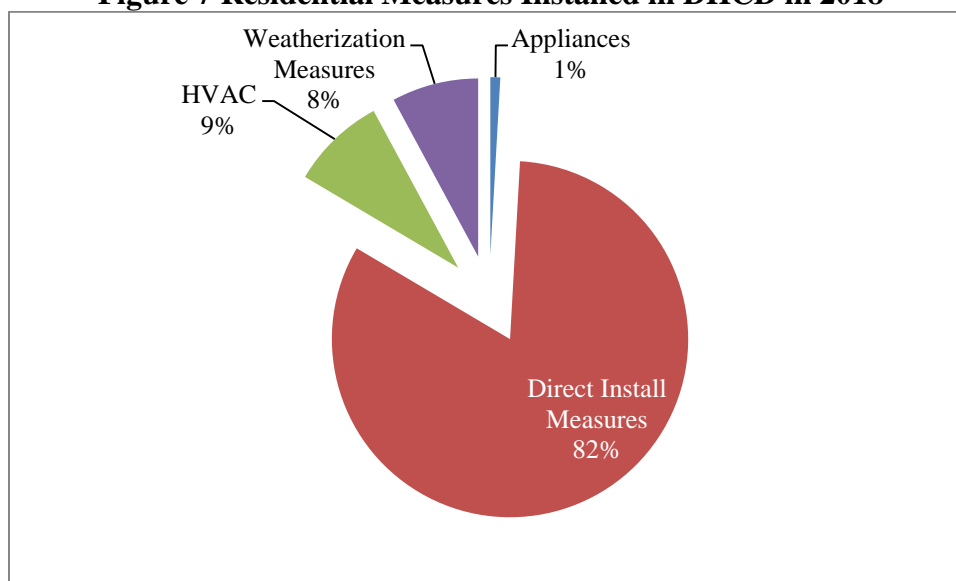
DHCD offers two programs, one for single family homes and another for multifamily properties. In 2018, DHCD weatherized approximately 1,651 limited-income homes and four multifamily properties at a total cost of \$13.9 million. Total energy savings per job averaged 1,214 kWh.

Table 10 DHCD Reported Savings vs Targets for 2018

Program	Energy/Demand Savings	Incremental 2018 Reported Savings	2018 Target Savings ²³	% of Target Achieved
Single Family	MWh	2,005	5,903	34%
	MW	1.2	1.7	71%
Multifamily	MWh	138	1,021	14%
	MW	0.04	0.3	13%

²³ EmPOWER Maryland reduction targets are based upon the individual EmPOWER Maryland filings of DHCD.

Figure 7 Residential Measures Installed in DHCD in 2018



Demand Response

The EmPOWER Maryland Act requires the Utilities to implement cost-effective demand response programs; although, there are not currently goals established for the magnitude of demand reduction that each Utility must target (following the realization of the legislatively mandated 15 percent by 2015 targets). The Commission approved four residential demand response programs in late 2007 and early 2008,²⁴ all of which were operational by the end of 2009.²⁵

Customers who have chosen to participate in the direct load control programs included in the Utilities' demand response portfolios have a switch or thermostat installed at their properties to briefly curtail usage of central air conditioning or an electric heat pump in instances of system reliability issues or high electricity prices during critical peak hours. Each direct load control DR program includes the following common components: (1) customer participation in DR programs is voluntary; (2) upon receiving a customer request, the utility installs either a programmable thermostat or a direct load control switch for a central air conditioning system or for an electric heat pump on a customer's premise; (3) the Utilities provide a one-time installation incentive and annual bill credits to the participants during the specified summer peak months; and (4) with the exception of the SMECO DR program, customers can select one of three cycling choices (50 percent, 75 percent, or 100 percent).²⁶ Utilities will invoke the cycling process when PJM calls for an emergency event or if the Utilities individually determine that an

²⁴ See Commission Letter Order (Nov. 30, 2007).

²⁵ The Commission did not approve a DR program for PE similar to those implemented for BGE, Pepco, DPL, and SMECO because PE's proposed program was not cost effective due to lower zonal capacity prices.

²⁶ The three cycling choices represent the air conditioner compressor working cycled reduced by 50 percent, 75 percent, and 100 percent under PJM—or utility-invoked emergency events during summer peak season. SMECO only offers a 50 percent and 75 percent cycling level with corresponding bill credits of \$50 and \$75 during the summer months.

event is necessary during summer peak season. Table 11 summarizes the incentives offered by the Utilities to the residential program participants.

Table 11 Utilities’ Incentive Levels for Residential Demand Response Program Participants

Utility	50% Cycling		75% Cycling		100% Cycling		Bill Credit Months
	Installation Incentive	Annual Bill Credit	Installation Incentive	Annual Bill Credit	Installation Incentive	Annual Bill Credit	
BGE	\$50	\$50	\$75	\$75	\$100	\$100	Jun.–Sept.
Pepco	\$40	\$40	\$60	\$60	\$80	\$80	Jun.– Oct.
DPL	\$40	\$40	\$60	\$60	\$80	\$80	Jun.– Oct.
SMECO	***	\$50	***	\$75	N/A	N/A	Jun.– Oct.

*** A participant in SMECO CoolSentry program can keep the installed thermostat at no additional cost following 12 months of program participation; otherwise, the thermostat will be removed if the participant terminates participation less than 12 months after installation.

Table 12 summarizes the number of active devices installed for each of the Utilities’ direct load control program on a program-to-date basis through December 31, 2018.

Table 12 Utilities’ Residential Direct Load Program Device Installation

Utility	Residential	Commercial	Total
BGE	376,419	N/A	376,419
DPL	38,296	2,461	40,757
Pepco	221,036	5,886	226,922
SMECO	46,120	50	46,170
Total	681,871	8,397	690,268

Table 13 summarizes the demand reduction capability for the Utilities’ DLC programs as of December 31, 2018.

Table 13 DLC Program Coincident Peak Demand Reduction (MW)

Utility	Program-to-Date Reported
BGE	286.104
DPL	40.802
Pepco	230.026
SMECO	55.856
Total	612.788

Additional demand reductions are expected to stem from smart grid-enabled dynamic pricing programs, as well as from other non-EmPOWER funded programs such as conservation voltage reduction (“CVR”). Table 14 summarizes the reported demand reductions from the dynamic pricing programs for 2013-2018. BGE, Pepco, and DPL are currently the only Utilities that operate dynamic pricing programs. Demand reductions from dynamic pricing programs represent a snapshot for a particular time period and are dependent upon customer engagement and participation; therefore, demand reductions attributable to dynamic pricing programs could change year-to-year.

Table 14 Dynamic Pricing Demand Reduction (MW)

Utility	2013	2014	2015	2016	2017	2018
BGE	0	209	309	336	330	140
DPL	0	0	143	39	31	47
Pepco	309	125	47	126	135	124
Total	309	334	499	501	496	311

PJM RPM Capacity Market

2018 was the second year in which the PJM Reliability Pricing Model (“RPM”) Base Residual Auction (“BRA”) for Delivery Year (“DY”) 2021/2022 procured 100 percent Capacity Performance (“CP”) Resources. CP Resources must be able to provide energy and reserves during performance assessment intervals (“PAIs”) throughout the Delivery Year. PAIs are those times when PJM declares emergency actions. Resources that are not capable of meeting the CP requirements throughout the entire Delivery Year can still qualify to bid in the RPM if they can aggregate with another resource, effectively creating an annual CP resource. Alternatively, by employing advanced metering, supervisory control and variable retail rates, a load management resource can qualify as a Price Responsive Demand (“PRD”) Resource. A PRD resource will not be treated as a supply resource in the RPM capacity market and will not receive a capacity payment. However, it serves to reduce the demand for capacity, thereby reducing capacity costs.

The EmPOWER Maryland programs received lower PJM revenues to directly offset program costs due to the change to the Capacity Performance. The load reduction resources in the DLC programs were offered as PRD resources with no capacity payment. This lowered the demand obligations for the Utilities. The AMI enabled dynamic pricing programs do not qualify as an annual CP resource; however, the Utilities were able to aggregate these programs with another resource to meet the annual CP requirements and bid into the BRA. The dynamic pricing programs will only receive capacity payments for half of the 2021/2022 DY because they were aggregated with another resource. Demand reductions from the EE&C program are the only demand reduction resources that qualify as a CP resource for the current RPM structure and will receive the full capacity payment for all resources cleared.

The following tables illustrate the cleared capacity and PJM capacity payments for the DLC, EE&C and DP programs.

Table 15 Demand Response Program BRA Results

	Cleared Capacity (MW)	PJM Capacity Payment (Million \$)
DY 2009/2010	217	\$18.8
DY 2010/2011	415	\$26.4
DY 2011/2012	662	\$26.6
DY 2012/2013	953	\$46.5
DY 2013/2014	803	\$67.7
DY 2014/2015	772	\$33.9
DY 2015/2016	625	\$36.0
DY 2016/2017	554	\$24.1
DY 2017/2018	536	\$23.5
DY 2018/2019	522	\$11.5
DY 2019/2020	230	\$1.6
DY 2020/2021	265	\$9.2
DY 2021/2022²⁷	N/A	N/A
Total	6,554	\$325.8

The Utilities also bid capacity reductions from their EE&C programs and AMI-enabled dynamic pricing programs. Similar to the DLC programs, the Utilities earn capacity payments from PJM for these commitments; the payments are used to offset EE&C program costs and to fund the rebates earned by customers in the dynamic pricing program. Table 16 and Table 17 summarize the capacity bid into the PJM capacity market from the EE&C and dynamic pricing programs by delivery year, and the payments the Utilities receive from PJM.

Table 16 EE&C Program BRA Results

	Cleared Capacity (MW)	PJM Capacity Payment (Million \$)
DY 2012/2013	168	\$8.2
DY 2013/2014	107	\$8.7
DY 2014/2015	179	\$8.3
DY 2015/2016	175	\$10.2
DY 2016/2017	226	\$9.5
DY 2017/2018	243	\$10.8
DY 2018/2019	172	\$10.1
DY 2019/2020	184	\$6.8
DY 2020/2021	199	\$5.8
DY 2021/2022	180	\$11.4
Total	1,833	\$89.8

²⁷ The DLC program committed 589 MW of capacity as a Price Responsive Demand resource. Under the prior RPM construct, 589 MW would have earned approximately \$32.8 million in capacity payments from PJM.

Table 17 Dynamic Pricing Program BRA Results

	Cleared Capacity (MW)	PJM Capacity Payment (Million \$)
DY 2014/2015	267	\$12.2
DY 2015/2016	426	\$23.3
DY 2016/2017	461	\$20.0
DY 2017/2018	387	\$17.0
DY 2018/2019	378	\$10.0
DY 2019/2020	225	\$2.2
DY 2020/2021	425	\$13.1
DY 2021/2022	177	\$4.8
Total	2,746	\$102.6

Table 18 illustrates the amount of capacity cleared in the BRA by the EmPOWER Utilities for the delivery years of 2020/2021 and 2021/2022. The table also shows the amount of capacity revenue that the Utilities can expect to receive from PJM in the two delivery years, which will be used to offset the costs of the DR, EE&C, and dynamic pricing programs borne by ratepayers.

The amount of capacity cleared in the 2021/2022 DY auctions is 531 MW less than the amount of capacity cleared in the 2020/2021 DY. There are two reasons for this decline. First, the utilities did not bid any capacity from the demand response programs in this auction as these resources do not meet the Capacity Performance requirements. These resources were offered as PRD resources and do not receive capacity payments. Second, capacity cleared for Dynamic Pricing resources are required to aggregate with winter resources in order to clear the capacity auction. There were fewer winter resources to aggregate with in the 2021/2022 auction compared to the 2020/2021 auction.

Table 18 Maryland Utilities' PJM BRA Results and Expected Revenue for Delivery Years 2020/2021 and 2021/2022

DY 2020/2021					DY 2021/2022				
Cleared Bids (MW)				Value	Cleared Bids (MW)				Value
DR	DP	EE&C	Total	(\$Million)	DR	DP	EE&C	Total	(\$Million)
265	425	199	889	\$28.0	N/A	177	180	357	\$15.1

EmPOWER Maryland Funding Levels

EE&C Program Funding

On December 22, 2017, in Order No. 88514, the Commission approved the 2018-2020 program cycle budgets based on the EmPOWER Maryland Utilities' proposals. Table 19 breaks down the 2018 Commission-approved budgets for each of the Utilities, while Table 20 illustrates

the actual 2018 expenditures by the Utilities with respect to their EmPOWER Maryland EE&C programs.

Table 19 Forecasted 2018 EE&C Budgets

Utility	Residential	C&I	DHCD Limited-Income Program	Total
BGE	\$72,944,885	\$55,759,404	\$15,967,824	\$144,672,113
DPL	\$8,230,867	\$17,738,765	\$0	\$25,969,632
PE	\$17,148,430	\$14,500,151	\$5,132,134	\$36,780,715
Pepco	\$26,640,533	\$52,110,023	\$0	\$78,750,556
SMECO	\$12,012,668	\$5,755,281	\$0	\$17,767,949
Total	\$136,977,383	\$145,863,624	\$21,099,958	\$303,940,965

Table 20 Reported 2018 EE&C Spending

Utility	Residential	C&I	DHCD Limited-Income Program	Total
BGE	\$61,102,028	\$47,212,198	\$16,764,710	\$125,078,936
DPL	\$7,728,258	\$12,503,242	\$4,523,343	\$24,754,843
PE	\$14,363,140	\$7,113,234	\$3,142,528	\$24,618,902
Pepco	\$21,434,053	\$35,094,126	\$3,671,859	\$60,200,038
SMECO	\$9,300,656	\$5,123,762	\$9,551	\$14,433,969
Total	\$113,928,135	\$107,046,562	\$28,111,991	\$249,086,688

Table 21 details the EmPOWER Maryland EE&C program surcharges and revenue requirements for each of the Utilities. The EmPOWER Maryland surcharges are a volumetric-based charge, subject to the individual ratepayer's monthly energy usage. The revenue requirements do not correspond to the filed budgets because program costs are amortized and collected over a five-year period as directed by the Commission in Order No. 81637.²⁸

Table 21 2018 EE&C Monthly Surcharges (per kWh) and Revenue Requirements

Utility	Residential	Small C&I	Large C&I	Revenue Requirement
BGE	\$0.00434	\$0.00666	\$0.00287	\$109,228,077
DPL	\$0.00587	\$0.00779	\$0.00779	\$26,699,656
PE	\$0.00693	\$0.00328	\$0.00324	\$31,616,819
Pepco	\$0.00585	\$0.00640	\$0.00640	\$86,480,512
SMECO	\$0.00591	\$0.00360	\$0.00360	\$17,981,383

²⁸ *In the Matter of the Commission's Investigation of Advanced Metering Technical Standards, Demand Side Management (DSM) Cost Effectiveness Tests, DSM Competitive Neutrality, and Recovery of Costs Advanced Meters and DSM Programs*, Case No. 9111.

Demand Response Program Funding

The December 22, 2017 Commission Order similarly approved three-year budgets for the demand response programs operated by BGE, DPL, Pepco, and SMECO. Table 22 details the EmPOWER Maryland demand response surcharges and revenue requirements for each of the Utilities operating an approved DR program.²⁹

Table 22 2018 Demand Response Monthly Surcharges (per kWh) and Revenue Requirements

Utility	Residential	C&I	Revenue Requirement
BGE	\$0.00287	N/A	\$35,133,912
DPL	\$0.00156	\$0.00000	\$3,119,999
Pepco	\$0.00290	\$0.00019	\$18,140,777
SMECO	\$0.00379	\$0.00079	\$9,543,832

Table 23 details the respective forecasted and reported budgets for each of the EmPOWER Utilities operating an approved DR program during 2018. All of the Utilities' programs were under budget for the 2018 program year.

Table 23 2018 Demand Response Forecasted and Reported Budgets

Utility	Forecasted Budget	Reported Costs	Variance
BGE	\$38,579,992	\$34,477,147	(\$4,102,845)
DPL	\$4,882,147	\$3,986,976	(\$895,171)
Pepco	\$20,856,009	\$16,799,832	(\$4,056,177)
SMECO	\$8,571,218	\$7,852,023	(\$719,195)
Total	\$72,889,366	\$63,115,978	(\$9,773,388)

Evaluation, Measurement & Verification

Determining and validating electricity savings and related impacts is a critical component of EE&C and DR programs. The process of evaluation, measurement, and verification ("EM&V") of resulting program savings is particularly important in determining the effectiveness of program delivery, the factors driving or impeding customer participation in programs, characteristics of participants and non-participant customers, determinants of equipment decisions, and customer satisfaction with program delivery. Moreover, the design and depth of program data collection, monitoring, and analyses can impact the accuracy and prudence of compliance results. Given the scale of the EmPOWER Maryland initiative and the potential bill impacts, the Commission is sensitive to the issue of program credibility and transparency. This process also evaluates free-ridership, spillover, cost-effectiveness, deemed savings calculations, etc., pertinent to a thorough and ongoing review of viable and cost-effective energy efficiency and demand response programs.

²⁹ PE did not operate a separate DR program during 2018 and therefore did not file for a surcharge recovery of DR program costs.

Based on EM&V best practices, the Commission adopted an independent, third-party evaluator model to review the EmPOWER portfolio results.³⁰ In this model, the Utilities direct primary evaluation and verification activities through an EM&V contractor; subsequently, the Commission’s third-party, independent evaluator provides independent analysis and due diligence of the EM&V process. Because this thorough evaluation process requires up to six months following the receipt of program data from the prior calendar year to complete, this report illuminates the results of the Utilities’ 2017 program year reported savings.

Overall EM&V Findings of the 2017 EmPOWER EE&C Program

Energy and Peak Demand Savings

In 2017, Navigant’s evaluation of the first-year savings³¹ was 839,140 MWh and 156.878 MW, which was 95 percent and 96 percent of the Utilities’ reported energy and demand savings for that year. For the 2017 program year, Navigant estimated an effective Net-to-Gross (“NTG”) ratio of 0.76 for annual energy savings and 0.79 for peak demand savings. The NTG ratio is used to derive savings specifically attributable to the EmPOWER programs by calculating free-ridership levels and reducing reported gross savings by that amount.³² Following the application of the calculated NTG ratios, the net savings for program year 2015 were 637,959 MWh and 123.466 MW.

As the EmPOWER Maryland Independent Evaluator, Itron, Inc. (“Itron”), supports the Commission’s oversight of the statewide evaluation of the EmPOWER EE&C programs conducted by Navigant. Itron’s verification analysis confirmed Navigant’s results and accepted all of the evaluated energy and demand savings estimates for program year 2017. This important result should increase ratepayer and other stakeholders’ confidence that the evaluated savings from the EmPOWER Maryland programs are real and credible.

Given that the key energy assumption values and NTG ratios have been updated and other anomalies in the program tracking databases have been rectified to improve the quality of reporting, it is expected that the Utilities’ reported savings estimates for 2018 should continue to be very similar to the evaluation results. Changes to evaluation parameters and codes and standards will have the effect of raising the baseline level of energy savings, therefore reducing the incremental energy savings achieved by installing efficient equipment. The EM&V contractors will monitor and reflect these changes in future evaluation cycles.

Cost Effectiveness

Table 24 presents the 2017 total resource cost (“TRC”) test cost-effectiveness results by sector for each of the Utilities.³³ The sector-level benefit-to-cost ratios reflect the present value

³⁰ Order No. 82869 (Aug. 31, 2009).

³¹ “First-year savings” is the amount of energy a measure will save in the first year in which the measure is installed.

³² A “free rider” is a customer who would have installed an energy efficiency measure absent the utility-provided EmPOWER incentive.

³³ The 2018 program year cost-effectiveness results are expected in the second half of 2019.

of the benefits compared to the present value of the costs, aggregated from each program in the sector-level sub-portfolio. As noted, TRC ratios greater than 1.0 indicate that the financial benefits that accrue over the life of the measures exceed the financial costs of the program; specifically, the costs associated with utility program administration, the provision of incentives to free riders, and customer outlays for the efficiency measures. Statewide, both the Residential and C&I sub-portfolios were cost effective in 2017, with overall TRC scores of 1.89 and 2.24, respectively.

Table 24 2017 Portfolio TRC Results

	Residential	Commercial	Portfolio
BGE	1.81	2.77	2.27
Pepco	2.26	1.77	1.98
PE	1.51	1.52	1.52
DPL	1.67	1.77	1.73
SMECO	2.10	2.04	2.08
Statewide	1.89	2.24	2.07

At the statewide level, the 2017 EmPOWER portfolio is expected to generate approximately \$2.07 in utility and participant benefits for each dollar of utility and participant cost. For a total investment of \$250 million,³⁴ the State’s Utilities, participants, and ratepayers will realize approximately \$516 million³⁵ in financial benefits via electricity, fuel, and water savings generated over the lifetime of the measures installed through the EmPOWER program. These results correspond to a net benefit of approximately \$266 million.

When assessing whether to approve the Utilities’ plans, the Commission evaluates cost effectiveness at the sub-portfolio level, i.e., the C&I and Residential sub-portfolios should both generate TRC ratios greater than 1.0. Thus, individual programs do not necessarily need to be cost effective as long as other programs are sufficiently cost-effective to generate sector-level TRC ratios that are greater than 1.0. The Commission may approve individual programs that are not individually cost effective to ensure a broader array of energy-saving opportunities amongst rate classes, income levels, etc., or because the program may promote innovative technologies and market-transformative practices leading to broader energy savings. All EmPOWER Utilities have developed cost-effective portfolios that pass the TRC test—most by a comfortable margin.

2018 per Capita Electricity Consumption and Peak Demand

Table 25 and Table 26 compare the per capita energy use and peak demand from 2007 to 2018 for all Maryland utilities. In 2018, a majority of the State’s electric utilities experienced an increase in per capita energy use and per capita peak demand as compared to 2017 levels. The primary causes for the per capita increase is an increase in electricity usage during a colder than normal winter combined with a nominal decrease in the State’s population.

³⁴ The \$250 million total investment is the present value of both utility and participant costs.

³⁵ The \$516 million in financial benefits is the present value of both utility and participant benefits.

Table 25 2007 - 2018 per Capita Energy Consumption

	Per Capita Energy Use MWh											
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
BGE	13.41	12.99	12.72	13.17	12.65	12.26	12.06	11.86	11.82	11.57	11.31	11.44
Pepco	9.32	9.05	8.81	8.97	8.91	8.18	8.10	7.81	7.94	7.73	7.56	7.60
PE	18.46	19.49	18.86	19.39	17.17	16.93	17.53	17.64	17.39	17.57	17.60	18.10
Delmarva	13.70	12.60	12.83	13.14	13.02	12.61	12.60	12.55	13.00	12.73	12.65	12.89
SMECO	11.22	10.57	10.47	10.83	10.85	10.61	10.49	10.21	10.25	10.03	9.72	9.75
Choptank	13.70	12.65	12.79	13.06	12.58	12.31	12.92	12.55	13.04	12.73	13.24	13.42
Hagerstown	9.33	9.01	8.67	8.95	8.37	7.93	7.71	7.60	7.62	7.58	7.49	8.27
Easton	20.25	19.23	17.82	18.48	16.59	16.65	16.52	16.41	16.55	16.33	16.03	17.12
Thurmont	15.08	14.53	14.26	14.37	13.73	13.02	13.27	13.02	13.68	13.06	12.61	13.41
Berlin	11.05	10.60	9.93	10.84	9.31	9.40	9.37	9.90	10.61	10.15	9.86	11.06
Williamsport	9.54	8.92	8.37	8.56	9.20	9.44	9.87	10.06	10.04	9.64	9.39	9.85
Somerset	4.22	N/A	N/A	4.48	4.49	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A&N Coop.	9.25	11.10	9.52	8.87	8.05	10.83	10.81	11.06	N/A	N/A	N/A	N/A

Table 26 2007 - 2018 per Capita Peak Demand

	Per Capita Energy Use kW											
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
BGE	2.77	2.69	2.75	2.55	2.70	2.38	2.38	2.27	2.36	2.40	2.34	2.36
Pepco	1.96	1.95	2.05	1.99	1.98	1.79	1.55	1.57	1.88	2.03	1.62	1.62
PE	3.36	3.35	3.04	2.93	3.24	3.27	3.10	2.62	3.68	3.49	3.42	3.42
Delmarva	3.16	2.78	2.81	2.77	2.76	2.80	2.72	2.62	2.76	2.83	2.67	2.67
SMECO	2.28	2.29	2.43	2.40	2.42	2.22	2.15	1.93	2.76	2.36	2.41	2.42
Choptank	3.16	2.72	2.81	2.44	2.77	3.17	3.33	2.59	3.33	2.83	2.99	2.98
Hagerstown	1.87	1.78	1.68	1.76	1.71	1.65	1.54	1.28	1.66	1.50	1.52	1.55
Easton	4.54	4.37	3.91	4.13	4.04	4.09	3.81	3.24	4.27	3.73	3.63	3.63
Thurmont	2.74	2.55	2.20	2.21	2.58	2.41	2.39	2.03	4.33	3.26	2.94	3.11
Berlin	2.31	2.35	2.27	2.58	1.99	2.44	2.09	2.19	2.30	1.17	2.21	2.27
Williamsport	1.79	1.52	1.47	1.17	1.64	1.85	1.87	1.39	2.48	2.15	2.18	2.21
Somerset	1.11	N/A	N/A	0.36	1.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A&N Coop.	2.10	2.29	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 27 illustrates the per capita electricity usage and peak demand statewide. Generally, statewide per capita energy usage has been lower in 2012-2018 than 2007-2011.

Table 27 Statewide Per Capita Electricity Usage and Peak Demand 2007-2018

Year	Per Capita Energy Use MWh	Per Capita Energy Use kW
2007	12.38	2.56
2008	11.74	2.49
2009	11.73	2.53
2010	12.02	2.40
2011	11.70	2.50
2012	11.21	2.28
2013	11.13	2.18
2014	10.91	2.07
2015	10.96	2.37
2016	10.74	2.39
2017	10.53	2.21
2018	10.68	2.22

Upcoming Milestones

The Commission will be reviewing six Work Group reports as a result of Commission Order Nos. 88783 and 88964.

- Finance Work Group - The final report is to include possible residential financing options for energy efficiency programs, as well as how residential financing options can be integrated into the EmPOWER program, and any legislation needed to effectuate an affordable and effective residential financing option.
- Midstream Work Group
 - Marketing - This report provides the Utilities' Midstream Program implementation activities to date, consistent with the directive in Order No. 88964.
 - Contractor Licensing and Insurance Requirements - the Commission directed the work group to file its findings on prior contractor license and insurance requirements under the Utilities' HVAC programs, as well as current contractor license and insurance requirements under the Utilities' Midstream Programs
- Behavior Work Group – The Commission directed the Work Group to provide information and recommendations on a program cap, the use of advance EM&V, and cost recovery for Behavior programs.
- Limited Income Work Group – The Commission directed the Work Group to develop effective means to cross-market low income programs between DHCD and the Utilities.
- Cost Recovery Work Group – This Work Group was directed to investigate the appropriate rate of return for the EmPOWER programs, impact to the surcharge and ratepayers for adjusting the amortization period for all EmPOWER programs,

investigate performance bases rates, and transition plans from the current surcharge structure to another.

Planning for the 2021-2023 EmPOWER Program cycle will commence during 2019. The initial step will be to invite outside parties to propose ideas for new programs or program enhancements.