

**MARYLAND PUBLIC  
SERVICE COMMISSION**

**STATUS OF PROGRAMS THAT SUPPORT THE  
STATE'S GREENHOUSE GAS REDUCTION  
EFFORTS OR ADDRESS CLIMATE CHANGE**

**REPORT OF 2022**  
For Calendar Year 2021

Pursuant to  
§ 2-1305(c) of the Environmental Article  
*Annotated Code of Maryland*

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## **Introduction**

The Maryland Public Service Commission (“Commission”) is an independent, quasi-judicial State agency<sup>1</sup> established by the Maryland General Assembly to regulate the activities of public service companies and for-hire transportation companies doing business in Maryland. The Commission is empowered under the Public Utilities Article (“PUA”), *Annotated Code of Maryland*, to hear and decide matters related to, among others, (1) rate adjustments, (2) applications to exercise or abandon franchises, (3) applications to modify the type or scope of service, (4) approval of issuance of securities, (5) promulgation of new rules and regulations, (6) mergers or acquisitions of electric companies or gas companies, and (7) quality of utility and common carrier service. Additionally, the Commission has the authority to issue a Certificate of Public Convenience and Necessity (CPCN) for the construction or modification of a new generating station, a qualified generator lead line, or an overhead transmission line designed to carry a voltage in excess of 69,000 volts.

While the Commission is not a designated lead agency for the energy sector reduction strategies or programs identified in the State’s 2030 Greenhouse Gas Reduction Act Plan,<sup>2</sup> the Commission submits annual reports to the Maryland General Assembly on the Renewable Energy Portfolio Standard (“RPS”)<sup>3</sup> and the EmPOWER Maryland Energy Efficiency Act (“EmPOWER Maryland”)<sup>4</sup>. Consistent with prior years, the Commission submits the 2022 RPS and EmPOWER Maryland reports, with data for CY2021, pursuant to State Environmental Article § 2-1305, as Attachments A and B, respectively. These reports provide detail descriptions of their respective program implementation status. Additionally, the Commission conducted adjudicatory-type proceedings in several energy-related matters in 2021 that go on to support the State’s clean energy policies and greenhouse gas emissions reductions efforts. Notable cases and activities are highlighted in the Commission’s CY2021 Annual Report, which can be found on the Commission’s website (<https://www.psc.state.md.us/wp-content/uploads/2020-MD-PSC-Annual-Report.pdf>). To supplement the attached reports, the Commission highlights the total estimated greenhouse gas (“GHG”) emissions from both programs for CY2021 below.

## **Estimated Greenhouse Gas Emissions Reductions**

For calendar year 2021, the RPS and EmPOWER Maryland were estimated<sup>5</sup> to achieve a combined GHG emissions reduction of more than 11.8 million metric tons of carbon dioxide, based on the following estimates by program:

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<sup>1</sup> The Public Service Commission is not a member of the Maryland Commission on Climate Change (“MCCC”) but makes available its technical expertise on energy sector topics during the MCCC’s meetings.

<sup>2</sup> The Maryland Energy Administration remains the lead agency under the 2030 GGRA Implementation Plan for EmPOWER Maryland and the RPS.

<sup>3</sup> PUA § 7-712.

<sup>4</sup> PUA § 7-211.

<sup>5</sup> Estimated equivalent amounts of avoided CO<sub>2</sub> emissions were converted using U.S. EPA Greenhouse Gas Equivalencies Calculator, based on energy data contained in the attached RPS and EmPOWER Maryland reports.

<b>Program</b>	<b>Metric Tons CO<sub>2</sub> Avoided</b>
Renewable Portfolio Standard	10,760,379
EmPOWER Maryland	1,062,127
<b>Total</b>	<b>11,822,506</b>

### **Consideration of New Statutory Factors**

During the 2021 legislative session, the Maryland General Assembly enacted House Bill 298, which took effect on October 1, 2021, and requires the Commission to consider climate impacts, Maryland’s climate policies, and fair labor standards in exercising the Commission’s regulatory oversight over public service companies. The law also requires the PSC to consider the climate effects on generating station and transmission projects prior to granting a Certificate of Public Convenience and Necessity. After the law took effect, the Commission issued a notice on October 6, 2021, advising regulated companies and other affected entities of the new factors set forth under PUA § 2-113. Between October 1, 2021 and December 31, 2021, apart from two contested proceedings before the Commission,<sup>6</sup> there were no program matters in which parties presented evidence of deleterious effects on any of the factors enumerated under PUA § 2-113.

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<sup>6</sup> See Case No. 9664, *Columbia Gas of Maryland, Inc.’s Application for Authority to Increase Rates and Charges*, Proposed Order at 52-23 (October 29, 2021), adopted with modifications by Order No. 90001 (December 3, 2021); Case No. 9516, *In re Continuing Investigation of the Commodity and Purchased Gas Adjustment Charges of UGI Utilities, Inc.*, Order No. 90071 at 9 (January 6, 2022). Both of these contested matters do not constitute programs relevant to § 2-1305, but additional information is available through the Commission’s website.

**PUBLIC SERVICE COMMISSION  
OF MARYLAND**

**RENEWABLE ENERGY PORTFOLIO  
STANDARD REPORT**

**With Data for Calendar Year 2021**

In compliance with Section 7-712 of  
the Public Utilities Article,  
*Annotated Code of Maryland*

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## I. INTRODUCTION

This document constitutes the annual report of the Public Service Commission of Maryland (“Commission”) regarding the implementation of the Maryland Renewable Energy Portfolio Standard (“RPS”) Program, with data for calendar year 2021. This report is submitted pursuant to § 7-712 of the Public Utilities Article, *Annotated Code of Maryland* (“PUA”), which requires the Commission to report to the General Assembly on the status of the implementation of the RPS Program on or before December 1 of each year.<sup>1</sup> The Maryland RPS Program is designed to support a stable and predictable market for energy generated from renewables, and to lower the cost to consumers of electricity produced from these resources. Implementation of the RPS Program assists in overcoming market barriers seen as impediments to the development of the industry. Moreover, increasing reliance upon renewable energy technologies to satisfy electric power requirements can result in long-term emission reductions, increased fuel diversity, and economic benefits to the State.<sup>2</sup>

The calendar year 2021 electricity supplier compliance reports, as verified by the Commission, indicate that the State of Maryland RPS obligations were almost entirely fulfilled through the submission of the appropriate level of Tier 1 and Tier 2 Renewable Energy Credits (“RECs”).<sup>3</sup> Remaining calendar year 2021 RPS obligations were satisfied by compliance fees, also known as Alternative Compliance Payments (“ACPs”).

### A. Objectives of the Program

The objective of PUA § 7-701 *et seq.* (hereinafter, “RPS Statute”) is to recognize and to develop the benefits associated with a diverse portfolio of renewable energy resources to serve Maryland. The State’s RPS Program does this by recognizing the environmental and consumer benefits associated with renewable energy. The RPS Program requires electricity suppliers to supply a prescribed minimum portion of their retail electricity sales with various renewable energy resources, which have been classified within the RPS Statute as Tier 1 and Tier 2 renewable sources. The program is implemented through the creation, sale, and transfer of RECs.

The development of renewable energy resources is further promoted by requiring electricity suppliers to provide an ACP for failing to acquire sufficient RECs to satisfy the RPS as set forth in PUA § 7-703. Compliance fees are deposited into the Maryland Strategic Energy Investment Fund (“SEIF”) as dedicated funds to provide for loans and grants that spur the creation of new Tier 1 renewable energy resources in the State. Responsibility for developing renewable energy resources is vested with the Maryland Energy Administration (“MEA”).

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<sup>1</sup> Electricity suppliers must file a RPS compliance report with the Commission for the prior calendar year by April 1st of the subsequent year. Consequently, this report, which is due to the General Assembly in December 2022, highlights data from electricity suppliers’ 2021 compliance reports and other relevant 2021 data. In compliance with PUA § 7-712, topics addressed in this report include the availability of Tier 1, Tier 1 Solar, and Tier 2 renewable energy sources, compliance fees collected to support in-State renewable projects, and other pertinent information.

<sup>2</sup> See PUA § 7-702, which describes the legislative intent and legislative findings in support of the enactment of the Maryland Renewable Energy Portfolio Standard.

<sup>3</sup> See Section I.B.2 for a description of eligible Tier 1 and Tier 2 resources and requirements.

## B. Overview of the Maryland RPS Program

Under the RPS Program, Maryland electricity suppliers are required to demonstrate compliance on an annual basis with an escalating renewable energy portfolio standard. This requirement applies to both competitive retail suppliers and electric companies in the State, including those that provide Standard Offer Service.<sup>4</sup> Electricity suppliers must file annual compliance reports with the Commission verifying that the renewable requirement for each entity has been satisfied.

A REC constitutes the renewable attributes associated with the production of one megawatt-hour (“MWh”) of electricity generated using eligible renewable resources. As such, a REC is a uniquely-identified tradable commodity equal to one MWh of electricity generated or obtained from an eligible renewable energy resource. Generators and electricity suppliers may trade RECs using a Commission-approved system known as the Generation Attributes Tracking System (“GATS”). The GATS system is operated by PJM Environmental Information Services, Inc. (“PJM-EIS”) and is designed to track the ownership and trading of generation attributes.<sup>5</sup> A REC has a three-year lifespan during which it may be transferred, sold, or redeemed. However, each electricity supplier must document annually the retirement of RECs equal to the percentage specified by the RPS statute<sup>6</sup> or pay an ACP commensurate with any shortfalls.

### 1. Registration of Renewable Energy Facilities

Facilities eligible for the Maryland RPS Program must be located in PJM (the wholesale bulk power control area in which Maryland resides)<sup>7</sup> or in a control area that is adjacent to the PJM region,<sup>8</sup> so long as the electricity produced is delivered into the PJM region. However, facilities generating electricity from solar energy, geothermal, poultry litter-to-energy, waste-to-energy, or refuse-derived fuel are eligible only if the facility is connected with the electric

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<sup>4</sup> Standard Offer Service (“SOS”) is electricity supply purchased from an electric company by the company’s retail customers who cannot or choose not to transact with a competitive supplier operating in the retail market. *See* PUA §§ 7-501(n) and 7-510(c).

<sup>5</sup> An attribute is “a characteristic of a generator, such as location, vintage, emissions output, fuel, state RPS Program eligibility, etc.” PJM-EIS, *GATS Operating Rules* (May 2014) at 3.

<sup>6</sup> Using the Tier 2 RPS requirement as an example, assume a hypothetical electricity supplier operating in the State had 100,000 MWh in retail electricity sales for 2021. In 2021, the Tier 2 requirement was 2.5 percent; therefore, the electricity supplier would have to either verify the purchase of 2,500 Tier 2 RECs or pay an ACP for deficits. Similar requirements apply to Tier 1 and Tier 1 Solar, although the percentage obligation and ACP denomination differs depending on the tier and calendar year, as outlined by the RPS Statute.

<sup>7</sup> The PJM wholesale market includes all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia.

<sup>8</sup> A control area is an “electric system or systems, bounded by interconnection metering and telemetry, capable of controlling generation to maintain its interchange schedule with other control areas and contributing to frequency regulation. For the purposes of this document, a control area is defined in broad terms to include transmission system operations, market, and load-serving functions within a single organization. A control area operator may be a system operator, a transmission grid operator, or a utility.” PJM-EIS, *Generation Attribute Tracking System (GATS) Operating Rules* (April 2018) at 5. For example, the multi-state area controlled by the PJM Regional Transmission Operator is one control area, as is the adjacent Midwest Independent System Operator (“MISO”) multi-state area, and the adjacent New York ISO.

distribution grid serving Maryland. Finally, energy from a thermal biomass system must be used in Maryland to qualify for the RPS program.<sup>9</sup>

Before recommending certification of a Renewable Energy Facility (“REF”), Commission Staff must determine whether the facility meets the standards set forth by the RPS statute and Commission regulations (COMAR 20.61). REF applicants who qualify under Maryland’s RPS Program must complete the appropriate application for REF certification posted on the Commission’s RPS website.<sup>10</sup> In addition to the geographic requirements, applicants must also meet the fuel source requirements associated with Tier 1 or Tier 2 (*see* Table 1, below). Verification of the fuel source is completed with the aid of Energy Information Administration Form 860 (“EIA-860”) to validate each facility’s rated nameplate capacity, fuel source(s), location, and commercial operation in-service date.<sup>11</sup> Facilities that co-fire a REC-eligible renewable fuel source with non-eligible fuel sources must also submit a formula or methodology to account for the proportion of total electricity generated by the eligible fuel sources, which then may be credited with RECs. In addition to obtaining Commission certification, all REFs must register with GATS to track and transact business related to RECs. The GATS account must be established with the certification number issued by the Commission upon approval of the REF application.

## 2. Maryland RPS Annual Percentage Requirements

To comply with the Maryland RPS Program, electricity suppliers must acquire RECs derived from Maryland-certified Tier 1 and Tier 2 renewable sources, as defined in PUA § 7-701. Eligible fuel sources for Tier 1 RECs and Tier 2 RECs are listed in Table 1; solar has its own standard within Tier 1.

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<sup>9</sup> There are currently no thermal biomass facilities in Maryland.

<sup>10</sup> REF applications are maintained by the Commission and are accessible online, available at: <https://www.psc.state.md.us/electricity/description-documents-maryland-renewable-energy-portfolio-standard-program/>.

<sup>11</sup> Submitting Form EIA-860 is a requirement under Section 13(b) of the Federal Energy Administration Act of 1974 (Public Law 93-275) for generating plants, regulated and unregulated, which have a nameplate rating of 1 MW or more, are operating or plan to operate within five years, and are connected to the transmission grid.



**Table 1 Eligible Tier 1 and Tier 2 Sources**

<b>Tier 1 Renewable Sources</b>	<b>Tier 2 Renewable Sources</b>
<ul style="list-style-type: none"> <li>● Solar, including energy from photovoltaic technologies and solar water heating systems</li> <li>● Wind</li> <li>● Qualifying Biomass</li> <li>● Methane from a landfill or wastewater treatment plant</li> <li>● Geothermal</li> <li>● Ocean</li> <li>● Fuel Cell that produces electricity from a Tier 1 source</li> <li>● Hydroelectric power plant less than 30 MW capacity</li> <li>● Poultry litter-to-energy</li> <li>● Waste-to-energy</li> <li>● Refuse-derived fuel</li> <li>● Thermal energy from a thermal biomass system</li> </ul>	<ul style="list-style-type: none"> <li>● Hydroelectric power other than pump storage generation</li> </ul> <p><i>(Note: Tier 1 RECs may be used to satisfy Tier 2 obligations)</i></p>

As shown in the table below, there is a different percentage schedule corresponding to each tier and set-aside requirement comprising the Maryland RPS Program.

- The Tier 1 requirements gradually increase until peaking in 2030, after which they are maintained at those levels.
- The Tier 1 Solar set-aside requirement increases from 7.5 percent in 2021 to 14.5 percent by 2030.<sup>12</sup> This ramp-up period for the solar carve-out corresponds in part with the implementation of the pilot program on community solar energy generating facilities, which was established by the passage of Senate Bill 398 and House Bill 1087 and signed into law in May 2015. The three-year pilot program was extended through 2024 by House Bill 683, enacted in May 2019. There is a potential that Solar Renewable Energy Credits (“SRECs”) generated by eligible community solar facilities could serve to help meet the increasing Tier 1 Solar set-aside in the coming years.
- Beginning in 2017, a constant Tier 1 Offshore Wind set-aside of up to 2.5 percent commenced as part of the Tier 1 portfolio.<sup>13</sup> In Order No. 88192, the Commission

<sup>12</sup> “Tier 1 Solar set-aside” refers to the requirement to obtain RECs for energy derived from qualified solar energy facilities. The Tier 1 Solar set-aside requirement applies to retail electricity sales in the State by electricity suppliers and is a subset of the Tier 1 standard.

<sup>13</sup> The Maryland Offshore Wind Energy Act of 2013 (2013 Md. Laws, Ch. 003) established an offshore wind set-aside within the Tier 1 requirement. Beginning in 2017, Tier 1 may include a Commission-determined amount of

established specific offshore wind carve-outs from 2021 through 2042 ranging from 0.60 percent to 2.03 percent. Senate Bill 516, enacted in May 2019, increased the RPS requirements to 50 percent by 2030, and established additional offshore wind carve-outs beginning in 2027. The Commission will incorporate these increased carve-outs into the offshore wind RPS obligations as part of its review of Round 2 offshore wind project applications.

- Beginning in 2023, a Tier 1 geothermal set-aside of up to 0.05 percent will commence as part of the Tier 1 portfolio, rising to 1.0 percent in 2028.
- Maryland’s Tier 2 requirement of 2.5 percent was re-established by Senate Bill 65 in 2021.

**Table 2 Annual RPS Requirements by Tier**

<b>Compliance Year</b>	<b>Tier 1 (Excluding Carve-outs)</b>	<b>Solar</b>	<b>Offshore Wind<sup>14</sup></b>	<b>Post 2022 Geothermal</b>	<b>Tier 2</b>	<b>Total</b>
2021	21.93%	7.50%	1.37%	N/A	2.50%	33.30%
2022	23.24%	5.50%	1.36%	N/A	2.50%	32.60%
2023	23.87%	6.00%	2.03%	0.05%	2.50%	34.45%
2024	27.06%	6.50%	0.14%	0.15%	2.50%	36.35%
2025	26.84%	7.00%	1.66%	0.25%	2.50%	38.25%
2026	27.39%	8.00%	2.61%	0.50%	2.50%	41.00%
2027	18.98%	9.50%	13.02%	0.75%	2.50%	44.75%
2028	18.98%	11.00%	13.02%	1.00%	2.50%	46.50%
2029	23.98%	12.50%	13.02%	1.00%	2.50%	53.00%
2030+	22.48%	14.50%	13.02%	1.00%	2.50%	53.50%

At certain renewable procurement cost thresholds, an electricity supplier can request that the Commission consider a delay in scheduled Tier 1 and Tier 1 Solar RPS percentages.<sup>15</sup> To date, no such request has been made by electricity suppliers operating in the Maryland marketplace.

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offshore wind RECs (“ORECs”), not to exceed 2.5 percent. The project must be generating RECs in order for the obligation to begin. In the absence of a Commission-determined OREC obligation, electricity suppliers must satisfy the carve-out using RECs derived from other Tier 1 renewable sources.

<sup>14</sup> This percentage includes only the Commission-approved offshore wind energy carve-out from Order No. 88192 and Order No. 90011.

<sup>15</sup> PUA § 7-705(e)-(f).

### 3. Maryland RPS Alternative Compliance Payment Requirements

Electricity suppliers who do not meet their RPS obligation through the retirement of eligible RECs must submit an ACP for every unit of shortfall. Table 3 presents the ACP schedule separated by tiers for each compliance year of the RPS Program moving forward.

**Table 3 ACP Schedule (\$/MWh)**

<b>Compliance Year</b>	<b>Tier 1 (Excluding Carve-outs)</b>	<b>Solar</b>	<b>Post 2022 Geothermal</b>	<b>Tier 2</b>	<b>IPL<sup>16</sup> Tier 1</b>
2021	\$30	\$80	N/A	\$15	\$2
2022	\$30	\$60	N/A	\$15	\$2
2023	\$30	\$60	\$100	\$15	\$2
2024	\$27.50	\$60	\$100	\$15	\$2
2025	\$25	\$55	\$100	\$15	\$2
2026	\$24.75	\$45	\$90	\$15	\$2
2027	\$24.50	\$35	\$80	\$15	\$2
2028	\$22.50	\$32.50	\$65	\$15	\$2
2029	\$22.50	\$25	\$65	\$15	\$2
2030+	\$22.35	\$22.50	\$65	\$15	\$2

ACPs are remitted to the Maryland SEIF. With the passage of Chapter 757 of 2019, Alternative Compliance Payment revenues under the RPS are now required to be used to benefit low-income renewable energy projects.<sup>17</sup>

## **II. ELECTRICITY SUPPLIER COMPLIANCE REPORTS**

Calendar year 2021 marked the 16th compliance year for the Maryland RPS. The RPS compliance reports submitted to the Commission by electricity suppliers, along with information obtained from GATS, provide information regarding the retired RECs and the underlying REFs (e.g., type and location of generators) utilized by electricity suppliers to comply with Maryland RPS obligations.<sup>18</sup> RPS compliance reports were filed by 107 electricity suppliers, including: 78

<sup>16</sup> Industrial Process Load (“IPL”) means the consumption of electricity by a manufacturing process at an establishment classified in the manufacturing sector under the North American Industry Classification System. Under PUA § 7-705(b)(2) and COMAR 20.61.01.06.E(5), a supplier sale for IPL is required to meet the entire Tier 1 obligation for electricity sales, including solar. However, the ACP for an IPL Tier 1 non-solar shortfall and a Tier 1 Solar shortfall is the same. For IPL, there is no ACP for Tier 2 shortfalls.

<sup>17</sup> State Government Article, § 9–20B–05(i).

<sup>18</sup> According to PUA § 7-709, a REC can be diminished or extinguished before the expiration of three years by: the electricity supplier that received the credit; a nonaffiliated entity of the electricity supplier that purchased or otherwise received the transferred credit; or demonstrated noncompliance by the generating facility with the requirements of PUA § 7-704(f). In the PJM region, the regional term of art is “retirement,” which describes the process of removing a REC from circulation by the REC owner, *i.e.*, the owner “diminishes or extinguishes the REC.” PJM-EIS, *GATS Operating Rules* (May 2014) at 54-56.

competitive retail suppliers; 18 brokers or competitive electricity suppliers with zero retail electricity sales; and 11 electric companies, of which four are investor-owned utilities.

According to the filed compliance reports, there were approximately 58.7 million MWh of total retail electricity sales in Maryland for 2021 (up from 57.1 million MWh in 2020); 57.5 million MWh of retail electricity sales were subject to RPS compliance, and 1.2 million MWh were exempt.<sup>19</sup> Maryland electricity suppliers retired about 15.2 million RECs in 2021, more than the 14.3 million RECs retired for compliance in 2020. The total cost of RECs retired in 2021 totaled \$332.7 million, up from \$223.2 million in 2020.

Table 4 displays the average cost per REC retired in each tier since 2008. The increase in REC prices likely reflects the increasing RPS requirements. The rise in SREC prices may be attributable to an increase in demand for SRECs due to the effects of the Clean Energy Jobs Act.

**Table 4 Average Cost of RECs per Tier (2008 – 2021)**

<b>Year</b>	<b>Tier 1 Non-Solar</b>	<b>Tier 1 Solar</b>	<b>Tier 2</b>
2008	\$0.94	\$345.45	\$0.56
2009	\$0.96	\$345.28	\$0.43
2010	\$0.99	\$328.57	\$0.38
2011	\$2.02	\$278.26	\$0.45
2012	\$3.19	\$201.92	\$0.44
2013	\$6.70	\$159.71	\$1.81
2014	\$11.64	\$144.06	\$1.81
2015	\$13.87	\$130.39	\$1.71
2016	\$12.22	\$110.63	\$0.96
2017	\$7.14	\$38.18	\$0.48
2018	\$6.54	\$31.91	\$0.66
2019	\$7.77	\$47.26	\$1.05
2020	\$8.24	\$66.10	\$1.06
2021	\$14.36	\$72.59	\$6.45

As demonstrated by the table below, the aggregated cost of compliance with the Maryland RPS Program displays a general growth rate apart from a reduction in 2017. Despite the downward trends in 2017 continuing into 2018, in 2019 Tier 1 and Solar REC prices increased significantly since 2018. This trend only accelerated beginning in 2019, with REC costs rising 56.9 percent from 2019 to 2020, and an additional 83.6 percent from 2020 to 2021, with the total cost of compliance increasing to \$409.8 million.

<sup>19</sup> According to PUA § 7-703(a)(2), exceptions for the RPS requirement may include: IPL which exceeds 300,000,000 kWh by a single customer in a year; regions where residential customer rates are subject to a freeze or cap (*see* PUA § 7-505); or electric cooperatives under a purchase agreement that existed prior to October 1, 2004, until the expiration of the agreement. COMAR 20.61.01.06(D) exempts any sale of electricity that is marketed or otherwise represented to customers as renewable or having characteristics of a Tier 1 renewable source or Tier 2 renewable source.

**Table 5 Total Cost of RECs per Year (2016 – 2021)**

	Tier	2016	2017	2018	2019	2020	2021
<b>Total REC Costs</b>	Tier 1	\$88,200,121	\$50,045,621	\$56,406,247	\$79,320,505	\$99,836,127	\$187,346,301
	Solar	\$45,556,987	\$21,275,664	\$27,351,388	\$55,166,116	\$122,943,987	\$144,411,601
	Tier 2	\$1,441,416	\$687,785	\$1,049,293	\$58,899	\$386,590	\$959,225
	ACPs	\$33,933	\$55,032	\$67,796	\$7,730,223	\$52,240	\$77,129,013
	<b>Total</b>	<b>\$135,234,473</b>	<b>\$72,066,120</b>	<b>\$84,876,742</b>	<b>\$142,277,762</b>	<b>\$223,220,964</b>	<b>\$409,848,162</b>
<b>Total RECs Retired</b>	Tier 1	7,216,439	7,006,113	8,627,737	10,210,275	12,117,585	13,045,432
	Solar	411,787	557,224	857,232	1,167,329	1,859,976	1,989,505
	Tier 2	1,501,587	1,448,567	1,599,819	55,879	366,260	148,702
	<b>Total</b>	<b>9,129,813</b>	<b>9,011,904</b>	<b>11,084,788</b>	<b>11,433,483</b>	<b>14,343,821</b>	<b>15,183,639</b>
<b>RPS % Required</b>	Tier 1	12.00%	11.95%	14.30%	15.20%	22.00%	23.30%
	Solar	0.70%	1.15%	1.50%	5.50%	6.00%	7.50%
	Tier 2	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
	<b>Total</b>	<b>15.20%</b>	<b>15.60%</b>	<b>18.30%</b>	<b>23.20%</b>	<b>30.50%</b>	<b>33.30%</b>

Due to a significant shortfall in available SRECs, ACPs accounted for a significant portion (\$77.1 million) of the total \$409.8 million RPS compliance costs in 2021. Prior to 2021, reliance on ACPs had been limited. This shortage of SRECs explains why the average SREC costs rose to \$72.59, just shy of the \$80 ACP for SRECs, after having fallen every year up until 2019.

**Table 6 Results of the 2021 RPS Compliance Reports**

RPS Compliance Year		Tier 1 Non-Solar	Tier 1 Solar	Tier 1 IPL	Tier 2	Total
2021	RPS Obligation	12,975,526	2,912,479	-	147,946	16,035,951
	Retired RECs	13,045,432	1,989,505	-	148,702	15,183,639
	ACP Required	\$232,930	\$76,884,624	-	\$11,459	\$77,129,013

*Note: Some electricity suppliers retired more RECs than required.*

RECs are valid to demonstrate RPS compliance for the calendar year in which they were generated and in the following two calendar years.<sup>20</sup> Figure 1 aggregates the Maryland RPS tiers on the basis of generation year. For the 2021 compliance year, 45.4 percent of RECs retired were generated in 2021; 40.4 percent were generated in 2020; and the remaining 14.2 percent were generated in 2019. This data conveys that RECs are in high demand as they are most often retired the year of their generation.

<sup>20</sup> COMAR 20.61.03.01 C (unless the REC is diminished or extinguished before expiration).

**Figure 1 RECs Retired in 2021 by Generation Year**

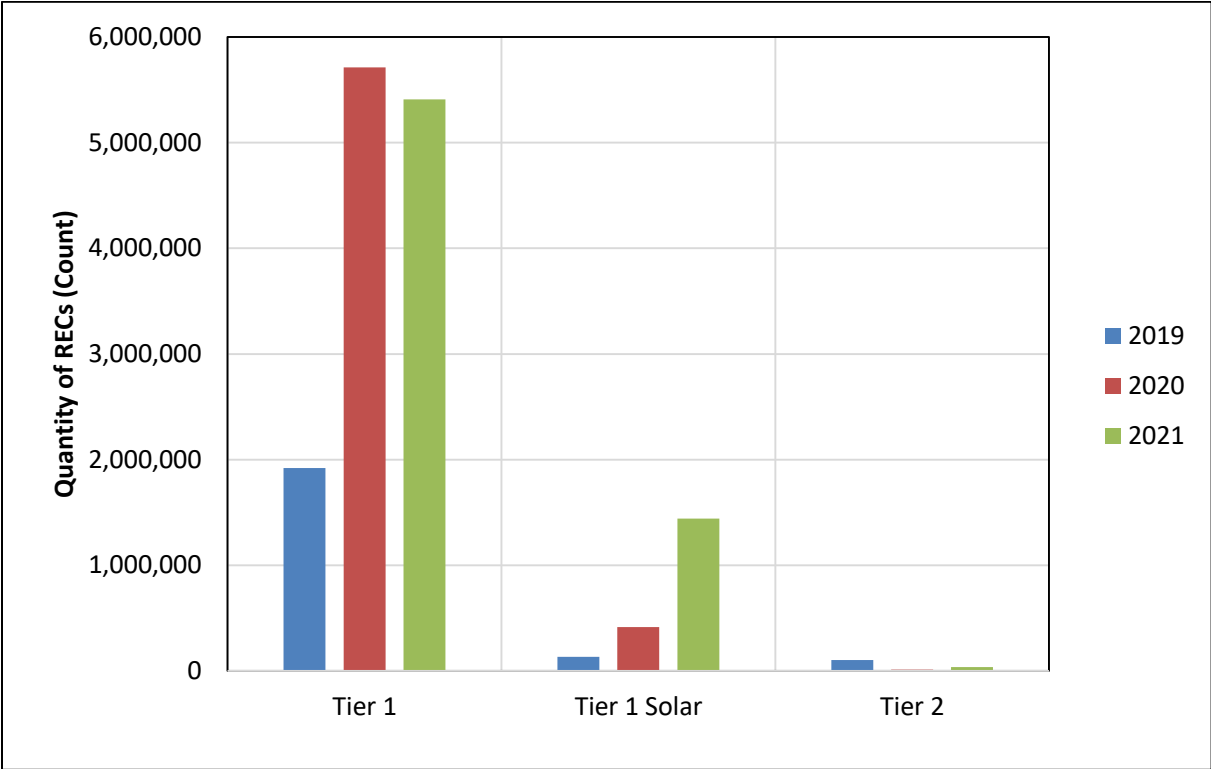
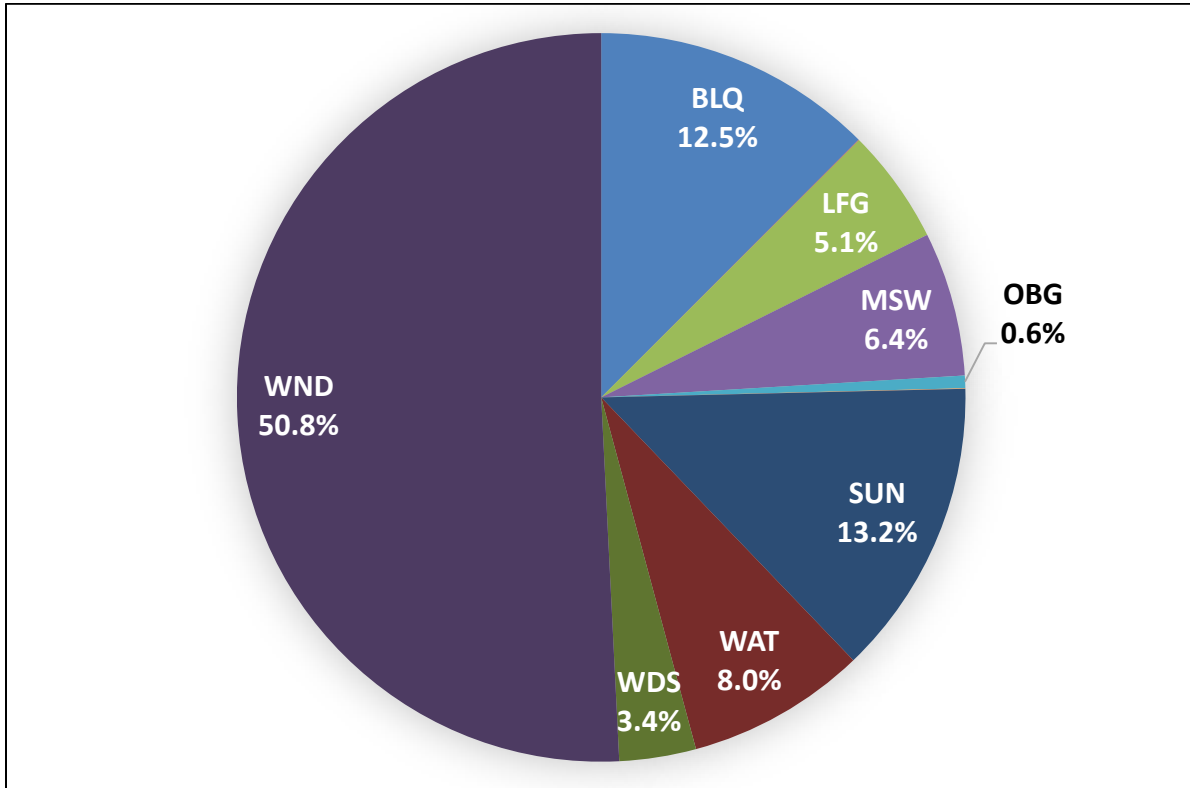


Figure 2 illustrates the fuel sources used to satisfy Tier 1 RPS requirements for the 2021 RPS compliance year. Of the Tier 1 RECs retired for 2021, the resources from which the RECs were sourced consisted primarily of wind, municipal solid waste, and black liquor. Although not pictured, Tier 2 RPS requirements for the 2021 RPS compliance year were satisfied exclusively by RECs derived from hydroelectric power.

**Figure 2 2021 Tier 1 Retired RECs by Fuel Source<sup>21</sup>**

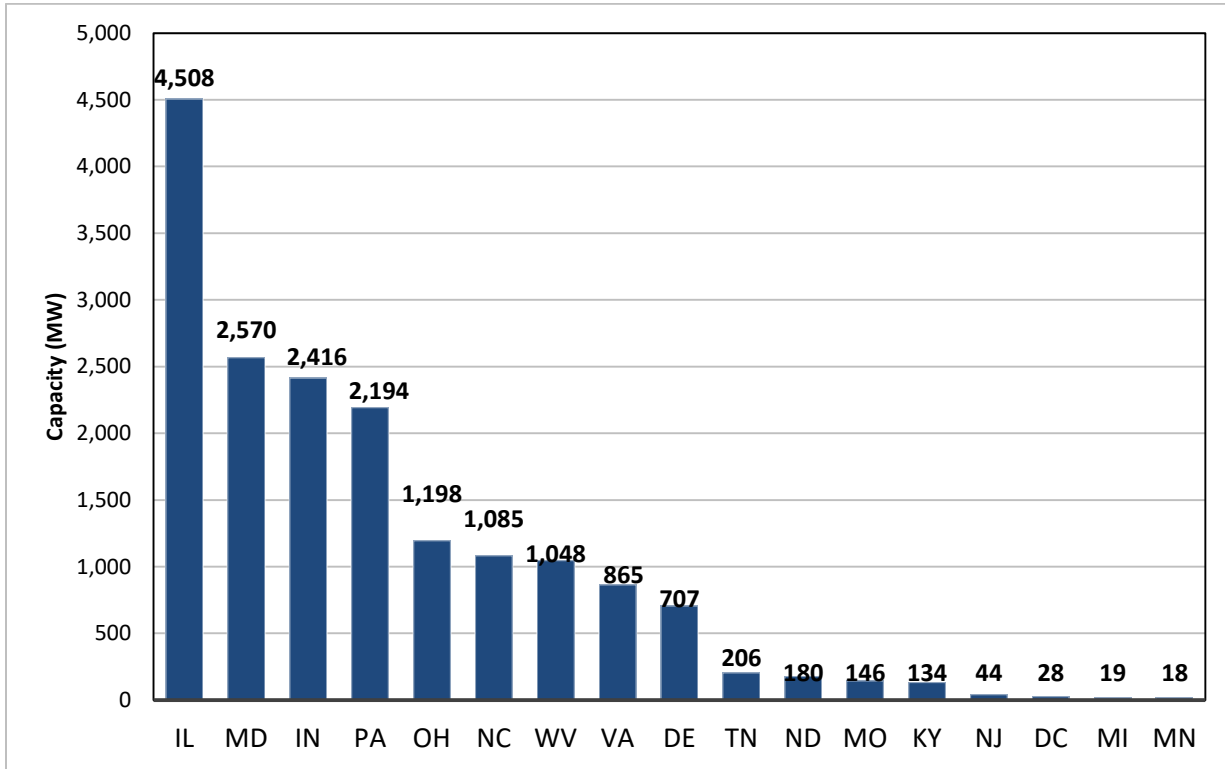


Abbreviations: BLQ, Black Liquor; LFG, Landfill Gas; MSW, Municipal Solid Waste; OBG, Other Biomass Gas; SUN, PV solar; WAT, Hydroelectric; WDS, Wood and Waste Solids; WND, Wind.

Figure 3 presents the geographical location and the total generating capacity (17,365 MW) for all Maryland RPS-certified facilities regardless of Tier. RPS requirements also exist in the surrounding states, which generally support out-of-state and regional market participation. Illinois is the largest single contributor, with over 97 percent of its registered capacity being wind generation.

<sup>21</sup> WAT includes Tier 1 only. Solar thermal and geothermal contributed too few RECs to be seen on the chart.

**Figure 3 Total Rated Capacity by State (MW)<sup>22</sup>**



For the 2021 compliance year, Figure 4 displays aggregated REC data to convey general relationships among the states that contributed RECs. Illinois supplied the largest number of RECs purchased by retail electricity suppliers (24.1 percent), followed by Maryland (21.0 percent), Virginia (17.1 percent), and Pennsylvania (9.5 percent). The remaining 13 states contributed a total of 28.4 percent of all RECs retired in 2021. The majority of RECs from in-State generators were sourced from Tier 1 non-solar (37.6 percent) and solar photovoltaic (61.8 percent).

<sup>22</sup> PJM-EIS, Generation Attribute Tracking System, Database query, (August 1, 2021). The information in this figure does not include Commission-authorized RECs that have not established a REC account with PJM GATS.



**Figure 4 Number of RECs Retired by Facility Location (2021)**

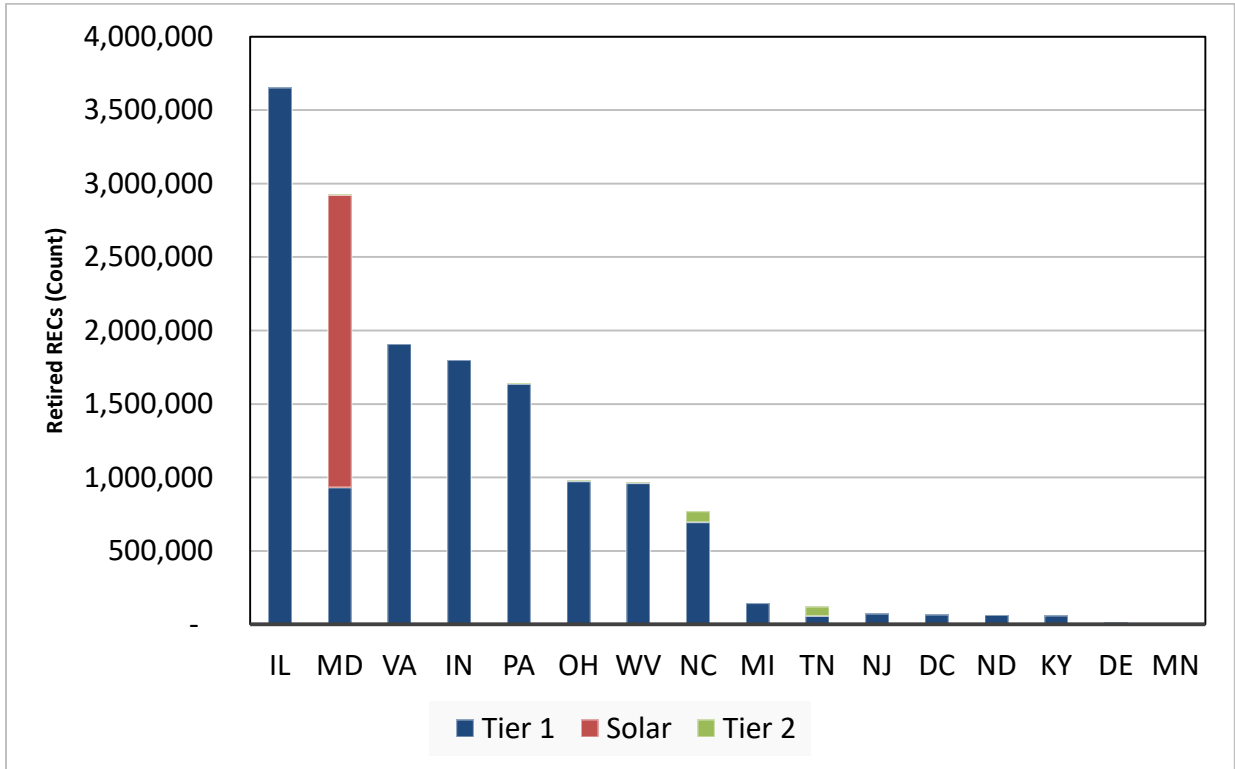


Table 7 and Table 8 provide the quantitative data in support of the previous figure. Table 7 provides the reported levels of RECs retired by Maryland electricity suppliers in 2021 on a tier and aggregate basis, whereas Table 8 provides the information on a percentage basis. As noted above, Illinois-generated RECs, followed by Maryland, Virginia, and Indiana were used in the largest aggregate amounts by Maryland electricity suppliers for 2021 RPS compliance.

**Table 7 2021 RECs Retired by State**

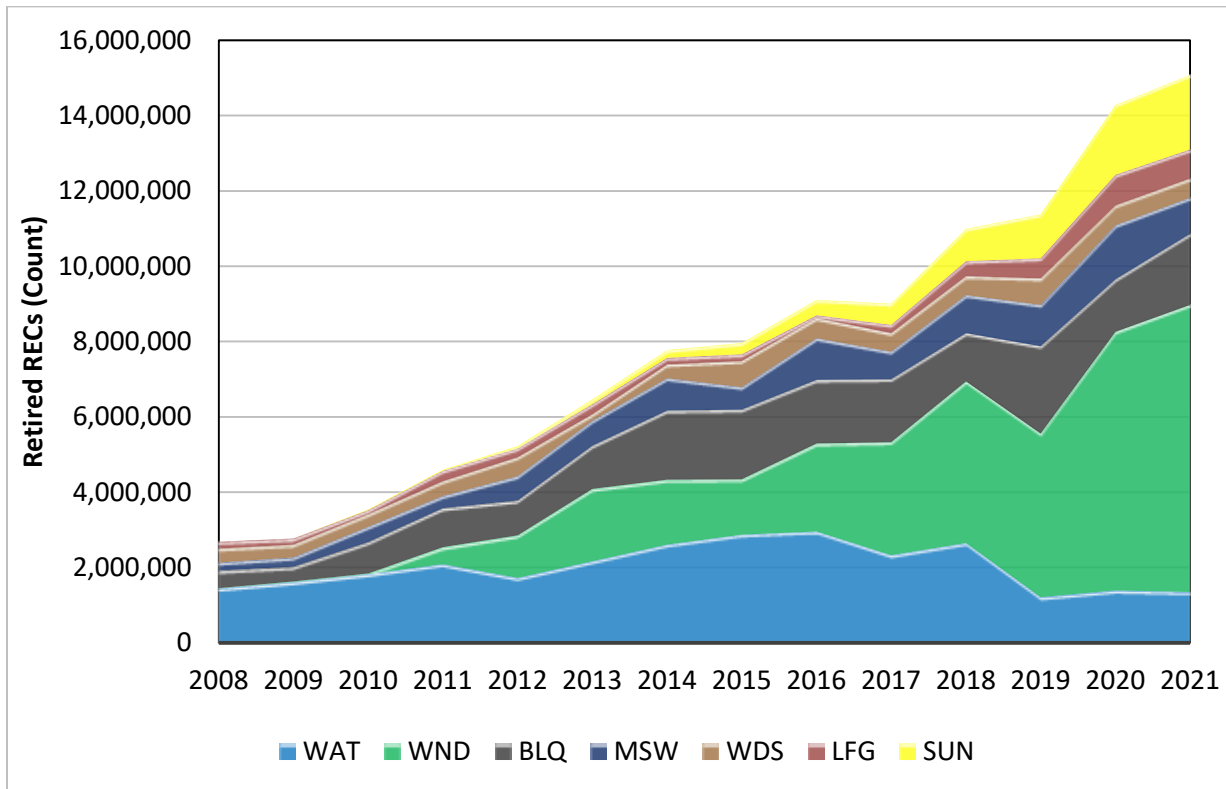
<b>State</b>	<b>Tier 1 Non-Solar</b>	<b>Tier 1 Solar</b>	<b>Tier 2</b>	<b>All Tiers</b>
IL	3,653,465	-	-	3,653,465
MD	933,575	1,989,505	450	2,923,530
VA	1,907,806	-	-	1,907,806
IN	1,798,840	-	-	1,798,840
PA	1,638,795	-	56	1,638,851
OH	975,127	-	3,999	979,126
WV	961,164	-	6,550	967,714
NC	690,283	-	74,369	764,652
MI	144,895	-	-	144,895
TN	57,714	-	63,278	120,992
NJ	71,964	-	-	71,964
DC	66,339	-	-	66,339
ND	64,409	-	-	64,409
KY	59,113	-	-	59,113
DE	16,480	-	-	16,480
MN	613	-	-	613
<b>Total</b>	<b>13,045,432</b>	<b>1,989,505</b>	<b>148,702</b>	<b>15,183,639</b>

**Table 8 2021 RECs Retired by State (%)**

<b>State</b>	<b>Tier 1 Non-Solar</b>	<b>Tier 1 Solar</b>	<b>Tier 2</b>	<b>All Tiers</b>
IL	28.0%	0.0%	0.0%	24.1%
MD	7.2%	100.0%	0.3%	19.3%
VA	14.6%	0.0%	0.0%	12.6%
IN	13.8%	0.0%	0.0%	11.8%
PA	12.6%	0.0%	0.0%	10.8%
OH	7.5%	0.0%	2.7%	6.4%
WV	7.4%	0.0%	4.4%	6.4%
NC	5.3%	0.0%	50.0%	5.1%
MI	1.1%	0.0%	0.0%	1.0%
TN	0.4%	0.0%	42.6%	0.8%
NJ	0.6%	0.0%	0.0%	0.5%
DC	0.5%	0.0%	0.0%	0.4%
ND	0.5%	0.0%	0.0%	0.4%
KY	0.5%	0.0%	0.0%	0.4%
DE	0.1%	0.0%	0.0%	0.1%
MN	0.0%	0.0%	0.0%	0.0%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Figure 5 illustrates the growth in RECs retired in total and by fuel type from the introduction of the solar carve-out of the RPS requirement in 2008. For the third year in a row, wind was the largest contributor of total number of RECs. Total wind RECs retired for compliance have tripled since 2016. In 2020, solar REC retirements grew to be the second largest contributor of RECs. Note that the contributions from qualifying biomass sourced from agricultural crops, geothermal, other biomass liquid and gas, and solar thermal are too small to be seen on this chart.

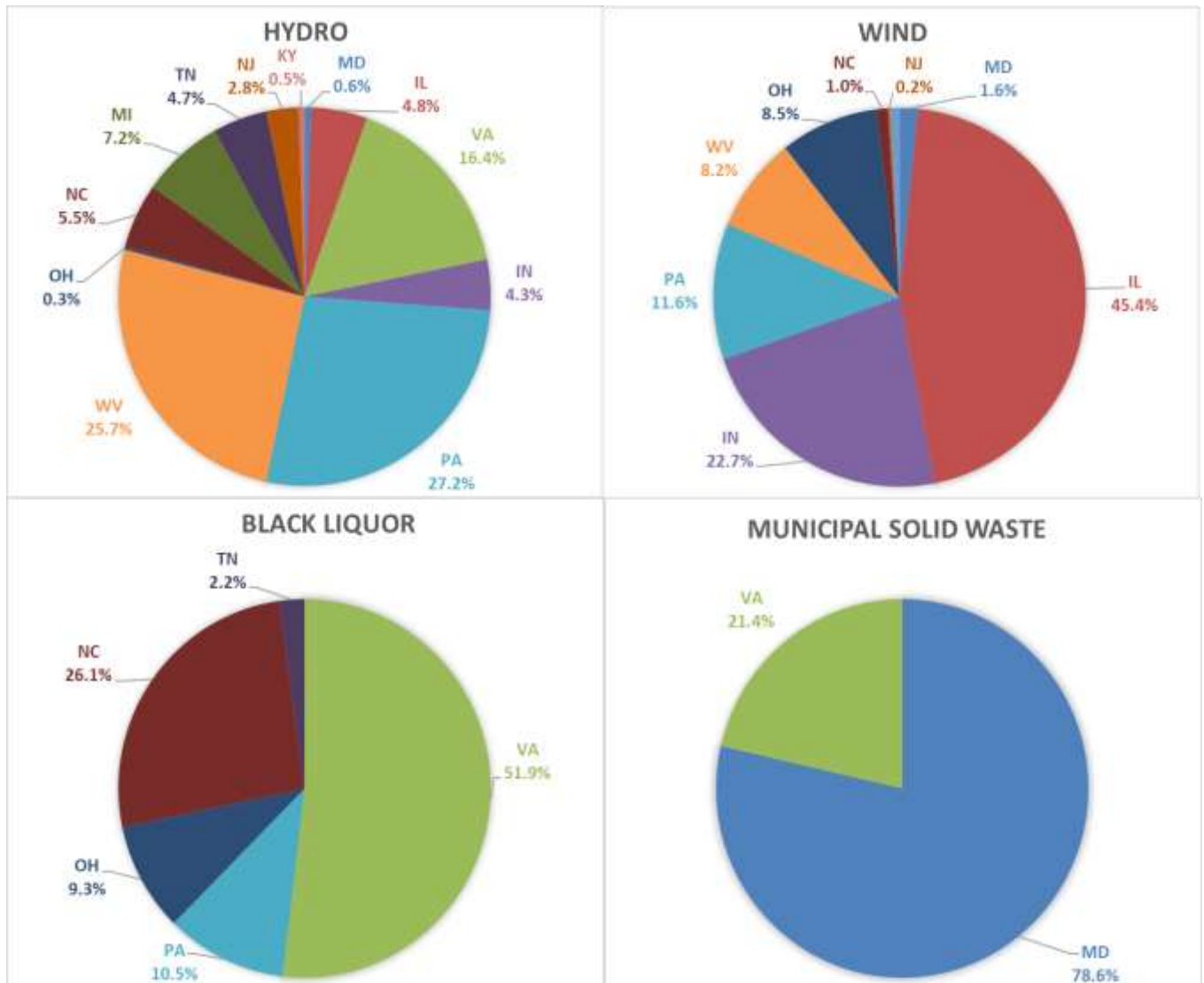
**Figure 5 RECs Retired by Fuel Type (2008 – 2021)**



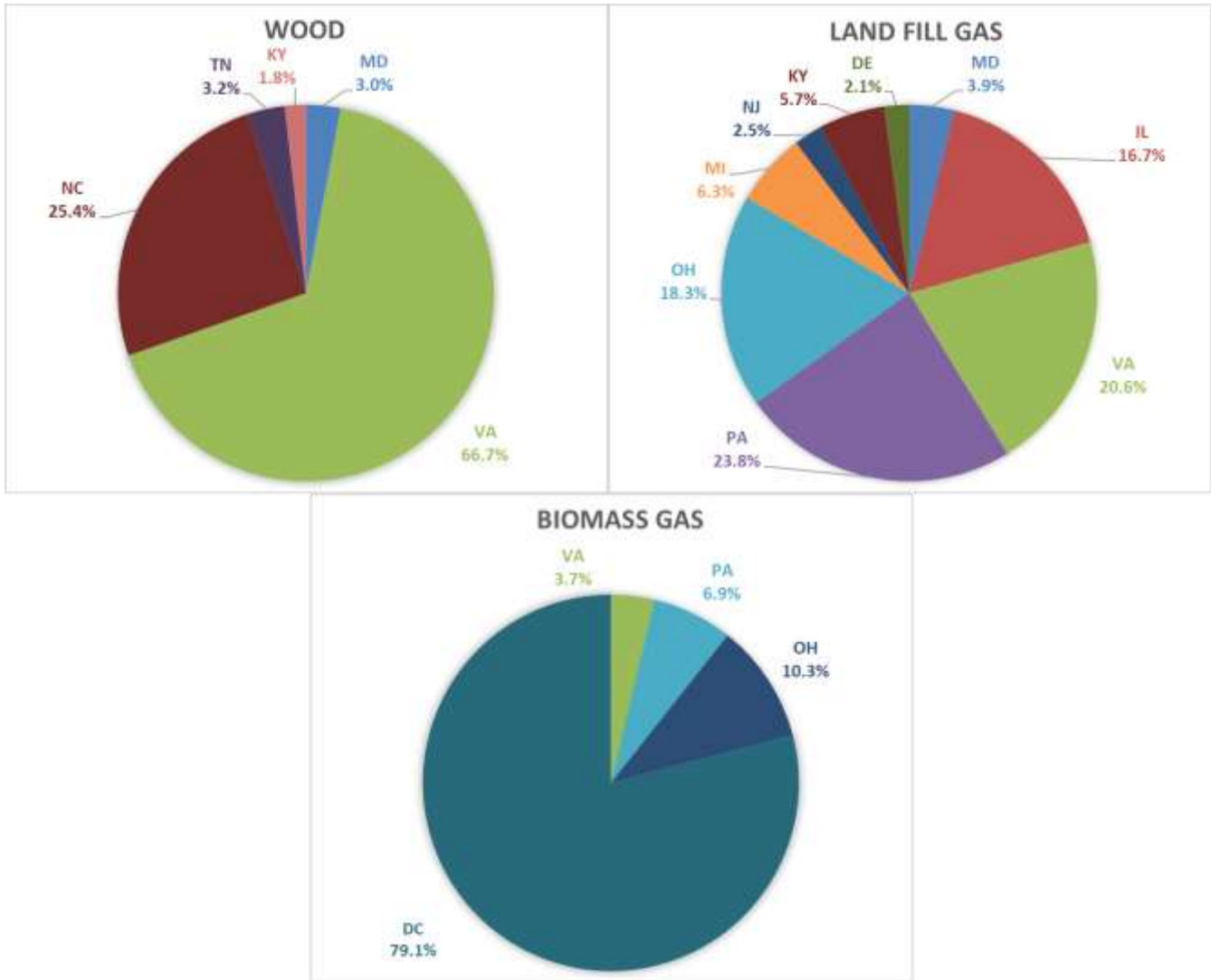
Abbreviations: BLQ, Black Liquor; LFG, Landfill Gas; MSW, Municipal Solid Waste; SUN, Solar Photovoltaic; WAT, Hydroelectric; WDS, Wood and Waste Solids; WND, Wind.

In 2021, all the RECs retired from geothermal and solar sources originated in Maryland. The seven remaining fuels used to comply with Maryland’s 2021 RPS requirements corresponded to RECs generated in multiple other states, and Figure 6 shows the percentage contribution from each state for each of these seven fuels. Facilities located in Maryland provided 78.6 percent of municipal solid waste RECs retired for compliance in 2021. Maryland resources provided only 1.6 percent of wind RECs, 0.6 percent of hydroelectric RECs, 3.9 percent of landfill gas RECs, and 3.0 percent of wood and waste solids RECs.

**Figure 6 Percentage of RECs Generated in Each State, by Fuel (2021)**<sup>23</sup>



<sup>23</sup> Additional information pertaining to the source of renewable energy used to meet Maryland’s 2021 RPS compliance requirements is presented in Appendices A and B. Appendix A provides a breakdown of the *number of RECs* used by electricity suppliers according to tier, fuel type, and facility location, while Appendix B presents the *number of facilities* by tier, fuel type, and facility location that provided RECs for compliance.



### III. MARYLAND RENEWABLE ENERGY FACILITIES

Implementation of the Maryland RPS Program can provide an incentive for renewable generators to locate in Maryland and generate electricity. The renewable requirement establishes a market for renewable energy, and, to the extent Maryland’s geography and natural resources can be utilized to generate renewable electricity, developers may locate projects within the State. This section of the report provides information about the REFs located in Maryland in 2021.<sup>24</sup> Renewable energy generated in Maryland can be used both in Maryland and in other states for RPS compliance purposes, and also can be sold in support of competitive retail electricity

<sup>24</sup> Specific information pertaining to the State’s REFs as described herein was made available by PJM-EIS in the GATS State Agency Report.

supplier product offerings (*i.e.*, green power products).<sup>25</sup> Green power products are generally offered to the public with higher concentrations of electricity generated by renewable energy resources (*e.g.*, 50 or 100 percent) than required by Maryland’s RPS.

As shown in Table 9, in 2021, eligible sources located within Maryland generated approximately 1.3 million Tier 1 non-solar RECs, 1.6 million Tier 1 SRECs, and 2.1 million Tier 2 RECs. Additional analyses pertaining to the Maryland-based renewable generators are presented in Appendices B through D. Appendix B shows the disposition of RECs generated in Maryland in 2021. Appendix C provides the number of renewable energy facilities by county that are both located in Maryland and registered with GATS to participate in any one of the PJM states’ RPS programs. Appendix D provides the total capacity of these facilities, broken out by county and tier.

**Table 9 2021 Maryland-Generated RECs by Fuel Source**

<b>Fuel Type</b>		<b>RECs (Quantity)</b>	<b>RECs (Percent)</b>
<b>Tier 1</b>	Geothermal	2,888	0.1%
	Landfill Gas	42,988	0.9%
	Municipal Solid Waste	745,717	14.8%
	Solar Thermal <sup>26</sup>	17	0.0%
	Small Hydro	13,899	0.3%
	Wood Waste	13,842	0.3%
	Wind	517,711	10.3%
<b>Tier 1 Solar</b>	Solar PV	1,588,033	31.6%
	Solar Thermal	2,901	0.1%
<b>Tier 2</b>	Large Hydro	2,097,157	41.7%
<b>Total</b>		<b>5,025,153</b>	<b>100.0%</b>

Table 10 presents additional detail regarding the disposition of Maryland-generated RECs in calendar year 2021. Approximately 28 percent of the RECs generated by renewable facilities located within Maryland during 2021 are available for potential future sale in Maryland or in other states in subsequent compliance years. Just over 42 percent of all RECs generated in Maryland were retired in 2021 to meet the RPS requirements in Maryland and various other PJM states. Labeled as “Other” in Table 10, just over 29 percent of RECs were used for other purposes, which may include pending transfers between parties.

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<sup>25</sup> Facilities located in Maryland are not necessarily registered by the Commission for the Maryland RPS; rather, certain facilities may seek certification out-of-state in support of a long-term contract for the RECs from an out-of-state counterparty. Counterparties can include an electricity supplier operating in a different state and purchasing the RECs to satisfy the RPS requirement for another state or other entities, such as brokers, that purchase the REC output for resale.

<sup>26</sup> Tier 1 Solar RECs may be used to satisfy Tier 1 obligations.

**Table 10 Disposition of 2021 Maryland-Generated RECs**

REC Tier	Available	RPS Compliance	Other	Total
Tier 1 Non-Solar	583,669	747,277	6,116	1,337,062
Tier 1 Solar	168,720	1,444,107	279	1,613,106
Tier 2	624,623	0	1,472,534	2,097,157
<b>Total</b>	<b>1,377,012</b>	<b>2,191,384</b>	<b>1,478,929</b>	<b>5,047,325</b>
(%)	<b>27.3%</b>	<b>43.4%</b>	<b>29.3%</b>	<b>100.0%</b>

Source: PJM-EIS

Table 11 presents, on a state-by-state basis, the distribution of the RECs both generated in-State and retired for RPS compliance purposes. In 2021, Maryland-generated RECs were retired for compliance purposes in five jurisdictions: the District of Columbia, Delaware, Maryland, New Jersey, and Pennsylvania.

**Table 11 2021 Maryland-Generated RECs Retired for RPS Compliance by State**

Tier	Fuel Type	DC	DE	MD	NJ	PA	Total
<b>Tier 1 Non-Solar</b>	Geothermal	-	-	2,492	-	-	2,492
	Land Fill Gas	-	-	114	-	2,695	2,809
	Municipal Solid Waste	-	-	517,534	-	-	517,534
	Small Hydro	-	-	7,538	5,420	-	12,958
	Wood Waste	-	-	9,335	-	-	9,335
	Wind	-	95,849	87,590	-	18,710	202,149
	<b>Subtotal</b>	-	<b>95,849</b>	<b>624,603</b>	<b>5,420</b>	<b>21,405</b>	<b>747,277</b>
<b>Percentage</b>	<b>0.0%</b>	<b>12.8%</b>	<b>83.6%</b>	<b>0.7%</b>	<b>2.9%</b>	<b>100.0%</b>	
<b>Tier 1 Solar</b>	Solar PV	2,493	-	1,439,106	-	7	1,441,606
	Solar Thermal	-	-	2,501	-	-	2,501
	<b>Subtotal</b>	<b>2,493</b>	-	<b>1,441,607</b>	-	<b>7</b>	<b>1,444,107</b>
	<b>Percentage</b>	<b>0.2%</b>	<b>0.0%</b>	<b>99.8%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>100.0%</b>
<b>Tier 2</b>	Large Hydro	-	-	-	-	-	-
	<b>Subtotal</b>	-	-	-	-	-	-
	<b>Percentage</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>
<b>All Tiers</b>	<b>2,493</b>	<b>2,493</b>	<b>95,849</b>	<b>2,066,210</b>	<b>5,420</b>	<b>21,412</b>	<b>2,191,384</b>
	<b>0.1%</b>	<b>0.1%</b>	<b>4.4%</b>	<b>94.3%</b>	<b>0.2%</b>	<b>1.0%</b>	<b>100.0%</b>

Source: PJM-EIS.

#### **IV. CONCLUSION**

The electricity supplier compliance reports for 2021, verified by the Commission, indicate that most Maryland RPS obligations were met via the purchase and retirement of RECs; there were \$77.1 million in ACPs. Approximately 19 percent of RECs used for compliance in 2021 came from in-State resources, down from 21 percent in 2020. RECs derived from two fuel types—wind (50.2 percent), and black liquor (12.4 percent)—were the predominant sources of non-solar Tier 1 compliance in 2021. The Tier 1 Solar carve-out was met by the retirement of RECs generated exclusively in Maryland. Companies demonstrated Tier 2 compliance by purchasing RECs derived from large hydroelectric sources. Throughout this next year, the Commission will continue to: review applications from facilities requesting certification as a Maryland REF, oversee the RPS Program, and verify that the electricity suppliers in Maryland procure a sufficient amount of electricity generated by renewable resources.



## **APPENDICES**

### Appendix A Location of Facilities that Provided RECs for 2021 RPS Compliance

	DC	DE	IL	IN	KY	MD	MI	MN	NC	ND	NJ	OH	PA	TN	VA	WV	Total
<i><b>Tier 1 Non-solar</b></i>																	
Black Liquor	-	-	-	-	-	-	-	-	2	-	-	1	2	1	4	-	10
Geothermal	-	-	-	-	-	78	-	-	-	-	-	-	-	-	-	-	78
Landfill Gas	-	2	11	-	6	5	1	-	-	-	5	7	14	-	13	-	64
Municipal Solid Waste	-	-	-	-	-	2	-	-	-	-	-	-	-	-	1	-	3
Other Biomass Gas	1	-	-	-	-	-	-	-	-	-	-	3	1	-	2	-	7
Small Hydro	-	-	3	2	2	1	5	1	-	-	1	-	7	-	17	5	44
Wood Waste	-	-	-	-	1	1	-	-	2	-	-	-	-	1	4	-	9
Wind	-	-	30	13	-	5	-	-	1	1	1	16	20	-	-	5	92
<i><b>Tier 1 Solar</b></i>																	
Solar PV	-	-	-	-	-	71,885	-	-	-	-	-	-	-	-	-	-	71,885
Solar Thermal	-	-	-	-	-	790	-	-	-	-	-	-	-	-	-	-	790
<i><b>Tier 2</b></i>																	
Large Hydro	-	-	-	-	-	1	-	-	6	-	-	1	2	2	-	3	15
<b>Total</b>	<b>1</b>	<b>2</b>	<b>44</b>	<b>15</b>	<b>9</b>	<b>72,768</b>	<b>6</b>	<b>1</b>	<b>11</b>	<b>1</b>	<b>7</b>	<b>28</b>	<b>46</b>	<b>4</b>	<b>41</b>	<b>13</b>	<b>72,997</b>

Note: In order to prevent double counting, facilities using multiple fuels are only listed under their primary fuel.

**Appendix B Disposition of 2021 Vintage RECs Generated in Maryland**

Fuel Type and Tier	RECs Retired for RPS Compliance by State						Available	Other	Total RECs Generated
	DC	DE	MD	NJ	PA	Total			
Geothermal	-	-	2,492	-	-	2,492	396	-	2,888
Landfill Gas	-	-	114	-	2,695	2,809	40,179	-	42,988
Municipal Solid Waste	-	-	517,534	-	-	517,534	228,183	-	745,717
Small Hydro	-	-	7,538	5,420	-	12,958	941	-	13,899
Solar Thermal	-	-	-	-	-	-	17	-	17
Wind	-	95,849	87,590	-	18,710	202,149	309,446	6,116	517,711
Wood Waste	-	-	9,335	-	-	9,335	4,507	-	13,842
<b><i>Tier 1 Non-solar Total</i></b>	-	95,849	624,603	5,420	21,405	747,277	583,669	6,116	1,337,062
Solar PV	2,493	-	1,439,106	-	7	1,441,606	168,320	279	1,610,205
Solar Thermal	-	-	2,501	-	-	2,501	400	-	2,901
<b><i>Tier 1 Solar Total</i></b>	2,493	-	1,441,607	-	7	1,444,107	168,720	279	1,613,106
Large Hydro	-	-	-	-	-	-	624,623	1,472,534	2,097,157
<b><i>Tier 2 Total</i></b>	-	-	-	-	-	-	624,623	1,472,534	2,097,157
<b><i>Grand Total</i></b>	<b>2,493</b>	<b>95,849</b>	<b>2,066,210</b>	<b>5,420</b>	<b>21,412</b>	<b>2,191,384</b>	<b>1,377,012</b>	<b>1,478,929</b>	<b>5,047,325</b>

## Appendix C Number of Renewable Energy Facilities Located in Maryland

Maryland County	Tier 1	Solar	Tier 2	Total
Allegany	1	62	-	63
Anne Arundel	60	9,577	-	9,637
Baltimore	107	8,534	-	8,641
Baltimore City	2	1,263	-	1,265
Calvert	3	950	-	953
Caroline	-	391	-	391
Carroll	16	2,460	-	2,476
Cecil	21	1,746	-	1,767
Charles	3	3,150	-	3,153
Dorchester	1	389	-	390
Frederick	36	3,228	-	3,264
Garrett	6	65	-	71
Harford	90	4,365	1	4,456
Howard	55	4,395	-	4,450
Kent	1	370	-	371
Montgomery	52	13,190	-	13,242
Prince George's	13	21,256	-	21,269
Queen Anne's	6	767	-	773
Somerset	1	323	-	324
St. Mary's	2	1,637	-	1,639
Talbot	5	274	-	279
Washington	30	1,209	-	1,239
Wicomico	3	1,293	-	1,296
Worcester	1	589	-	590
<b>Total</b>	515	81,483	1	81,999

Note: This list includes all renewable generators that are both: 1) located within Maryland, and 2) registered to participate in any one of the PJM states' renewable energy programs as of August 1, 2022.

**Appendix D Capacity of Renewable Energy Facilities Located in Maryland  
(MW)**

<b>Maryland County</b>	<b>Tier 1 Non-Solar</b>	<b>Tier 1 Solar</b>	<b>Tier 2</b>	<b>Total</b>
Allegany	65.0	5.6	-	70.6
Anne Arundel	4.8	143.1	-	147.9
Baltimore	72.9	132.9	-	205.9
Baltimore City	0.1	16.5	-	16.7
Calvert	0.1	11.9	-	12.0
Caroline	-	12.9	-	12.9
Carroll	0.5	52.8	-	53.3
Cecil	0.8	40.4	-	41.2
Charles	0.1	50.7	-	50.8
Dorchester	0.0	17.1	-	17.1
Frederick	0.9	94.3	-	95.2
Garrett	210.0	6.9	-	216.9
Harford	3.3	77.6	474.0	554.9
Howard	2.9	69.6	-	72.5
Kent	0.0	21.7	-	21.7
Montgomery	80.2	154.2	-	234.4
Prince George's	13.6	270.4	-	284.1
Queen Anne's	0.2	43.9	-	44.1
Somerset	3.8	153.6	-	157.4
St. Mary's	0.1	18.0	-	18.1
Talbot	70.4	14.0	-	84.4
Washington	0.9	95.6	-	96.5
Wicomico	6.1	47.0	-	53.1
Worcester	0.0	24.2	-	24.2
<b>Total</b>	<b>536.7</b>	<b>1,575.2</b>	<b>474.0</b>	<b>2,585.9</b>

Note: This list includes all renewable generators that are both: 1) located within Maryland, and 2) registered to participate in any one of the PJM states' renewable energy programs as of August 1, 2022.

PUBLIC SERVICE COMMISSION  
OF MARYLAND

The EmPOWER Maryland Energy Efficiency Act  
REPORT OF 2022

With Data for Compliance Year 2021

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

6 St. Paul Street  
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May 2022

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## Report Contents

This document constitutes the 2022 annual report of the Public Service Commission of Maryland regarding the EmPOWER Maryland Energy Efficiency Act (“EmPOWER Maryland”). 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 May 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 6, 2021 to review the semi-annual EmPOWER reports filed by the EmPOWER Maryland Utilities<sup>1</sup> (hereinafter “Utilities”), Washington Gas Light Company (“WGL”), and the Maryland Department of Housing and Community Development (“DHCD”), with data from the third and fourth quarters of 2020. Following these hearings, on June 14, 2021, the Commission issued Order No. 89855 which addressed program design and evaluation issues. Specifically, the Commission approved several new programs and program pilots. Further, the Commission directed the Finance Work Group to provide additional information pertaining to any cost differential associated with lowering the

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<sup>1</sup> 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”).



credit score requirement for the CEA Pilot Program by March 1, 2022 and to file a final report on the CEA Pilot Program by July 15, 2023.

The Commission held its second legislative-style hearing on November 16, 2021, to consider the semi-annual EmPOWER reports filed by the Utilities, WGL, and DHCD for the first and second quarters of 2021. On December 14, 2021, the Commission issued Order No. 90003 which provided direction on programmatic improvements and modifications. Specifically, the Order directed the Cost Recovery Work Group and the Future Programming Work Group to coordinate on cost recovery and Performance Incentive Mechanism (“PIM”) proposals. The Order also directed several Work Groups, including the EmPOWER Reporting and Process Improvement (“ERPI”), Finance, Midstream, and Limited-Income Work Groups, to develop reports to be filed throughout 2022 for the Commission’s review.

## **Initiative Highlights**

- Program-to-date, the Utilities’ EmPOWER Maryland programs have saved a total of 13,491,536 MWh and 2,663 MW. The expected savings associated with EmPOWER Maryland programs is over \$12.7 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 2021, is \$0.030 per kWh<sup>2</sup> - significantly lower than the current cost of Standard Offer Service (“SOS”), which ranges from \$0.068 to \$0.083 per kWh.
- Program-to-date, the Utilities have spent over \$3.5 billion on the EmPOWER Maryland programs, including approximately \$2.3 billion on EE&C programs, and \$1.0 billion on DR programs.
- EmPOWER EE&C programs continue to be cost effective on a statewide basis in 2020, with a statewide Total Resource Cost (“TRC”) score of 1.29 verified for program year 2020. For every dollar of reported utility or participant cost, the EmPOWER EE&C programs generate approximately \$1.29 in benefits.
- Program-to-date, 47,476 limited-income customers participated in EmPOWER Maryland through the Residential Limited-Income Programs. Of the program-to-date participants, 1,809 limited-income households participated in 2021. The average savings per participant in 2021 was 1,784 kWh. Program-to-date spending on limited-income energy efficiency programs is approximately \$194.2 million.
- The average monthly residential surcharge bill impacts<sup>3</sup> for 2021 were as follows:

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<sup>2</sup> The lifecycle cost per kWh is calculated by dividing the total EE&C expenditures by the total lifecycle energy savings of the Utilities.

<sup>3</sup> Bill impacts are calculated assuming an average residential monthly usage of 1,000 kilowatt-hours (“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.

**Table 1: Average Monthly Residential Bill Impacts from EmPOWER Maryland Surcharge in 2021**

	EE&C	DR	Dynamic Pricing <sup>4</sup>	Total
<b>BGE</b>	\$4.23	\$2.41	(\$0.22)	<b>\$6.42</b>
<b>DPL</b>	\$5.97	\$1.37	\$0.52	<b>\$7.86</b>
<b>PE</b>	\$6.19	N/A	N/A	<b>\$6.19</b>
<b>Pepco</b>	\$4.74	\$2.16	\$0.25	<b>\$7.15</b>
<b>SMECO</b>	\$5.92	\$2.70	N/A	<b>\$8.62</b>

- The reported energy savings for 2021 and program-to-date are as follows:

**Table 2 EE&C Reported Achievements<sup>5,6</sup>**

	2021 Reported Energy Savings (MWh) <sup>7</sup>	2021 Energy Savings as a % of 2016 Retail Sales Baseline	2021 Target Energy Savings %	Program-to-Date Reduction (MWh) <sup>8</sup>
<b>BGE</b>	762,403	32,001,806	2.38%	7,267,011
<b>DPL</b>	104,349	4,205,544	2.48%	831,855
<b>PE</b>	127,374	7,412,446	1.72%	3,531,333
<b>Pepco</b>	421,894	14,546,641	2.90%	1,257,578
<b>SMECO</b>	69,323	3,388,854	2.05%	603,759

## EmPOWER Maryland Portfolios

For the 2021-2023 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.<sup>9</sup> 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.

<sup>4</sup> 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 2021 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 2020. The dynamic pricing surcharge for BGE was negative in 2021 (*i.e.* resulted in a credit) because the PJM Capacity payments received by the Utility exceeded the rebate credits paid to customers.

<sup>5</sup> “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.

<sup>6</sup> 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.

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

<sup>8</sup> 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.

<sup>9</sup> 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*.

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.<sup>10</sup>

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,<sup>11</sup> 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. 89679, issued on December 18, 2020, the Commission approved plans for the 2021-2023 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.<sup>12</sup> Commercial and Industrial ("C&I") 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 shell upgrades. For larger commercial buildings or industrial facilities, a utility can customize its program offerings for cost-effective improvements.

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<sup>10</sup> 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.

<sup>11</sup> 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).

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

## Baltimore Gas and Electric Company (“BGE”)

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

BGE realized 106 percent of its 2021 annual energy savings target (or 762,403 MWh) and 111 percent of its forecasted 2021 annual demand reduction target (or 540 MW). BGE’s programs reached nearly 7.5 million participants and installed over 7.8 million measures in homes and businesses in the BGE service territory for just over \$145.2 million.

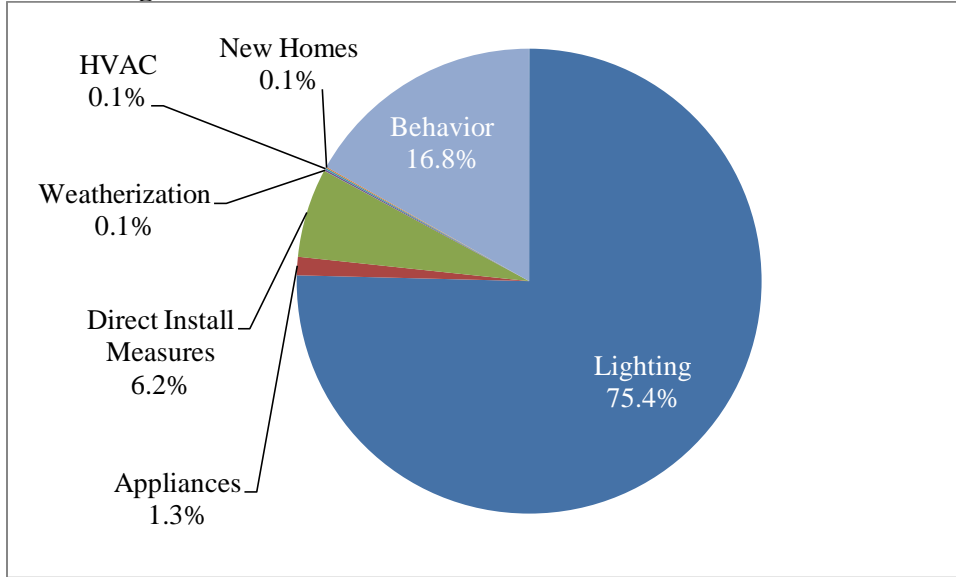
**Table 3 BGE Reported Savings vs Targets for 2021**

	2021 Reported Savings	2021 Target Savings <sup>13,14</sup>	% of Target Achieved
<b>MWh</b>	762,403	717,097	106%
<b>MW</b>	540	488	111%

<sup>13</sup> EmPOWER Maryland reduction targets are based upon the individual EmPOWER Maryland filings of each Utility.

<sup>14</sup> 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 1 Residential Measures Installed in BGE in 2021**



**Potomac Electric Power Company (“Pepco”)**

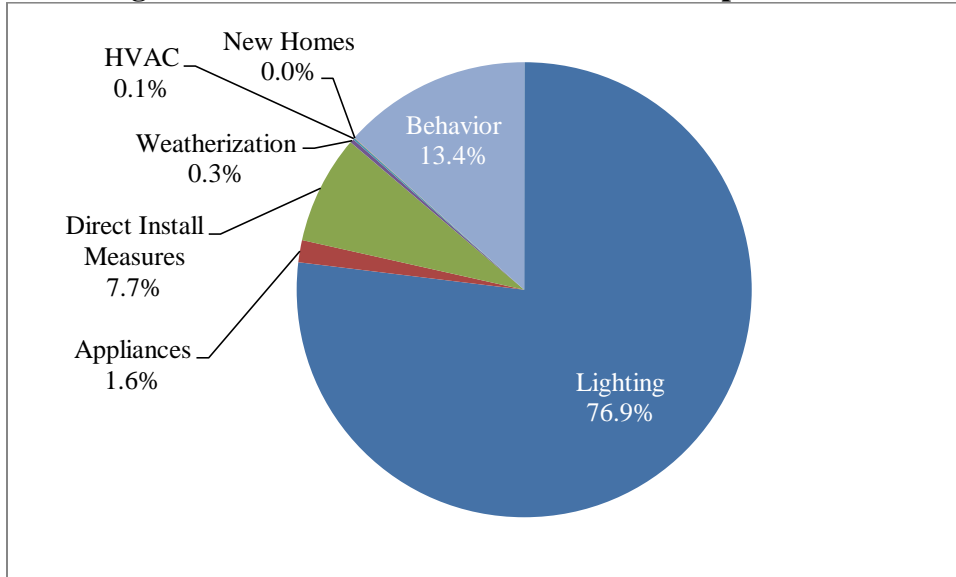
Pepco EmPOWER Programs	
Residential Program	Commercial Programs
Appliance Rebates	Combined Heat and Power
Appliance Recycling	Custom
Behavior Based	Energy Efficient Communities
Home Performance with Energy Star	Midstream Products
HVAC	Prescriptive
Lighting	Retrocommissioning
Quick Home Energy Checkup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

Pepco realized 105 percent of its 2021 annual energy savings target (or 401,056 MWh) and 117 percent of its forecasted 2021 annual demand reduction target (or 396 MW). Pepco’s programs reached over 793,000 participants and installed over 3.6 million measures in homes and businesses in the Pepco service territory for approximately \$88.7 million.

**Table 4 Pepco Reported Savings vs Targets for 2021**

	2021 Reported Savings	2021 Target Savings <sup>15,16</sup>	% of Target Achieved
<b>MWh</b>	421,894	401,056	105%
<b>MW</b>	462	396	117%

**Figure 2 Residential Measures Installed in Pepco in 2021**



**The Potomac Edison Company (“PE”)**

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

PE realized 85 percent of its 2021 annual energy savings target (or 127,374 MWh) and 98 percent of its forecasted 2021 annual demand reduction target (or 21 MW). PE’s programs

<sup>15</sup> EmPOWER Maryland reduction targets are based upon the individual EmPOWER Maryland filings of each Utility.

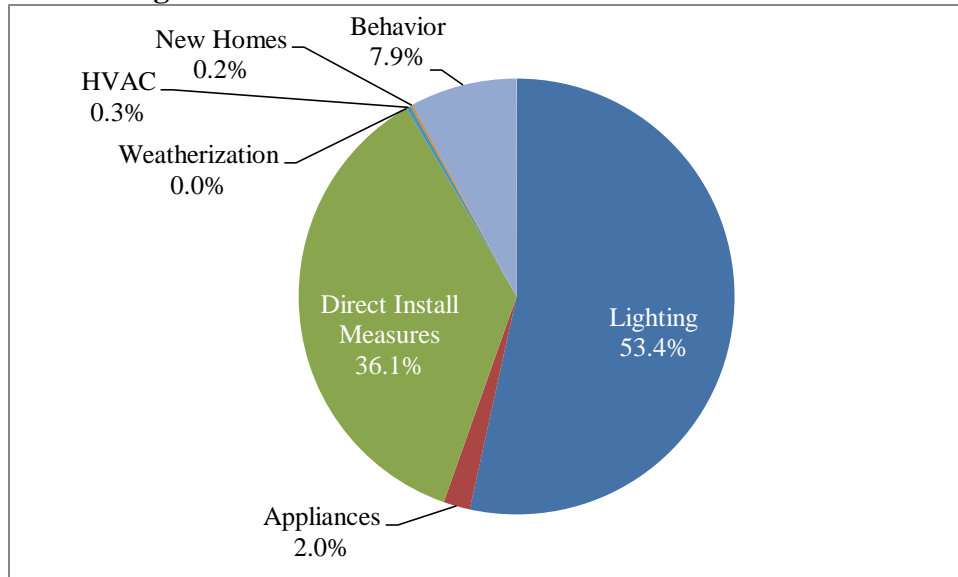
<sup>16</sup> The demand reduction targets and reported achievements include peak demand reductions generated by both EE&C and DR programs, as both components are part of the total portfolio.

reached over 421,000 participants and installed over 1.7 million measures in homes and businesses in the PE service territory for approximately \$28.0 million.

**Table 5 PE Reported Savings vs Targets for 2021**

	2021 Reported Savings	2021 Target Savings <sup>17</sup>	% of Target Achieved
<b>MWh</b>	127,374	149,925	85%
<b>MW</b>	21	21	98%

**Figure 3 Residential Measures Installed in PE in 2021**



**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
Home Performance with Energy Star	Midstream Products
HVAC	Prescriptive
Lighting	Retrocommissioning
Quick Home Energy Checkup	Small Business
Residential New Construction	
Schools	
Smart Thermostats	

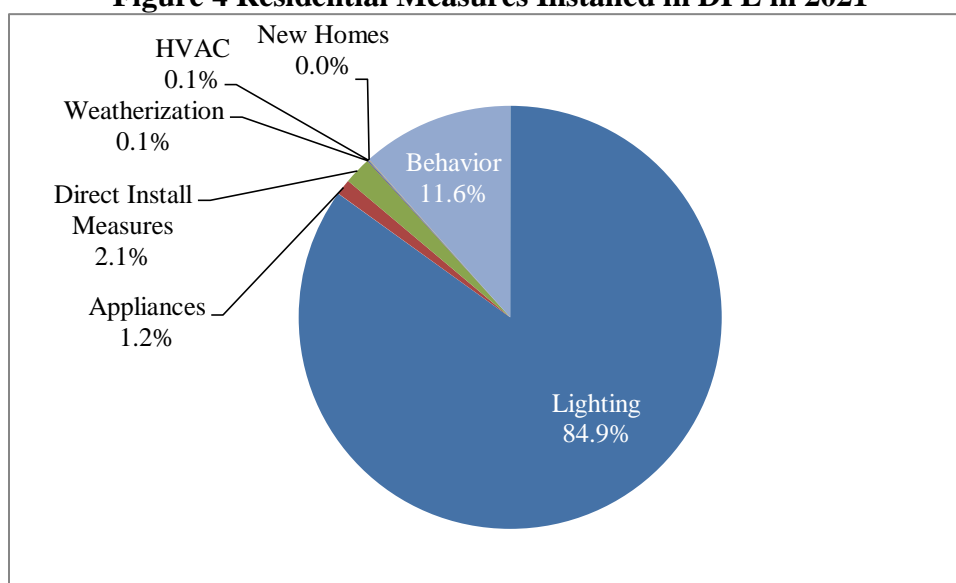
<sup>17</sup> EmPOWER Maryland reduction targets are based upon the individual EmPOWER Maryland filings of each Utility.

DPL realized 103 percent of its 2021 annual energy savings target (or 104,349 MWh) and 107 percent of its forecasted 2021 annual demand reduction target (or 121 MW). DPL’s programs reached over 302,000 participants and installed nearly 1.0 million measures in homes and businesses in the DPL service territory for approximately \$30.1 million.

**Table 6 DPL Reported Savings vs Targets for 2021**

	2021 Reported Savings	2021 Target Savings <sup>18,19</sup>	% of Target Achieved
<b>MWh</b>	104,349	101,171	103%
<b>MW</b>	121	114	107%

**Figure 4 Residential Measures Installed in DPL in 2021**



<sup>18</sup> EmPOWER Maryland reduction targets are based upon the individual EmPOWER Maryland filings of each Utility.

<sup>19</sup> 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.



## 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 Improvement	Retrocommissioning
HVAC	Small Business
Lighting	
My Energy Target	
Residential New Construction	
Schools	
Smart Thermostats	

SMECO realized 113 percent of its 2021 annual energy savings target (or 69,323 MWh) and 91 percent of its forecasted 2021 annual demand reduction target (or 63 MW). SMECO’s programs reached over 387,000 participants and installed almost 1.0 million measures in homes and businesses in the SMECO service territory for approximately \$23.1 million.

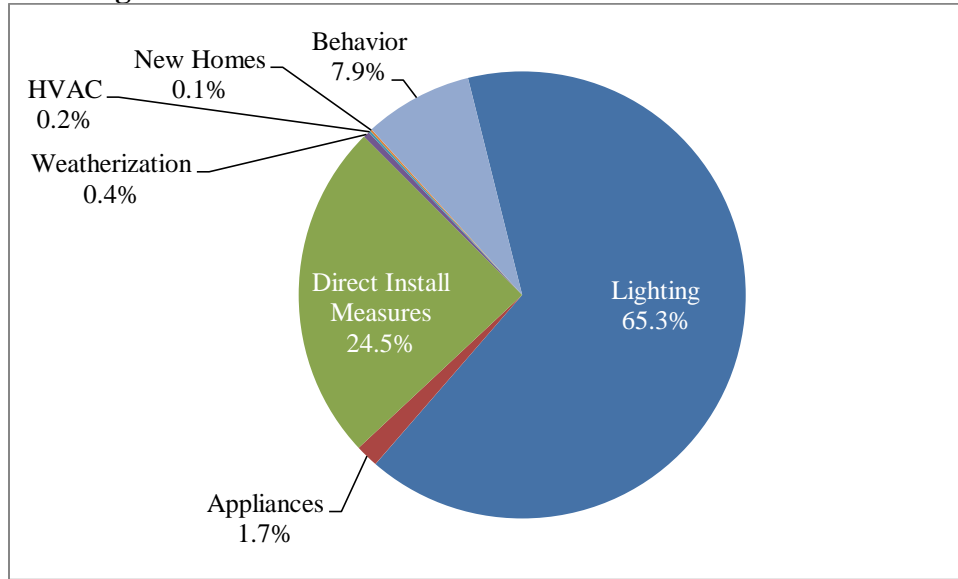
**Table 7 SMECO Reported Savings vs Targets for 2021**

	2021 Reported Savings	2021 Target Savings <sup>20,21</sup>	% of Target Achieved
<b>MWh</b>	69,323	61,459	113%
<b>MW</b>	63	70	91%

<sup>20</sup> EmPOWER Maryland reduction targets are based upon the individual EmPOWER Maryland filings of each Utility.

<sup>21</sup> 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 2021**



**Washington Gas Light Company (“WGL”)**

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

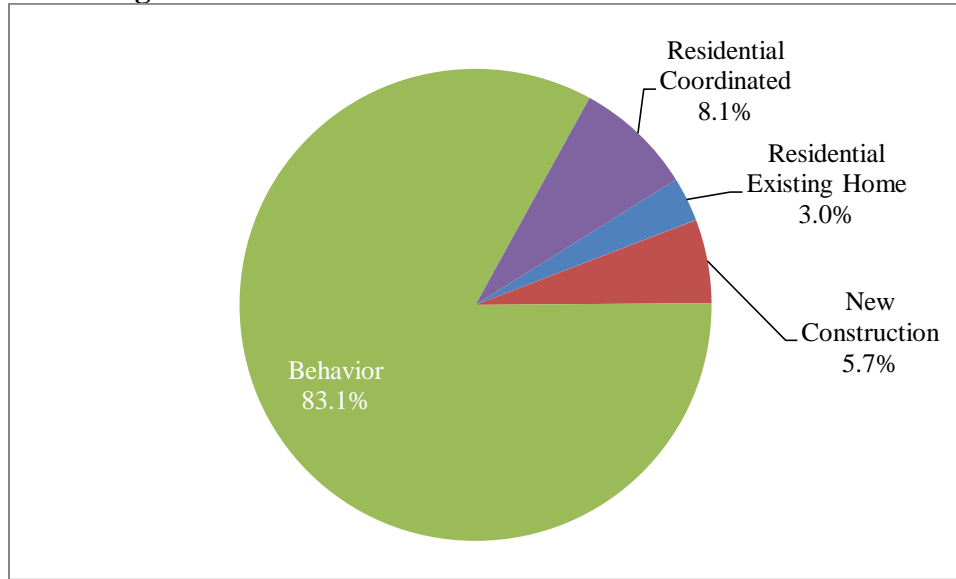
WGL realized 73 percent of its 2021 annual energy savings target (or 1,793,677 Therms). WGL’s programs reached over 129,000 participants and installed over 140,531 measures in homes and businesses in the WGL service territory for approximately \$11.7 million.

**Table 8 WGL Reported Savings vs Targets for 2021**

	2021 Reported Savings	2021 Target Savings <sup>22</sup>	% of Target Achieved
<b>Therms</b>	1,793,677	2,458,542	73%

<sup>22</sup> EmPOWER Maryland reduction targets are based upon the individual EmPOWER Maryland filings of each Utility.

**Figure 6 Residential Measures Installed in WGL in 2021**



## 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. 89679, DHCD's 2021-2023 program cycle plan was approved.<sup>23</sup>

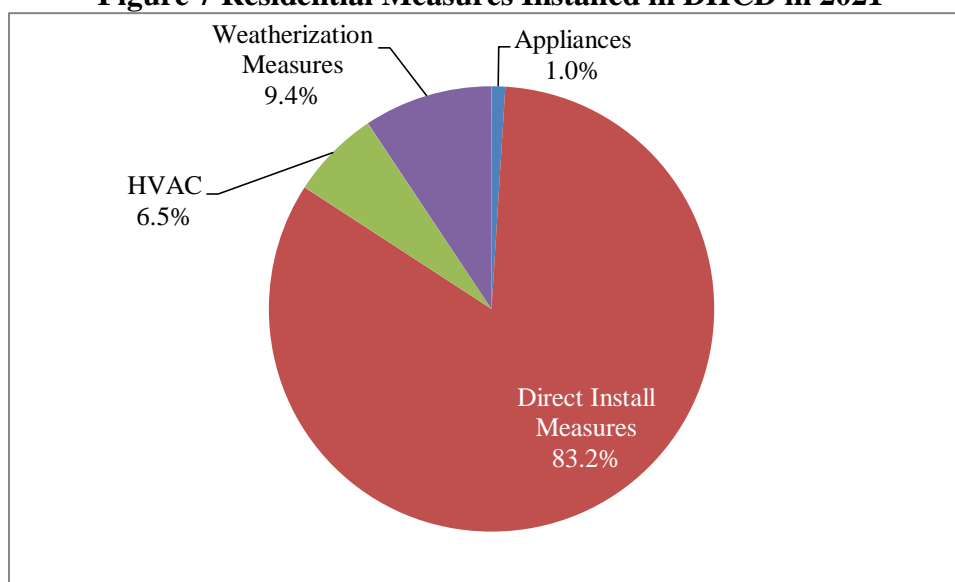
DHCD offers two programs, one for single family homes and another for multifamily properties. In 2021, DHCD weatherized approximately 1,500 limited-income homes and 152 multifamily properties at a total cost of \$10.8 million. The average savings per participant in 2021 was 1,784 kWh.

<sup>23</sup> DHCD also partners with WGL to implement limited-income programs in WGL's service territory.

**Table 9 DHCD Reported Savings vs Targets for 2021**

Program	Energy/Demand Savings	2021 Reported Savings	2021 Target Savings <sup>24</sup>	% of Target Achieved
Single Family	MWh	2,963	4,212	70%
	MW	0.826	1.177	70%
Multifamily	MWh	232	2,542	9%
	MW	0.069	0.398	17%

**Figure 7 Residential Measures Installed in DHCD in 2021**



## 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,<sup>25</sup> all of which were operational by the end of 2009.<sup>26</sup>

Customers who have chosen to participate in the direct load control (“DLC”) 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

<sup>24</sup> EmPOWER Maryland reduction targets are based upon the individual EmPOWER Maryland filings of DHCD.

<sup>25</sup> See Commission Letter Order (Nov. 30, 2007).

<sup>26</sup> 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.

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).<sup>27</sup> Utilities will invoke the cycling process when PJM calls for an emergency event or if the Utilities individually determine that an event is necessary during summer peak season. Table 10 summarizes the incentives offered by the Utilities to the residential program participants.

**Table 10 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	
<b>BGE</b>	\$50	\$50	\$75	\$75	\$100	\$100	Jun.–Sept.
<b>Pepco</b>	\$40	\$40	\$60	\$60	\$80	\$80	Jun.– Oct.
<b>DPL</b>	\$40	\$40	\$60	\$60	\$80	\$80	Jun.– Oct.
<b>SMECO</b>	***	\$50	***	\$75	N/A	N/A	Jun.– Oct.

\*\*\* A participant in SMECO’s 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 11 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, 2021.

**Table 11 Utilities’ Residential Direct Load Program Device Installation**

Utility	Residential	Commercial	Total
<b>BGE</b>	370,311	N/A	370,311
<b>DPL</b>	38,668	2,797	41,465
<b>Pepco</b>	232,564	5,943	238,507
<b>SMECO</b>	38,432	94	38,526
<b>Total</b>	<b>679,975</b>	<b>8,834</b>	<b>688,809</b>

Table 12 summarizes the demand reduction capability for the Utilities’ DLC programs as of December 31, 2021.

<sup>27</sup> 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.

**Table 12 DLC Program Coincident Peak Demand Reduction (MW)**

Utility	Program-to-Date Reported
<b>BGE</b>	246.693
<b>DPL</b>	39.796
<b>Pepco</b>	242.404
<b>SMECO</b>	51.988
<b>Total</b>	<b>580.881</b>

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 13 summarizes the reported demand reductions from the dynamic pricing programs for 2013-2021. 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 13 Dynamic Pricing Demand Reduction (MW)**

Utility	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>BGE</b>	0	209	309	336	330	140	111	110	125
<b>DPL</b>	0	0	143	39	31	47	0	54	64
<b>Pepco</b>	309	125	47	126	135	124	91	55	140
<b>Total</b>	<b>309</b>	<b>334</b>	<b>499</b>	<b>501</b>	<b>496</b>	<b>311</b>	<b>202</b>	<b>219</b>	<b>329</b>

## **PJM Reliability Pricing Model Capacity Market**

PJM conducted the Base Residual Auction (“BRA”) for Delivery Years (“DY”) 2022/2023 in June of 2021 after the auctions was postponed in 2019 due to the complexities arisen from the Federal Energy Regulatory Commission’s (“FERC”) orders stating the PJM auction was non-competitive and adding a Minimum Offer Price Rule (“MOPR”) that was applicable to any capacity resource that was deemed to receive a state subsidy. After receiving FERC orders on October 15 and November 12, 2021, approving PJM’s proposal for fixing the capacity market rules by imposing a MOPR, PJM released a schedule for the capacity auctions. The BRA for the 2022/2023 DY was held in December of 2021 and the BRA for the 2023/2024 DY will be held in June 2022.

EmPOWER Maryland programs are eligible to participate in the capacity auctions and can receive payments from PJM that are used to offset the costs in the EmPOWER programs and lower the surcharge.

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

**Table 14 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 2021/2022 <sup>28</sup>	N/A	N/A
DY 2022/2023 <sup>29</sup>	N/A	N/A
<b>Total</b>	<b>6,554</b>	<b>\$325.8</b>

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 15 and Table 16 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 15 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
DY 2022/2023	49	\$2.0
<b>Total</b>	<b>1,882</b>	<b>\$91.8</b>

<sup>28</sup> 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.

<sup>29</sup> The DLC program committed 233 MW of capacity as a Price Responsive Demand Resource. Under the prior RPM construct, 233 MW would have earned \$9.8 million in capacity payments from PJM.

**Table 16 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
DY 2022/2023	186	\$2.5
<b>Total</b>	<b>2,932</b>	<b>\$105.1</b>

Table 17 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 17 Maryland Utilities' PJM BRA Results and Expected Revenue for Delivery Years 2021/2022 and 2022/2023**

DY 2021/2022					DY 2022/2023				
Cleared Bids (MW)				Value	Cleared Bids (MW)				Value
DR	DP	EE&C	Total	(\$Million)	DR	DP	EE&C	Total	(\$Million)
N/A	177	180	357	\$15.1	N/A	186	49	235	\$4.4

## EmPOWER Maryland Funding Levels

### EE&C Program Funding

On December 18, 2020, in Order No. 89679, the Commission approved the 2021-2023 program cycle budgets based on the EmPOWER Maryland Utilities' proposals. Table 18 breaks down the 2021 Commission-approved budgets for each of the Utilities, while Table 19 illustrates



the actual 2021 expenditures by the Utilities with respect to their EmPOWER Maryland EE&C programs.

**Table 18 Forecasted 2021 EE&C Budgets**

Utility	Residential	C&I	DHCD Limited-Income Program	Total
<b>BGE</b>	\$63,827,574	\$51,766,958	\$13,110,731	<b>\$128,705,263</b>
<b>DPL</b>	\$8,718,188	\$18,973,175	\$0	<b>\$27,691,363</b>
<b>PE</b>	\$18,953,207	\$23,515,745	\$2,318,310	<b>\$44,787,262</b>
<b>Pepco</b>	\$28,085,352	\$47,734,597	\$0	<b>\$75,819,949</b>
<b>SMECO</b>	\$17,763,440	\$7,755,851	\$0	<b>\$25,519,292</b>
<b>Total</b>	<b>\$137,347,760</b>	<b>\$149,746,327</b>	<b>\$15,429,041</b>	<b>\$302,523,128</b>

**Table 19 Reported 2021 EE&C Spending**

Utility	Residential	C&I	DHCD Limited-Income Program	Total
<b>BGE</b>	\$48,032,185	\$47,665,402	\$13,388,033	<b>\$109,085,620</b>
<b>DPL</b>	\$7,394,634	\$14,754,314	\$3,676,929	<b>\$25,825,877</b>
<b>PE</b>	\$14,139,391	\$13,823,950	\$2,861,213	<b>\$30,824,555</b>
<b>Pepco</b>	\$23,937,072	\$42,236,638	\$3,057,608	<b>\$69,231,318</b>
<b>SMECO</b>	\$11,280,558	\$5,987,221	\$10,741	<b>\$17,278,519</b>
<b>Total</b>	<b>\$104,783,839</b>	<b>\$124,467,526</b>	<b>\$22,994,524</b>	<b>\$252,245,889</b>

Table 20 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.<sup>30</sup>

**Table 20 2021 EE&C Monthly Surcharges (per kWh) and Revenue Requirements**

Utility	Residential	Small C&I	Large C&I	Revenue Requirement
<b>BGE</b>	\$0.00452	\$0.01035	\$0.00398	\$119,180,237
<b>DPL</b>	\$0.00120	\$0.00681	\$0.00681	\$24,940,242
<b>PE</b>	\$0.00717	\$0.00523	\$0.00525	\$36,285,965
<b>Pepco</b>	\$0.00473	\$0.00625	\$0.00625	\$75,845,666
<b>SMECO</b>	\$0.00819	\$0.00474	\$0.00474	\$21,183,704

## Demand Response Program Funding

The December 17, 2020 Commission Order similarly approved three-year budgets for the demand response programs operated by BGE, DPL, Pepco, and SMECO. Table 21 details the

<sup>30</sup> *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.

EmPOWER Maryland demand response surcharges and revenue requirements for each of the Utilities operating an approved DR program.<sup>31</sup>

**Table 21 2021 Demand Response Monthly Surcharges (per kWh) and Revenue Requirements**

Utility	Residential	C&I	Revenue Requirement
<b>BGE</b>	\$0.00150	N/A	\$16,818,773
<b>DPL</b>	\$0.00120	\$0.00009	\$2,601,954
<b>Pepco</b>	\$0.00184	\$0.00014	\$11,192,212
<b>SMECO</b>	\$0.00167	\$0.00070	\$4,551,124

Table 22 details the respective forecasted and reported budgets for each of the EmPOWER Utilities operating an approved DR program during 2021. All of the Utilities’ programs were under budget for the 2021 program year.

**Table 22 2021 Demand Response Forecasted and Reported Budgets**

Utility	Forecasted Budget	Reported Costs	Variance
<b>BGE</b>	\$48,033,082	\$35,893,452	<b>(\$12,139,630)</b>
<b>DPL</b>	\$4,304,506	\$4,199,534	<b>(\$104,972)</b>
<b>Pepco</b>	\$17,633,599	\$18,664,636	<b>\$1,031,036</b>
<b>SMECO</b>	\$6,149,691	\$5,521,015	<b>(\$628,677)</b>
<b>Total</b>	<b>\$76,120,879</b>	<b>\$64,278,637</b>	<b>(\$11,842,242)</b>

## 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.

Based on EM&V best practices, the Commission adopted an independent, third-party evaluator model to review the EmPOWER portfolio results.<sup>32</sup> In this model, the Utilities direct primary evaluation and verification activities through an EM&V contractor; subsequently, the

<sup>31</sup> PE did not operate a separate DR program during 2021 and therefore did not file for a surcharge recovery of DR program costs.

<sup>32</sup> Order No. 82869 (Aug. 31, 2009).

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’ 2020 program year reported savings.

## **Overall EM&V Findings of the 2020 EmPOWER EE&C Program**

### **Energy and Peak Demand Savings**

In 2020, Guidehouse’s evaluation of the first-year savings<sup>33</sup> was 1,166,360 MWh and 235.105 MW, which was 96 percent and 106 percent of the Utilities’ reported energy and demand savings for that year. For the 2020 program year, Guidehouse estimated an effective Net-to-Gross (“NTG”) ratio of 0.71 for annual energy savings and 0.78 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.<sup>34</sup> Following the application of the calculated NTG ratios, the net savings for program year 2020 were 830,640 MWh and 182.967 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 2020. 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 2021 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 23 presents the 2020 total resource cost (“TRC”) test cost-effectiveness results by sector for each of the Utilities.<sup>35</sup> The sector-level benefit-to-cost ratios reflect the present value 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

<sup>33</sup> “First-year savings” is the amount of energy a measure will save in the first year in which the measure is installed.

<sup>34</sup> A “free rider” is a customer who would have installed an energy efficiency measure absent the utility-provided EmPOWER incentive.

<sup>35</sup> The 2021 program year cost-effectiveness results are expected in the second half of 2022.

and C&I sub-portfolios were cost effective in 2020, with overall TRC scores of 1.27 and 1.30, respectively.

**Table 23 2020 Portfolio TRC Results**

	Residential	Commercial	Portfolio
<b>BGE</b>	1.38	1.32	1.34
<b>Pepco</b>	0.94	1.22	1.14
<b>PE</b>	1.42	1.29	1.34
<b>DPL</b>	0.86	1.47	1.32
<b>SMECO</b>	1.50	1.18	1.39
<b>Statewide</b>	1.27	1.30	1.29

At the statewide level, the 2020 EmPOWER portfolio is expected to generate approximately \$1.29 in utility and participant benefits for each dollar of utility and participant cost. For a total investment of \$314 million,<sup>36</sup> the State’s Utilities, participants, and ratepayers will realize approximately \$407 million<sup>37</sup> 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 \$93 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.

## **2021 per Capita Electricity Consumption and Peak Demand**

Table 24 and Table 25 compare the per capita energy use and peak demand from 2011 to 2021 for all Maryland utilities. In 2021, a majority of the State’s electric utilities experienced a decrease in per capita energy use and per capita peak demand as compared to 2020 levels.

<sup>36</sup> The \$309 million total investment is the present value of both utility and participant costs.

<sup>37</sup> The \$401 million in financial benefits is the present value of both utility and participant benefits.

**Table 24 2011 - 2021 Per Capita Energy Consumption**

	Per Capita Energy Use MWh										
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>BGE</b>	12.65	12.26	12.06	11.86	11.82	11.57	11.31	11.44	11.25	11.17	11.10
<b>Pepco</b>	8.91	8.18	8.1	7.81	7.94	7.73	7.56	7.6	7.45	7.21	7.17
<b>PE</b>	17.17	16.93	17.53	17.64	17.39	17.57	17.6	18.1	17.47	17.04	16.52
<b>Delmarva</b>	13.02	12.61	12.6	12.55	13	12.73	12.65	12.89	12.52	12.1	9.79
<b>SMECO</b>	10.85	10.61	10.49	10.21	10.25	10.03	9.72	9.75	9.96	9.45	9.20
<b>Choptank</b>	12.58	12.31	12.92	12.55	13.04	12.73	13.24	13.42	12.52	12.1	N/A
<b>Hagerstown</b>	8.37	7.93	7.71	7.6	7.62	7.58	7.49	8.27	8.05	7.71	7.91
<b>Easton</b>	16.59	16.65	16.52	16.41	16.55	16.33	16.03	17.12	17.36	15.01	15.63
<b>Thurmont</b>	13.73	13.02	13.27	13.02	13.68	13.06	12.61	13.41	11.94	11.77	11.22
<b>Berlin</b>	9.31	9.4	9.37	9.9	10.61	10.15	9.86	11.06	10.13	10.05	10.21
<b>Williamsport</b>	9.2	9.44	9.87	10.06	10.04	9.64	9.39	9.85	9.65	9.34	9.86
<b>Somerset</b>	4.49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>A&amp;N Coop.</b>	8.05	10.83	10.81	11.06	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**Table 25 2011 - 2021 Per Capita Peak Demand**

	Per Capita Energy Use kW										
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>BGE</b>	2.7	2.38	2.38	2.27	2.36	2.4	2.34	2.36	2.22	2.3	2.29
<b>Pepco</b>	1.98	1.79	1.55	1.57	1.88	2.03	1.62	1.62	2.73	2.6	2.58
<b>PE</b>	3.24	3.27	3.1	2.62	3.68	3.49	3.42	3.34	3.19	3.39	3.28
<b>Delmarva</b>	2.76	2.8	2.72	2.62	2.76	2.83	2.67	2.64	2.67	2.61	2.11
<b>SMECO</b>	2.42	2.22	2.15	1.93	2.76	2.36	2.41	2.42	2.27	2	1.94
<b>Choptank</b>	2.77	3.17	3.33	2.59	3.33	2.83	2.99	2.98	3.31	3.08	N/A
<b>Hagerstown</b>	1.71	1.65	1.54	1.28	1.66	1.5	1.52	1.55	1.49	1.56	1.52
<b>Easton</b>	4.04	4.09	3.81	3.24	4.27	3.73	3.63	3.63	3.6	3.42	3.42
<b>Thurmont</b>	2.58	2.41	2.39	2.03	4.33	3.26	2.94	3.11	3.44	2.63	2.45
<b>Berlin</b>	1.99	2.44	2.09	2.19	2.3	1.17	2.21	2.27	2.1	2.31	2.25
<b>Williamsport</b>	1.64	1.85	1.87	1.39	2.48	2.15	2.18	2.21	2.52	2.09	1.96
<b>Somerset</b>	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>A&amp;N Coop.</b>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 26 illustrates the per capita electricity usage and peak demand statewide. Generally, statewide per capita energy usage has been lower in 2019-2021 than previous years.

**Table 26 Statewide Per Capita Electricity Usage and Peak Demand 2007-2021**

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
2019	10.49	2.50
2020	10.27	2.49
2021	10.02	2.42

## Upcoming Milestones

The Commission will review several Work Group reports as a result of Commission Order Nos. 89855 and 90003.

- Finance Work Group
  - A report, filed March 1, 2022, on any cost differential associated with lowering the credit score requirement for the CEA Pilot Program and the (anticipated or actual) launch date and reporting templates for the CEA Pilot Program
  - A final report, filed July 25, 2023 on the CEA Pilot Program
- ERPI Work Group
  - A report, filed February 15, 2022, on advising the Commission of the metrics established and communications made to the Utilities regarding Midstream Program data
  - To file updated reporting templates designed to include relevant greenhouse gas reduction data by April 15, 2022
- Midstream Work Group
  - A status report, filed by April 15, 2022, with the ERPI Work Group to establish and communicate to the Utilities the necessary reporting metrics for their respective Midstream Programs
- Limited Income Work Group
  - A status report, filed by April 15, 2022, with DHCD on an analysis of whether the current MEEHA funding allocation for each service territory is reasonable and, if appropriate, to submit to the Commission for approval the revised budget(s) containing modified funding allocation

Finally, the current goal structure for EmPOWER Maryland is mandated by legislation through the end of the 2021-2023 program cycle. The Commission is required to provide the General

Assembly with recommendations on future goals and cost effectiveness by July 1, 2022. The Commission established a Future of EmPOWER Work Group and directed the Work Group to convene at the start of the 2021-2023 program cycle and develop a plan and timeline to be filed with the Commission by April 15, 2021. The Work Group was directed to file final recommendations by April 15, 2022, to allow time for the Commission and stakeholders to review the Work Group's findings prior to the Commission reporting any recommendations to the General Assembly.