PUBLIC SERVICE COMMISSION OF MARYLAND

TEN-YEAR PLAN (2023 – 2032) OF ELECTRIC COMPANIES IN MARYLAND

Prepared for the
Maryland Department of Natural Resources
In compliance with §7-201
Of the Public Utilities Article, *Annotated Code of Maryland*
November 2023

State of Maryland
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I. Introduction

This report constitutes the Maryland Public Service Commission's *Ten-Year Plan (2023-2032) of Electric Companies in Maryland*. The Ten-Year Plan is submitted annually by the Commission to the Secretary of the Department of Natural Resources in compliance with §7-201 of the Public Utilities Article, *Annotated Code of Maryland*. It is a compilation of information pertaining to the long-range plans of Maryland's electric companies. The report also includes discussion of selected developments that may affect these long-range plans. The analysis contained in the Ten-Year Plan uses forecasts provided by Maryland utilities, PJM Interconnection, LLC ("PJM"), and other state and federal agencies.

The 2023 – 2032 Ten-Year Plan provides a forward-looking analysis of the composition of Maryland's electricity and generation profile and covers topics relevant to Maryland, including load growth forecasts, and the state of the state's generation resources and electric transmission system.

Changes to Maryland's supply and demand profile may necessitate additional infrastructure investment in the state's distribution network to ensure the safe, reliable, and economic supply of electricity to end users. The Commission exercises its statutory and regulatory power to ensure adequate, economical, and efficient delivery of utility services in the state.[1] A record of these proceedings is published in the Commission's annual report.

II. Background

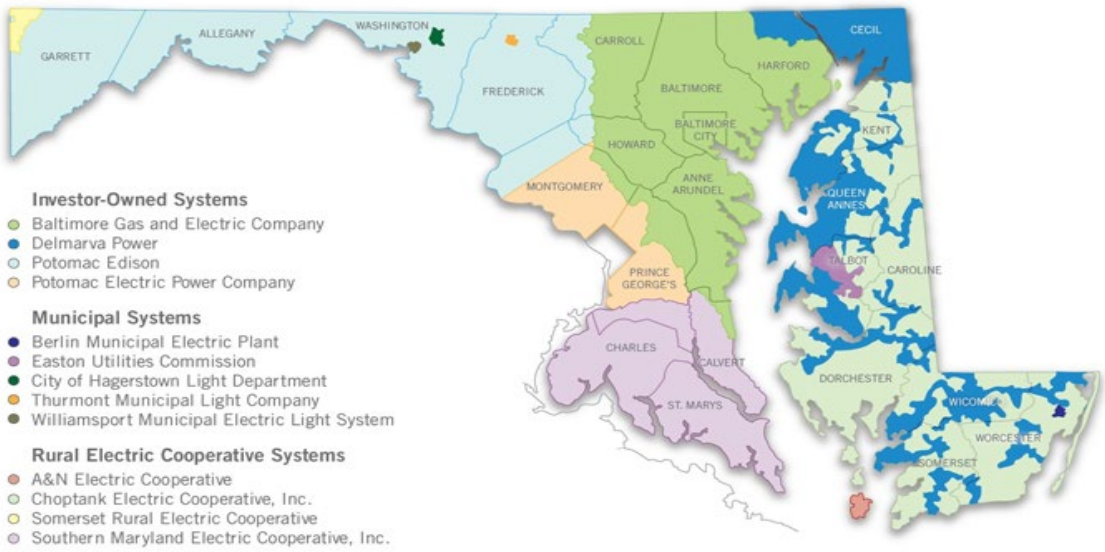
Maryland is geographically divided into 13 electric utility service territories.[2] The four largest, by number of Maryland customers, are served by investor-owned utilities ("IOUs"); four represent electric cooperatives (two of which serve mainly rural

[1] The Maryland Public Service Commission and the Maryland Energy Administration represented Maryland on a 16-state task force on future distribution system planning. This task force started work in 2019 and was funded by the U.S. Department of Energy ("DOE"). The task force was staffed and sponsored by the DOE, the National Association of Regulatory Utility Commissioners ("NARUC"), and the National Association of State Energy Officers ("NASEO"). This work continued through 2020 and produced a report of its findings in February 2021 at https://pubs.naruc.org/pub/14F19AC8-155D-0A36-311F-4002BC140969.

[2] The Maryland utilities: Baltimore Gas and Electric Company ("BGE"), Delmarva Power & Light Company ("DPL"), The Potomac Edison Company ("PE"), Potomac Electric Power Company ("Pepco"), Berlin Municipal Electric Plant ("Berlin"), Easton Utilities Commission ("Easton"), City of Hagerstown Light Department ("Hagerstown"), Thurmont Municipal Light Company ("Thurmont"), Williamsport Municipal Electric Light System ("Williamsport"), A&N Electric Cooperative ("A&N"), Choptank Electric Cooperative, Inc. ("Choptank"), Somerset Rural Electric Cooperative ("Somerset"), and Southern Maryland Electric Cooperative, Inc. ("SMECO").

areas of Maryland); and five are served by electric municipal operations.[3] PJM sub-regions, known as zones, generally correspond with the IOU service territories. PJM zones for three of the four IOUs traverse state boundaries and extend into other jurisdictions.[4] Figure 1 provides a geographic picture of the Maryland utilities' service territories. Figure 2 depicts the Maryland's PJM forecast zones.

Figure 1: Maryland Utilities and their Service Territories in Maryland[5]

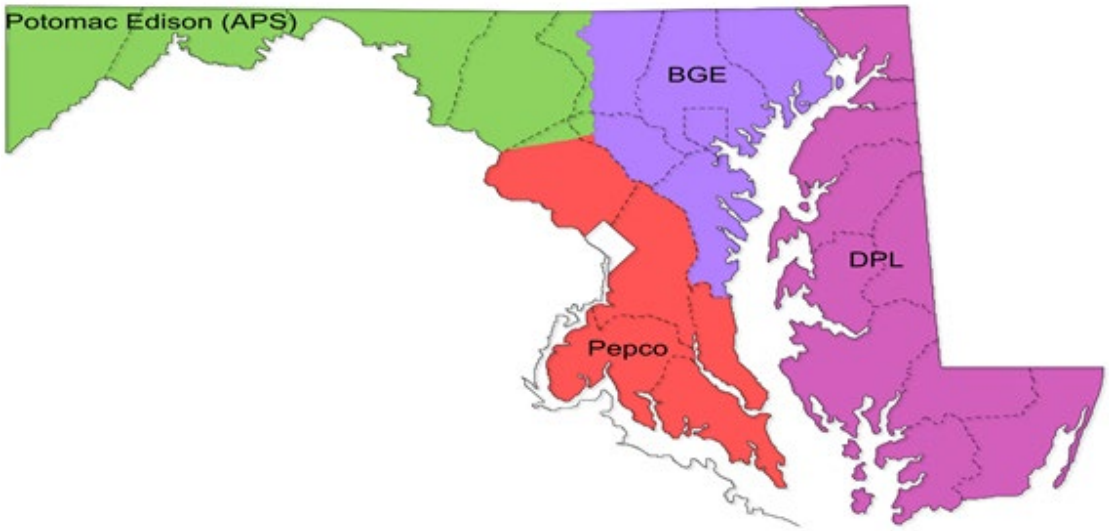


[3] The Commission regulates all Maryland public service companies, as defined by §1-101(x) of the Public Utilities Article, *Annotated Code of Maryland*.

[4] Potomac Electric Power Company, Delmarva Power & Light Company, and The Potomac Edison Company are the three IOUs that extend into other jurisdictions. Pepco, DPL, and PE data are a subset of the PJM zonal data, since PJM's zonal forecasts are not limited to Maryland. The Baltimore Gas and Electric Company zone, alone, resides solely within the State of Maryland.

[5] *Cumulative Environmental Impact Report 18*, Maryland Department of Natural Resources, Figure 2-16, http://www.pprp.info/ceir18/HTML/Report-18-Chapter-2-4.html (last updated September 2018).

Figure 2: PJM Maryland Forecast Zones[6]



III. Maryland Load Growth Forecasts

Each year, PJM presents a Load Forecast Report for each PJM zone, region, and locational deliverability area that is derived in part from an independent economic forecast prepared by Moody's Analytics. The economic analysis includes projections related to the expected annual growth of the gross domestic product ("GDP") and can provide insight into possible trends for regional population growth and household disposable income, which in turn can impact energy sector planning.

The PJM forecast contrasts GDP growth projections included in the current (*i.e.* September 2022) load forecast with that of the previous year (*i.e.* September 2021), as depicted below in Table 1. At the outset of the 2023-2032 planning period discussed in this Ten-Year Plan, the projected average GDP growth reflected in the current PJM load forecast is higher than that projected by the previous year's forecast for roughly the same time period. The Commission notes that the GDP projections included in the most recent PJM Load Forecast Report may not be reflective of current trends of the GDP which is dropping mainly as a result of a sharp drop in net exports. GDP shows a first quarter leap in GDP of 2.0 percent.[7]

Demand forecasts submitted by the Maryland utilities for the 2023-2032 planning period discussed in this Ten-Year Plan are comparable to the forecasts provided to the Commission over the last several years. The Maryland utilities' load forecasts indicate a modest amount of projected annual growth in the number of customers, energy sales, and demand throughout the state.

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[6] *PJM Load Forecast Report,* PJM, (Jan. 2021), https://www.pjm.com/-/media/library/reports-notices/load-forecast/2021-load-report.ashx.
[7] The current GDP can be found at the Bureau of Economic Analysis, https://www.bea.gov/data/gdp/gross-domestic-product.

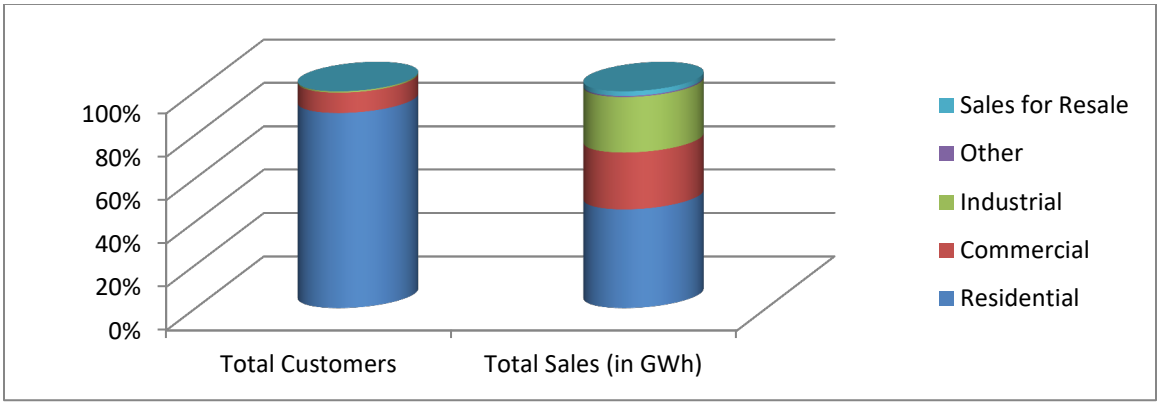
Table 1: Comparison of Compound Annual Growth Rate Projections – 2020, 2021, 2022 and 2023[8]

Forecasts	Ten Year Plan 2020-2029	Ten Year Plan 2021-2030	Ten Year Plan 2022-2031	Ten Year Plan 2023-2032
Customer Growth	0.7%	0.7%	0.7%	0.6%
Energy Sales	0.1%	0.4%	0.4%	0.3%
Summer Peak Demand	0.3%	1.4%	0.9%	0.7%
Winter Peak Demand	0.5%	0.7%	0.8%	0.4%

A. Customer Growth Forecasts[9]

At the close of 2022, approximately 90 percent of utility customers in Maryland were categorized as residential ratepayers; however, residential sales represented only 46 percent of the year's total retail energy sales, as illustrated in Figure 3 below.[10] Conversely, commercial and industrial ("C&I") customers represented just 10 percent of Maryland utility customers, but accounted for over half of the total retail energy sales for the state.

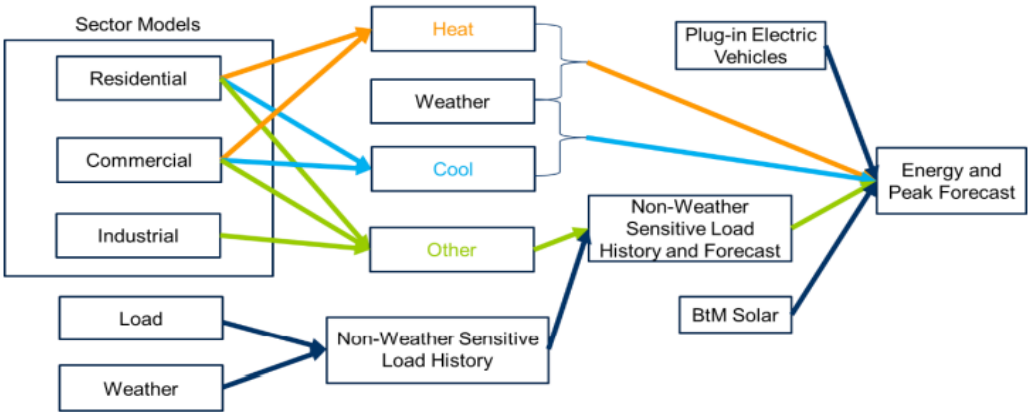
Figure 3 Total Customers and Energy Sales (in GWh) by Customer Class for 2022



PJM's process for modeling the load forecast involves creating a series of models where daily load is regressed on calendar, weather, economic and end-use variables. The economic, weather, and end-use variables are compiled into indices which are then treated as independent variables in the final regression.[11]

[8] *See* Appendix Tables 1(a)(i), 2(a)(i), 3(a)(i), 3(a)(iii).
[9] *See* Appendix Table 1(a) for a complete list of utility-by-utility customer growth forecasts.
[10] *See* Appendix Tables 1(b)(i) and 1(b)(ii).
[11] *PJM Load Forecast Supplement,* PJM, (Jan. 2023) https://www.pjm.com/-/media/planning/res-adeq/load-forecast/load-forecast-supplement.ashx.

Figure 4 Example of PJM Load Forecast Modeling



As reflected in Table 2 below, the statewide forecasted compound annual growth rate during the planning period is 0.63 percent for all customer classes, which translates into a 5.78 percent increase in the total number of Maryland customers by the end of this 10-year planning period.

Table 2: Maryland Customer Forecast (All Customer Classes)[12]

Year	Berlin	BGE	DPL	Easton	Hagers-town	PE	Pepco	SMECO	Thur-mont	William-sport	Total
2023	2,667	1,335,866	218,578	11,022	17,539	288,758	596,684	175,838	2,879	1,023	**2,650,854**
2024	2,668	1,342,377	219,058	11,058	17,580	292,621	600,258	177,910	2,879	1,023	**2,667,432**
2025	2,682	1,348,948	219,784	11,094	17,620	296,376	603,895	180,096	2,879	1,023	**2,684,397**
2026	2,695	1,355,742	220,539	11,130	17,661	300,082	607,634	182,078	2,879	1,023	**2,701,463**
2027	2,708	1,362,831	221,207	11,166	17,702	303,734	611,278	184,250	2,879	1,023	**2,718,778**
2028	2,735	1,370,064	221,877	11,202	17,743	307,293	614,944	186,122	2,879	1,023	**2,735,883**
2029	2,763	1,377,366	222,550	11,238	17,784	310,791	618,635	188,002	2,879	1,023	**2,753,030**
2030	2,790	1,384,628	223,224	11,274	17,825	314,245	622,348	190,074	2,879	1,023	**2,770,311**
2031	2,818	1,391,349	223,900	11,310	17,866	317,656	626,086	191,946	2,879	1,023	**2,786,834**
2032	2,847	1,398,670	224,579	11,346	17,907	321,006	629,847	193,916	2,879	1,023	**2,804,020**
Change (2023-2032)	**179**	**62,804**	**6,001**	**324**	**368**	**32,248**	**33,163**	**18,078**	**0**	**0**	**153,166**
Percent Change (2023-2032)	**6.73%**	**4.70%**	**2.75%**	**2.94%**	**2.10%**	**11.17%**	**5.56%**	**10.28%**	**0.00%**	**0.00%**	**5.78%**
Compound Annual Growth Rate	**0.73%**	**0.51%**	**0.30%**	**0.32%**	**0.23%**	**1.18%**	**0.60%**	**1.09%**	**0.00%**	**0.00%**	**0.63%**

[12] *See* Appendix Table 1(a)(i). Note that Choptank, A&N and Somerset did not provide the requested applicable information in response to the Commission's 2023 data request for the Ten-Year Plan.

The customer forecasts provided by the utilities are comparable to the forecasts they provided for the 2022-2031 Ten-Year Plan. Overall, the increase in the number of customers across Maryland is primarily driven by growth in the residential class. Growth in the residential sector is projected to account for an additional 141,248 customers by 2032, or 92 percent of total new customers projected. The largest percentage increase in the number of customers is projected to occur in PE's service territory with an increase of 12 percent, or 29,324 new residential customers. The largest absolute increase in the number of customers is projected to come from BGE's residential customer base, with the addition of 56,100 residential customers forecasted during this planning period.[13] BGE's projected increase in its residential customer base accounts for 40 percent of the total number of new residential customers across all service territories during the 10-year planning period.[14] The increase in residential customers for BGE translates into a compound annual growth rate of 0.51 percent.[15]

Maryland utilities are projecting an increase in their customer bases during this planning period. Table 3 below shows that the aggregated utilities' customer forecasts are 1.18 percent higher than the projections provided during the previous planning period. The most significant percentage change observable in the aggregated statewide data between the previous and current Ten-Year Plan forecasts is within the "Industrial" customer class,[16] largely attributable to an increased projection by BGE.

Table 3: Projected Percentage Increase in the Number of Customers by Class, 2023 – 2032[17]

	All Utilities		
Class	**2022 to 2031**	**2023 to 2032**	**Difference**
Residential	7.23%	5.93%	-1.30%
Commercial	4.52%	4.21%	-0.31%
Industrial	6.51%	9.34%	2.83%
Other	-0.70%	-1.01%	-0.31%
Resale	0.00%	0.00%	0.00%
Total Customers	**6.96%**	**5.78%**	**-1.18%**

[13] *See* Appendix Table 1(a)(ii).
[14] *Id*.
[15] *Id.*
[16] The "Other" rate class refers to customers that do not fall into one of the listed classes; street lighting is an example of a rate class included under "Other." The Resale class refers to Sales for Resale which is energy supplied to other electric utilities, cooperatives, municipalities, and federal and state electric agencies for resale to end use consumers. PE is the only utility with any resale customers; these wholesale customers are PJM, Monongahela Power Company, West Penn Power Company, and Old Dominion Electric Cooperative.
[17] *See* Appendix Table 1(a)(i)-(vi) for more information.

B. Energy Sales Forecast

The Maryland utilities provide forecasts for energy sales and peak load in terms of "Gross of Demand Side Management ("DSM")" and "Net of DSM."[18] In order to provide a more complete look at Maryland energy sales and peak demand forecasts, Sections III.B and III.C discuss the forecasts in "Gross of DSM" terms, which reflect the forecasts *before* the impact of DSM programs. Table 4 shows the energy sales forecast within Maryland (Gross of DSM) for the 10-year planning period, as provided by the utilities.

Table 4: Maryland Energy Sales Forecast (GWh) (Gross of DSM) [19]

	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Total
Change (2023-2032)	3	(75)	31	14	7	2,031	(352)	189	1,848
Percent Change (2023-2032)	7.22%	0.25%	0.61%	5.87%	2.27%	23.63%	2.18%	5.29%	2.90%
Compound Annual Growth Rate	0.78%	0.03%	0.07%	0.64%	0.25%	2.38%	0.24%	0.57%	0.32%

The aggregated forecasts show a compound annual increase of 0.32 percent across all the Maryland service territories for 2023-2032, a decrease from the 0.38 percent annual growth rate reported in the 2022-2031 Ten-Year Plan. This result is primarily due to Pepco's revised projection of a negative energy sales growth rate in the 2023 – 2032 Ten-Year Plan. The overall growth projected by Pepco for this 10-year planning period is the lowest of any Maryland utility in absolute terms, with the company projecting 352 GWh less in energy sales by 2032.

C. Peak Load Forecasts

PJM's 2023 Load Forecast Report includes long-term projections of peak loads for the entire wholesale market region and each PJM zone.[20,21] Due to the fact that the PJM zones can extend outside of Maryland, the utilities submit peak demand forecasts restricted to their Maryland service territories as part of the Ten-Year Plan.[22] According to PJM's 2023 Load Forecast Report, the PJM Regional Transmission Organization

[18] *See* Appendix Table 2(a)(ii) for the Maryland Energy Sales forecast, Net of DSM programs; Appendix Table 3(a)(ii) for the Maryland Summer Peak Demand Forecast, Net of DSM programs; and Appendix Table 3(a)(iv) for the Maryland Winter Peak Demand Forecast, Net of DSM programs.
[19] *See* Appendix Table 2(a) for utility-by-utility energy sales forecasts for the Maryland service territory, available by Gross and Net of DSM. *See* Appendix Table 2(b) for the same information on a system wide basis.
[20] *PJM Load Forecast Report,* PJM, (Jan. 2023) at 33-36, Table B-1, https://www.pjm.com/-/media/library/reports-notices/load-forecast/2023-load-report.ashx.
[21] The four PJM zones spanning the Maryland service territory include APS, BGE, DPL, and PEPCO. *See supra* Figure 2 for a map of the Maryland zones. "APS" represents the Allegheny Power Zone, of which PE is a sub-zone.
[22] *See* Appendix Table 3(a) for more information on in-state peak demand forecasts for Maryland utilities, available for summer and winter, and by gross and net of DSM programs. *See* Appendix Table 3(b) for the same information, presented as system wide data for utilities operating in Maryland.

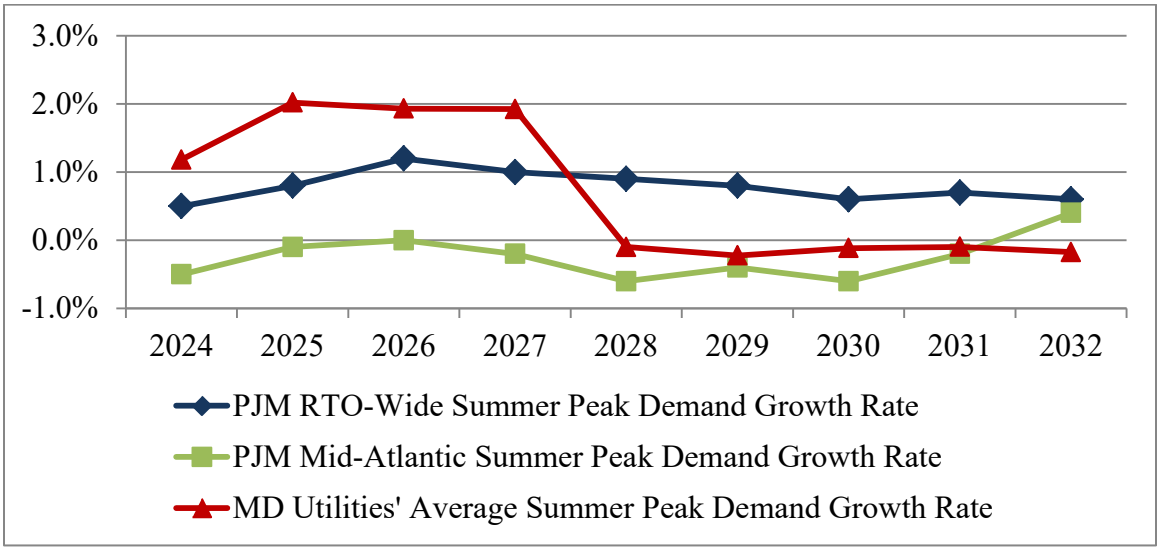
("RTO") will continue to be summer peaking during the next 15 years.[23] In 2023, three of the PJM zones of which Maryland is comprised are projected to experience their peak demands during the month of July,[24] the same month as the broader PJM Mid-Atlantic region.[25] The APS region is an exception which is projected to experience its peak demands during January.

In contrast to PJM's forecasts, Berlin, Hagerstown, PE, SMECO, Thurmont, and Williamsport are forecasting their peak demands to occur in the winter in most or all the forecasted years. These utilities have generally peaked in the winter over the past few planning periods for reasons such as: higher concentrations of electric heating; geographical features; and colder temperatures.

Figure 5 compares the average of the Maryland utilities' forecasted summer peak demands for their Maryland service territories with summer forecasts for the PJM Mid-Atlantic region and for the PJM RTO as a whole. In the near-term, the Maryland utilities are showing stronger peak demand growth rate than the PJM RTO and the PJM Mid-Atlantic region. Also reflected in Figure 5 is a drop in the summer peak demand growth rates for the Maryland utilities in 2027, after which time the growth rates generally level off through 2032 and follows a similar path to the PJM RTO and the PJM Mid-Atlantic region.

[23] *PJM Load Forecast Report,* PJM, (Jan. 2023) at 1-2, https://www.pjm.com/-/media/library/reports-notices/load-forecast/2023-load-report.ashx.
[24] *Id.* at 45-46, Table B-5.
[25] *Id.* Three of the Maryland PJM zones (BGE, DPL, and Pepco) are part of the PJM Mid-Atlantic Region. The fourth Maryland PJM zone (APS) is part of the PJM Western Region data set.

Figure 5 Average of Utilities' Projected Summer Peak Demand Growth Rates (Gross of DSM) Compared to Projected Summer Peak Demand Growth Rates for PJM Mid-Atlantic and PJM RTO[26,27]



The Maryland utilities also provided peak demand forecasts for the winter season in response to the Ten-Year Plan data request. Figure 6 below depicts an average of the Maryland utilities' forecasted winter peak demands, contrasted with winter peak demand forecasts for the PJM Mid-Atlantic region and for the PJM RTO.

[26] *PJM Load Forecast Report,* PJM, (Jan. 2023) at 33-36, Table B-1, https://www.pjm.com/-/media/library/reports-notices/load-forecast/2022-load-report.ashx.
[27] *See* Appendix Table 3(a)(i).

Figure 6 Average of Utilities' Projected Winter Peak Demand Growth Rates (Gross of DSM) Compared to Projected Winter Peak Demand Growth Rates for PJM Mid-Atlantic and PJM RTO[28,29]

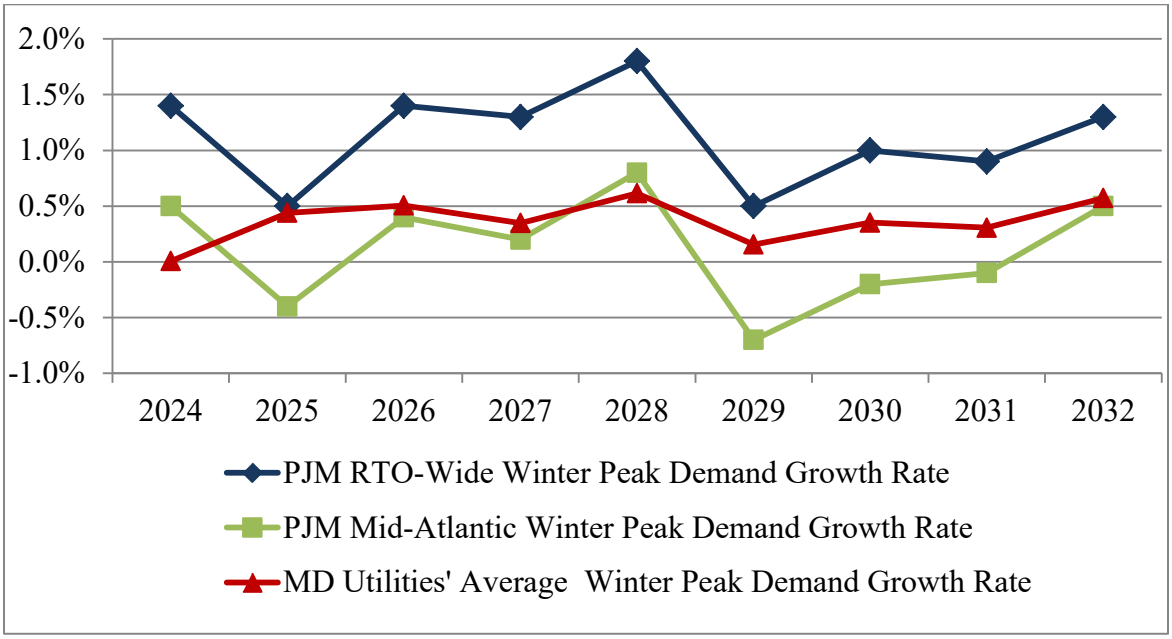
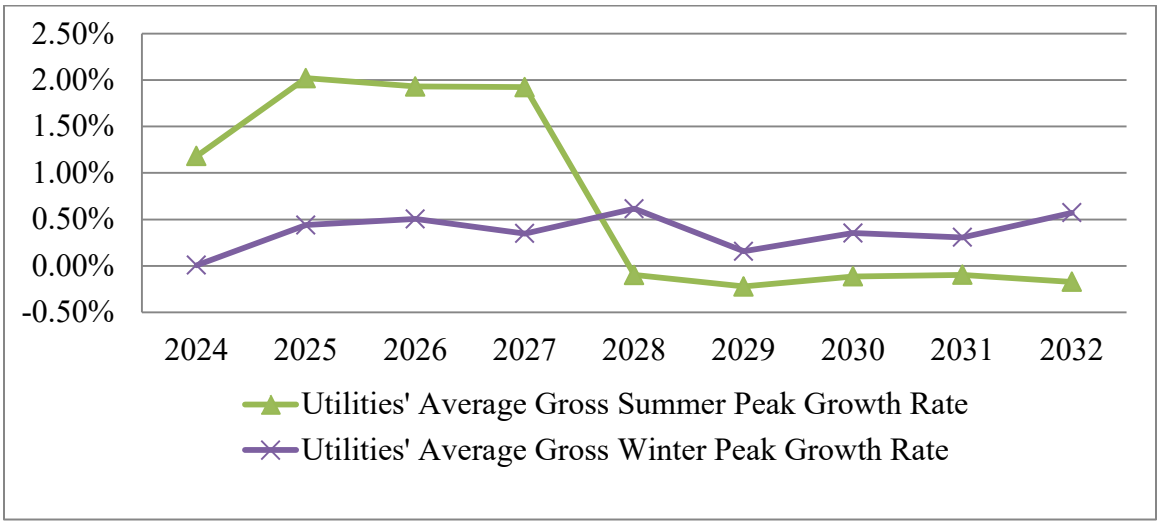


Figure 7 shows that the utilities' average gross winter peak growth rate rises substantially from 2023 to 2024 and is more stable throughout the 10-year planning period than the average gross summer peak growth rate which drops substantially from 2027 to 2028.

[28]. *See* Appendix Table 3(a)(iii).
[29] *PJM Load Forecast Report,* PJM, (Jan. 2023) at 37-40, Table B-2, https://www.pjm.com/-/media/library/reports-notices/load-forecast/2023-load-report.ashx.

Figure 7 Utilities' Projected Summer Peak Demand Growth Rates (Gross of DSM) Compared to Utilities' Projected Winter Peak Demand Growth Rates (Gross of DSM)



As shown in Table 5 and Table 6 below, the 10-year forecasted Maryland growth rates of summer and winter peak demand (gross of DSM) are 0.70 percent and 0.37 percent, respectively.[30] In 2032, at the end of this planning timeframe, these growth rates translate into an expected summer peak demand load (gross of DSM) for the Maryland service territory of 15,119 MW and an expected winter peak demand load (gross of DSM) for Maryland of 11,905 MW.[31]

Table 5: Maryland Summer Peak Demand Forecast (MW) (Gross of DSM)[32,33]

	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Total
Change (2023-2032)	1	(471)	5	3	1	247	1,091	44	921
Percent Change (2023-2032)	7.75%	6.75%	0.45%	4.98%	2.27%	14.72%	32.54%	4.93%	6.49%
Compound Annual Growth Rate	0.83%	0.77%	0.05%	0.54%	0.25%	1.54%	3.18%	0.54%	0.70%

[30] *See* Appendix Table 3(a).
[31] *See* Appendix Tables 3(a)(i) and 3(a)(iii).
[32] *Id*.
[33] Thurmont and Williamsport were not included in this table because the companies do not have any changes in their peak demand forecasts over the 10-year period.

Table 6: Maryland Winter Peak Demand Forecast (MW) (Gross of DSM)[34, 35]

	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Total
Change (2023-2032)	6	(89)	16	3	2	350	40	58	386
Percent Change (2023-2032)	38.77%	-1.51%	1.71%	4.21%	2.27%	19.34%	2.21%	6.32%	3.35%
Compound Annual Growth Rate	3.71%	-0.17%	0.19%	0.46%	0.25%	1.98%	0.24%	0.68%	0.37%

D. Impact of Demand Side Management

DSM programs result in lower growth of both energy sales and peak demand. To evaluate the impact of DSM programs, this section reflects the Maryland utilities' energy sales forecasts *after* the benefits of DSM programs are included ("net of DSM"). For purposes of this section, only the five utilities participating in EmPOWER Maryland are evaluated: BGE, DPL, PE, Pepco, and SMECO ("the participating utilities").[36] According to the participating utilities' Ten-Year Plan forecasts, the DSM programs will save a total of 31,257 GWh over the planning period. These savings will be achieved by reducing the annual rate of growth in energy sales and peak demand.

The tables below compare the growth in DSM savings across the participating utilities from 2023 to 2026. The forecasted savings post-2023, however, fluctuate in method and amount across the participating utilities given that Commission-approved plans for utility-implemented EE&C programs pertain only to the 2021-2023 program cycle.[37] Table 7 shows the growth in demand savings from DSM programs due to EE&C portfolios, while Table 8 shows the growth in total demand savings attributable to DSM programs as a whole. The variation in the magnitude of impact of the EE&C and DSM programs by utility are due to the different sizes of the programs offered and the way in which the data was forecasted by the participating utilities. Also, the Commission notes that demand savings projections later in the 2023-2032 planning horizon may be affected by future iterations of EmPOWER Maryland program cycle proposals, as well as pending changes to the capacity market as a result of PJM's Capacity Performance Construct.

[34] *See* Appendix Tables 3(a)(i) and 3(a)(iii).
[35] Thurmont and Williamsport were not included in this table because the companies do not have any changes in their peak demand forecasts over the 10-year period.
[36] *See* The EmPOWER Maryland Report to the General Assembly for more information on the energy efficiency and demand response programs associated with EmPOWER Maryland, *available at:* https://www.psc.state.md.us/wp-content/uploads/2022-EmPOWER-Maryland-Energy-Efficiency-Act-Standard-Report.pdf.
[37] Because the Commission has only approved plans pertaining to the 2021-2023 program cycle at this date, BGE did not include any EE&C savings projections after 2023, except for its Residential Demand Response Program and CVR, and Dynamic Pricing. The other participating utilities assume a level of savings post-2023.

Table 7: Average Annual Increase in Demand Savings due to DSM Programs from 2023 to 2026 for EE&C Programs[38]

Description	BGE	DPL	PE	Pepco	SMECO
Average Annual MW Savings Increase due to DSM Programs	-11.3%	6.5%	10.4%	20.1%	0.0%

Table 8: Average Annual Increase in Demand Savings due to DSM Programs from 2023 to 2026 for all DSM Programs[39]

Description	BGE	DPL	PE	Pepco	SMECO
Average Annual MW Savings Increase due to DSM Programs	-6.8%	4.5%	9.7%	18.6%	0.0%

IV. Transmission, Supply, and Generation

To ensure a safe, reliable, and economic supply of electricity in Maryland, an appropriate balance of generation, DSM, imports, and transmission must be achieved. While importation and DSM offer ancillary benefits to managing the power supply, it is critical that local generation is established and maintained to mitigate the risk to Maryland's long-term reliability.

For purposes of the Ten-Year Plan, the congestion costs and the role of transmission infrastructure in planning processes are discussed in Section IV.A; Section IV.B focuses on the state-specific impact of Maryland's status as a net importer of electricity. Information related to the Commission's concerns about the capacity, composition, and advanced age of Maryland's current generation profile is discussed in Section IV.C.

Maryland depends on PJM to operate the regional transmission system and to schedule the flows of power around the state (including importing power from other areas into Maryland). All load serving entities in PJM are required to ensure that they have sufficient capacity contracts to provide reliable electric service during periods of peak demand. As of 2021, Maryland's net summer generating capacity was 13,006 MW.[40] Maryland's peak demand forecast for 2023, net of utility demand-side management and energy conservation measures, is approximately 11,935 MW.[41] Maryland had the capability to meet over 103.6 percent of its summer peak demand with in-state generation

[38] Responses to the Commission's Ten-Year Plan data requests.
[39] *Id.*
[40] The U.S. Energy Information Administration ("EIA"), State Electricity Profile: Maryland; http://www.eia.gov/electricity/state/Maryland/. The EIA's most recent data available is from 2021. The next anticipated release date is listed as December 2023.
[41] *See* Appendix Table 3(a)(ii).

in 2021.[42] Notwithstanding the ability to meet peak capacity, Maryland still imports a significant portion of its electricity needs as discussed in more detail in Part B of this section.

A. Regional Transmission [43]

PJM in its 2022 Regional Transmission Expansion Plan ("RTEP") authorized about $2.4 billion in system transmission improvement projects. The development of the RTEP considers the total effects of system trends, which are often driven by federal and state policy decisions. The planning process applies the North American Electric Reliability Corporation ("NERC") Planning Standard through the application of a wide range of reliability analyses (including load and generation deliverability tests) over a 15-year planning horizon.[44]

1. Regional Transmission Congestion

This section of the Ten-Year Report discusses congestion in PJM and the Maryland Control Zones. Congestion reflects the underlying characteristics of the power system, including the nature and capability of transmission facilities as well as the cost and geographical distribution of facilities. Congestion occurs when available, least-cost energy cannot be delivered to all load because of inadequate transmission facilities, thereby causing the price of energy in the constrained area to be higher than in an unconstrained area. PJM's Locational Marginal Pricing ("LMP") system is designed to reflect the value of energy at a specific location and time of delivery, thus measuring the impact of congestion throughout the PJM system. Total congestion costs for the PJM RTO increased by 151.3 percent ($1.51 billion) between 2021 and 2022.[45]

2. Regional Transmission Upgrades

The Commission recognizes the need to maintain and improve the transmission system within Maryland in order to ensure safe, reliable, and economic electric service to the state's ratepayers. As with increases in local generating capacity and the reduction of system load, transmission expansions and improvements can reduce congestion and LMP differences among zones; such improvements may also support reliability requirements

[42] The peak demand net of DSM programs for the summer of 2021 was 12,551 according to the 2021-2030 Ten-Year Plan. 13,006/12,551 = 103.6%.
[43] *See* Appendix Table 4 for a full list of transmission enhancements proposed by Maryland utilities.
[44] *2022 Regional Transmission Expansion Plan.* PJM, (March 14, 2023) at 4, https://www.pjm.com/-/media/library/reports-notices/2022-rtep/2022-rtep-report.ashx.
[45] Monitoring Analytics, *State of the Market Report for PJM - 2022*, PJM, (March 9, 2023) at 625, https://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2022/2022-som-pjm-sec11.pdf.

and mitigate economic concerns. PJM's 2022 RTEP authorized seven transmission upgrades for Maryland for approximately $36.6 million. [46]

Appendix 4 lists all transmission enhancements identified by the Maryland utilities in response to data requests for the Ten-Year Plan. Together, the 12 identified transmission enhancements in Appendix Table 4 account for 55 miles of upgrades.

B. Electricity Imports

Maryland continues to be a net importer of electricity, similar to many other states in PJM.[47] As of 2021, 39 percent of the electricity consumed in the state is imported from other states and internationally.[48] Nine of the 13 PJM states plus the District of Columbia are net importers of electricity. In a nationwide comparison, Maryland is the fifth largest electricity importer based on percentage of electricity sales.[49] Only the District of Columbia, Massachusetts, Vermont, and Delaware exceed Maryland in the percentage of electricity sales that are imported. In contrast, as of 2021, the states within the PJM region that exported more electricity in aggregate than consumed within each state are: Illinois, Pennsylvania, Michigan, and West Virginia.[50]

Maryland continues to be a net importer as in-state generation has declined in recent years. In 2008, Maryland resources generated over 50 million MWh in electricity. By 2021, however, in-state resources generated slightly over 38 million MWh.[51] The EmPOWER Maryland program, together with other energy efficiency efforts across the state, contributes to a decrease in the peak demand, which reduces the need to increase capacity and generation capabilities both in Maryland and throughout the PJM region. According to EIA, Maryland is ranked 43rd in the country for per capita energy consumption.[52]

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[46] 2022 Maryland and District of Columbia State Infrastructure Report, PJM, at 15-17, (May 2023), https://www.pjm.com/-/media/library/reports-notices/state-specific-reports/2022/2022-maryland-dc-state-infrastructure-report.ashx?la=en.

[47] PJM operates, but does not own, the transmission systems in: (1) Maryland; (2) all or part of 12 other states; and (3) the District of Columbia. With FERC approval, PJM undertakes the task of coordinating the movement of wholesale electricity and provides access to the transmission grid for utility and non-utility users alike. Within the PJM region, power plants are dispatched to meet load requirements without regard to operating company boundaries. Generally, adjacent utility service territories import or export wholesale electricity as needed to reduce the total amount of capacity required by balancing retail load and generation capacity.

[48] *State Electricity Profiles 2021*, U.S. Energy Information Administration, (November 10, 2022) at Table 10, https://www.eia.gov/electricity/state/maryland/xls/md.xlsx.

[49] *State Electricity Profiles 2021*, U.S. Energy Information Administration, (November 10, 2022), at Table 10, (for each state, https://www.eia.gov/electricity/state/index.php).

[50] *Id.*

[51] *State Electricity Profiles 2021*, U.S. Energy Information Administration, (November 10, 2022) at Table 5, https://www.eia.gov/electricity/state/maryland/state_tables.php.

[52] *Maryland State Energy Profile*, U.S. Energy Information Administration (November 17, 2022), https://www.eia.gov/state/print.php?sid=MD.

C. Maryland Capacity and Generation Profiles

The capacity and generation profiles of in-state resources must be comprehensively analyzed for both short-term and long-term reliability planning purposes due to the uncertain future of coal-fired generation.[53] In Case No. 9214, the Commission observed the state's reliability risk is further heightened because neighboring states that export electricity into Maryland also have at-risk coal-fired generation.[54]

1. Conventional Capacity and Generation Profiles, 2021

Coal-fired power plants represent 14.8 percent of the electric generating capacity in Maryland, of which 75 percent of such capacity is aged 31 years or older. Table 9 and Table 10 below depict the electric generating capacity in Maryland, as well as the age of plants by fuel type.[55]

Table 9: Maryland Summer Peak Capacity Profile, 2021[56]

Primary Fuel Type	Capacity	
	Summer (MW)	Percent of Total
Coal	1,758.0	14.8%
Oil	1,350.5	11.4%
Natural Gas	5,651.2	47.5%
Nuclear	1,707.8	14.4%
Hydroelectric	590.0	5.0%
Other and Renewables	840.7	7.1%
Total	**11,898.2**	**100.0%**

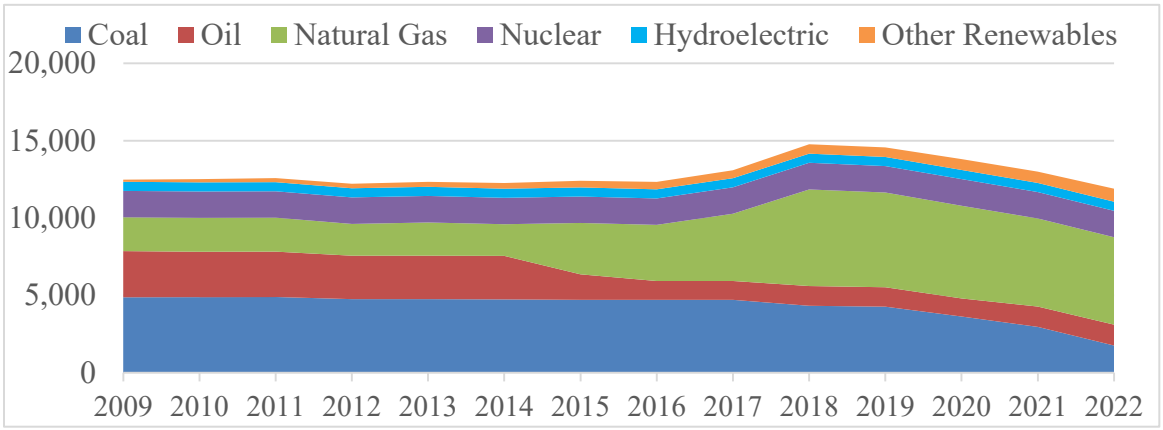
[53] The uncertainty stems from the economic pressure on coal because of decreasing natural gas prices, as well as from regulations promulgated by the U.S. Environmental Protection Agency.
[54] Case No. 9214, *In the Matter of* Maryland generation capacity in 2022.
[54] *Report EIA-860: "3_1_Generator Whether New Generating Facilities Are Needed to Meet Long-Term Demand for Standard Offer Service.* Order No. 84815 (April 12, 2012) at 19.
[55] *See* Appendix Table 5 for a list of Maryland generation capacity in 2022.
[56] *Report EIA-860: "3_1_Generator_Y2022_Early_Release"* Excel, U.S. Energy Information Administration (June 1, 2023), https://www.eia.gov/electricity/data/eia860/.

Table 10: Age of Maryland Generation by Fuel Type, 2021[57]

Primary Fuel Type	Age of Plants, By Percent			
	1-10 Years	11-20 Years	21-30 Years	31+ Years
Coal	0%	0%	25%	75%
Oil	6%	6%	10%	78%
Natural Gas	39%	28%	15%	17%
Nuclear	0%	0%	0%	100%
Hydroelectric	0%	0%	0%	100%
Other and Renewables	75%	21%	1%	4%

Maryland's summer peak capacity profile decreased by 1,101 MW in 2022 compared to 2021, as illustrated in Figure 8. The capacity reduced in 2022 can be largely attributed to decreases in coal.

Figure 8 Maryland Summer Capacity Profile (MW), 2009 – 2022[58]



Maryland's generating profile differs from its capacity profile. Coal and nuclear facilities typically generate an overwhelming majority of all electricity produced in Maryland, even though these resources represent a little under half of in-state capacity.[59] Conversely, oil and certain natural gas facilities, which operate as mid-merit or peaking units that come on-line when needed, generate 37 percent of the electric energy produced in Maryland while representing 59 percent of in-state capacity. Table 11 summarizes Maryland's 2021 in-state generation profile according to fuel source.

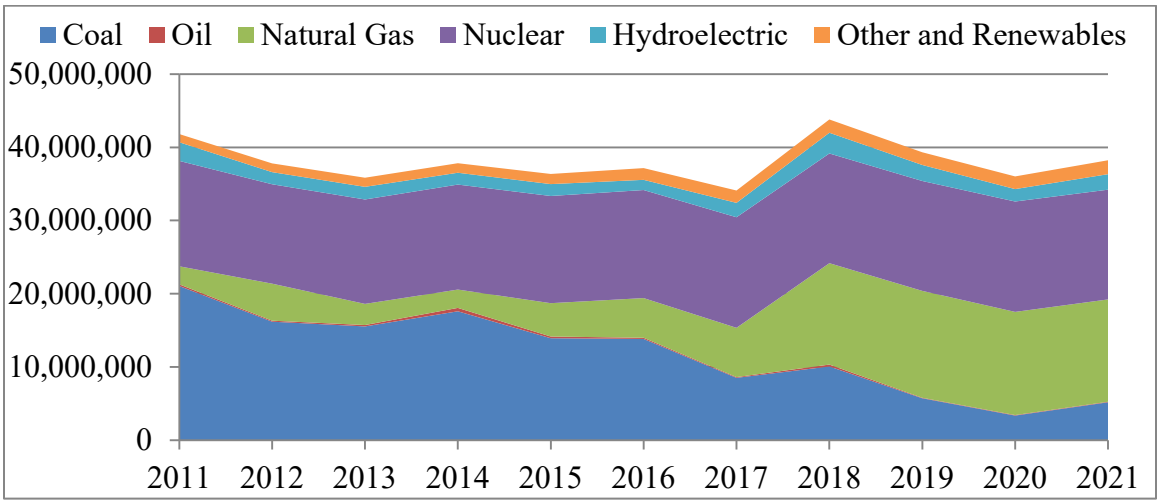
[57] *Id.*
[58] U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report."
[59] *See supra* Table 9. Coal facilities represented 14.8 percent of the in-state capacity in 2022, while nuclear facilities represented 14.4 percent of capacity. Therefore, coal and nuclear facilities combined for 29.2 percent of Maryland's generating capacity profile in 2022.

Table 11: Maryland Generation Profile, 2021[60]

Primary Fuel Source	Generation	
	Annual (MWh)	Percent of Total
Coal	5,173,979	13.5%
Oil	72,669	0.2%
Gas	13,977,747	36.6%
Nuclear	14,993,633	39.2%
Hydroelectric	2,117,149	5.5%
Other & Renewables	1,900,537	5.0%
Total	**38,235,714**	**100.0%**

Unlike the stability historically exhibited by Maryland's summer capacity profile, the percentage of in-state generation derived from various fuel sources continues to evolve as illustrated in Figure 9 below. Between 2011 and 2021, in-state coal generation decreased by 15,885 GWhs. The percentage of coal generation has dropped from 50 percent in 2011 to 14 percent in 2021. The increase in in-state generation can be largely attributed to a leap in coal generation, which increased by 54 percent in 2021 compared to 2022.

Figure 9 Maryland Generation Profile, 2011 – 2021[61]



The standard life expectancy for coal generation facilities is approximately 40 years, though extensions can often be granted for up to 60 years. This assessment places a significant percentage of total Maryland coal generation capacity at or near the end of its normal operational life, a fact made especially concerning considering that coal generation facilities provided 13.5 percent of the in-state generation in 2021.

[60] *State Electricity Profiles 2020*, U.S. Energy Information Administration, (November 2, 2021) at Table 5, https://www.eia.gov/electricity/state/maryland/state_tables.php.
[61] *Id.*

PJM lists five plants retired in 2022: two coal-powered plants and three oil-fired power stations totaling 1,280.7 MW in capacity.[62] There are three and two pending deactivation requests in the DPL and BGE service territories respectively, with a combined capacity of 1,450.9 MWs; while PJM currently registers 3.2 GW of capacity resources requesting deactivation within the RTO.[63]

2. Proposed Conventional Generation Additions[64]

The construction of new generation, both conventional and renewable, is a way to address the in-state capacity and electricity import issues discussed in previous sections. As of the date of this report, there were 6,251 MWs of proposed new generation active in the PJM queue, with 44 percent consisting of solar projects.[65]

3. Proposed Renewable Generation Additions

The Commission recognizes the importance renewable generation plays in meeting Maryland's energy needs while also addressing environmental concerns. Based on the PJM queue, Maryland's renewable generation capacity is planned to increase by an estimated 2,793 MW over the next several years as shown in Table 12 below. This does not, however, account for smaller renewable generators, notably residential solar; these smaller renewable generators are not required to obtain PJM interconnection status, but simply require interconnection with the local utility.

Table 12: Proposed New Renewable Generation in Maryland

Utility	Fuel Type	In-Service Date Range	Total Capacity (MW)
PE (APS)	Solar	2022-2026	474.0
	Hydro	2023	15.0
	Wind	2023-2024	47.9
BGE	Solar	2022-2024	72.7
DPL	Solar	2021-2026	774.4
Pepco	Solar	2023-2025	1,377.0
PPL	Solar	2022	12.00
SMECO	Solar	2023-2026	19.6
		Total (MW):	**2,792.6**

[62] Generation Deactivations, PJM, https://www.pjm.com/planning/services-requests/gen-deactivations.aspx.
[63] *Id.*
[64] *See* Appendix Table 6 for a complete list of new renewable generation proposed in Maryland.
[65] New Services Queue, PJM (July 2023), https://www.pjm.com/planning/services-requests/interconnection-queues.aspx.

The amount of solar resources in Maryland will continue to increase due to a suite of state policy initiatives: the requirement that the Renewable Portfolio Standard ("RPS") solar carve-out be interconnected to the distribution network serving Maryland; net metering incentives; tax incentives; the community solar pilot program (now a permanent program); and grants administered by the Maryland Energy Administration.

On December 17, 2021, the Commission approved two offshore wind projects in compliance with the Clean Energy Jobs Act of 2019.[66] The two projects, along with earlier approved projects, are expected to generate over 7 million MWhs annually beginning in 2027. These projects are currently working with the Bureau of Ocean Energy Management ("BOEM"), the federal agency responsible for overseeing the development of energy projects located offshore in federal waters, for approval to begin construction. The increasing renewable generation penetration may have the potential to impact the grid, and the Commission will continue to monitor the successful integration of these renewables.

4. Nuclear Generation

The Commission also recognizes the important role nuclear generation plays in meeting Maryland's energy needs. Nuclear energy provides reliability and resiliency to the grid while assisting Maryland in reaching its Regional Greenhouse Gas Initiative ("RGGI") commitments and its goals under the Greenhouse Gas Emissions Reduction Act. CEJA also required DNR to conduct an additional study on the relevancy and outlook for nuclear capacity on Maryland's generating portfolio both currently and in the future.

5. Storage

The Energy Storage – Targets and Maryland Energy Storage Program – Establishment Act was passed in 2023 and requires the Commission to establish targets for the cost-effective deployment of new energy storage devices in the State with a goal of achieving 3,000 MW cumulative energy storage capacity by the end of delivery 2033. There are also several storage projects in the PJM queue that are projected to begin operating in the near future as illustrated in Table 13 below.

[66] Case No. 9666, *Skipjack Offshore Energy, LLC and US Wind, Inc.'s Offshore Wind Applications under the Clean Energy Jobs Act of 2019.* Order No. 90011 (December 17, 2021).

Table 13 Proposed New Storage Generation in Maryland PJM Queue Effective Date: July 2023

Transmission Owner	Project Name	County Location	PJM Queue Status	PJM Queue #	Project Capacity (MW)	Projected In-Service Date
APS	Westernport 34.5 kV	Garrett	Active	AG1-099	20.0	4/30/2023
APS	Black Oak-Hatfield 500 kV	Garrett	Active	AG1-363	220.0	12/31/2024
APS	Ringgold 138 kV	Washington	Active	AG1-470	20.0	9/6/2024
APS	Cumberland 138 kV	Allegany	Active	AG2-308	100.0	12/31/2025
APS	Catoctin-Carroll 138 kV	Frederick	Active	AH2-262	10.2	3/1/2026
APS	Ringgold 138 kV II	Washington	Active	AI2-311	30.0	1/11/2025
BGE	Waugh Chapel 230 kV	Anne Arundel	Active	AG1-104	120.0	6/1/2024
BGE	Wagner 115 kV	Baltimore County	Active	AG1-290	4.0	10/31/2021
BGE	Brandon Shores 230 kV	Anne Arundel	Active	AG2-207	110.0	3/31/2023
BGE	Wagner 115 kV	Anne Arundel	Active	AG2-225	46.0	12/31/2022
BGE	Brandon Shores 230 kV	Anne Arundel	Active	AG2-319	150.0	12/31/2025
BGE	East Point - Golden Ring 115kV	Baltimore County	Active	AH1-261	135.0	6/30/2025
BGE	Northeast-CP Crane 115kV	Baltimore County	Active	AH2-162	200.0	3/1/2026
BGE	Northeast-CP Crane 115kV	Baltimore County	Active	AI1-130	75.0	9/7/2026
BGE	TBD 115 kV	Baltimore County	Active	AI1-131	75	9/7/2026
BGE	Northeast - Windy Edge 115 kV	Baltimore County	Active	AI1-189	110	12/31/2027
DPL	Colora 230 kV	Cecil	Active	AF2-208	40.32	10/15/2022
DPL	Airey-Vienna 69 kV II	Dorchester	Active	AG1-450	25	12/31/2022
DPL	Church 138 kV	Queen Anne's	Active	AG2-281	50	5/1/2024
DPL	Easton - Steele 138 kV III	Talbot	Active	AG2-379	20	9/15/2023
DPL	Carville 138 kV IV	Queen Anne's	Active	AG2-380	20	9/15/2023
DPL	Church - Oil City 138 kV II	Caroline	Active	AG2-381	20	9/15/2023
DPL	3 Bridges Rd 34.5 kV	Caroline	Active	AG2-419	20	5/31/2023
DPL	Kings Creek 138kV	Somerset	Active	AH1-356	30	9/30/2023
DPL	Crisfield 69kV	Somerset	Active	AH2-049	20	6/2/2025
DPL	Talbot 69 kV	Worcester	Active	AH2-337	80	2/27/2026
DPL	Rock Springs 500 kV	Cecil	Active	AI2-054	0	6/1/2028
DPL	Colora 230 kV	Cecil	Active	AI2-307	60.48	9/10/2026
PEPCO	Dickerson 230 kV	Montgomery	Active	AG1-483	542.5	6/1/2024
PEPCO	Morgantown 230 kV	Charles	Active	AG2-301	150	12/31/2023
PEPCO	Dickerson 230 kV	Montgomery	Active	AG2-302	150	12/31/2023
PEPCO	Chalk Point 230kV	Prince George's	Active	AH1-552	670.2	6/1/2025
PEPCO	Ripley Switch – Grayton 69kV	Charles	Active	AH2-118	85	12/1/2024
PEPCO	Oak Grove - Hawkins Gate 230kV	Charles	Active	AH2-265	200	3/1/2026
PEPCO	Talbert 230kV	Prince George's	Active	AH2-332	115	12/31/2025

PEPCO	Morgantown 230 kV	Charles	Active	AI2-457	1122	10/1/2027
SMECO	Sollers 230kV	Calvert	Active	AH2-423	180	12/31/2025
				Total	**1,811.0**	

D. PJM's Reliability Pricing Model

As a means of ensuring reliability of the electric system in the RTO, PJM annually conducts a long-term planning process that compares the potential available generation capacity located within the RTO and the import capability of the RTO against the estimated demand of customers within the RTO. Consequently, the model projects the amount of generation and transmission required to maintain the reliability of the electric grid within PJM. The amount of capacity procured in PJM's Reliability Pricing Model ("RPM") is roughly based upon a forecast of the peak load projected by PJM for a particular year, plus a reserve margin. The RPM works in conjunction with PJM's RTEP to ensure reliability in the PJM region for future years. Locational constraints are also identified for a delivery year in the PJM Regional Transmission Expansion Planning Process ("RTEPP") prior to each Base Residual Auction ("BRA"). Locational constraints are capacity import capability limitations that are caused by transmission facility limitations or voltage limitations. Resources in the unconstrained Locational Deliverability Areas ("LDA") (and capacity imported into constrained LDAs) are paid the Unconstrained (lower) Resource Clearing Price.

Using this information, PJM evaluates offers from resources three years in advance to be available for a one year delivery period running from June through May (up to three years for new generation) through the BRA.[67] Once PJM completes its RTEPP and conducts the BRA, PJM is in a position to evaluate the reliability of its system. PJM must operate the transmission system to meet reliability criteria established by the Federal Energy Regulatory Commission ("FERC") and administered by NERC.

The Mid-Atlantic Advisory Council ("MAAC") LDA[68] has experienced significant volatility in Net Zonal Load[69] capacity prices as a result of the past 10 BRAs. The historical pattern suggests that future BRA results could vary significantly from year to year and must be closely monitored by PJM.

[67] PJM Manual 18: PJM Capacity Market, Section 1: Overview of the PJM Capacity Market Reliability Pricing Model, PJM Markets & Operations (last revised February 9, 2023), https://www.pjm.com/directory/manuals/m18/index.html#Sections/Section%201%20Overview%20of%20the%20PJM%20Capacity%20Market.html.
[68] MAAC includes the South-West MAAC ("SWMAAC") which is the zone serving central Maryland.
[69] The Zonal Net Load capacity price reflects the BRA resource clearing price and credits from any transmission capacity transfer rights.

Table 14 PJM BRA Capacity Prices by Zone[70]

Delivery Year	APS ($/MW-day)	BGE ($/MW-day)	DPL($/MW-day)	PEPCO ($/MW-day)	RTO Price ($/MW-day)
2014/2015	$125.94	$135.25	$142.99	$135.25	$125.94
2015/2016	$134.62	$165.78	$165.78	$165.78	$136.00
2016/2017	$59.37	$119.13	$119.13	$119.13	$59.37
2017/2018	$120.00	$120.00	$120.00	$120.00	$120.00
2018/2019	$164.77	$164.77	$225.42	$164.77	$164.77
2019/2020	$100.00	$100.30	$119.77	$100.00	$100.00
2020/2021	$76.53	$86.04	$187.87	$86.04	$76.53
2021/2022	$140.00	$200.30	$165.73	$140.00	$140.00
2022/2023	$50.00	$126.50	$97.86	$95.79	$50.00
2023/2024	$34.13	$69.95	$69.95	$49.49	$34.13
2024/2025	$28.92	$73.00	$90.64	$49.49	$28.92

V. Conclusion

Electricity sector planning will continue to be affected by several different issues over the next 10 years, including projections regarding Maryland utility customers, energy sales, and in-state capacity and generation profiles. Other factors that will play a significant role in the planning process will be Maryland's median income, the state's population, and its housing stock. The Maryland utilities' load forecasts indicate a modest amount of projected annual growth in the number of customers, energy sales and peak demand throughout the State during the 2023-2032 planning horizon. In response to these and other developments, the 2023-2032 Ten-Year Plan will enable continued review and assessment of the impacts that the above-mentioned issues will have on Maryland's long-term electricity resource planning.

Internally, the Commission created a work group on distribution system planning under its grid modernization proceeding, Public Conference 44 ("PC44") and Case 9665. The PC44 Distribution System Planning Work Group is reviewing the current planning processes in Maryland, related state policies, and existing utility programs that interface with distribution system planning. The Commission will review progress and recommendations from the work group at the end of the year.

[70] *PJM RPM Auction User Information: Delivery Year*, PJM Markets & Operations (Delivery Years 2014-2025), https://www.pjm.com/markets-and-operations/rpm.aspx.

V. Appendices to the Public Service Commission of Maryland's Ten-Year Plan (2023-2032) of Electric Companies in Maryland

*Data in Appendices 1-4 was derived from the Utilities' responses to Staff's Data Request

Appendix 1(a): Maryland Customer Forecasts

Appendix Table 1(a)(i): All Customer Classes (number of customers)

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	2,667	1,335,866	218,578	11,022	17,539	288,758	596,684	175,838	2,879	1,023	**2,650,854**
2024	2,668	1,342,377	219,058	11,058	17,580	292,621	600,258	177,910	2,879	1,023	**2,667,432**
2025	2,682	1,348,948	219,784	11,094	17,620	296,376	603,895	180,096	2,879	1,023	**2,684,397**
2026	2,695	1,355,742	220,539	11,130	17,661	300,082	607,634	182,078	2,879	1,023	**2,701,463**
2027	2,708	1,362,831	221,207	11,166	17,702	303,734	611,278	184,250	2,879	1,023	**2,718,778**
2028	2,735	1,370,064	221,877	11,202	17,743	307,293	614,944	186,122	2,879	1,023	**2,735,883**
2029	2,763	1,377,366	222,550	11,238	17,784	310,791	618,635	188,002	2,879	1,023	**2,753,030**
2030	2,790	1,384,628	223,224	11,274	17,825	314,245	622,348	190,074	2,879	1,023	**2,770,311**
2031	2,818	1,391,349	223,900	11,310	17,866	317,656	626,086	191,946	2,879	1,023	**2,786,834**
2032	2,847	1,398,670	224,579	11,346	17,907	321,006	629,847	193,916	2,879	1,023	**2,804,020**
Change (2023-2032)	**179**	**62,804**	**6,001**	**324**	**368**	**32,248**	**33,163**	**18,078**	**0**	**0**	**153,166**
Percent Change (2023-2032)	**6.73%**	**4.70%**	**2.75%**	**2.94%**	**2.10%**	**11.17%**	**5.56%**	**10.28%**	**0.00%**	**0.00%**	**5.78%**
Compound Annual Growth Rate	**0.73%**	**0.51%**	**0.30%**	**0.32%**	**0.23%**	**1.18%**	**0.60%**	**1.09%**	**0.00%**	**0.00%**	**0.63%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.

Appendix Table 1(a)(ii): Residential (number of customers)

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	2,190	1,206,385	184,752	8,603	14,918	254,450	545,573	159,700	2,493	861	**2,379,925**
2024	2,190	1,212,151	185,158	8,628	14,955	257,986	549,107	161,700	2,493	861	**2,395,230**
2025	2,201	1,217,978	185,769	8,653	14,993	261,416	552,680	163,800	2,493	861	**2,410,844**
2026	2,212	1,224,027	186,404	8,678	15,030	264,798	556,358	165,700	2,493	861	**2,426,561**
2027	2,223	1,230,371	186,964	8,703	15,068	268,126	559,948	167,800	2,493	861	**2,442,558**
2028	2,245	1,236,859	187,526	8,728	15,105	271,361	563,561	169,600	2,493	861	**2,458,340**
2029	2,268	1,243,417	188,090	8,753	15,143	274,534	567,197	171,400	2,493	861	**2,474,156**
2030	2,290	1,249,933	188,655	8,778	15,181	277,663	570,857	173,400	2,493	861	**2,490,112**
2031	2,313	1,255,909	189,222	8,803	15,219	280,748	574,540	175,200	2,493	861	**2,505,309**
2032	2,336	1,262,485	189,791	8,828	15,257	283,774	578,248	177,100	2,493	861	**2,521,173**
Change (2023-2032)	**146**	**56,100**	**5,039**	**225**	**339**	**29,324**	**32,675**	**17,400**	**0**	**0**	**141,248**
Percent Change (2023-2032)	**6.69%**	**4.65%**	**2.73%**	**2.62%**	**2.27%**	**11.52%**	**5.99%**	**10.90%**	**0.00%**	**0.00%**	**5.93%**
Compound Annual Growth Rate	**0.72%**	**0.51%**	**0.30%**	**0.29%**	**0.25%**	**1.22%**	**0.65%**	**1.16%**	**0.00%**	**0.00%**	**0.64%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.

Appendix 1(a) (Continued): Maryland Customer Forecasts

Appendix Table 1(a)(iii): Commercial (number of customers)

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	321	116,340	29,385	2,419	2,574	31,405	49,879	15,710	343	146	**248,521**
2024	324	116,918	29,458	2,430	2,577	31,738	49,924	15,782	343	146	**249,640**
2025	325	117,496	29,570	2,441	2,580	32,070	49,993	15,868	343	146	**250,833**
2026	327	118,074	29,688	2,452	2,584	32,399	50,059	15,950	343	146	**252,022**
2027	328	118,652	29,794	2,463	2,587	32,727	50,118	16,022	343	146	**253,180**
2028	332	119,230	29,900	2,474	2,590	33,054	50,178	16,094	343	146	**254,340**
2029	335	119,808	30,006	2,485	2,593	33,381	50,237	16,174	343	146	**255,509**
2030	338	120,385	30,113	2,496	2,597	33,709	50,296	16,246	343	146	**256,670**
2031	342	120,963	30,220	2,507	2,600	34,036	50,356	16,318	343	146	**257,831**
2032	345	121,541	30,328	2,518	2,603	34,361	50,415	16,388	343	146	**258,988**
Change (2023-2032)	**24**	**5,201**	**943**	**99**	**29**	**2,956**	**536**	**678**	**0**	**0**	**10,467**
Percent Change (2023-2032)	**7.54%**	**4.47%**	**3.21%**	**4.09%**	**1.13%**	**9.41%**	**1.08%**	**4.32%**	**0.00%**	**0.00%**	**4.21%**
Compound Annual Growth Rate	**0.81%**	**0.49%**	**0.35%**	**0.45%**	**0.12%**	**1.00%**	**0.12%**	**0.47%**	**0.00%**	**0.00%**	**0.46%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.

Appendix Table 1(a)(iv): Industrial (number of customers)

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	130	12,878	532	0	47	2,597	0	7	8	8	**16,207**
2024	129	13,046	534	0	47	2,590	0	7	8	8	**16,369**
2025	129	13,215	537	0	47	2,584	0	7	8	8	**16,535**
2026	130	13,384	539	0	47	2,579	0	7	8	8	**16,702**
2027	131	13,553	541	0	47	2,575	0	7	8	8	**16,870**
2028	132	13,722	543	0	47	2,572	0	7	8	8	**17,039**
2029	133	13,891	545	0	47	2,569	0	7	8	8	**17,209**
2030	134	14,060	547	0	47	2,568	0	7	8	8	**17,379**
2031	136	14,229	549	0	47	2,566	0	7	8	8	**17,550**
2032	137	14,398	552	0	47	2,565	0	7	8	8	**17,721**
Change (2023-2032)	**7**	**1,520**	**19**	**0**	**0**	**(32)**	**0**	**0**	**0**	**0**	**1,514**
Percent Change (2023-2032)	**5.46%**	**11.80%**	**3.61%**	**N/A**	**0.00%**	**-1.24%**	**N/A**	**0.00%**	**0.00%**	**0.00%**	**9.34%**
Compound Annual Growth Rate	**0.59%**	**1.25%**	**0.39%**	**N/A**	**0.00%**	**-0.14%**	**N/A**	**0.00%**	**0.00%**	**0.00%**	**1.00%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.

Appendix 1(a) (Continued): Maryland Customer Forecasts

Appendix Table 1(a)(v): Other (number of customers)

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	26	264	3,908	0	0	303	1,233	421	35	8	**6,197**
2024	26	261	3,908	0	0	303	1,227	421	35	8	**6,189**
2025	26	259	3,908	0	0	303	1,222	421	35	8	**6,182**
2026	26	257	3,908	0	0	303	1,217	421	35	8	**6,175**
2027	26	255	3,908	0	0	303	1,211	421	35	8	**6,168**
2028	27	253	3,908	0	0	303	1,206	421	35	8	**6,161**
2029	27	251	3,908	0	0	303	1,201	421	35	8	**6,154**
2030	27	250	3,908	0	0	303	1,195	421	35	8	**6,147**
2031	27	248	3,908	0	0	303	1,190	421	35	8	**6,141**
2032	28	247	3,908	0	0	303	1,185	421	35	8	**6,135**
Change (2023-2032)	**2**	**(16)**	**0**	**0**	**0**	**0**	**(48)**	**0**	**0**	**0**	**(63)**
Percent Change (2023-2032)	**6.69%**	**-6.25%**	**0.00%**	**N/A**	**N/A**	**0.00%**	**-3.90%**	**N/A**	**0.00%**	**0.00%**	**-1.01%**
Compound Annual Growth Rate	**0.72%**	**-0.71%**	**0.00%**	**N/A**	**N/A**	**0.00%**	**-0.44%**	**N/A**	**0.00%**	**0.00%**	**-0.11%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.
Note: The "Other" rate class refers to customers that do not fall into one of the listed classes, for example street lighting.

Appendix Table 1(a)(vi): Resale (number of customers)

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	0	0	0	0	0	3	0	0	0	0	**3**
2024	0	0	0	0	0	3	0	0	0	0	**3**
2025	0	0	0	0	0	3	0	0	0	0	**3**
2026	0	0	0	0	0	3	0	0	0	0	**3**
2027	0	0	0	0	0	3	0	0	0	0	**3**
2028	0	0	0	0	0	3	0	0	0	0	**3**
2029	0	0	0	0	0	3	0	0	0	0	**3**
2030	0	0	0	0	0	3	0	0	0	0	**3**
2031	0	0	0	0	0	3	0	0	0	0	**3**
2032	0	0	0	0	0	3	0	0	0	0	**3**
Change (2023-2032)	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**3**
Percent Change (2023-2032)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Compound Annual Growth Rate	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.
Note: The "Resale" class refers to "Sales for Resale," which is energy supplied to other electric utilities, cooperatives, municipalities, and federal and state electric agencies for resale to end-use consumers. PE is the only utility with any resale customers.

Appendix 1(b): 2021 Customer Numbers and Energy Sales

Appendix Table 1(b)(i): Customer Class Breakdown as of December 31, 2022 (number of customers)

	System Wide						Maryland					
Utility	**Residential**	**Commercial**	**Industrial**	**Other**	**Sales for Resale**	**Total**	**Residential**	**Commercial**	**Industrial**	**Other**	**Sales for Resale**	**Total**
Berlin	2,186	321	129	26	0	**2,662**	2,186	321	129	26	0	**2,662**
BGE	1,200,502	115,562	12,707	267	0	**1,329,038**	1,200,502	115,562	12,707	267	0	**1,329,038**
DPL	479,551	64,479	268	599	0	**544,897**	183,381	27,876	151	258	0	**211,667**
Easton	8,528	2,405	0	0	0	**10,933**	8,528	2,405	0	0	0	**10,933**
Hagerstown	14,918	2,574	47	0	0	**17,539**	14,918	2,574	47	0	0	**17,539**
PE	380,849	49,342	4,412	596	5	**435,204**	250,592	30,615	2,585	301	3	**284,095**
PEPCO	850,165	78,072	0	188	0	**928,425**	543,701	50,964	0	161	0	**594,826**
SMECO	157,304	15,607	6	421	0	**173,338**	157,304	15,607	6	421	0	**173,338**
Thurmont	2,493	342	8	36	0	**2,878**	2,493	342	8	36	0	**2,878**
Williamsport	862	145	8	8	0	**1,023**	862	145	8	8	0	**1,023**
Total	**3,097,357**	**328,850**	**17,585**	**2,140**	**5**	**3,445,937**	**2,364,466**	**246,411**	**15,498**	**1,478**	**3**	**2,627,998**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.
Note: "System wide" includes the entire distribution system of a utility, which may extend beyond the Maryland service territory into Washington, D.C.; Delaware; and parts of West Virginia. The affected utilities include DPL, PE, and Pepco.

Appendix Table 1(b)(ii): Utilities' 2022 Energy Sales by Customer Class (GWh)

	System Wide						Maryland					
Utility	**Residential**	**Commercial**	**Industrial**	**Other**	**Sales for Resale**	**Total**	**Residential**	**Commercial**	**Industrial**	**Other**	**Sales for Resale**	**Total**
Berlin	28	3	15	0	0	**47**	28	3	15	0	0	**46**
BGE	13,068	2,820	13,130	208	0	**29,226**	13,068	2,820	13,130	208	0	**29,150**
DPL	5,420	5,153	1,464	44	0	**12,081**	2,189	1,652	347	11	0	**4,178**
Easton	109	135	0	0	0	**244**	109	135	0	0	0	**249**
Hagerstown	167	88	61	0	0	**316**	167	88	61	0	0	**311**
PE	5,322	2,826	2,418	22	1,298	**11,885**	3,349	2,021	1,422	16	1,267	**8,014**
PEPCO	8,120	14,835	0	136	0	**23,091**	5,613	7,491	0	59	0	**13,279**
SMECO	2,207	1,190	52	9	0	**3,458**	2,207	1,190	52	9	0	**3,478**
Thurmont	37	16	20	1	0	**73**	37	16	20	1	0	**73**
Williamsport	10	3	7	0	0	**20**	10	3	7	0	0	**19**
Total	**34,486**	**27,070**	**17,165**	**420**	**1,298**	**80,440**	**26,776**	**15,420**	**15,053**	**304**	**1,267**	**58,798**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.
Note: "System wide" includes the entire distribution system of a utility, which may extend beyond the Maryland service territory into Washington, D.C.; Delaware; and parts of West Virginia. The affected utilities include DPL, PE, and Pepco.

Appendix 2(a): Energy Sales Forecast by Utility (Maryland Service Territory Only)

Appendix Table 2(a)(i): Maryland Energy Sales Forecast, Gross of DSM (GWh)

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	45	29,712	5,003	245	314	8,596	16,118	3,570	74	20	**63,698**
2024	45	29,451	5,029	247	315	8,824	16,144	3,591	74	20	**63,740**
2025	45	29,408	5,066	248	316	9,009	16,201	3,602	74	20	**63,988**
2026	46	29,363	5,102	250	316	9,190	16,282	3,630	74	20	**64,272**
2027	46	29,316	5,144	252	317	9,407	16,384	3,652	74	20	**64,612**
2028	46	29,366	5,122	253	318	9,656	16,258	3,680	74	20	**64,793**
2029	47	29,252	5,099	255	319	9,875	16,133	3,700	74	20	**64,774**
2030	47	29,304	5,077	256	320	10,111	16,010	3,721	74	20	**64,940**
2031	48	29,411	5,055	258	320	10,354	15,887	3,742	74	20	**65,170**
2032	48	29,637	5,034	260	321	10,627	15,766	3,759	74	20	**65,546**
Change (2023-2032)	**3**	**(75)**	**31**	**14**	**7**	**2,031**	**(352)**	**189**	**0**	**0**	**1,848**
Percent Change (2023-2032)	**7.22%**	**-0.25%**	**0.61%**	**5.87%**	**2.27%**	**23.63%**	**-2.18%**	**5.29%**	**0.00%**	**0.00%**	**2.90%**
Compound Annual Growth Rate	**0.78%**	**-0.03%**	**0.07%**	**0.64%**	**0.25%**	**2.38%**	**-0.24%**	**0.57%**	**0.00%**	**0.00%**	**0.32%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.

Appendix Table 2(a)(ii): Maryland Energy Sales Forecast, Net of DSM (GWh)

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	45	28,976	4,166	245	314	7,301	13,125	3,489	74	20	**57,757**
2024	45	29,201	4,136	247	315	7,403	12,924	3,510	74	20	**57,875**
2025	45	29,158	4,108	248	316	7,442	12,750	3,521	74	20	**57,683**
2026	46	29,112	4,080	250	316	7,481	12,601	3,549	74	20	**57,529**
2027	46	29,066	4,058	252	317	7,537	12,473	3,571	74	20	**57,413**
2028	46	29,116	4,035	253	318	7,628	12,347	3,599	74	20	**57,437**
2029	47	29,002	4,013	255	319	7,690	12,222	3,619	74	20	**57,260**
2030	47	29,053	3,991	256	320	7,768	12,098	3,640	74	20	**57,268**
2031	48	29,161	3,969	258	320	7,853	13,153	3,661	74	20	**57,340**
2032	48	29,387	3,948	260	321	7,968	13,143	3,678	74	20	**57,559**
Change (2023-2032)	**3**	**411**	**(218)**	**14**	**7**	**667**	**(109)**	**189**	**0**	**0**	**(198)**
Percent Change (2023-2032)	**7.22%**	**1.42%**	**5.24%**	**5.87%**	**2.27%**	**9.13%**	**0.82%**	**5.41%**	**0.00%**	**0.00%**	**-0.34%**
Compound Annual Growth Rate	**0.78%**	**0.16%**	**0.60%**	**0.64%**	**0.25%**	**0.98%**	**0.09%**	**0.59%**	**0.00%**	**0.00%**	**-0.04%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.

Appendix 2(b): Energy Sales Forecast by Utility (System Wide)

Appendix Table 2(b)(i): System Wide Energy Sales Forecast, Gross of DSM (GWh)

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	45	29,712	13,041	245	314	16,238	27,468	3,570	74	20	**90,728**
2024	45	29,451	13,114	247	315	16,531	27,532	3,591	74	20	**90,920**
2025	45	29,408	13,173	248	316	16,823	27,660	3,602	74	20	**91,369**
2026	46	29,363	13,248	250	316	17,002	27,797	3,630	74	20	**91,746**
2027	46	29,316	13,301	252	317	17,302	27,960	3,652	74	20	**92,240**
2028	46	29,366	13,234	253	318	17,617	27,704	3,680	74	20	**92,312**
2029	47	29,252	13,168	255	319	17,885	27,451	3,700	74	20	**92,169**
2030	47	29,304	13,102	256	320	18,176	27,200	3,721	74	20	**92,220**
2031	48	29,411	13,036	258	320	18,476	26,953	3,742	74	20	**92,338**
2032	48	29,637	12,971	260	321	18,820	26,708	3,759	74	20	**92,618**
Change (2023-2032)	**3**	**(75)**	**(70)**	**14**	**7**	**2,582**	**(759)**	**189**	**0**	**0**	**1,891**
Percent Change (2023-2032)	**7.22%**	**-0.25%**	**-0.54%**	**5.87%**	**2.27%**	**15.90%**	**-2.77%**	**5.29%**	**0.00%**	**0.00%**	**2.08%**
Compound Annual Growth Rate	**0.78%**	**-0.03%**	**-0.06%**	**0.64%**	**0.25%**	**1.65%**	**-0.31%**	**0.57%**	**0.00%**	**0.00%**	**0.23%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.
Note: "System wide" includes the entire distribution system of a utility, which may extend beyond the Maryland service territory into Washington, D.C., Delaware, and parts of West Virginia. The affected utilities include DPL, PE, and Pepco.

Appendix Table 2(b)(ii): System Wide Energy Sales Forecast, Net of DSM (GWh)

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	45	28,976	11,995	245	314	14,882	23,405	3,489	74	20	**83,445**
2024	45	29,201	11,969	247	315	15,049	23,076	3,510	74	20	**83,505**
2025	45	29,158	11,921	248	316	15,195	22,781	3,521	74	20	**83,279**
2026	46	29,112	11,885	250	316	15,232	22,495	3,549	74	20	**82,980**
2027	46	29,066	11,817	252	317	15,371	22,236	3,571	74	20	**82,770**
2028	46	29,116	11,751	253	318	15,528	21,980	3,599	74	20	**82,684**
2029	47	29,002	11,684	255	319	15,638	21,726	3,619	74	20	**82,384**
2030	47	29,053	11,618	256	320	15,772	21,476	3,640	74	20	**82,276**
2031	48	29,161	11,552	258	320	15,914	21,229	3,661	74	20	**82,237**
2032	48	29,387	11,487	260	321	16,100	20,984	3,678	74	20	**82,359**
Change (2023-2032)	**3**	**411**	**(508)**	**14**	**7**	**1,218**	**(2,421)**	**189**	**0**	**0**	**(1,086)**
Percent Change (2023-2032)	**7.22%**	**1.42%**	**-4.23%**	**5.87%**	**2.27%**	**8.18%**	**-10.34%**	**5.41%**	**0.00%**	**0.00%**	**-1.30%**
Compound Annual Growth Rate	**0.78%**	**0.16%**	**-0.48%**	**0.64%**	**0.25%**	**0.88%**	**-1.21%**	**0.59%**	**0.00%**	**0.00%**	**-0.15%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.
Note: "System wide" includes the entire distribution system of a utility, which may extend beyond the Maryland service territory into Washington, D.C.; Delaware; and parts of West Virginia. The affected utilities include DPL, PE, and Pepco.

Appendix 3(a): Peak Demand Forecasts (Maryland Service Territory Only)

Appendix Table 3(a)(i): Maryland Summer, Gross of DSM Programs (MW)

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	11	6,974	1,152	58	60	1,680	3,352	892	15	4	**14,198**
2024	11	6,826	1,159	58	61	1,703	3,630	900	15	4	**14,366**
2025	11	6,804	1,165	58	61	1,728	3,905	905	15	4	**14,656**
2026	11	6,776	1,174	59	61	1,753	4,176	910	15	4	**14,939**
2027	11	6,748	1,183	59	61	1,781	4,448	915	15	4	**15,226**
2028	11	6,705	1,177	59	61	1,811	4,449	919	15	4	**15,211**
2029	11	6,641	1,173	60	61	1,839	4,449	924	15	4	**15,177**
2030	12	6,601	1,168	60	62	1,867	4,444	928	15	4	**15,160**
2031	12	6,558	1,162	60	62	1,897	4,444	932	15	4	**15,145**
2032	12	6,503	1,157	61	62	1,927	4,443	936	15	4	**15,119**
Change (2023-2032)	**1**	**(471)**	**5**	**3**	**1**	**247**	**1,091**	**44**	**0**	**0**	**921**
Percent Change (2023-2032)	**7.75%**	**6.75%**	**0.45%**	**4.98%**	**2.27%**	**14.72%**	**32.54%**	**4.93%**	**0.00%**	**0.00%**	**6.49%**
Compound Annual Growth Rate	**0.83%**	**0.77%**	**0.05%**	**0.54%**	**0.25%**	**1.54%**	**3.18%**	**0.54%**	**0.00%**	**0.00%**	**0.70%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.

Appendix Table 3(a)(ii): Maryland Summer, Net of DSM Programs (MW) [71]

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	5	6,474	903	58	60	1,471	2,127	818	15	4	**11,935**
2024	5	6,428	898	58	61	1,474	2,132	826	15	4	**11,900**
2025	5	6,406	894	58	61	1,476	2,135	831	15	4	**11,884**
2026	5	6,378	890	59	61	1,478	2,133	836	15	4	**11,859**
2027	6	6,350	886	59	61	1,480	2,133	841	15	4	**11,836**
2028	6	6,307	880	59	61	1,484	2,134	845	15	4	**11,795**
2029	6	6,243	876	60	61	1,487	2,135	850	15	4	**11,736**
2030	6	6,203	871	60	62	1,490	2,129	854	15	4	**11,693**
2031	6	6,160	865	60	62	1,494	2,129	858	15	4	**11,653**
2032	6	6,105	860	61	62	1,499	2,128	862	15	4	**11,602**
Change (2023-2032)	**1**	**(369)**	**(42)**	**3**	**1**	**28**	**1**	**44**	**0**	**0**	**(333)**
Percent Change (2023-2032)	**15.99%**	**5.70%**	**4.69%**	**4.98%**	**2.27%**	**1.89%**	**0.06%**	**5.38%**	**0.00%**	**0.00%**	**-2.79%**
Compound Annual Growth Rate	**1.66%**	**-0.65%**	**-0.53%**	**0.54%**	**0.25%**	**0.21%**	**0.01%**	**0.58%**	**0.00%**	**0.00%**	**-0.31%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.

[71] Berlin reported to Staff 6.9 MW of DSM savings per year. This was attributed to the town generating 6.9 MW of fossil fuel generation from generators that they own, operate, and dispatch independent of PJM.

Appendix 3(a) (Continued): Peak Demand Forecasts (Maryland Service Territory Only)

Appendix Table 3(a)(iii): Maryland Winter, Gross of DSM Programs (MW)

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	15	5,872	943	60	69	1,808	1,805	921	22	5	**11,520**
2024	16	5,822	946	60	69	1,838	1,812	931	22	5	**11,520**
2025	16	5,828	947	60	70	1,868	1,822	933	22	5	**11,571**
2026	17	5,832	951	61	70	1,899	1,833	940	22	5	**11,630**
2027	18	5,829	954	61	70	1,938	1,827	947	22	5	**11,670**
2028	18	5,841	957	61	70	1,982	1,830	956	22	5	**11,742**
2029	19	5,812	955	62	70	2,021	1,833	961	22	5	**11,760**
2030	20	5,792	956	62	70	2,064	1,843	967	22	5	**11,801**
2031	20	5,777	958	62	71	2,109	1,841	974	22	5	**11,837**
2032	21	5,783	960	62	71	2,158	1,844	979	22	5	**11,905**
Change (2023-2032)	**6**	**(89)**	**16**	**3**	**2**	**350**	**40**	**58**	**0**	**0**	**385**
Percent Change (2023-2032)	**38.77%**	**1.51%**	**1.71%**	**4.21%**	**2.27%**	**19.34%**	**2.21%**	**6.32%**	**0.00%**	**0.00%**	**3.35%**
Compound Annual Growth Rate	**3.71%**	**0.17%**	**0.19%**	**0.46%**	**0.25%**	**1.98%**	**0.24%**	**0.68%**	**0.00%**	**0.00%**	**0.37%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.

Appendix Table 3(a)(iv): Maryland Winter, Net of DSM Programs (MW)

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	15	5,755	943	60	69	1,608	1,805	921	22	5	**11,203**
2024	16	5,747	946	60	69	1,618	1,812	931	22	5	**11,226**
2025	16	5,753	947	60	70	1,626	1,822	933	22	5	**11,254**
2026	17	5,757	951	61	70	1,636	1,833	940	22	5	**11,291**
2027	18	5,754	954	61	70	1,650	1,827	947	22	5	**11,307**
2028	18	5,766	957	61	70	1,670	1,830	956	22	5	**11,355**
2029	19	5,737	955	62	70	1,685	1,833	961	22	5	**11,349**
2030	20	5,717	956	62	70	1,704	1,843	967	22	5	**11,366**
2031	20	5,702	958	62	71	1,725	1,841	974	22	5	**11,378**
2032	21	5,708	960	62	71	1,750	1,844	979	22	5	**11,422**
Change (2023-2032)	**6**	**(47)**	**16**	**3**	**2**	**142**	**40**	**58**	**0**	**0**	**219**
Percent Change (2023-2032)	**38.77%**	**0.82%**	**1.71%**	**4.21%**	**2.27%**	**8.82%**	**2.21%**	**6.32%**	**0.00%**	**0.00%**	**1.96%**
Compound Annual Growth Rate	**3.71%**	**-0.09%**	**0.19%**	**0.46%**	**0.25%**	**0.94%**	**0.24%**	**0.68%**	**0.00%**	**0.00%**	**0.22%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table

Appendix 3(b): Peak Demand Forecasts (System Wide)

Appendix Table 3(b)(i): System Wide Summer, Gross of DSM (MW)

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	11	6,974	4,152	58	60	3,043	7,428	892	15	4	**22,637**
2024	11	6,826	4,152	58	61	3,083	7,720	900	15	4	**22,830**
2025	11	6,804	4,152	58	61	3,104	8,006	905	15	4	**23,121**
2026	11	6,776	4,158	59	61	3,129	8,274	910	15	4	**23,397**
2027	11	6,748	4,163	59	61	3,156	8,548	915	15	4	**23,680**
2028	11	6,705	4,137	59	61	3,187	8,549	919	15	4	**23,648**
2029	11	6,641	4,119	60	61	3,214	8,551	924	15	4	**23,601**
2030	12	6,601	4,098	60	62	3,244	8,534	928	15	4	**23,556**
2031	12	6,558	4,073	60	62	3,273	8,535	932	15	4	**23,524**
2032	12	6,503	4,052	61	62	3,307	8,532	936	15	4	**23,483**
Change (2023-2032)	**1**	**(471)**	**(100)**	**3**	**1**	**263**	**1,103**	**44**	**0**	**0**	**845**
Percent Change (2023-2032)	**7.75%**	**6.75%**	**2.40%**	**4.98%**	**2.27%**	**8.66%**	**14.85%**	**4.93%**	**0.00%**	**0.00%**	**3.73%**
Compound Annual Growth Rate	**0.83%**	**0.77%**	**0.27%**	**0.54%**	**0.25%**	**0.93%**	**1.55%**	**0.54%**	**0.00%**	**0.00%**	**0.41%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.
Note: "System wide" includes the entire distribution system of a utility, which may extend beyond the Maryland service territory into Washington, D.C.; Delaware; and parts of West Virginia. The affected utilities include DPL, PE, and Pepco.

Appendix Table 3(b)(ii): System Wide Summer, Net of DSM (MW)[72, 73]

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	5	6,474	3,861	58	60	2,826	6,194	818	15	4	**20,316**
2024	5	6,428	3,841	58	61	2,846	6,209	826	15	4	**20,293**
2025	5	6,406	3,823	58	61	2,844	6,217	831	15	4	**20,264**
2026	5	6,378	3,807	59	61	2,845	6,213	836	15	4	**20,223**
2027	6	6,350	3,791	59	61	2,847	6,214	841	15	4	**20,188**
2028	6	6,307	3,765	59	61	2,852	6,215	845	15	4	**20,130**
2029	6	6,243	3,747	60	61	2,854	6,217	850	15	4	**20,057**
2030	6	6,203	3,726	60	62	2,858	6,200	854	15	4	**19,988**
2031	6	6,160	3,701	60	62	2,863	6,201	858	15	4	**19,930**
2032	6	6,105	3,680	61	62	2,871	6,198	862	15	4	**19,863**
Change (2023-2032)	**1**	**(369)**	**(181)**	**3**	**1**	**44**	**4**	**44**	**0**	**0**	**(453)**
Percent Change (2023-2032)	**15.99%**	**5.70%**	**4.69%**	**4.98%**	**2.27%**	**1.56%**	**0.06%**	**5.38%**	**0.00%**	**0.00%**	**2.23%**
Compound Annual Growth Rate	**1.66%**	**0.65%**	**0.53%**	**0.54%**	**0.25%**	**0.17%**	**0.01%**	**0.58%**	**0.00%**	**0.00%**	**0.25%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.
Note: "System wide" includes the entire distribution system of a utility, which may extend beyond the Maryland service territory into Washington, D.C.; Delaware; and parts of West Virginia. The affected utilities include DPL, PE, and Pepco.

[72] Berlin reported to Staff 6.9 MW of DSM savings per year. This was attributed to the town generating 6.9 MW of fossil fuel generation from generators that they own, operate, and dispatch independent of PJM.
[73] Choptank's DSM programs include: a voluntary program among the consumers to drop load during "beat-the-peak" alerts; a legacy air conditioner and water heater switch program; and the availability of experimental interruptible rates, in which a few consumers are still enrolled.

Appendix 3(b) (Continued): Peak Demand Forecasts (System Wide)

Appendix Table 3(b)(iii): System Wide Winter, Gross of DSM (MW)

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	15	5,872	3,623	60	69	3,525	5,422	921	22	5	**19,534**
2024	16	5,822	3,632	60	69	3,558	5,445	931	22	5	**19,560**
2025	16	5,828	3,636	60	70	3,586	5,474	933	22	5	**19,631**
2026	17	5,832	3,651	61	70	3,614	5,508	940	22	5	**19,719**
2027	18	5,829	3,662	61	70	3,652	5,489	947	22	5	**19,754**
2028	18	5,841	3,674	61	70	3,697	5,498	956	22	5	**19,842**
2029	19	5,812	3,669	62	70	3,733	5,507	961	22	5	**19,860**
2030	20	5,792	3,673	62	70	3,776	5,538	967	22	5	**19,925**
2031	20	5,777	3,678	62	71	3,823	5,531	974	22	5	**19,963**
2032	21	5,783	3,685	62	71	3,878	5,542	979	22	5	**20,048**
Change (2023-2032)	**6**	**(89)**	**62**	**3**	**2**	**352**	**120**	**58**	**0**	**0**	**514**
Percent Change (2023-2032)	**38.77%**	**1.51%**	**1.71%**	**4.21%**	**2.27%**	**9.99%**	**2.21%**	**6.32%**	**0.00%**	**0.00%**	**2.63%**
Compound Annual Growth Rate	**3.71%**	**0.17%**	**0.19%**	**0.46%**	**0.25%**	**1.06%**	**0.24%**	**0.68%**	**0.00%**	**0.00%**	**0.29%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.
Note: "System wide" includes the entire distribution system of a utility, which may extend beyond the Maryland service territory into Washington, D.C.; Delaware; and parts of West Virginia. The affected utilities include DPL, PE, and Pepco.

Appendix Table 3(b)(iv): System Wide Winter, Net of DSM (MW)

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2023	15	5,755	3,623	60	69	3,317	5,422	921	22	5	**19,209**
2024	16	5,747	3,632	60	69	3,330	5,445	931	22	5	**19,257**
2025	16	5,753	3,636	60	70	3,336	5,474	933	22	5	**19,306**
2026	17	5,757	3,651	61	70	3,343	5,508	940	22	5	**19,373**
2027	18	5,754	3,662	61	70	3,356	5,489	947	22	5	**19,383**
2028	18	5,766	3,674	61	70	3,377	5,498	956	22	5	**19,447**
2029	19	5,737	3,669	62	70	3,389	5,507	961	22	5	**19,440**
2030	20	5,717	3,673	62	70	3,408	5,538	967	22	5	**19,481**
2031	20	5,702	3,678	62	71	3,431	5,531	974	22	5	**19,495**
2032	21	5,708	3,685	62	71	3,461	5,542	979	22	5	**19,556**
Change (2023-2032)	**6**	**(47)**	**62**	**3**	**2**	**144**	**120**	**58**	**0**	**0**	**347**
Percent Change (2023-2032)	**38.77%**	**-0.82%**	**1.71%**	**4.21%**	**2.27%**	**4.35%**	**2.21%**	**6.32%**	**0.00%**	**0.00%**	**1.81%**
Compound Annual Growth Rate	**3.71%**	**-0.09%**	**0.19%**	**0.46%**	**0.25%**	**0.47%**	**0.24%**	**0.68%**	**0.00%**	**0.00%**	**0.20%**

Note: A&N, Choptank, and Somerset did not report applicable information for this table.
Note: "System wide" includes the entire distribution system of a utility, which may extend beyond the Maryland service territory into Washington, D.C.; Delaware; and parts of West Virginia. The affected utilities include DPL, PE, and Pepco.

Appendix 4: Transmission Enhancements, by Service Territory

Appendix Table 4: Transmission Enhancements, by Service Territory

								Start location		End Location	
Transmission Owner	**Voltage (kV)**	**Length (miles)**	**No. of Circuits**	**Start Date**	**Comp. Date**	**In-Service Date**	**Purpose**	**County**	**Terminal**	**County**	**Terminal**
BGE	230	2	2	Jan-17	May-22	May-22	Supplemental	Baltimore City	Hawkins Point	Baltimore County	Sollers Point
BGE	115	<1	2	Nov-19	May-22	May-22	Supplemental	Harford County	Edgewood	Harford County	Perryman
PE	138	3.2	1	2022	2026	2026	Baseline Transmission Reliability	Allegany	Messick Road	Mineral	Ridgeley
PE	500	15.3	1	2021	2025	2025	Rebuild Existing Line	Frederick	Doubs	Loudoun	Goose Creek (VA)
PE	138	17.7	1	2022	2027	2027	Baseline Transmission Reliability	Allegany	Messick Road	Morgan	Morgan (WV)
PE	138	0.1	2	2013	2025	2025	Accommodate for Generator Interconnection	Allegany	Dans Mountain (new)	Allegany	Carlos Junction-Ridgeley (WV)
PE	230	0	1	2017	Suspended		Baseline Transmission Reliability	Washington	Ringgold	Washington	Ringgold
PE	230	0	1.00	2017	Suspended		Baseline Transmission Reliability	Frederick	Catoctin	Frederick	Catoctin
PE	230	9.7	1	2017	Suspended		Baseline Transmission Reliability	Washington	Ringgold	Frederick	Catoctin
PE	230	0	1	2017	Suspended		Baseline Transmission Reliability	Frederick	Garfield	Frederick	Garfield
Pepco	500	n/a	n/a	Oct-21	Mar-22	Mar-22	Upgrade Relays	Montgomery	Brighton	Montgomery	Brighton
SMECO	69	6.8	1	Q4 - 2021	Q4 - 2022	Q1 - 2023	capacity / reliability	Charles	Ryceville	Saint Mary's	Chaptico

Appendix 5: List of Maryland Generators, as of December 31, 2021

Appendix Table 5: List of Maryland Generators, as of December 31, 2021

Owner / Operator	Plant Name	County	Capacity Statistics (MW)		
			Nameplate	Summer	% Summer
Brandon Shores LLC	Brandon Shores	Anne Arundel	685.1	635.0	93%
Brandon Shores LLC	Brandon Shores	Anne Arundel	685.1	638.0	93%
H.A. Wagner LLC	Herbert A Wagner	Anne Arundel	132.8	126.0	95%
H.A. Wagner LLC	Herbert A Wagner	Anne Arundel	359.0	305.0	85%
H.A. Wagner LLC	Herbert A Wagner	Anne Arundel	414.7	397.0	96%
H.A. Wagner LLC	Herbert A Wagner	Anne Arundel	16.0	12.9	81%
Constellation Power Source Gen	Perryman	Harford	53.1	52.0	98%
Constellation Power Source Gen	Perryman	Harford	53.1	51.0	96%
Constellation Power Source Gen	Perryman	Harford	53.1	52.0	98%
Constellation Power Source Gen	Perryman	Harford	192.0	139.0	72%
Constellation Power Source Gen	Perryman	Harford	141.0	109.8	78%
Constellation Power Source Gen	Philadelphia	Baltimore City	20.7	15.3	74%
Constellation Power Source Gen	Philadelphia	Baltimore City	20.7	16.0	77%
Constellation Power Source Gen	Philadelphia	Baltimore City	20.7	14.8	71%
Constellation Power Source Gen	Philadelphia	Baltimore City	20.7	14.8	71%
Calpine Mid-Atlantic Generation LLC	Crisfield	Somerset	2.9	2.6	90%
Calpine Mid-Atlantic Generation LLC	Crisfield	Somerset	2.9	2.6	90%
Calpine Mid-Atlantic Generation LLC	Crisfield	Somerset	2.9	2.6	90%
Calpine Mid-Atlantic Generation LLC	Crisfield	Somerset	2.9	2.6	90%
NRG Vienna Operations Inc	Vienna Operations	Dorchester	18.6	14.3	77%
NRG Vienna Operations Inc	Vienna Operations	Dorchester	162.0	153.0	94%
BP Piney & Deep Creek LLC	Deep Creek	Garrett	10.0	9.0	90%
BP Piney & Deep Creek LLC	Deep Creek	Garrett	10.0	9.0	90%
Lanyard Power Holdings, LLC	Chalk Point Power	Prince Georges	659.0	595.0	90%
Lanyard Power Holdings, LLC	Chalk Point Power	Prince Georges	659.0	585.3	89%
Lanyard Power Holdings, LLC	Chalk Point Power	Prince Georges	35.0	24.0	69%
Lanyard Power Holdings, LLC	Chalk Point Power	Prince Georges	103.0	86.0	83%
Lanyard Power Holdings, LLC	Chalk Point Power	Prince Georges	103.0	86.0	83%
Lanyard Power Holdings, LLC	Chalk Point Power	Prince Georges	125.0	109.0	87%

Appendix 5: List of Maryland Generators, as of December 31, 2021

Lanyard Power Holdings, LLC	Chalk Point Power	Prince Georges	125.0	109.0	87%
Lanyard Power Holdings, LLC	Dickerson Power	Montgomery	163.0	147.0	90%
Lanyard Power Holdings, LLC	Dickerson Power	Montgomery	163.0	147.0	90%
Lanyard Power Holdings, LLC	Morgantown Generating Plant	Charles	65.0	54.0	83%
Lanyard Power Holdings, LLC	Morgantown Generating Plant	Charles	65.0	54.0	83%
Lanyard Power Holdings, LLC	Morgantown Generating Plant	Charles	65.0	54.0	83%
Lanyard Power Holdings, LLC	Morgantown Generating Plant	Charles	65.0	54.0	83%
Exelon Power	Conowingo	Harford	45.0	48.0	107%
Exelon Power	Conowingo	Harford	55.6	65.0	117%
Exelon Power	Conowingo	Harford	55.6	65.0	117%
Exelon Power	Conowingo	Harford	36.0	36.0	100%
Exelon Power	Conowingo	Harford	48.0	48.0	100%
Exelon Power	Conowingo	Harford	47.7	48.0	101%
Exelon Power	Conowingo	Harford	36.0	36.0	100%
Exelon Power	Conowingo	Harford	47.7	48.0	101%
Exelon Power	Conowingo	Harford	48.0	48.0	100%
Exelon Power	Conowingo	Harford	55.6	65.0	117%
Exelon Power	Conowingo	Harford	55.6	65.0	117%
Easton Utilities Comm	Easton	Talbot	3.5	3.5	100%
Easton Utilities Comm	Easton	Talbot	1.5	1.5	100%
Easton Utilities Comm	Easton	Talbot	1.5	1.5	100%
Easton Utilities Comm	Easton	Talbot	3.8	3.6	95%
Easton Utilities Comm	Easton	Talbot	4.1	4.1	100%
Easton Utilities Comm	Easton	Talbot	5.6	5.6	100%
Easton Utilities Comm	Easton	Talbot	5.6	5.6	100%
Easton Utilities Comm	Easton	Talbot	2.5	2.0	80%
Easton Utilities Comm	Easton	Talbot	2.5	2.0	80%
Easton Utilities Comm	Easton	Talbot	3.0	2.5	83%
Easton Utilities Comm	Easton 2	Talbot	1.5	1.5	100%
Easton Utilities Comm	Easton 2	Talbot	1.5	1.5	100%
Easton Utilities Comm	Easton 2	Talbot	5.4	4.5	83%
Easton Utilities Comm	Easton 2	Talbot	5.4	4.5	83%
Easton Utilities Comm	Easton 2	Talbot	6.2	6.2	100%
Easton Utilities Comm	Easton 2	Talbot	6.2	6.2	100%
Easton Utilities Comm	Easton 2	Talbot	6.3	6.3	100%
Easton Utilities Comm	Easton 2	Talbot	6.3	6.3	100%
Exelon Nuclear	Calvert Cliffs Nuclear Power Plant	Calvert	918.0	866.0	94%
Exelon Nuclear	Calvert Cliffs Nuclear Power Plant	Calvert	932.4	841.8	90%
A & N Electric Coop	Smith Island	Somerset	0.5	0.4	80%
A & N Electric Coop	Smith Island	Somerset	1.0	1.0	100%
Town of Berlin - (MD)	Berlin	Worcester	1.1	1.1	100%
Town of Berlin - (MD)	Berlin	Worcester	2.5	2.5	100%
Town of Berlin - (MD)	Berlin	Worcester	2.0	2.0	100%

Appendix 5: List of Maryland Generators, as of December 31, 2021

Essential Power Rock Springs LLC	Essential Power Rock Springs LLC	Cecil	198.9	167.5	84%
Essential Power Rock Springs LLC	Essential Power Rock Springs LLC	Cecil	175.9	166.5	95%
Essential Power Rock Springs LLC	Essential Power Rock Springs LLC	Cecil	198.9	169.0	85%
Essential Power Rock Springs LLC	Essential Power Rock Springs LLC	Cecil	198.9	169.0	85%
Wheelabrator Environmental Systems	Wheelabrator Baltimore Refuse	Baltimore City	60.2	57.0	95%
Wheelabrator Environmental Systems	Wheelabrator Baltimore Refuse	Baltimore City	4.3	4.3	100%
AES WR Ltd Partnership	AES Warrior Run Cogeneration Facility	Allegany	229.0	180.0	79%
Maryland Environmental Service	Eastern Correctional Institute	Somerset	1.9	1.3	68%
Maryland Environmental Service	Eastern Correctional Institute	Somerset	1.9	1.3	68%
Maryland Environmental Service	Eastern Correctional Institute	Somerset	1.0	1.0	100%
Maryland Environmental Service	Eastern Correctional Institute	Somerset	1.0	1.0	100%
Prince George's County	Brown Station Road Plant I	Prince Georges	0.9	0.8	89%
Prince George's County	Brown Station Road Plant I	Prince Georges	0.9	0.8	89%
Prince George's County	Brown Station Road Plant I	Prince Georges	0.9	0.8	89%
Covanta Montgomery, Inc.	Montgomery County Resource Recovery	Montgomery	67.8	54.0	80%
American Sugar Refining, Inc.	Domino Sugar Baltimore	Baltimore City	5.0	5.0	100%
American Sugar Refining, Inc.	Domino Sugar Baltimore	Baltimore City	2.5	2.5	100%
American Sugar Refining, Inc.	Domino Sugar Baltimore	Baltimore City	10.0	10.0	100%
KMC Thermo, LLC	Brandywine Power Facility	Prince Georges	98.7		
KMC Thermo, LLC	Brandywine Power Facility	Prince Georges	98.7		
KMC Thermo, LLC	Brandywine Power Facility	Prince Georges	91.4	230.0	252%
Prince George's County	Brown Station Road Plant II	Prince Georges	1.0	0.8	80%
Prince George's County	Brown Station Road Plant II	Prince Georges	1.0	0.8	80%
Prince George's County	Brown Station Road Plant II	Prince Georges	1.0	0.8	80%
Prince George's County	Brown Station Road Plant II	Prince Georges	1.0	0.8	80%
Trigen-Cinergy Solutions College Park	UMCP CHP Plant	Prince Georges	11.0	9.4	85%
Trigen-Cinergy Solutions College Park	UMCP CHP Plant	Prince Georges	11.0	9.4	85%
Trigen-Cinergy Solutions College Park	UMCP CHP Plant	Prince	5.4	2.0	37%

Appendix 5: List of Maryland Generators, as of December 31, 2021

		Georges			
Trigen Inner Harbor East, LLC	Inner Harbor East Heating	Baltimore City	2.1	2.1	100%
Energy Power Partners	Eastern Landfill Gas LLC	Baltimore	1.0	1.3	130%
Energy Power Partners	Eastern Landfill Gas LLC	Baltimore	1.0	1.3	130%
Energy Power Partners	Eastern Landfill Gas LLC	Baltimore	1.0	1.3	130%
Energy Power Partners	Eastern Landfill Gas LLC	Baltimore	1.0	1.3	130%
National Institutes of Health	NIH Cogeneration Facility	Montgomery	28.0	27.6	99%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
CPV Maryland LLC	CPV St Charles Energy Center	Charles	223.6	215.0	96%
CPV Maryland LLC	CPV St Charles Energy Center	Charles	223.6	214.6	96%
CPV Maryland LLC	CPV St Charles Energy Center	Charles	328.1	303.6	93%
Roth Rock Wind Farm LLC	Roth Rock Wind Farm LLC	Garrett	40.0	40.0	100%
Roth Rock Wind Farm LLC	Roth Rock North Wind Farm, LLC	Garrett	10.0	10.0	100%
Criterion Power Partners LLC	Criterion	GARRETT	70.0	70.0	100%
Luminace Solar Maryland, LLC	McCormick & Co. Inc. at Belcamp	Harford	1.4	1.4	100%
NRG Solar Arrowhead LLC	FedEx Field Solar Facility	Prince Georges	2.0	2.0	100%
Constellation Solar Horizons LLC	Mount Saint Mary's	Frederick	13.7	13.7	100%
Terraform Arcadia	Perdue Salisbury Photovoltaic	Wicomico	1.0	1.0	100%
IKEA Property Inc	IKEA Perryville 460	Cecil	2.1	2.0	95%
IKEA Property Inc	IKEA College Park 411	Prince Georges	1.0	1.0	100%
IKEA Property Inc	IKEA College Park 411	Prince Georges	1.0	1.0	100%
GSA Metropolitan Service Center	Central Utility Plant at White Oak	Montgomery	5.7	5.6	98%
GSA Metropolitan Service Center	Central Utility Plant at White Oak	Montgomery	2.3	2.3	100%

Appendix 5: List of Maryland Generators, as of December 31, 2021

GSA Metropolitan Service Center	Central Utility Plant at White Oak	Montgomery	2.3	2.3	100%
GSA Metropolitan Service Center	Central Utility Plant at White Oak	Montgomery	5.0	5.0	100%
GSA Metropolitan Service Center	Central Utility Plant at White Oak	Montgomery	2.3	2.3	100%
GSA Metropolitan Service Center	Central Utility Plant at White Oak	Montgomery	4.3	4.3	100%
GSA Metropolitan Service Center	Central Utility Plant at White Oak	Montgomery	4.3	4.3	100%
GSA Metropolitan Service Center	Central Utility Plant at White Oak	Montgomery	4.3	4.3	100%
GSA Metropolitan Service Center	Central Utility Plant at White Oak	Montgomery	4.3	4.3	100%
GSA Metropolitan Service Center	Central Utility Plant at White Oak	Montgomery	7.5	7.5	100%
GSA Metropolitan Service Center	Central Utility Plant at White Oak	Montgomery	7.5	7.5	100%
GSA Metropolitan Service Center	Central Utility Plant at White Oak	Montgomery	4.5	4.5	100%
Terraform Arcadia	Kent County-Kennedyville	Kent	1.0	1.0	100%
Terraform Arcadia	Rock Hall	Kent	1.0	1.0	100%
Terraform Arcadia	Kent County - Worton Complex	Kent	1.0	1.0	100%
LES Operations Services LLC	Millersville LFG	Anne Arundel	1.6	1.5	94%
LES Operations Services LLC	Millersville LFG	Anne Arundel	1.6	1.5	94%
Howard County - Maryland	Alpha Ridge LFG	Howard	1.0	1.0	100%
Luminace Solar Maryland II, LLC	UMMS at Pocomoke	Somerset	2.8	2.8	100%
Arevon Energy, Inc.	Maryland Solar	Washington	27.0	20.9	77%
SMECO Solar LLC	Herbert Farm Solar	Charles	5.5	5.5	100%
Tesla Inc.	Queen Anne's County	Queen Annes	2.0	2.0	100%
Fourmile Wind Energy, LLC	Fourmile Ridge	Garrett	40.0	40.0	100%
Mayor and City Council of Baltimore City	Back River Waste Water Treatment	Baltimore City	1.1	0.9	82%
Mayor and City Council of Baltimore City	Back River Waste Water Treatment	Baltimore City	1.1	0.9	82%
Mayor and City Council of Baltimore City	Back River Waste Water Treatment	Baltimore City	0.8	0.8	100%
Fair Wind Power Partners, LLC	Fair Wind	Garrett	30.0	30.0	100%
Old Dominion Electric Coop	Wildcat Point Generation Facility	Cecil	310.3	252.3	81%
Old Dominion Electric Coop	Wildcat Point Generation Facility	Cecil	310.3	241.1	78%
Old Dominion Electric Coop	Wildcat Point Generation Facility	Cecil	493.0	497.9	101%
SunE SEM 1, LLC	Chimes West Friendship (Nixon Farms)	Howard	1.2	1.2	100%
NVT LICENSES, LLC	UMES (MD) - Princess Anne	Somerset	2.0	2.1	105%
Rockfish Solar LLC	Rockfish Solar LLC	Charles	10.3	10.3	100%
Luminace Solar Maryland, LLC	General Motors Corp at White Marsh MD	Baltimore	1.0	1.0	100%
Luminace Solar Maryland II, LLC	CNE at Cambridge MD	Dorchester	3.2	3.2	100%
Great Bay Solar I LLC	Great Bay Solar 1	Somerset	75.0	75.0	100%
AES Tait LLC	AES Warrior Run Energy Storage Project	Allegany	11.0	5.0	45%
Consolidated Edison Solutions Inc.	CES VMT Solar	Washington	1.1	1.1	100%
Luminace Solar Holding, LLC	CCBC-Catonsville	Howard	1.6	1.6	100%
SunE DB27, LLC	Elkton Solar	Cecil	1.6	1.6	100%
Tesla Inc.	Town of Chestertown- Chestertown WWTP	Kent	1.0	1.0	100%
PSEG Keys Energy Center, LLC	Keys Energy Center	Prince Georges	359.6	325.0	90%

Appendix 5: List of Maryland Generators, as of December 31, 2021

PSEG Keys Energy Center, LLC	Keys Energy Center	Prince Georges	235.5	231.0	98%
PSEG Keys Energy Center, LLC	Keys Energy Center	Prince Georges	235.5	231.0	98%
SunE DB42, LLC	Cecil County CCVT HS	Cecil	2.0	2.0	100%
Terraform Arcadia	Presbyterian Senior Living Service	Baltimore	1.2	1.2	100%
Tesla Inc.	The Clorox Company	Harford	1.6	1.6	100%
Tesla Inc.	Chesapeake College	Queen Annes	1.5	1.5	100%
Altus Power America Management, LLC	MEBA	Talbot	1.5	1.5	100%
Tesla Inc.	Wye Mills VNEM CSG	Queen Annes	10.0	10.0	100%
Luminace Solar MC, LLC	Archdiocese of Baltimore J	Harford	2.0	2.0	100%
Luminace Solar MC, LLC	Archdiocese of Baltimore L	Harford	2.0	2.0	100%
Luminace Solar MC, LLC	Baltimore City B	Harford	2.0	2.0	100%
Luminace Solar MC, LLC	Baltimore City D	Harford	2.0	2.0	100%
Luminace Solar MC, LLC	Baltimore City F	Harford	2.0	2.0	100%
Luminace Solar MC, LLC	Baltimore City G	Harford	2.0	2.0	100%
Luminace Solar MC, LLC	City of Havre De Grace C	Harford	2.0	2.0	100%
Luminace Solar MC, LLC	Sod Run WTP A	Harford	2.0	2.0	100%
Annapolis Solar Park, LLC	Annapolis Solar Park, LLC	Anne Arundel	12.0	12.0	100%
Luminace Solar MC, LLC	Havre de Grace II - E at Perryman	Harford	1.4	1.4	100%
MN8 Energy LLC	Longview Solar	Wicomico	13.6	13.6	100%
MN8 Energy LLC	Church Hill	Queen Annes	6.0	6.0	100%
Tesla Inc.	Montgomery County Correctional Facility	Montgomery	1.4	1.4	100%
Tesla Inc.	Garrett County - DPU Treatment Plant	Garrett	1.2	1.2	100%
UGI Energy Services, LLC	Emmitsburg Solar Arrays	Frederick	1.7	1.7	100%
Terraform Arcadia	Pfeffers	Baltimore	1.0	1.0	100%
US Dept of Army, Garrison, APG	APG Combined Heat and Power Plant	Harford	7.9	6.2	78%
CleanCapital Holdings	IGS Solar I - BWI5	Baltimore	1.1	1.1	100%
IGS ORIX Solar I, LLC	IGS Solar I - BWI2	Baltimore	1.4	1.4	100%
Cypress Creek Renewables	Baker Point	Frederick	9.0	9.0	100%
Montevue Lane Solar, LLC	Fort Detrick Solar PV	Frederick	15.7	15.7	100%
Montgomery County Solar	Montgomery County Solar	Montgomery	1.9	1.9	100%
GWCC PV Solar Farm	GWCC PV Solar Farm	Prince Georges	1.6	1.6	100%
Luminace Solar MC, LLC	Gateway Solar	Worcester	5.0	5.0	100%
Luminace Solar MC, LLC	Gateway Solar	Worcester	2.6	2.6	100%
NRG Chalk Point CT	NRG Chalk Point CT	Prince Georges	94.0	80.2	85%
Terraform Arcadia	Bowie State Solar	Prince Georges	1.3	1.3	100%
IOS II LLC	First Baptist Church of Glenarden	Prince Georges	1.5	1.6	107%
Tesla Inc.	Bd of Educ of Queen Anne's Cnty, Cnty HS	Queen Annes	1.7	1.7	100%
Constellation New Energy Inc.	NIST Solar	Montgomery	4.0	4.0	100%

Appendix 5: List of Maryland Generators, as of December 31, 2021

Northstar Macy's Maryland 2015, LLC	Macy's MD Joppa Solar Project	Harford	1.8	1.8	100%
Altus Power America Management, LLC	Synergen Panorama, LLC CSG	Prince Georges	5.0	5.0	100%
Greenbacker Renewable Energy Corporation	Sol Phoenix	Prince Georges	2.5	2.5	100%
Greenbacker Renewable Energy Corporation	Blue Star	Kent	7.5	7.5	100%
Standard Solar	UMCES Ground Mount	Dorchester	2.0	2.0	100%
Standard Solar	Anne Arundel County Public Schools	Anne Arundel	1.0	1.0	100%
Onyx Asset Services Group	APG Old Bayside	Harford	1.7	1.7	100%
Onyx Asset Services Group	APG New Chesapeake	Harford	2.3	2.3	100%
Chester Woods Point Solar, LLC	Chester Woods Point Solar, LLC CSG	Queen Annes	2.0	2.0	100%
Westbound Solar LLC	Amazon Maryland DCA1	Baltimore	1.3	1.3	100%
Standard Solar	MNCPPC Germantown Solar	Montgomery	1.0	1.0	100%
Greenbacker Renewable Energy Corporation	Solar Hagerstown	Washington	10.0	7.5	75%
Nautilus Solar Solutions	BTC2 Solar (CSG)	Baltimore	2.0	2.0	100%
Nautilus Solar Solutions	Upper Marlboro 1 CSG	Prince Georges	2.0	2.0	100%
Nautilus Solar Solutions	White CSG	Baltimore	2.0	2.0	100%
Nautilus Solar Solutions	Gibbons CSG	Worcester	2.0	2.0	100%
Old Court Rd Solar, LLC	Old Court Rd Solar	Howard	2.0	2.0	100%
Francis Scott Key Mall	Francis Scott Key Mall	Frederick	1.6	2.1	131%
White Marsh Mall	White Marsh Mall	Baltimore	1.1	1.1	100%
Bluefin Origination 1, LLC	Bluefin Origination 1	Prince Georges	2.0	2.0	100%
Tesla Inc.	Frederick County - Landfill	Frederick	2.0	2.0	100%
Tesla Inc.	Wor-Wic Community College - Offsite	Wicomico	2.0	2.0	100%
MN8 Energy LLC	Spruce - WCMD - Rubble II	Washington	2.0	2.0	100%
MN8 Energy LLC	Spruce - WCMD - Rubble I	Washington	2.0	2.0	100%
MN8 Energy LLC	Spruce - WCMD - Creek	Washington	2.0	2.0	100%
MN8 Energy LLC	Spruce - WCMD - Resh I	Washington	2.0	2.0	100%
Sheriff Rd Solar LLC	Sheriff Road	Prince Georges	1.1	1.1	100%
Madison Energy Holdings LLC	Pinesburg Solar LLC	Washington	4.3	4.3	100%
Madison Energy Holdings LLC	Timonium Fairgrounds	Baltimore	1.9	1.9	100%
Bluegrass Solar, LLC	Bluegrass Solar	Queen Annes	79.6	79.6	100%
Forefront Power, LLC	MD - CS - Potomac Edison Co - GA29 TPE	Garrett	2.0	2.0	100%
Bioenergy DevCo	Maryland Bioenergy Center (Jessup)	Howard	1.1	1.1	100%
6685 Santa Barbara Ct	6685 Santa Barbara Ct	Howard	1.0	1.0	100%
Hartz Solar, LLC	7448 Candlewood Road	Anne Arundel	1.5	1.5	100%
Nautilus Solar Solutions	Kirby Road Solar, LLC	Prince Georges	1.3	1.3	100%
Standard Solar	MNCPPC Randall Farm	Prince Georges	1.4	1.4	100%
Nautilus Solar Solutions	Burns Solar One LLC	Baltimore	2.0	2.0	100%

Appendix 5: List of Maryland Generators, as of December 31, 2021

Nautilus Solar Solutions	Hostetter Solar One, LLC	Washington	2.0	2.0	100%
Nautilus Solar Solutions	P52ES 1755 Henryton Rd Phase 1 LLC CSG	Howard	1.9	1.9	100%
Nautilus Solar Solutions	P52ES 1755 Henryton Rd Phase 2 LLC	Howard	1.9	1.9	100%
Nautilus Solar Solutions	White Marsh Solar	Baltimore	1.5	1.5	100%
Nautilus Solar Solutions	Mason Solar One LLC	Cecil	1.0	1.0	100%
Nautilus Solar Solutions	Pittman Solar One LLC	Washington	2.0	2.0	100%
Nautilus Solar Solutions	Bulldog Solar One, LLC	Prince Georges	2.0	2.0	100%
Distributed Solar Development, LLC	MD - PR97 (CSG)	Prince Georges	2.0	2.0	100%
Invenergy Services LLC	Todd Solar	Dorchester	20.0	20.0	100%
Standard Solar	OER Checkerspot	Anne Arundel	1.5	1.5	100%
Tesla Inc.	City of Bowie	Prince Georges	2.0	2.0	100%
Hampstead Solar, LLC	Bomber CSG	Carroll	6.0	6.0	100%
Lanyard Power Holdings, LLC	Chalk Point Steam	Prince Georges	16.0	18.0	113%
ICFTS MD Solar, LLC	Hollins Ferry CSG	Baltimore City	1.5	1.5	100%
Distributed Solar Development, LLC	MD - CS - Potomac Edison Co - GA25 TPE (Community Solar)	Garrett	2.0	2.0	100%
Distributed Solar Development, LLC	MD - CS - BGE - PR24 TPE	Prince Georges	2.0	2.0	100%
Standard Solar	OER Monarch CSG	Prince Georges	2.0	2.0	100%
Standard Solar	OER Patuxent CSG	Anne Arundel	2.8	2.0	71%
Standard Solar	Shepherds Mill CSG	Carroll	2.0	2.0	100%
TPE MD MO32 LLC	MO32 (CSG)	Montgomery	2.0	2.0	100%
TPE MD MO33 LLC	MO33 CSG	Montgomery	2.0	2.0	100%
Snowden River Parkway, LLC	Snowden River CSG	Howard	1.9	1.9	100%
Conductive Power	Rockdale	Washington	2.0	2.0	100%
AlphaStruxure Service Co LP	Brookville Smart Bus Depot Microgrid	Montgomery	1.5	1.5	100%
AlphaStruxure Service Co LP	Brookville Smart Bus Depot Microgrid	Montgomery	1.7	1.7	100%
CleanCapital Holdings	KDC Solar TC Little Patuxent WWTP LLC	Howard	2.0	2.0	100%
CleanCapital Holdings	KDC Solar TC George Howard LLC	Howard	2.0	2.0	100%
CleanCapital Holdings	KDC Solar TC Blandair Park LLC	Howard	2.0	2.0	100%
Convergent Energy and Power LP	Federalsburg Energy Storage 1 LLC	Caroline	1.2	1.2	100%
Convergent Energy and Power LP	Federalsburg Energy Storage 1 LLC	Caroline	0.8	0.8	100%
Solar DG MD Holabird Broening ACC, LLC	CPG - Duke 5300A Holabird	Baltimore City	1.5	1.5	100%
Solar DG MD Holabird Broening ACC, LLC	CPG - Duke 5300B Holabird	Baltimore City	1.5	1.5	100%
Solar DG MD Holabird AJCFB, LLC	CPG - Duke 5900 Holabird	Baltimore City	1.5	1.5	100%

Appendix 5: List of Maryland Generators, as of December 31, 2021

Solar DG MD Holabird AJCFB, LLC	CPG - Duke 6000 Holabird	Baltimore City	1.5	1.5	100%
			13,077.8	**11,905.9**	**91%**

Appendix 6: Proposed New Renewable Generation in Maryland PJM Queue

Appendix Table 6: Proposed New Renewable Generation in Maryland PJM Queue
Effective Date: July 2023

Transmission Owner	Project Name	County Location	PJM Queue Status	PJM Queue #	Fuel Type	Project Capacity (MW)	Projected In-Service Date
APS	Oakland-Gorman 69 kV	Garrett	Active	AF2-112	Solar	6.7	6/1/2022
APS	Westernport 34.5 kV	Garrett	Active	AG1-099	Solar; Storage	20	4/30/2023
APS	Oakland-Gorman 69 kV	Garrett	Active	AG1-101	Solar	6.7	6/1/2022
APS	Black Oak-Hatfield 500 kV	Garrett	Active	AG1-363	Solar; Storage	220	12/31/2024
APS	Lappans 34.5 kV	Washington	Active	AG2-078	Solar	13.2	5/23/2022
APS	Hagerstown-Conservit 34.5 kV	Washington	Active	AG2-279	Solar	13.6	9/30/2024
APS	Westvaco - Mt Zion 138 kV	Garrett	Active	AG2-505	Hydro	15	12/31/2023
APS	Carlos Junction 138 kV	Allegany	Active	AG2-615	Solar	62.6	12/31/2023
APS	Mount Storm-Pruntytown 500kV	Garrett	Active	AH1-283	Solar	120	10/31/2024
APS	Catoctin-Carroll 138 kV	Frederick	Active	AH2-262	Solar; Storage	10.2	3/1/2026
APS	Lappans 34.5kV II	Washington	Active	AI2-351	Solar	1	6/1/2025
APS	Carlos Jct. – Ridgeley 138 kV	Allegany	Active	AI2-353	Wind	16	4/1/2024
APS	Frostburg 138 kV	Allegany	Active	AI2-490	Wind	31.9	12/15/2023
BGE	Graceton 230 kV	Harford	Active	AG2-587	Solar	36	6/1/2024
BGE	Waugh Chapel 115 kV	Anne Arundel	Active	AG2-617	Solar	33	12/31/2023
BGE	Fitzell 33 kV	Baltimore County	Active	AG2-673	Solar	3.7	12/30/2022
DPL	Price 69 kV	Queen Anne's	Active	AF2-313	Solar	12.7	8/15/2021
DPL	Airey-Vienna 69 kV	Dorchester	Active	AF2-358	Solar	60	12/15/2023
DPL	Todd 69 kV II	Dorchester	Active	AG2-092	Solar	11	12/31/2021
DPL	Princess Anne–Loretto 69 kV	Somerset	Active	AG2-101	Solar	35.16	6/1/2024
DPL	Mt. Hermon 25 kV	Wicomico	Active	AG2-115	Solar	3.6	8/29/2022
DPL	Airey - Golden Hill 69 kV	Dorchester	Active	AG2-181	Solar	16.8	6/1/2024
DPL	Hebron 69 kV II	Wicomico	Active	AG2-274	Solar	0	12/31/2022
DPL	3 Bridges Rd 34.5 kV	Caroline	Active	AG2-419	Solar; Storage	20	5/31/2023
DPL	West Cambridge - Vienna 69 kV	Dorchester	Active	AG2-592	Solar	16.8	6/1/2024
DPL	Edgewood 12.47 kV	Wicomico	Active	AH1-057	Solar	3.4	1/31/2023
DPL	Price 69kV	Queen Anne's	Active	AH1-253	Solar	9.3	10/1/2024
DPL	Todd 25kV	Dorchester	Active	AH1-316	Solar	4.4	12/31/2025
DPL	Hillsboro-Wye Mills 138kV	Queen Anne's	Active	AH1-351	Solar	30	5/1/2025
DPL	Mt Olive - Kenny 69kV	Worcester	Active	AH1-380	Solar	12	12/20/2024
DPL	Church-Oil City 138kV	Queen Anne's	Active	AH1-536	Solar	25.6	3/1/2025
DPL	Carville 138kV	Queen Anne's	Active	AH1-620	Solar	45.6	12/1/2025
DPL	Steele-Milford 230kV	Allegany	Active	AH1-621	Solar	72	12/1/2025
DPL	New Hope 12.47 kV	Allegany	Active	AH2-052	Solar	0	12/2/2022
DPL	Mardela Springs 12.47 kV	Wicomico	Active	AH2-053	Solar	0	12/2/2022
DPL	Edgewood 12.47 kV I	Wicomico	Active	AH2-054	Solar	0	12/2/2022

DPL	TBD 69kV	Unknown	Active	AH2-055	Solar	0	2/15/2022
DPL	TBD 69kV	Prince George's	Active	AH2-065	Solar	0	12/1/2022
DPL	Edgewood 12.47 kV II	Wicomico	Active	AH2-070	Solar	0	1/27/2023
DPL	Edgewood 12.47 kV III	Wicomico	Active	AH2-071	Solar	0	1/27/2023
DPL	West Cambridge - Airey 69 kV	Dorchester	Active	AH2-096	Solar	8.19	5/1/2023
DPL	Mt. Hermon 69 kV	Wicomico	Active	AH2-198	Solar	53.8	6/30/2026
DPL	Talbot 69 kV	Worcester	Active	AH2-337	Solar; Storage	80	2/27/2026
DPL	Easton - Steele 138 kV IV	Talbot	Active	AH2-365	Solar	10.8	6/1/2024
DPL	Church - Oil City 138 kV III	Caroline	Active	AH2-370	Solar	17.8	11/15/2023
DPL	Sign Post - Stockton 69 kV	Worcester	Active	AH2-379	Solar	17.0	3/1/2026
DPL	Todd 69 kV	Dorchester	Active	AI2-176	Solar	14.5	12/31/2021
DPL	Todd 25 kV	Dorchester	Active	AI2-177	Solar	5.8	7/31/2021
DPL	Rockawalkin 69 kV	Wicomico	Active	AI2-207	Solar	5.6	3/30/2023
DPL	Price 25 kV	Queen Anne's	Active	AI2-211	Solar	2.6	3/3/2023
DPL	King's Creek 138 kV	Somerset	Active	AI2-235	Solar	62.7	3/2/2023
DPL	Keeney - Steele 230 kV	Caroline	Active	AI2-260	Solar	82.1	12/30/2025
DPL	Hillsboro - Wye Mills 138 kV	Queen Anne's	Active	AI2-350	Solar	11.9	5/1/2025
DPL	Easton - Steele 138 kV	Talbot	Active	AI2-373	Solar	23.6	3/31/2026
PEPCO	Dickerson 230 kV	Montgomery	Active	AG1-483	Solar; Storage	542.5	6/1/2024
PEPCO	Ritchie 69 kV	Prince George's	Active	AG2-520	Solar	10.2	3/1/2024
PEPCO	Morgantown 230 kV	Charles	Active	AG2-618	Solar	69.1	12/31/2023
PEPCO	Chalk Point 230kV	Prince George's	Active	AH1-552	Solar; Storage	670.2	6/1/2025
PEPCO	Ripley Switch – Grayton 69kV	Charles	Active	AH2-118	Solar; Storage	85	12/1/2024
PPL	Columbia-Geisinger Tap #1 69 kV	Anne Arundel	Active	AF2-434	Solar	12	6/1/2022
SMECO	Bolton - Bennsville 69 kV	Charles	Active	AG2-647	Solar	4.6	3/31/2023
SMECO	Hughesville-Cedarville 69kV	Charles	Active	AH2-266	Solar	15	3/1/2026
					Total	**2,792.6**	