PUBLIC SERVICE COMMISSION OF MARYLAND

TEN-YEAR PLAN (2022 – 2031) OF ELECTRIC COMPANIES IN MARYLAND

Prepared for the
Maryland Department of Natural Resources
In compliance with Section 7-201
Of the Public Utilities Article, *Annotated Code of Maryland*
November 2022

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I. Introduction

This report constitutes the Maryland Public Service Commission's *Ten-Year Plan (2022-2031) 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 2022 – 2031 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

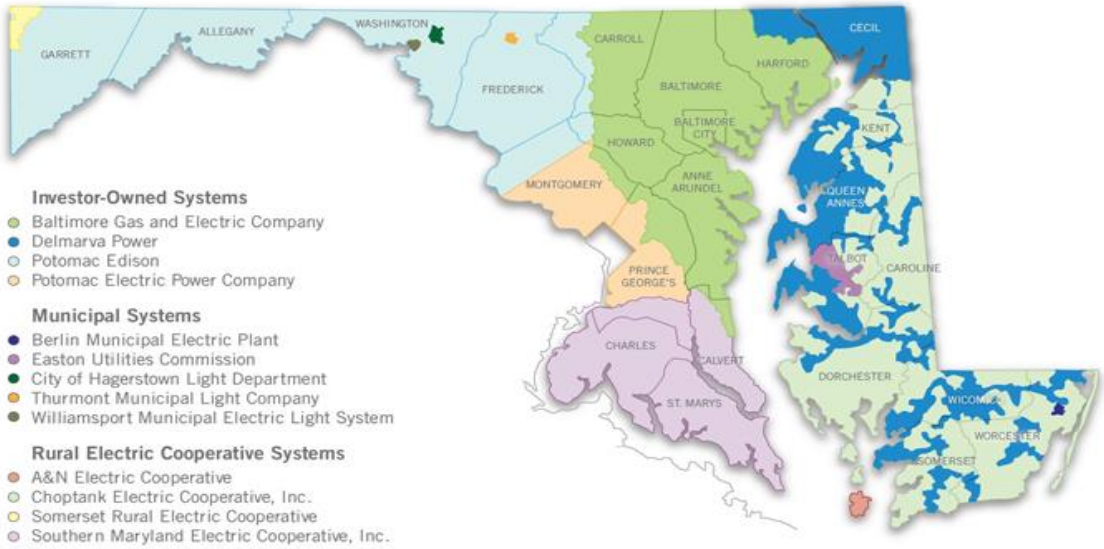
Maryland is geographically divided into 13 electric utility service territories.[2] The four largest, by number of Maryland customers, are served by investor-owned utilities ("IOUs"); four represent electric cooperatives (two of which serve mainly rural areas of

[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").

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]

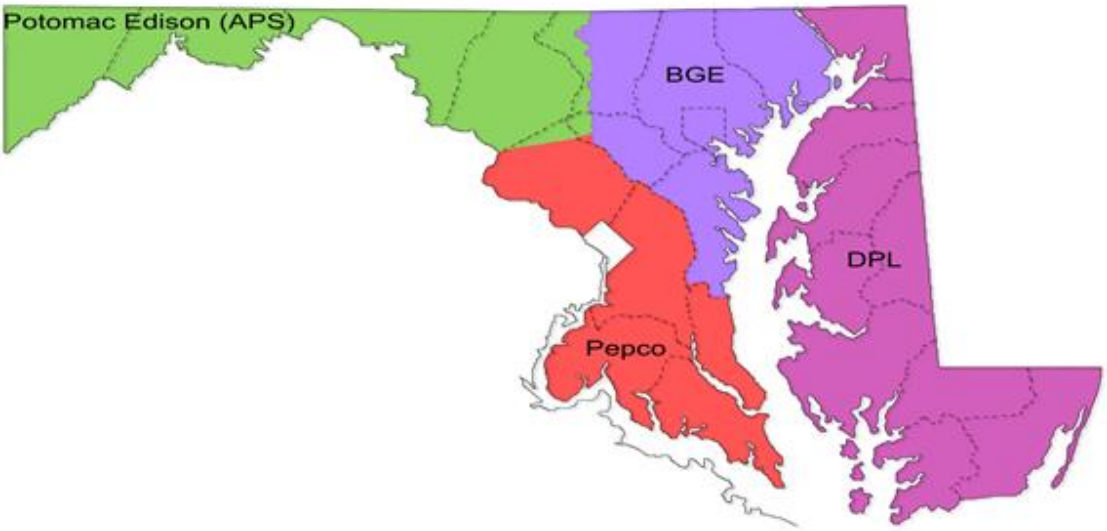


[3] The Commission regulates all Maryland public service companies, as defined by §1-101(x) of the Public Utilities Article, *Annotated Code of Maryland*.

[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 2021) load forecast with that of the previous year (*i.e.* September 2020), as depicted below in Table 1. At the outset of the 2022-2031 planning period discussed in this Ten-Year Plan, the projected average GDP growth reflected in the current PJM load forecast is lower 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 drop in GDP of 1.6 percent, and an expected second quarter drop in GDP of 0.9 percent.[7]

Demand forecasts submitted by the Maryland utilities for the 2022-2031 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.

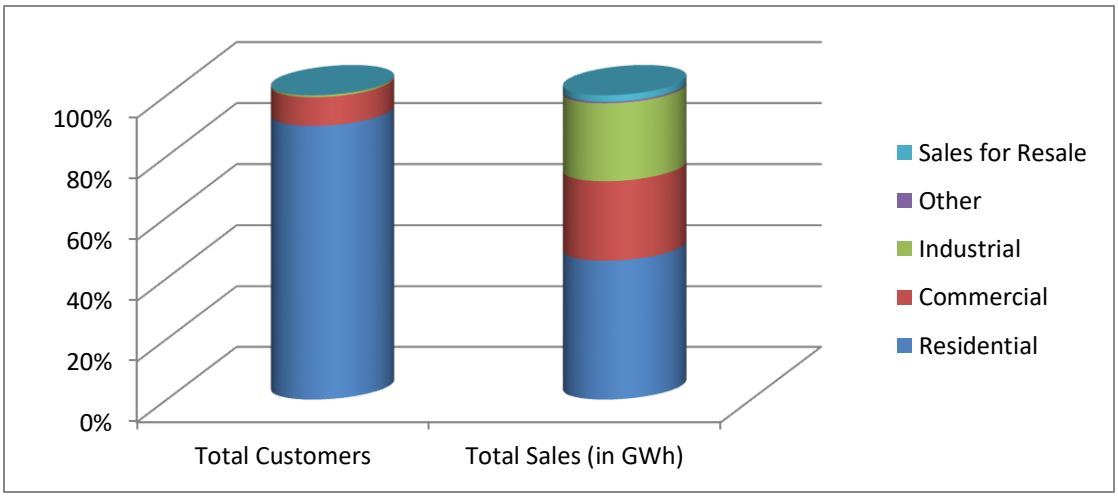
Table 1: Comparison of Compound Annual Growth Rate Projections – 2019, 2020, 2021, and 2022[8]

Forecasts	Ten Year Plan 2019-2028	Ten Year Plan 2020-2029	Ten Year Plan 2021-2030	Ten Year Plan 2022-2031
Customer Growth	0.8%	0.7%	0.7%	0.8%
Energy Sales	-0.2%	0.1%	0.4%	0.4%
Summer Peak Demand	0.3%	0.3%	1.4%	0.9%
Winter Peak Demand	0.3%	0.5%	0.7%	0.8%

A. Customer Growth Forecasts[9]

At the close of 2021, 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.

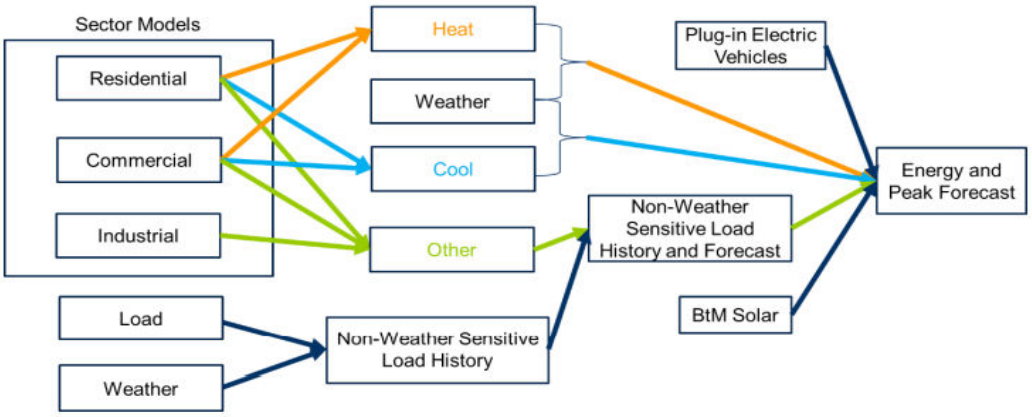
Figure 3 Total Customers and Energy Sales (in GWh) by Customer Class for 2021



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. 2022), 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 0.75 percent for all customer classes, which translates into a 6.96 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)[12,13]

Year	Berlin	BGE	DPL	Easton	Hagers-town	PE	Pepco	SMECO	Thur-mont	William-sport	Total
2022	2,643	1,332,243	215,538	10,852	17,540	282,523	594,159	173,796	2,874	1,018	**2,633,185**
2023	2,632	1,344,574	216,290	10,871	17,581	283,969	599,547	176,016	2,874	1,018	**2,655,372**
2024	2,645	1,355,844	217,136	10,890	17,621	286,018	604,686	178,126	2,874	1,018	**2,676,858**
2025	2,658	1,367,041	217,948	10,909	17,662	288,131	609,851	180,466	2,874	1,018	**2,698,558**
2026	2,671	1,377,083	218,738	10,928	17,703	290,325	614,917	182,486	2,874	1,018	**2,718,743**
2027	2,698	1,386,813	219,532	10,947	17,743	292,612	620,025	184,586	2,874	1,018	**2,738,849**
2028	2,725	1,395,903	220,329	10,966	17,784	294,983	625,176	186,696	2,874	1,018	**2,758,455**
2029	2,752	1,404,608	221,129	10,985	17,826	297,399	630,370	188,706	2,874	1,018	**2,777,667**
2030	2,780	1,413,405	221,932	11,004	17,867	299,850	635,608	190,816	2,874	1,018	**2,797,153**
2031	2,807	1,422,114	222,737	11,023	17,908	302,323	640,889	192,796	2,874	1,018	**2,816,490**
Change (2022-2031)	**165**	**89,871**	**7,200**	**171**	**368**	**19,800**	**46,730**	**19,000**	**-**	**-**	**183,305**
Percent Change (2022-2031)	**6.23%**	**6.75%**	**3.34%**	**1.58%**	**2.10%**	**7.01%**	**7.86%**	**10.93%**	**0.00%**	**0.00%**	**6.96%**
Compound Annual Growth Rate	**0.67%**	**0.73%**	**0.37%**	**0.17%**	**0.23%**	**0.76%**	**0.84%**	**1.16%**	**0.00%**	**0.00%**	**0.75%**

[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 2022 data request for the Ten-Year Plan.
[13] Numbers are rounded to nearest whole number.

The customer forecasts provided by the utilities are comparable to the forecasts they provided for the 2021-2030 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 171,109 customers by 2031, or 93 percent of total new customers projected. The largest percentage increase in the number of customers is projected to occur in SMECO's service territory with an increase of 11 percent, or 18,000 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 85,686 residential customers forecasted during this planning period.[14] BGE's projected increase in its residential customer base accounts for 50 percent of the total number of new residential customers across all service territories during the 10-year planning period.[15] The increase in residential customers for BGE translates into a compound annual growth rate of 0.77 percent.[16]

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 0.53 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,[17] largely attributable to an increased projection by BGE.

Table 3: Projected Percentage Increase in the Number of Customers by Class, 2022 – 2031[18]

	All Utilities		
Class	**2021 to 2030**	**2022 to 2031**	**Difference**
Residential	6.72%	7.23%	0.51%
Commercial	3.88%	4.52%	0.64%
Industrial	2.70%	6.51%	3.81%
Other	1.16%	-0.16%	-1.32%
Resale	0.00%	0.00%	0.00%
Total Customers	**6.43%**	**6.96%**	**0.53%**

[14] *See* Appendix Table 1(a)(ii).
[15] *Id.*
[16] *Id.*
[17] 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.
[18] *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."[19] 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) [20]

	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Total
Change (2022-2031)	3	(618)	67	13	7	1,613	811	317	2,213
Percent Change (2022-2031)	6.95%	2.09%	1.37%	5.03%	2.27%	18.82%	5.01%	8.83%	3.49%
Compound Annual Growth Rate	0.75%	-0.23%	0.15%	0.55%	0.25%	1.93%	0.54%	0.94%	0.38%

The aggregated forecasts show a compound annual increase of 0.38 percent across all the Maryland service territories for 2022-2031, a decrease from the 0.45 percent annual growth rate reported in the 2021-2030 Ten-Year Plan. This result is primarily due to BGE's revised projection of a negative energy sales growth rate in the 2022 – 2031 Ten-Year Plan. The overall growth projected by BGE for this 10-year planning period is the lowest of any Maryland utility in absolute terms, with the company projecting 618 GWh less in energy sales by 2031.

C. Peak Load Forecasts

PJM's 2022 Load Forecast Report includes long-term projections of peak loads for the entire wholesale market region and each PJM zone.[21,22] 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.[23] According

[19] *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.

[20] *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.

[21] *PJM Load Forecast Report,* PJM, (Jan. 2022) at 33-36, Table B-1, https://www.pjm.com/-/media/library/reports-notices/load-forecast/2022-load-report.ashx.

[22] 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.

[23] *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.

to PJM's 2022 Load Forecast Report, the PJM Regional Transmission Organization ("RTO") will continue to be summer peaking during the next 15 years.[24] In 2022, three of the PJM zones of which Maryland is comprised are projected to experience their peak demands during the month of July,[25] the same month as the broader PJM Mid-Atlantic region.[26] 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 of 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 shows the breakdown of which fuels Maryland households use as a heating source in 2020.

Figure 5 Percentage of MD Households Using Fuel for Heating Source[27]

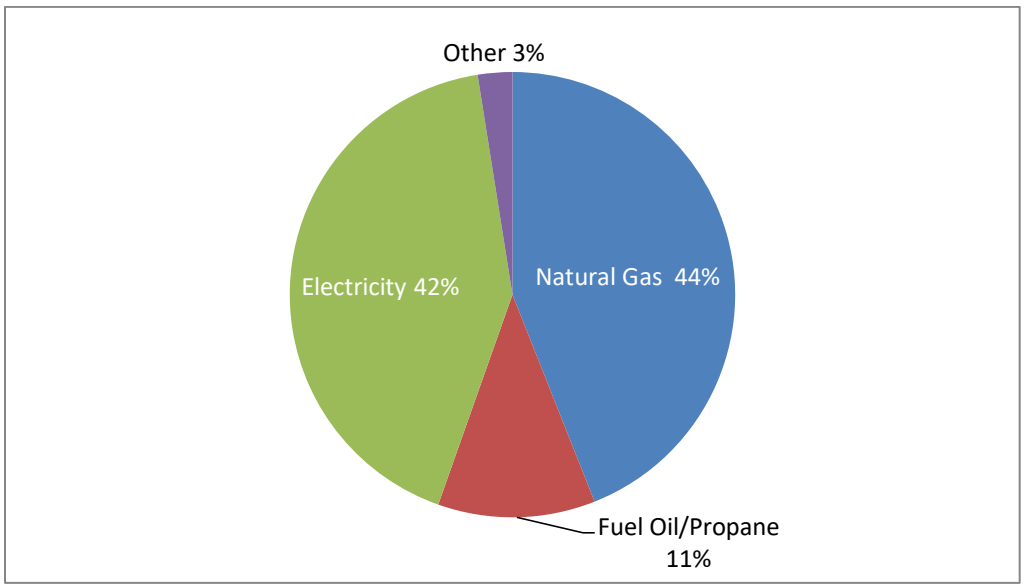
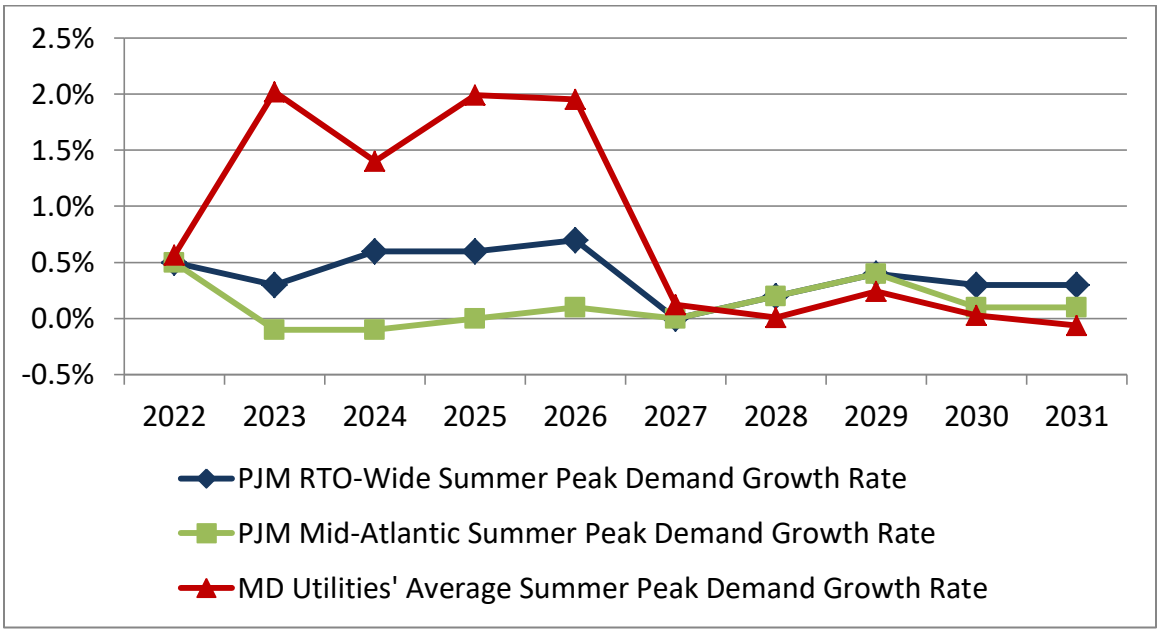


Figure 6 compares the average of the Maryland utilities' forecasted summer peak demands for their Maryland service territories with summer forecasts for the PJM Mid-Atlantic region and for the PJM RTO as a whole. In the near-term, the Maryland utilities are showing stronger peak demand growth rate than the PJM RTO and the PJM Mid-Atlantic region. Also reflected in Figure 6 is a drop in the summer peak demand growth

[24] *PJM Load Forecast Report,* PJM, (Jan. 2022) at 1-2, https://www.pjm.com/-/media/library/reports-notices/load-forecast/2022-load-report.ashx.
[25] *Id.* at 45-46, Table B-5.
[26] *Id.* Three of the Maryland PJM zones (BGE, DPL, and Pepco) are considered to be part of the PJM Mid-Atlantic Region. The fourth Maryland PJM zone (APS) is presented as part of the PJM Western Region data set.
[27] *Maryland State Energy Profile Analysis*, U.S. Energy Information Administration (November 18, 2021), https://www.eia.gov/state/analysis.php?sid=MD , https://www.eia.gov/state/print.php?sid=MD.

rates for the Maryland utilities in 2027, after which time the growth rates generally level off through 2031 and follows a similar path to the PJM RTO and the PJM Mid-Atlantic region.

Figure 6 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[28,29]



The Maryland utilities also provided peak demand forecasts for the winter season in response to the Ten-Year Plan data request. Figure 7 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.

[28] *PJM Load Forecast Report,* PJM, (Jan. 2022) at 33-36, Table B-1, https://www.pjm.com/-/media/library/reports-notices/load-forecast/2022-load-report.ashx.

[29] The Utilities' average summer peak demand growth rates were calculated using the Utilities' data responses to the Commission's 2021 data request for the Ten-Year Plan. *See* Appendix Table 3(a)(i).

Figure 7 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[30,31]

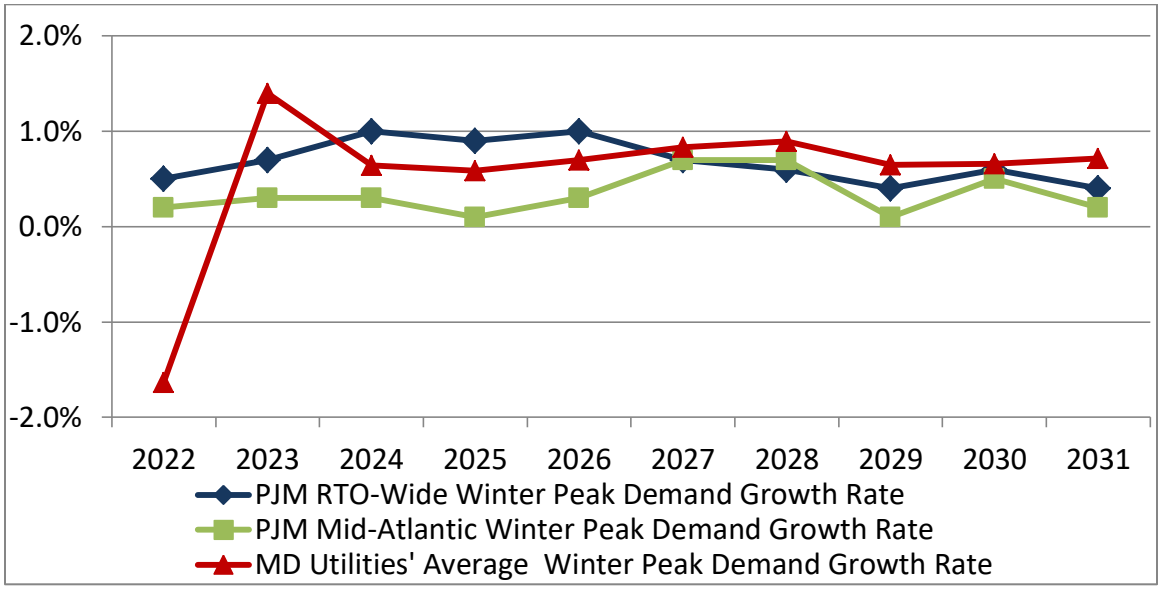
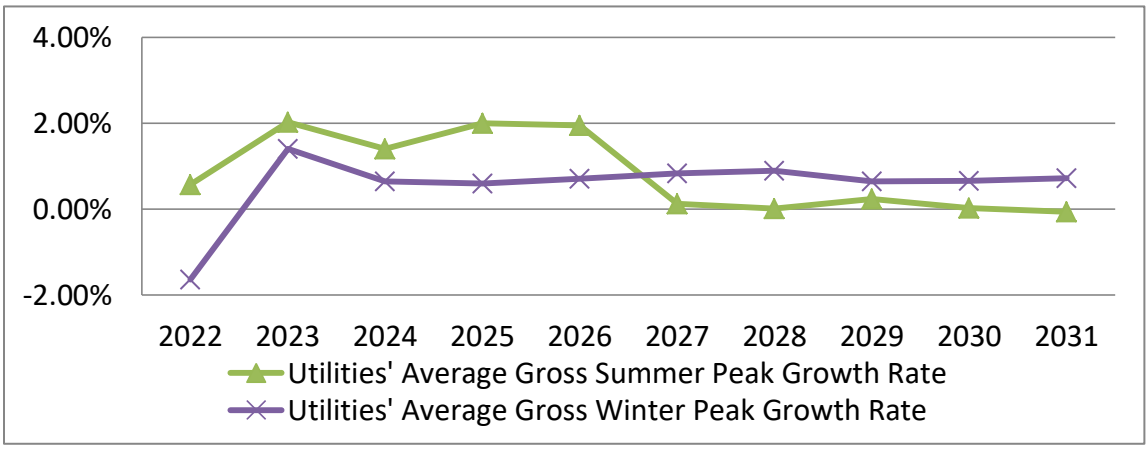


Figure 8 shows that the utilities' average gross winter peak growth rate rises substantially from 2022 to 2023 and is more stable throughout the 10-year planning period than the average gross summer peak growth rate which drops substantially from 2026 to 2027.

Figure 8 Utilities' Projected Summer Peak Demand Growth Rates (Gross of DSM) Compared to Utilities' Projected Winter Peak Demand Growth Rates (Gross of DSM)



[30] The utilities' average winter peak demand growth rates were calculated using the utilities' data responses to the Commission's 2022 data request for the Ten-Year Plan. *See* Appendix Table 3(a)(iii).
[31] *PJM Load Forecast Report,* PJM, (Jan. 2022) at 37-40, Table B-2, https://www.pjm.com/-/media/library/reports-notices/load-forecast/2022-load-report.ashx.

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 0.85 percent and 0.79 percent, respectively.[32] In 2031, 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 16,266 MW and an expected winter peak demand load (gross of DSM) for Maryland of 13,195 MW.[33]

Table 5: Maryland Summer Peak Demand Forecast (MW) (Gross of DSM)[34,35,36]

	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Total
Change (2022-2031)	1	(119)	52	2	1	201	1,028	29	1,196
Percent Change (2022-2031)	7.75%	-1.73%	4.78%	3.94%	2.27%	12.22%	23.49%	3.29%	7.94%
Compound Annual Growth Rate	0.83%	-0.19%	0.52%	0.43%	0.25%	1.29%	2.37%	0.36%	0.85%

Table 6: Maryland Winter Peak Demand Forecast (MW) (Gross of DSM)[37, 38,39]

	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Total
Change (2021-2030)	6	276	61	3	2	286	75	190	898
Percent Change (2021-2030)	37.99%	4.69%	6.34%	4.87%	2.27%	15.95%	2.85%	22.13%	7.30%
Compound Annual Growth Rate	3.64%	0.51%	0.69%	0.53%	0.25%	1.66%	0.31%	2.25%	0.79%

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").[40]

[32] *See* Appendix Table 3(a).
[33] *See* Appendix Tables 3(a)(i) and 3(a)(iii).
[34] *Id.*
[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] Numbers are rounded to nearest whole number.
[37] *See* Appendix Tables 3(a)(i) and 3(a)(iii).
[38] 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.
[39] Numbers are rounded to nearest whole number.
[40] *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:*

According to the participating utilities' Ten-Year Plan forecasts, the DSM programs will save a total of 32,586 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 2022 to 2025. 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.[41] 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 2022-2031 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.

Table 7: Average Annual Increase in Demand Savings due to DSM Programs from 2022 to 2025 for EE&C Programs[42]

Description	BGE	DPL	PE	Pepco	SMECO
Average Annual MW Savings Increase due to DSM Programs	-10.3%	7.3%	10.7%	19.6%	1.5%

Table 8: Average Annual Increase in Demand Savings due to DSM Programs from 2022 to 2025 for All DSM Programs[43]

Description	BGE	DPL	PE	Pepco	SMECO
Average Annual MW Savings Increase due to DSM Programs	-5.7%	6.1%	9.9%	18.2%	1.5%

https://www.psc.state.md.us/wp-content/uploads/2022-EmPOWER-Maryland-Energy-Efficiency-Act-Standard-Report.pdf.

[41] 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, with the exception of its Residential Demand Response Program and CVR, and Dynamic Pricing. The other participating utilities assume a level of savings post-2023.

[42] Responses to the Commission's Ten-Year Plan data requests.

[43] *Id.*

IV. Transmission, Supply, and Generation

In order 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 2020, Maryland's net summer generating capacity was 13,809 MW.[44] Maryland's peak demand forecast for 2022, net of utility demand-side management and energy conservation measures, is approximately 12,863 MW.[45] Maryland had the capability to meet over 106.5 percent of its summer peak demand with in-state generation in 2020.[46] 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 [47]

PJM in its 2021 Regional Transmission Expansion Plan ("RTEP") authorized about $920 million in system transmission improvement projects. The development of the RTEP takes into account 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.[48]

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[44] 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 2020. The next anticipated release date is listed as December 2022.
[45] *See* Appendix Table 3(a)(ii).
[46] The peak demand net of DSM programs for the summer of 2020 was 12,969 according to the 2020-2029 Ten-Year Plan. 14,809/12,969 = 106.5%.
[47] *See* Appendix Table 4 for a full list of transmission enhancements proposed by Maryland utilities.
[48] *2021 Regional Transmission Expansion Plan.* PJM, (March 7, 2022) at 4, https://www.pjm.com/-/media/library/reports-notices/2021-rtep/2021-rtep-report.ashx.

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 88.2 percent ($466.6 million) between 2020 and 2021.[49]

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 and mitigate economic concerns. PJM's 2020 RTEP authorized seven transmission upgrades for Maryland for approximately $48.9 million.[50]

Appendix 4 lists all transmission enhancements identified by the Maryland utilities in response to data requests for the Ten-Year Plan. Together, the 10 identified transmission enhancements in Appendix Table 4 account for 33.9 miles of upgrades.

B. Electricity Imports

Maryland continues to be a net importer of electricity, similar to many other states in PJM.[51] As of 2020, 42 percent of the electricity consumed in the state is imported from other states and internationally.[52] Nine of the 13 PJM states plus the District of

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[49] Monitoring Analytics, *State of the Market Report for PJM - 2021*, PJM, (March 10, 2021) at 564, https://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2021/2021-som-pjm-sec11.pdf.

[50] 2021 Maryland and District of Columbia State Infrastructure Report, PJM, at 17-20, (May 2022), *https://www.pjm.com/-/media/library/reports-notices/state-specific-reports/2021/2021-maryland-dc-state-infrastructure-report.ashx?la=en.*

[51] 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.

[52] *State Electricity Profiles 2020*, U.S. Energy Information Administration, (November 4, 2021) at Table 10, https://www.eia.gov/electricity/state/maryland/xls/md.xlsx.

Columbia are net importers of electricity. In a nationwide comparison, Maryland is the fifth largest electricity importer based on percentage of electricity sales, importing 40 percent of its electricity in 2019.[53] Only the District of Columbia, Massachusetts, Vermont and Delaware exceed Maryland in the percentage of electricity sales that are imported. In contrast, as of 2019, the states within the PJM region that exported more electricity in aggregate than consumed within each state are: Illinois, Pennsylvania, Michigan, and West Virginia.[54]

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 2020, however, in-state resources generated slightly over 36 million MWh.[55] 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.[56]

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.[57] 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.[58]

1. Conventional Capacity and Generation Profiles, 2020

Coal-fired power plants represent 23 percent of the electric generating capacity in Maryland, of which 75 percent of such capacity is aged 31 years or older. Within this category, 27 percent is considered "at-risk," as defined by PJM.[59] Table 9 and Table 10

[53] *State Electricity Profiles 2020*, U.S. Energy Information Administration, (November 4, 2021) at Table 10, (for each state, https://www.eia.gov/electricity/state/index.php).
[54] *Id.*
[55] *State Electricity Profiles 2020*, U.S. Energy Information Administration, (November 4, 2021) at Table 5, https://www.eia.gov/electricity/state/maryland/state_tables.php.
[56] *Maryland State Energy Profile*, U.S. Energy Information Administration, (November 18, 2021), https://www.eia.gov/state/print.php?sid=MD.
[57] The uncertainty stems from the economic pressure on coal as a result of decreasing natural gas prices, as well as from regulations promulgated by the U.S. Environmental Protection Agency.
[58] Case No. 9214, *In the Matter of Whether New Generating Facilities Are Needed to Meet Long-Term Demand for Standard Offer Service.* Order No. 84815 (April 12, 2012) at 19.
[59] PJM categorizes coal generation more than 40 years old and less than 400 MW as at "high-risk" of retirement. Case No. 9214, *In the Matter of Whether New Generating Facilities Are Needed to Meet Long-Term Demand for Standard Offer Service*, PJM Comments, (January 13, 2012) at 11-12.

below depict the electric generating capacity in Maryland, as well as the age of plants by fuel type.[60]

Table 9: Maryland Summer Peak Capacity Profile, 2020[61]

Primary Fuel Type	Capacity	
	Summer (MW)	Percent of Total
Coal	2,963.0	22.8%
Oil	1,314.3	10.1%
Natural Gas	5,694.4	43.8%
Nuclear	1,707.8	13.1%
Hydroelectric	590.0	4.5%
Other and Renewables	729.4	5.6%
Total	**12,998.9**	**100.0%**

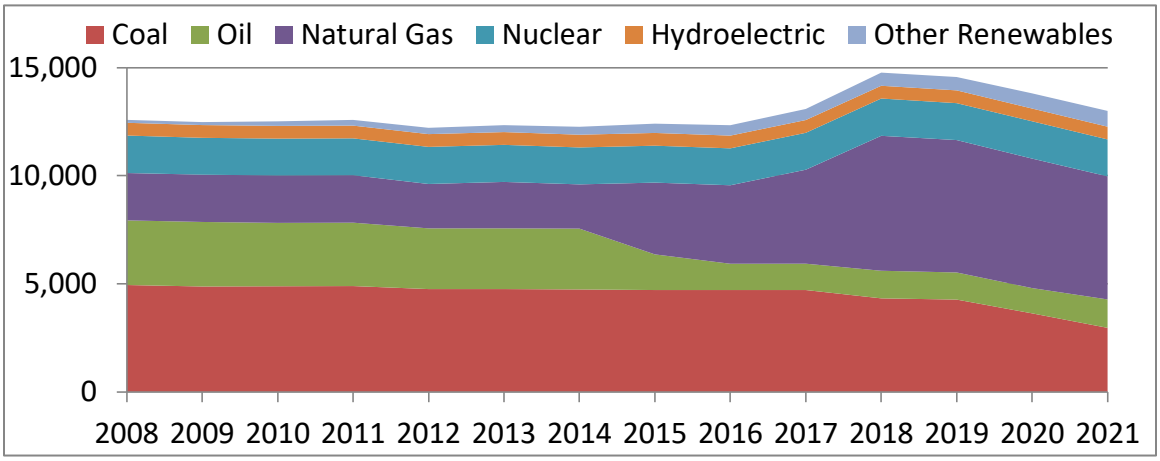
Table 10: Age of Maryland Generation by Fuel Type, 2020[62]

Primary Fuel Type	Age of Plants, By Percent			
	1-10 Years	11-20 Years	21-30 Years	31+ Years
Coal	0%	0%	17%	83%
Oil	6%	6%	10%	79%
Natural Gas	37%	28%	15%	20%
Nuclear	0%	0%	0%	100%
Hydroelectric	0%	0%	0%	100%
Other and Renewables	72%	23%	1%	4%

Maryland's summer peak capacity profile decreased by 812 MW in 2021 compared to 2020, as illustrated in Figure 9. The capacity reduced in 2021 can be largely attributed to decreases in coal.

[60] *See* Appendix Table 5 for a list of Maryland generation capacity in 2021.
[61] *Report EIA-860: "3_1_Generator_Y2021_Early_Release"* Excel, U.S. Energy Information Administration, (June 2, 2022), https://www.eia.gov/electricity/data/eia860/.
[62] *Id.*

Figure 9 Maryland Summer Capacity Profile (MW), 2008 – 2021[63]



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.[64] Conversely, oil and certain natural gas facilities, which operate as mid-merit or peaking units that come on-line when needed, generate 39 percent of the electric energy produced in Maryland while representing 54 percent of in-state capacity. Table 11 summarizes Maryland's 2020 in-state generation profile according to fuel source.

Table 11: Maryland Generation Profile, 2020[65]

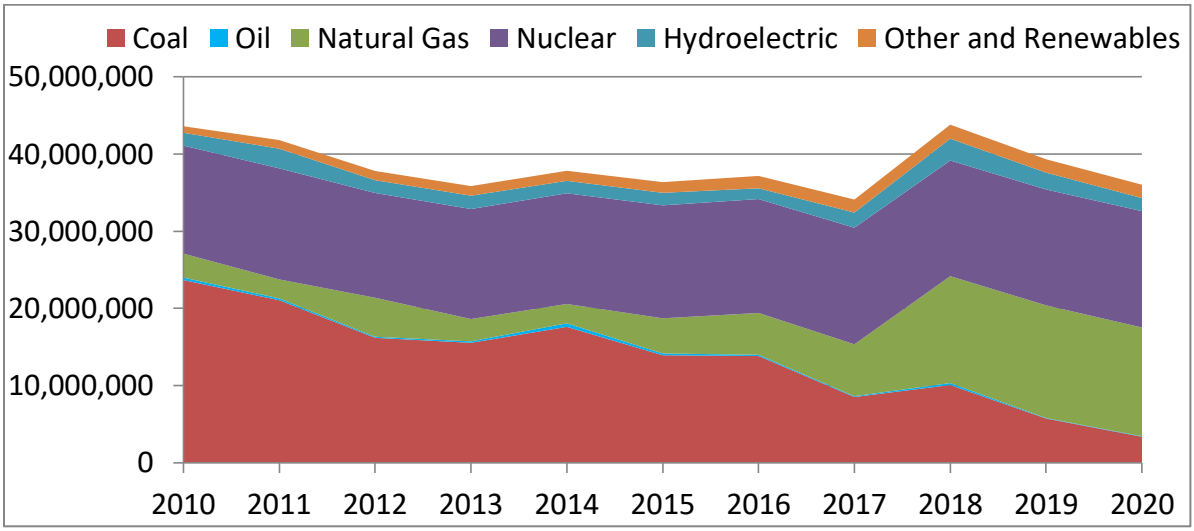
Primary Fuel Source	Generation	
	Annual (MWh)	Percent of Total
Coal	3,359,560	9.3%
Oil	70,379	0.2%
Gas	14,091,778	39.1%
Nuclear	15,080,557	41.9%
Hydroelectric	1,696,803	4.7%
Other & Renewables	1,730,127	4.8%
Total	**36,029,204**	**100.0%**

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

[63] U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report."
[64] *See supra* Table 9. Coal facilities represented 22.8 percent of the in-state capacity in 2021, while nuclear facilities represented 13.1 percent of capacity. Therefore, coal and nuclear facilities combined for 36 percent of Maryland's generating capacity profile in 2021.
[65] *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.

Figure 10 below. Between 2010 and 2020, in-state coal generation decreased by 20,309 GWhs. The percentage of coal generation has dropped from 54 percent in 2010 to 9 percent in 2020. The decrease in in-state generation can be largely attributed to a drop in coal generation, which decreased by 41 percent in 2020 compared to 2021.

Figure 10 Maryland Generation Profile, 2010 – 2020[66]



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 9.3 percent of the in-state generation in 2020. If operational extensions for Maryland coal generation units are not requested, additional in-state resources will be needed to avoid potential reliability concerns.

PJM lists three plants retired in 2021: two coal-powered plants and one methane-powered landfill totaling 672.5 MW in capacity.[67] There are three pending deactivation requests in the Pepco service territory with a combined capacity of 50 MWs; while PJM currently registers 5.8 GW of capacity resources requesting deactivation within the RTO.[68] PJM is completing reliability analyses and has so far identified no reliability impacts associated with these deactivation requests in Maryland.

[66] *Id.*
[67] Generation Deactivations, PJM, *https://www.pjm.com/planning/services-requests/gen-deactivations.aspx*.
[68] *Id.*

2. Proposed Conventional Generation Additions[69]

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 4,790 MWs of proposed new generation active in the PJM queue, with 57 percent consisting of solar projects.[70]

3. Renewable Generation and Proposed Additions[71]

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 2,759 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)
APS	Solar	2020-2024	645.6
	Hydro	2023	15.0
BGE	Solar	2022-2024	72.7
DPL	Solar	2017-2024	616.7
Pepco	Solar	2019-2020	1,377.0
PPL	Solar	2022	12.0
SMECO	Solar	2021-2023	19.6
		Total (MW):	**2,758.6**

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

[69] *See* Appendix Table 6 for a complete list of new renewable generation proposed in Maryland.
[70] New Services Queue, PJM, (July, 2021), https://www.pjm.com/planning/services-requests/interconnection-queues.aspx.
[71] Maryland's Renewable Portfolio Standard has helped incent new renewable generation capacity in Maryland via renewable energy credits ("RECs") and the compliance payments submitted to the Strategic Energy Investment Fund. RECs are the environmental attributes of renewable generation, and are separate from the actual electricity generation from Maryland's renewable resources. More details can be found at the *Renewable Energy Standard Report;* available at*:* *https://www.psc.state.md.us/wp-content/uploads/CY20-RPS-Annual-Report_Final.pdf.*

metering incentives; tax incentives; the community solar pilot 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.[72] 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 as the largest carbon-emission free energy generation source in the state at 82 percent of Maryland's emission-free electricity.[73] 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 Pilot Project Act was passed in 2019 and requires the Commission to establish an energy storage pilot program. The investor-owned electric companies were required to seek Commission approval for two storage pilot projects each in 2020, and the Commission approved eight energy storage pilot projects in April, 2021. 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.

[72] 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).
[73] *Maryland Fact Sheet*, NEI, https://www.nei.org/resources/fact-sheets/maryland.

Table 13 Proposed New Storage Generation in Maryland PJM Queue Effective Date: July 2022

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
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	112.1	6/30/2025
BGE	Northeast-CP Crane 115kV	Baltimore County	Active	AH2-162	200.0	3/1/2026
DPL	Colora 230 kV	Cecil	Active	AF2-208	40.3	10/15/2022
DPL	Airey-Vienna 69 kV II	Dorchester	Active	AG1-450	25.0	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
PEPCO	Dickerson 230 kV	Montgomery	Active	AG1-483	542.5	6/1/2024
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
SMECO	Sollers 230kV	Calvert	Active	AH2-423	180	12/31/2025
				Total	**3,230.3**	

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.[74] 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[75] has experienced significant volatility in Net Zonal Load[76] 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.

[74] PJM Manual 18: PJM Capacity Market, Section 1: Overview of the PJM Capacity Market Reliability Pricing Model, PJM Markets & Operations, (last revised July 27, 2022), https://www.pjm.com/directory/manuals/m18/index.html#Sections/Section%201%20Overview%20of%20the%20PJM%20Capacity%20Market.html.

[75] MAAC includes the South-West MAAC ("SWMAAC") which is the zone serving central Maryland.

[76] 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[77]

Delivery Year	APS ($/MW-day)	BGE ($/MW-day)	DPL ($/MW-day)	PEPCO ($/MW-day)	RTO Price ($/MW-day)
2013/2014	$27.73	$226.15	$245.09	$247.14	$27.73
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

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 2022-2031 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 led by an external facilitator and 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.

[77] *PJM RPM Auction User Information: Delivery Year*, PJM Markets & Operations, (Delivery Years 2012-2023), https://www.pjm.com/markets-and-operations/rpm.aspx.

V. Appendices to the Public Service Commission of Maryland's Ten-Year Plan (2022-2031) 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
2022	2,643	1,332,243	215,538	10,852	17,540	282,523	594,159	173,796	2,874	1,018	**2,633,185**
2023	2,632	1,344,574	216,290	10,871	17,581	283,969	599,547	176,016	2,874	1,018	**2,655,372**
2024	2,645	1,355,844	217,136	10,890	17,621	286,018	604,686	178,126	2,874	1,018	**2,676,858**
2025	2,658	1,367,041	217,948	10,909	17,662	288,131	609,851	180,466	2,874	1,018	**2,698,558**
2026	2,671	1,377,083	218,738	10,928	17,703	290,325	614,917	182,486	2,874	1,018	**2,718,743**
2027	2,698	1,386,813	219,532	10,947	17,743	292,612	620,025	184,586	2,874	1,018	**2,738,849**
2028	2,725	1,395,903	220,329	10,966	17,784	294,983	625,176	186,696	2,874	1,018	**2,758,455**
2029	2,752	1,404,608	221,129	10,985	17,826	297,399	630,370	188,706	2,874	1,018	**2,777,667**
2030	2,780	1,413,405	221,932	11,004	17,867	299,850	635,608	190,816	2,874	1,018	**2,797,153**
2031	2,807	1,422,114	222,737	11,023	17,908	302,323	640,889	192,796	2,874	1,018	**2,816,490**
Change (2022-2031)	**165**	**89,871**	**7,200**	**171**	**368**	**19,800**	**46,730**	**19,000**	**0**	**0**	**183,305**
Percent Change (2022-2031)	**6.23%**	**6.75%**	**3.34%**	**1.58%**	**2.10%**	**7.01%**	**7.86%**	**10.93%**	**0.00%**	**0.00%**	**6.96%**
Compound Annual Growth Rate	**0.67%**	**0.73%**	**0.37%**	**0.17%**	**0.23%**	**0.76%**	**0.84%**	**1.16%**	**0.00%**	**0.00%**	**0.75%**

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
2022	2,167	1,204,219	182,028	8,449	14,911	248,436	543,985	158,100	2,489	858	**2,365,642**
2023	2,154	1,216,086	182,639	8,462	14,948	249,678	548,935	160,200	2,489	858	**2,386,449**
2024	2,165	1,226,891	183,342	8,475	14,986	251,425	553,741	162,200	2,489	858	**2,406,571**
2025	2,176	1,237,623	184,019	8,488	15,023	253,232	558,572	164,400	2,489	858	**2,426,880**
2026	2,186	1,247,200	184,681	8,501	15,061	255,115	563,337	166,300	2,489	858	**2,445,728**
2027	2,208	1,256,465	185,345	8,514	15,098	257,085	568,143	168,300	2,489	858	**2,464,506**
2028	2,230	1,265,090	186,011	8,527	15,136	259,134	572,990	170,300	2,489	858	**2,482,766**
2029	2,253	1,273,329	186,680	8,540	15,174	261,222	577,879	172,200	2,489	858	**2,500,624**
2030	2,275	1,281,661	187,351	8,553	15,212	263,342	582,809	174,200	2,489	858	**2,518,749**
2031	2,298	1,289,904	188,025	8,566	15,250	265,480	587,781	176,100	2,489	858	**2,536,751**
Change (2022-2031)	**131**	**85,686**	**5,997**	**117**	**339**	**17,044**	**43,796**	**18,000**	**0**	**0**	**171,109**
Percent Change (2022-2031)	**6.04%**	**7.12%**	**3.29%**	**1.38%**	**2.27%**	**6.86%**	**8.05%**	**11.39%**	**0.00%**	**0.00%**	**7.23%**
Compound Annual Growth Rate	**0.65%**	**0.77%**	**0.36%**	**0.15%**	**0.25%**	**0.74%**	**0.86%**	**600.00%**	**0.00%**	**0.00%**	**0.78%**

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
2022	322	115,131	29,073	2,403	2,582	31,163	50,023	15,690	341	144	**246,872**
2023	325	115,481	29,212	2,409	2,585	31,375	50,461	15,810	341	144	**248,143**
2024	326	115,832	29,353	2,415	2,588	31,685	50,794	15,920	341	144	**249,398**
2025	328	116,182	29,484	2,421	2,592	31,996	51,128	16,060	341	144	**250,676**
2026	330	116,532	29,611	2,427	2,595	32,311	51,429	16,180	341	144	**251,900**
2027	333	116,883	29,739	2,433	2,598	32,631	51,731	16,280	341	144	**253,113**
2028	336	117,233	29,867	2,439	2,601	32,956	52,035	16,390	341	144	**254,342**
2029	340	117,583	29,996	2,445	2,605	33,284	52,341	16,500	341	144	**255,578**
2030	343	117,934	30,125	2,451	2,608	33,616	52,648	16,610	341	144	**256,819**
2031	347	118,284	30,255	2,457	2,611	33,950	52,958	16,690	341	144	**258,036**
Change (2022-2031)	**24**	**3,153**	**1,182**	**54**	**29**	**2,788**	**2,934**	**1,000**	**0**	**0**	**11,164**
Percent Change (2022-2031)	**7.53%**	**2.74%**	**4.07%**	**2.25%**	**1.13%**	**8.94%**	**5.87%**	**6.37%**	**0.00%**	**0.00%**	**4.52%**
Compound Annual Growth Rate	**0.81%**	**0.30%**	**0.44%**	**0.25%**	**0.12%**	**0.96%**	**0.64%**	**0.69%**	**0.00%**	**0.00%**	**0.49%**

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
2022	128	12,628	530	0	47	2,604	0	6	8	8	**15,958**
2023	128	12,745	532	0	47	2,597	0	6	8	8	**16,071**
2024	128	12,861	535	0	47	2,589	0	6	8	8	**16,182**
2025	129	12,978	537	0	47	2,583	0	6	8	8	**16,295**
2026	130	13,095	539	0	47	2,577	0	6	8	8	**16,410**
2027	131	13,212	541	0	47	2,573	0	6	8	8	**16,526**
2028	132	13,328	544	0	47	2,570	0	6	8	8	**16,643**
2029	134	13,445	546	0	47	2,567	0	6	8	8	**16,761**
2030	135	13,562	548	0	47	2,565	0	6	8	8	**16,879**
2031	136	13,679	551	0	47	2,563	0	6	8	8	**16,998**
Change (2022-2031)	**8**	**1,051**	**21**	**0**	**0**	**(40)**	**0**	**0**	**0**	**0**	**1,040**
Percent Change (2022-2031)	**6.49%**	**8.32%**	**3.91%**	**N/A**	**0.00%**	**-1.55%**	**N/A**	**0.00%**	**0.00%**	**0.00%**	**6.51%**
Compound Annual Growth Rate	**0.70%**	**0.89%**	**0.43%**	**N/A**	**0.00%**	**-0.17%**	**N/A**	**0.00%**	**0.00%**	**0.00%**	**0.70%**

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
2022	25	265	259	0	0	317	151	0	36	8	**1,061**
2023	25	263	259	0	0	316	151	0	36	8	**1,058**
2024	25	260	259	0	0	317	151	0	36	8	**1,056**
2025	25	258	259	0	0	318	151	0	36	8	**1,054**
2026	25	255	259	0	0	319	151	0	36	8	**1,053**
2027	26	254	259	0	0	320	151	0	36	8	**1,053**
2028	26	252	259	0	0	321	151	0	36	8	**1,053**
2029	26	250	259	0	0	323	151	0	36	8	**1,053**
2030	26	249	259	0	0	324	151	0	36	8	**1,053**
2031	27	247	259	0	0	326	151	0	36	8	**1,054**
Change (2022-2031)	**1**	**(18)**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**0**	**(7)**
Percent Change (2022-2031)	**5.42%**	**-6.86%**	**0.00%**	**N/A**	**N/A**	**2.97%**	**0.00%**	**N/A**	**0.00%**	**0.00%**	**-0.70%**
Compound Annual Growth Rate	**0.59%**	**-0.79%**	**0.00%**	**N/A**	**N/A**	**0.33%**	**0.00%**	**N/A**	**0.00%**	**0.00%**	**-0.08%**

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
2022	0	0	0	0	0	3	0	0	0	0	**3**
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**
Change (2022-2031)	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**3**
Percent Change (2022-2030)	**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; these wholesale customers are PJM, Monongahela Power Company, West Penn Power Company and Old Dominion Electric Cooperative.

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

Appendix Table 1(b)(i): Customer Class Breakdown as of December 31, 2021 (number of customers)

	System Wide						Maryland					
Utility	**Residential**	**Com-mercial**	**In-dustrial**	**Other**	**Sales for Resale**	**Total**	**Resi-dential**	**Com-mercial**	**In-dustrial**	**Other**	**Sales for Resale**	**Total**
Berlin	2,139	322	128	25	0	**2,613**	2,139	322	128	25	0	**2,613**
BGE	1,193,243	114,764	12,531	267	0	**1,320,805**	1,193,243	114,764	12,531	267	0	**1,320,805**
DPL	475,020	63,797	285	606	0	**539,709**	181,926	27,613	162	260	0	**209,961**
Easton	8,471	2,390	0	0	0	**10,861**	8,471	2,390	0	0	0	**10,861**
Hagers-town	14,932	2,564	47	0	0	**17,542**	14,932	2,564	47	0	0	**17,542**
PE	375,117	48,640	4,446	604	5	**428,811**	247,054	30,279	2,608	308	3	**280,252**
PEPCO	840,329	78,040	0	175	0	**918,545**	539,800	50,960	0	148	0	**590,908**
SMECO	155,541	15,468	6	431	0	**171,445**	155,541	15,468	6	431	0	**171,445**
Thurmont	2,492	339	8	37	0	**2,876**	2,492	339	8	37	0	**2,876**
William-sport	858	145	8	8	0	**1,019**	858	145	8	8	0	**1,019**
Total	**3,068,142**	**326,468**	**17,458**	**2,153**	**5**	**3,414,226**	**2,346,456**	**244,843**	**15,498**	**1,484**	**3**	**2,608,283**

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' 2021 Energy Sales by Customer Class (GWh)

	System Wide						Maryland					
Utility	**Resi-dential**	**Com-mercial**	**In-dustrial**	**Other**	**Sales for Resale**	**Total**	**Resi-dential**	**Com-mercial**	**In-dustrial**	**Other**	**Sales for Resale**	**Total**
Berlin	27	3	15	0	0	**46**	27	3	15	0	0	**46**
BGE	13,033	2,809	13,098	209	0	**29,150**	13,033	2,809	13,098	209	0	**29,150**
DPL	5,442	5,071	1,541	44	0	**12,099**	2,194	1,618	355	11	0	**4,178**
Easton	112	137	0	0	0	**249**	112	137	0	0	0	**249**
Hagers-town	163	88	60	0	0	**311**	163	88	60	0	0	**311**
PE	5,266	2,785	2,381	22	1,287	**11,741**	3,347	1,986	1,406	16	1,259	**8,014**
PEPCO	8,308	14,692	0	136	0	**23,136**	5,754	7,466	0	59	0	**13,279**
SMECO	2,225	1,193	51	9	0	**3,478**	2,225	1,193	51	9	0	**3,478**
Thurmont	38	16	19	1	0	**73**	38	16	19	1	0	**73**
William-sport	9	3	6	0	0	**19**	9	3	6	0	0	**19**
Total	**34,625**	**26,798**	**17,170**	**423**	**1,287**	**80,302**	**26,903**	**15,321**	**15,009**	**306**	**1,259**	**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
2022	46	29,557	4,876	250	311	8,568	16,206	3,590	75	20	**63,499**
2023	46	29,628	4,921	252	312	8,650	16,415	3,666	75	20	**63,985**
2024	46	29,196	4,962	253	313	8,858	16,634	3,698	75	20	**64,055**
2025	46	29,076	5,004	255	313	9,009	16,850	3,730	75	20	**64,379**
2026	47	28,957	5,047	256	314	9,177	17,070	3,756	75	20	**64,719**
2027	47	28,918	5,026	257	315	9,365	17,060	3,785	75	20	**64,869**
2028	48	28,933	5,005	259	316	9,593	17,049	3,816	75	20	**65,113**
2029	48	28,828	4,984	260	316	9,780	17,038	3,848	75	20	**65,198**
2030	49	28,841	4,963	262	317	9,975	17,028	3,879	75	20	**65,409**
2031	49	28,939	4,943	263	318	10,180	17,017	3,907	75	20	**65,712**
Change (2022-2031)	**3**	**(618)**	**67**	**13**	**7**	**1,613**	**811**	**317**	**0**	**0**	**2,213**
Percent Change (2022-2031)	**6.95%**	**-2.09%**	**1.37%**	**5.03%**	**2.27%**	**18.82%**	**5.01%**	**8.83%**	**0.00%**	**0.00%**	**3.49%**
Compound Annual Growth Rate	**0.75%**	**-0.23%**	**0.15%**	**0.55%**	**0.25%**	**1.93%**	**0.54%**	**0.94%**	**0.00%**	**0.00%**	**0.38%**

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
2022	46	28,813	4,130	250	311	7,401	13,252	3,529	75	20	**57,826**
2023	46	28,864	4,111	252	312	7,354	13,232	3,585	75	20	**57,850**
2024	46	28,946	4,089	253	313	7,431	13,220	3,617	75	20	**58,009**
2025	46	28,826	4,067	255	313	7,451	13,206	3,649	75	20	**57,908**
2026	47	28,707	4,046	256	314	7,489	13,195	3,675	75	20	**57,824**
2027	47	28,668	4,025	257	315	7,547	13,185	3,704	75	20	**57,844**
2028	48	28,683	4,004	259	316	7,644	13,174	3,735	75	20	**57,957**
2029	48	28,578	3,983	260	316	7,701	13,164	3,767	75	20	**57,912**
2030	49	28,591	3,962	262	317	7,766	13,153	3,798	75	20	**57,993**
2031	49	28,689	3,941	263	318	7,841	13,143	3,826	75	20	**58,165**
Change (2022-2031)	**3**	**(124)**	**(188)**	**13**	**7**	**440**	**(109)**	**297**	**0**	**0**	**339**
Percent Change (2022-2031)	**6.95%**	**-0.43%**	**-4.56%**	**5.03%**	**2.27%**	**5.94%**	**-0.82%**	**8.42%**	**0.00%**	**0.00%**	**0.59%**
Compound Annual Growth Rate	**0.75%**	**-0.05%**	**-0.52%**	**0.55%**	**0.25%**	**0.64%**	**-0.09%**	**0.90%**	**0.00%**	**0.00%**	**0.06%**

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
2022	46	29,557	12,860	250	311	16,203	27,600	3,590	75	20	**90,513**
2023	46	29,628	12,964	252	312	16,288	28,126	3,666	75	20	**91,376**
2024	46	29,196	13,078	253	313	16,657	28,381	3,698	75	20	**91,717**
2025	46	29,076	13,187	255	313	16,802	28,625	3,730	75	20	**92,129**
2026	47	28,957	13,303	256	314	17,055	28,897	3,756	75	20	**92,680**
2027	47	28,918	13,310	257	315	17,303	28,693	3,785	75	20	**92,723**
2028	48	28,933	13,316	259	316	17,604	28,492	3,816	75	20	**92,879**
2029	48	28,828	13,323	260	316	17,843	28,296	3,848	75	20	**92,858**
2030	49	28,841	13,330	262	317	18,094	28,103	3,879	75	20	**92,970**
2031	49	28,939	13,337	263	318	18,356	27,914	3,907	75	20	**93,179**
Change (2022-2031)	**3**	**(618)**	**477**	**13**	**7**	**2,153**	**314**	**317**	**0**	**0**	**2,666**
Percent Change (2022-2031)	**6.95%**	**-2.09%**	**3.71%**	**5.03%**	**2.27%**	**13.29%**	**1.14%**	**8.83%**	**0.00%**	**0.00%**	**2.95%**
Compound Annual Growth Rate	**0.75%**	**-0.23%**	**0.41%**	**0.55%**	**0.25%**	**1.40%**	**0.13%**	**0.94%**	**0.00%**	**0.00%**	**0.32%**

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
2022	46	28,813	11,928	250	311	14,975	23,490	3,529	75	20	**83,437**
2023	46	28,864	11,926	252	312	14,930	23,557	3,585	75	20	**83,567**
2024	46	28,946	11,934	253	313	15,168	23,333	3,617	75	20	**83,705**
2025	46	28,826	11,937	255	313	15,184	23,097	3,649	75	20	**83,402**
2026	47	28,707	11,943	256	314	15,306	22,889	3,675	75	20	**83,232**
2027	47	28,668	11,950	257	315	15,424	22,685	3,704	75	20	**83,146**
2028	48	28,683	11,956	259	316	15,594	22,485	3,735	75	20	**83,171**
2029	48	28,578	11,963	260	316	15,703	22,288	3,767	75	20	**83,019**
2030	49	28,591	11,970	262	317	15,824	22,096	3,798	75	20	**83,001**
2031	49	28,689	11,977	263	318	15,955	21,907	3,826	75	20	**83,079**
Change (2022-2031)	**3**	**(124)**	**49**	**13**	**7**	**980**	**(1,583)**	**297**	**0**	**0**	**(358)**
Percent Change (2022-2031)	**6.95%**	**-0.43%**	**0.41%**	**5.03%**	**2.27%**	**6.54%**	**-6.74%**	**8.42%**	**0.00%**	**0.00%**	**-0.43%**
Compound Annual Growth Rate	**0.75%**	**-0.05%**	**0.05%**	**0.55%**	**0.25%**	**0.71%**	**-0.77%**	**0.90%**	**0.00%**	**0.00%**	**-0.05%**

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
2022	11	6,918	1,089	57	63	1,649	4,379	887	14	4	**15,070**
2023	11	6,909	1,102	57	63	1,673	4,646	895	14	4	**15,374**
2024	11	6,804	1,117	58	63	1,704	4,918	898	14	4	**15,590**
2025	11	6,805	1,130	58	63	1,714	5,201	901	14	4	**15,901**
2026	11	6,816	1,143	58	63	1,736	5,462	904	14	4	**16,211**
2027	11	6,813	1,144	58	63	1,758	5,459	906	14	4	**16,231**
2028	11	6,806	1,147	59	64	1,782	5,439	909	14	4	**16,233**
2029	11	6,819	1,148	59	64	1,804	5,438	911	14	4	**16,271**
2030	11	6,814	1,148	59	64	1,827	5,421	914	14	4	**16,276**
2031	12	6,799	1,141	59	64	1,850	5,407	916	14	4	**16,266**
Change (2022-2031)	**1**	**(119)**	**52**	**2**	**1**	**201**	**1,028**	**29**	**0**	**0**	**1,196**
Percent Change (2022-2031)	**7.75%**	**-1.73%**	**4.78%**	**3.94%**	**2.27%**	**12.22%**	**23.49%**	**3.29%**	**0.00%**	**0.00%**	**7.94%**
Compound Annual Growth Rate	**0.83%**	**-0.19%**	**0.52%**	**0.43%**	**0.25%**	**1.29%**	**2.37%**	**0.36%**	**0.00%**	**0.00%**	**0.85%**

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) [78]

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2022	5	6,414	909	57	63	1,461	3,121	816	14	4	**12,863**
2023	5	6,391	911	57	63	1,466	3,116	821	14	4	**12,847**
2024	5	6,389	913	58	63	1,465	3,116	824	14	4	**12,851**
2025	5	6,390	915	58	63	1,466	3,126	827	14	4	**12,867**
2026	5	6,401	915	58	63	1,467	3,115	830	14	4	**12,873**
2027	5	6,398	916	58	63	1,469	3,112	832	14	4	**12,873**
2028	6	6,391	919	59	64	1,472	3,091	835	14	4	**12,854**
2029	6	6,404	920	59	64	1,475	3,090	837	14	4	**12,873**
2030	6	6,399	920	59	64	1,477	3,074	840	14	4	**12,857**
2031	6	6,384	913	59	64	1,480	3,060	842	14	4	**12,826**
Change (2022-2031)	**1**	**(30)**	**5**	**2**	**1**	**19**	**(61)**	**26**	**-**	**-**	**(37)**
Percent Change (2022-2031)	**16.33%**	**-0.47%**	**0.52%**	**3.94%**	**2.27%**	**1.28%**	**-1.95%**	**3.19%**	**0.00%**	**0.00%**	**-0.29%**
Compound Annual Growth Rate	**1.70%**	**-0.05%**	**0.06%**	**0.43%**	**0.25%**	**0.14%**	**-0.22%**	**0.35%**	**0.00%**	**0.00%**	**-0.03%**

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

[78] 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
2022	15	5,894	961	52	69	1,795	2,631	856	20	5	**12,297**
2023	16	5,917	969	52	69	1,817	2,656	948	20	5	**12,469**
2024	17	5,924	976	52	69	1,856	2,676	954	20	5	**12,549**
2025	17	5,955	981	53	69	1,870	2,686	966	20	5	**12,623**
2026	18	5,990	987	53	69	1,901	2,690	978	20	5	**12,711**
2027	19	6,032	994	53	69	1,934	2,698	993	20	5	**12,817**
2028	19	6,075	1,002	53	70	1,975	2,707	1,006	20	5	**12,932**
2029	20	6,107	1,007	54	70	2,006	2,708	1,019	20	5	**13,016**
2030	21	6,135	1,018	54	70	2,042	2,704	1,033	20	5	**13,101**
2031	21	6,170	1,022	54	70	2,081	2,706	1,046	20	5	**13,195**
Change (2022-2031)	**6**	**276**	**61**	**3**	**2**	**286**	**75**	**190**	**0**	**0**	**898**
Percent Change (2022-2031)	**37.99%**	**4.69%**	**6.34%**	**4.87%**	**2.27%**	**15.95%**	**2.85%**	**22.13%**	**0.00%**	**0.00%**	**7.30%**
Compound Annual Growth Rate	**3.64%**	**0.51%**	**0.69%**	**0.53%**	**0.25%**	**1.66%**	**0.31%**	**2.25%**	**0.00%**	**0.00%**	**0.79%**

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
2022	15	5,780	961	52	69	1,615	2,631	856	20	5	**12,004**
2023	16	5,802	969	52	69	1,618	2,656	948	20	5	**12,155**
2024	17	5,849	976	52	69	1,627	2,676	954	20	5	**12,245**
2025	17	5,880	981	53	69	1,633	2,686	966	20	5	**12,311**
2026	18	5,915	987	53	69	1,645	2,690	978	20	5	**12,380**
2027	19	5,957	994	53	69	1,659	2,698	993	20	5	**12,466**
2028	19	6,000	1,002	53	70	1,680	2,707	1,006	20	5	**12,562**
2029	20	6,032	1,007	54	70	1,692	2,708	1,019	20	5	**12,627**
2030	21	6,060	1,018	54	70	1,708	2,704	1,033	20	5	**12,693**
2031	21	6,095	1,022	54	70	1,728	2,706	1,046	20	5	**12,768**
Change (2022-2031)	**6**	**315**	**61**	**3**	**2**	**113**	**75**	**190**	**0**	**0**	**763**
Percent Change (2022-2031)	**37.99%**	**5.45%**	**6.34%**	**4.87%**	**2.27%**	**7.00%**	**2.85%**	**22.13%**	**0.00%**	**0.00%**	**6.36%**
Compound Annual Growth Rate	**3.64%**	**0.59%**	**0.69%**	**0.53%**	**0.25%**	**0.75%**	**0.31%**	**2.25%**	**0.00%**	**0.00%**	**0.69%**

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
2022	11	6,918	4,086	57	63	3,009	7,171	887	14	4	**22,220**
2023	11	6,909	4,118	57	63	3,042	7,440	895	14	4	**22,552**
2024	11	6,804	4,153	58	63	3,080	7,723	898	14	4	**22,807**
2025	11	6,805	4,183	58	63	3,094	8,016	901	14	4	**23,148**
2026	11	6,816	4,210	58	63	3,119	8,267	904	14	4	**23,465**
2027	11	6,813	4,215	58	63	3,144	8,261	906	14	4	**23,489**
2028	11	6,806	4,225	59	64	3,171	8,222	909	14	4	**23,484**
2029	11	6,819	4,232	59	64	3,196	8,220	911	14	4	**23,529**
2030	11	6,814	4,230	59	64	3,220	8,189	914	14	4	**23,518**
2031	12	6,799	4,201	59	64	3,245	8,163	916	14	4	**23,476**
Change (2022-2031)	**1**	**(119)**	**115**	**2**	**1**	**235**	**992**	**29**	**0**	**0**	**1,256**
Percent Change (2022-2031)	**7.75%**	**-1.73%**	**2.81%**	**3.94%**	**2.27%**	**7.82%**	**13.83%**	**3.29%**	**0.00%**	**0.00%**	**5.65%**
Compound Annual Growth Rate	**0.83%**	**-0.19%**	**0.31%**	**0.43%**	**0.25%**	**0.84%**	**1.45%**	**0.36%**	**0.00%**	**0.00%**	**0.61%**

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)[79, 80]

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2022	5	6,414	3,873	57	63	2,814	5,902	816	14	4	**19,962**
2023	5	6,391	3,882	57	63	2,826	5,892	821	14	4	**19,955**
2024	5	6,389	3,893	58	63	2,833	5,892	824	14	4	**19,975**
2025	5	6,390	3,899	58	63	2,838	5,912	827	14	4	**20,010**
2026	5	6,401	3,902	58	63	2,842	5,891	830	14	4	**20,011**
2027	5	6,398	3,907	58	63	2,847	5,885	832	14	4	**20,014**
2028	6	6,391	3,917	59	64	2,854	5,846	835	14	4	**19,989**
2029	6	6,404	3,924	59	64	2,858	5,844	837	14	4	**20,013**
2030	6	6,399	3,922	59	64	2,862	5,813	840	14	4	**19,983**
2031	6	6,384	3,893	59	64	2,867	5,787	842	14	4	**19,920**
Change (2022-2031)	**1**	**(30)**	**20**	**2**	**1**	**53**	**(115)**	**26**	**0**	**0**	**(42)**
Percent Change (2022-2031)	**16.33%**	**-0.47%**	**0.52%**	**3.94%**	**2.27%**	**1.88%**	**-1.95%**	**3.19%**	**0.00%**	**0.00%**	**-0.21%**
Compound Annual Growth Rate	**1.70%**	**-0.05%**	**0.06%**	**0.43%**	**0.25%**	**0.21%**	**-0.22%**	**0.35%**	**0.00%**	**0.00%**	**-0.02%**

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.

[79] 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.
[80] 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
2022	15	5,894	3,596	52	69	3,510	5,331	856	20	5	**19,348**
2023	16	5,917	3,628	52	69	3,548	5,381	948	20	5	**19,584**
2024	17	5,924	3,653	52	69	3,600	5,422	954	20	5	**19,716**
2025	17	5,955	3,672	53	69	3,622	5,443	966	20	5	**19,822**
2026	18	5,990	3,694	53	69	3,660	5,451	978	20	5	**19,938**
2027	19	6,032	3,718	53	69	3,703	5,466	993	20	5	**20,078**
2028	19	6,075	3,749	53	70	3,753	5,485	1,006	20	5	**20,235**
2029	20	6,107	3,770	54	70	3,790	5,486	1,019	20	5	**20,340**
2030	21	6,135	3,810	54	70	3,832	5,479	1,033	20	5	**20,459**
2031	21	6,170	3,824	54	70	3,880	5,483	1,046	20	5	**20,574**
Change (2022-2031)	**6**	**276**	**228**	**3**	**2**	**370**	**152**	**190**	**0**	**0**	**1,226**
Percent Change (2022-2031)	**37.99%**	**4.69%**	**6.34%**	**4.87%**	**2.27%**	**10.54%**	**2.85%**	**22.13%**	**0.00%**	**0.00%**	**6.34%**
Compound Annual Growth Rate	**3.64%**	**0.51%**	**0.69%**	**0.53%**	**0.25%**	**1.12%**	**0.31%**	**2.25%**	**0.00%**	**0.00%**	**0.68%**

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	Hagers-town	PE	Pepco	SMECO	Thur-mont	William-sport	Total
2022	15	5,780	3,596	52	69	3,323	5,331	856	20	5	**19,047**
2023	16	5,802	3,628	52	69	3,341	5,381	948	20	5	**19,262**
2024	17	5,849	3,653	52	69	3,363	5,422	954	20	5	**19,404**
2025	17	5,880	3,672	53	69	3,377	5,443	966	20	5	**19,502**
2026	18	5,915	3,694	53	69	3,396	5,451	978	20	5	**19,599**
2027	19	5,957	3,718	53	69	3,419	5,466	993	20	5	**19,719**
2028	19	6,000	3,749	53	70	3,450	5,485	1,006	20	5	**19,857**
2029	20	6,032	3,770	54	70	3,468	5,486	1,019	20	5	**19,943**
2030	21	6,060	3,810	54	70	3,491	5,479	1,033	20	5	**20,042**
2031	21	6,095	3,824	54	70	3,519	5,483	1,046	20	5	**20,138**
Change (2022-2031)	**6**	**315**	**228**	**3**	**2**	**197**	**152**	**190**	**0**	**0**	**1,091**
Percent Change (2022-2031)	**37.99%**	**5.45%**	**6.34%**	**4.87%**	**2.27%**	**5.93%**	**2.85%**	**22.13%**	**0.00%**	**0.00%**	**5.73%**
Compound Annual Growth Rate	**3.64%**	**0.59%**	**0.69%**	**0.53%**	**0.25%**	**0.64%**	**0.31%**	**2.25%**	**0.00%**	**0.00%**	**0.62%**

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 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**
PE	138	0.1	2	2013	2023	2023	Accommodate for Generator Interconnection	Allegany	Dans Mountain (new)	Allegany	Carlos Junction-Ridgeley (WV)
PE	230	0	1	2017	2022	2022	Baseline Transmission Reliability	Washington	Ringgold	Washington	Ringgold
PE	230	0	1	2017	2022	2022	Baseline Transmission Reliability	Frederick	Catoctin	Frederick	Catoctin
PE	230	9.7	1	2017	2022	2022	Baseline Transmission Reliability	Washington	Ringgold	Frederick	Catoctin
PE	230	0	1	2017	2022	2022	Baseline Transmission Reliability	Frederick	Garfield	Frederick	Garfield
PE	138	0	1	2019	2024	2024	Baseline Transmission Reliability	Allegany	Messick Road	Morgan (WV)	Morgan
PE	138	1.8	1	2022	7/17/1905	7/17/1905	Baseline Transmission Reliability	Allegany	Messick Road	Morgan (WV)	Ridgeley
PE	500	15.3	1.00	2021	2025	7/17/1905	Rebuild Existing Line	Frederick	Doubs	Loudoun (VA)	Goose Creek (DOM)
PE	230	0.2	1	2019	2023	7/15/1905	Baseline Transmission Reliability	Frederick	Doubs	Frederick	Monocacy
SMECO	69	6.8	1	Q4 - 2021	Q4 - 2022	Q4 - 2022	capacity / reliability	Charles	Ryceville	Saint Mary's	Chaptico

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

Appendix 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 George's	659.0	595.0	90%
Lanyard Power Holdings, LLC	Chalk Point Power	Prince George's	659.0	585.3	89%
Lanyard Power Holdings, LLC	Chalk Point Power	Prince George's	35.0	24.0	69%
Lanyard Power Holdings, LLC	Chalk Point Power	Prince George's	103.0	86.0	83%
Lanyard Power Holdings, LLC	Chalk Point Power	Prince George's	103.0	86.0	83%
Lanyard Power Holdings, LLC	Chalk Point Power	Prince George's	125.0	109.0	87%
Lanyard Power Holdings, LLC	Chalk Point Power	Prince George's	125.0	109.0	87%
Lanyard Power Holdings, LLC	Dickerson Power	Montgomery	19.0	18.0	95%
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%
Lanyard Power Holdings, LLC	Morgantown Generating Plant	Charles	18.0	13.0	72%

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

Owner / Operator	Plant Name	County	Capacity Statistics (MW)		
			Nameplate	Summer	% Summer
Lanyard Power Holdings, LLC	Morgantown Generating Plant	Charles	18.0	13.0	72%
Lanyard Power Holdings, LLC	Morgantown Generating Plant	Charles	626.0	596.0	95%
Lanyard Power Holdings, LLC	Morgantown Generating Plant	Charles	626.0	609.0	97%
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%
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%

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

Owner / Operator	Plant Name	County	Capacity Statistics (MW)		
			Nameplate	Summer	% Summer
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 George's	0.9	0.8	89%
Prince George's County	Brown Station Road Plant I	Prince George's	0.9	0.8	89%
Prince George's County	Brown Station Road Plant I	Prince George's	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 George's	98.7	98.7	100%
KMC Thermo, LLC	Brandywine Power Facility	Prince George's	98.7	98.7	100%
KMC Thermo, LLC	Brandywine Power Facility	Prince George's	91.4	230.0	252%
Prince George's County	Brown Station Road Plant II	Prince George's	1.0	0.8	80%
Prince George's County	Brown Station Road Plant II	Prince George's	1.0	0.8	80%
Prince George's County	Brown Station Road Plant II	Prince George's	1.0	0.8	80%
Prince George's County	Brown Station Road Plant II	Prince George's	1.0	0.8	80%
Trigen-Cinergy Solutions College Park	UMCP CHP Plant	Prince George's	11.0	9.4	85%
Trigen-Cinergy Solutions College Park	UMCP CHP Plant	Prince George's	11.0	9.4	85%
Trigen-Cinergy Solutions College Park	UMCP CHP Plant	Prince George's	5.4	2.0	37%
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%
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%

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

Owner / Operator	Plant Name	County	Capacity Statistics (MW)		
			Nameplate	Summer	% Summer
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	214.5	96%
CPV Maryland LLC	CPV St Charles Energy Center	Charles	223.6	214.1	96%
CPV Maryland LLC	CPV St Charles Energy Center	Charles	328.1	304.9	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%
Constellation Solar Maryland, LLC	McCormick & Co. Inc. at Belcamp	Harford	1.4	1.4	100%
NRG Solar Arrowhead LLC	FedEx Field Solar Facility	Prince George's	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 George's	1.0	1.0	100%
IKEA Property Inc	IKEA College Park 411	Prince George's	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%
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%
Constellation Solar Maryland II LLC	UMMS at Pocomoke	Somerset	2.8	2.8	100%
CD Arevon USA, 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 Anne's	2.0	2.0	100%
Fourmile Wind Energy, LLC	Fourmile Ridge	Garrett	40.0	40.0	100%

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

Owner / Operator	Plant Name	County	Capacity Statistics (MW)		
			Nameplate	Summer	% Summer
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	242.5	78%
Old Dominion Electric Coop	Wildcat Point Generation Facility	Cecil	310.3	242.5	78%
Old Dominion Electric Coop	Wildcat Point Generation Facility	Cecil	493.0	492.0	100%
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%
Constellation Solar Maryland, LLC	General Motors Corp at White Marsh MD	Baltimore	1.0	1.0	100%
Constellation 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%
Constellation 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 George's	359.6	299.0	83%
PSEG Keys Energy Center, LLC	Keys Energy Center	Prince George's	235.5	231.0	98%
PSEG Keys Energy Center, LLC	Keys Energy Center	Prince George's	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 Anne's	1.5	1.5	100%
Altus Power America Management, LLC	MEBA	Talbot	1.5	1.5	100%
Tesla Inc.	Wye Mills VNEM CSG	Queen Anne's	10.0	10.0	100%
Constellation Solar MC, LLC	Archdiocese of Baltimore J	Harford	2.0	2.0	100%
Constellation Solar MC, LLC	Archdiocese of Baltimore L	Harford	2.0	2.0	100%
Constellation Solar MC, LLC	Baltimore City B	Harford	2.0	2.0	100%
Constellation Solar MC, LLC	Baltimore City D	Harford	2.0	2.0	100%
Constellation Solar MC, LLC	Baltimore City F	Harford	2.0	2.0	100%
Constellation Solar MC, LLC	Baltimore City G	Harford	2.0	2.0	100%
Constellation Solar MC, LLC	City of Havre De Grace C	Harford	2.0	2.0	100%
Constellation 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%
Constellation Solar MC, LLC	Havre de Grace II - E at Perryman	Harford	1.4	1.4	100%
Goldman Sachs Renewable Power Group	Longview Solar	Wicomico	13.6	13.6	100%
Goldman Sachs Renewable Power Group	Church Hill	Queen Anne's	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%

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

Owner / Operator	Plant Name	County	Capacity Statistics (MW)		
			Nameplate	Summer	% Summer
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%
IGS Solar I, LLC	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 George's	1.6	1.6	100%
Constellation Solar MC, LLC	Gateway Solar	Worcester	5.0	5.0	100%
Constellation Solar MC, LLC	Gateway Solar	Worcester	2.6	2.6	100%
NRG Chalk Point CT	NRG Chalk Point CT	Prince George's	94.0	84.3	90%
Terraform Arcadia	Bowie State Solar	Prince George's	1.3	1.3	100%
IOS II LLC	First Baptist Church of Glenarden	Prince George's	1.5	1.6	107%
Tesla Inc.	Bd of Educ of Queen Anne's Cnty, Cnty HS	Queen Anne's	1.7	1.7	100%
Constellation New Energy Inc.	NIST Solar	Montgomery	4.0	4.0	100%
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 George's	5.0	5.0	100%
Greenbacker Renewable Energy Corporation	Sol Phoenix	Prince George's	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 Anne's	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	Kingsville CSG	Baltimore	2.0	2.0	100%
Nautilus Solar Solutions	Upper Marlboro 1 CSG	Prince George's	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 George's	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%
Goldman Sachs Renewable Power Group	Spruce - WCMD - Rubble II	Washington	2.0	2.0	100%
Goldman Sachs Renewable Power Group	Spruce - WCMD - Rubble I	Washington	2.0	2.0	100%
Goldman Sachs Renewable Power Group	Spruce - WCMD - Creek	Washington	2.0	2.0	100%
Goldman Sachs Renewable Power Group	Spruce - WCMD - Resh I	Washington	2.0	2.0	100%
Sheriff Rd Solar LLC	Sheriff Road	Prince George's	1.1	1.1	100%

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

Owner / Operator	Plant Name	County	Capacity Statistics (MW)		
			Nameplate	Summer	% Summer
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%
Forefront Power, LLC	MD - CS - Potomac Edison Co - GA29 TPE	Garrett	2.0	2.0	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 George's	1.3	1.3	100%
Standard Solar	MNCPPC Randall Farm	Prince George's	1.4	1.4	100%
Nautilus Solar Solutions	Burns Solar One LLC	Baltimore	2.0	2.0	100%
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	P52ES Raphel Rd Community Solar LLC	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 George's	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 George's	2.0	2.0	100%
Hampstead Solar, LLC	Bomber CSG	Carroll	6.0	6.0	100%
Lanyard Power Holdings, LLC	Chalk Point Steam	Prince George's	16.0	18.0	113%
ICFTS MD Solar, LLC	Hollins Ferry CSG	Baltimore City	1.5	1.5	100%
Standard Solar	OER Monarch CSG	Prince George's	2.0	2.0	100%
Standard Solar	Shepherds Mill CSG	Carroll	2.0	2.0	100%
Snowden River Parkway, LLC	Snowden River CSG	Howard	1.9	1.9	100%
			14,271.1	**13,005.8**	**91%**

Appendix 6: Proposed New Renewable Generation in Maryland PJM Queue

Appendix 6: Proposed New Renewable Generation in Maryland PJM Queue
Effective Date: July 2022

Transmission Owner	Project Name	County Location	PJM Queue Status	PJM Queue #	Fuel Type	Project Capacity (MW)	Projected In-Service Date
APS	Frostburg 138kV	Allegany	Active	AE2-030	Solar	7.56	8/24/2020
APS	Bedington 138 kV	Frederick	Active	AE2-333	Solar	60	12/1/2022
APS	Oakland-Gorman 69 kV	Garrett	Active	AF2-112	Solar	6.7	6/1/2022
APS	Albright-Mt. Zion 138 kV	Garrett	Active	AF2-356	Solar	105	12/1/2022
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
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	East New Market 69kV	Dorchester	Active	AC1-190	Solar	35	12/31/2017
DPL	Easton-Steele 138 kV	Talbot	Active	AE2-093	Solar	16.72	11/30/2021
DPL	Easton-Steele 138 kV II	Talbot	Active	AF1-015	Solar	6.3	11/30/2021
DPL	Price 69 kV	Queen Anne's	Active	AF2-313	Solar	12.7	8/15/2021
DPL	Jacktown 12 kV	Dorchester	Active	AF2-325	Solar	4.2	2/28/2022
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	3.5557	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	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	Bishopville - Worcester 138 kV	Worcester	Active	AH2-354	Solar	18.6	9/2/2024
DPL	Easton - Steele 138 kV IV	Talbot	Active	AH2-365	Solar	10.787	6/1/2024
DPL	Church - Oil City 138 kV III	Caroline	Active	AH2-370	Solar	17.816	11/15/2023
DPL	Sign Post - Stockton 69 kV	Worcester	Active	AH2-379	Solar	16.98	3/1/2026
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	**2,758.57**	