PUBLIC SERVICE COMMISSION OF MARYLAND

TEN-YEAR PLAN (2021 – 2030) 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 2021

State of Maryland
Public Service Commission

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I. Introduction

This report constitutes the Maryland Public Service Commission's *Ten-Year Plan (2021-2030) 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 2021 – 2030 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

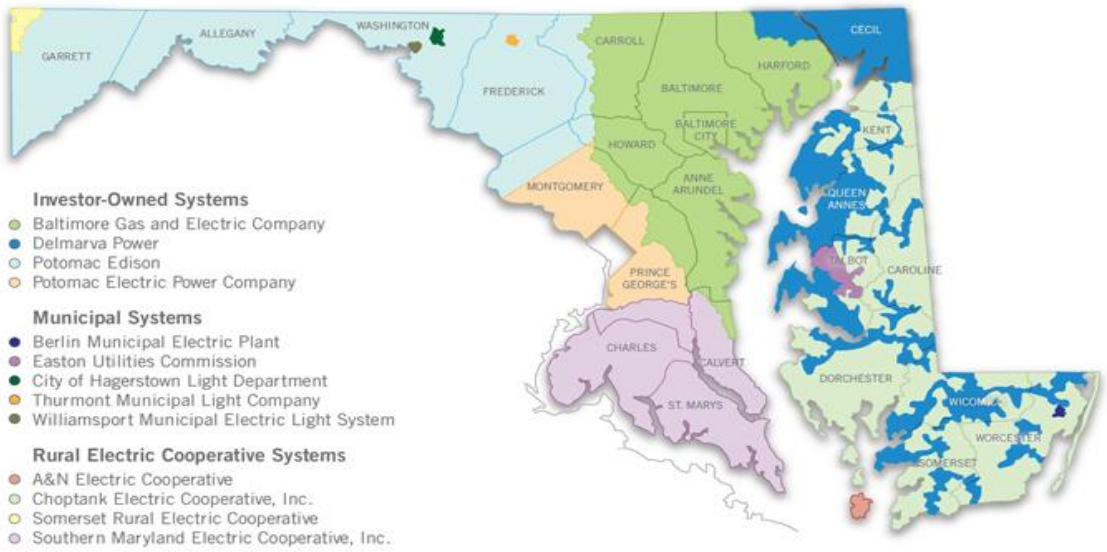
Maryland is geographically divided into 13 electric utility service territories.[2] The four largest, by number of Maryland customers, are served by investor-owned utilities ("IOUs"); four represent electric cooperatives (two of which serve mainly rural areas of

[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 are as follows: 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 PJM forecast zones of which Maryland is comprised.

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

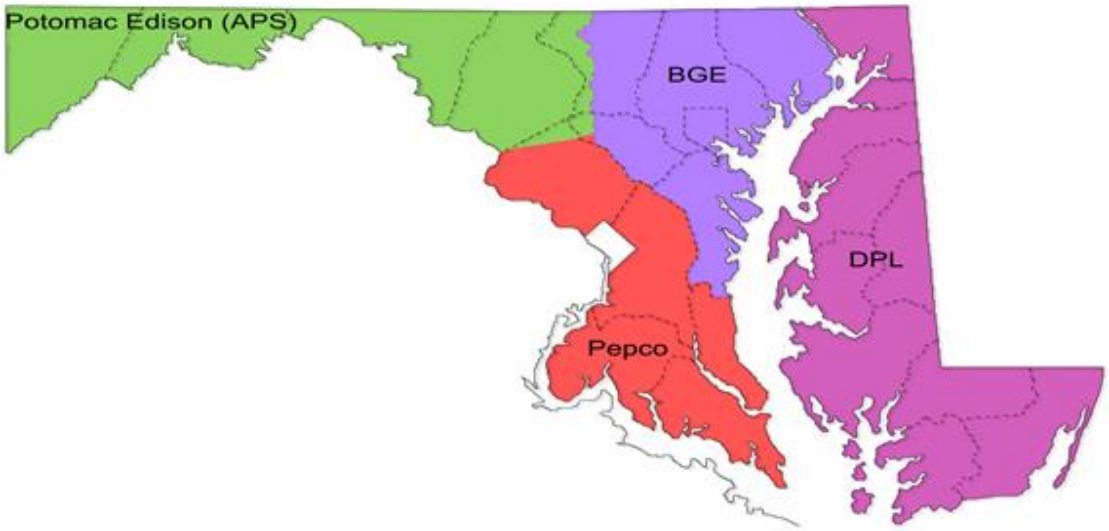


[3] The Commission regulates all Maryland public service companies, as defined by §1-101(x) of the Public Utilities Article, *Annotated Code of Maryland*.

[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 2020) load forecast with that of the previous year (*i.e.* September 2019), as depicted below in Table 1. At the outset of the 2021 – 2030 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 recovering from the impacts of COVID-19, which are forecasted to show a 1st quarter leap in GDP of 6.4%.[7]

Demand forecasts submitted by the Maryland utilities for the 2021 – 2030 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.

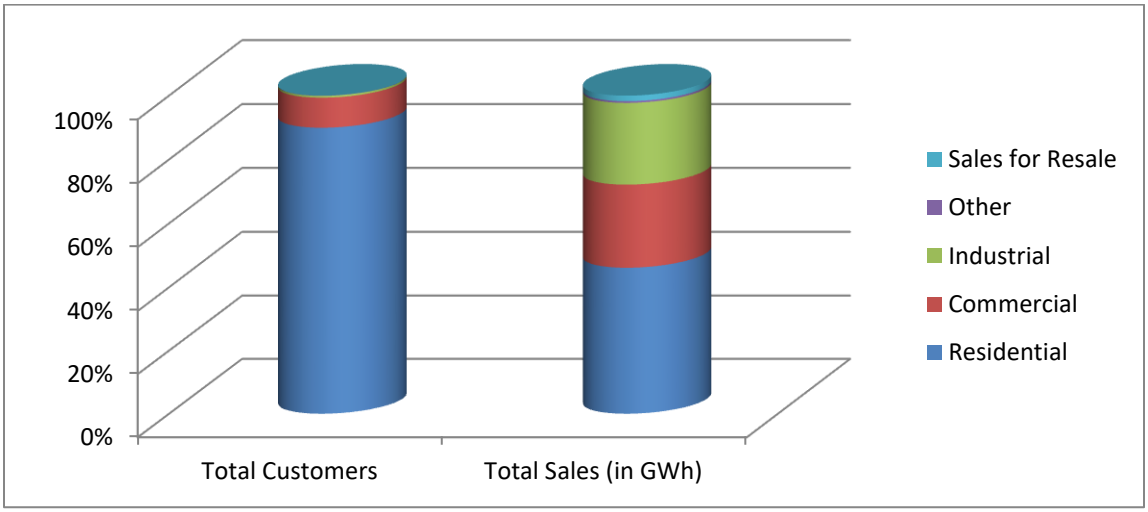
Table 1: Comparison of Compound Annual Growth Rate Projections – 2018, 2019, 2020 and 2021[8]

Forecasts	Ten Year Plan 2018-2027	Ten Year Plan 2019-2028	Ten Year Plan 2020-2029	Ten Year Plan 2021-2030
Customer Growth	0.8%	0.8%	0.7%	0.7%
Energy Sales	-0.5%	-0.2%	0.1%	0.4%
Summer Peak Demand	0.4%	0.3%	0.3%	1.4%
Winter Peak Demand	0.2%	0.3%	0.5%	0.7%

A. Customer Growth Forecasts[9]

At the close of 2020, approximately 90% of utility customers in Maryland were categorized as residential ratepayers; however, residential sales represented only 46% 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% 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 2020

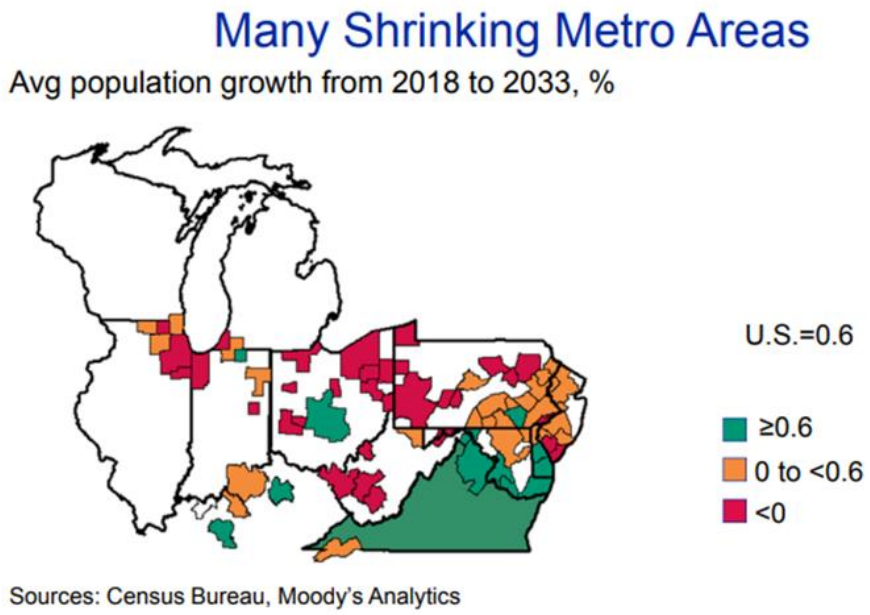


Utility customer growth, particularly in the residential sector, is closely linked to household formation projections. The current PJM load forecast incorporates projections of a near-term slow growth in housing formation rates with a more positive long-term

[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).

forecast.[11] Over the planning horizon, however, the projected housing formation rates differ widely across the PJM service territory, as evidenced by Figure 4 below.

Figure 4 Average Annual Household Growth from 2018 to 2033 (%)[12]



As illustrated by Figure 4 above, Maryland, along with other southern PJM states, has higher household formation rates than the remaining territory, and thus higher utility customer growth projections. The PJM load forecast attributes the increased household and customer projections to expected growth in service-oriented industries in the applicable states, including Maryland.[13] This trend regarding population growth, near-term increases in housing formation, and long-term stability is mirrored by the Maryland utilities' forecasts regarding customer growth. As reflected in Table 2 below, the statewide forecasted compound annual growth rate during the planning period is 0.69% for all customer classes, which translates into a 6.43% increase in the total number of Maryland customers by the end of this ten-year planning period.

[11] *PJM Load Forecast Report,* PJM, (Jan. 2021), https://www.pjm.com/-/media/library/reports-notices/load-forecast/2021-load-report.ashx.
[12] *PJM Load Forecast Report,* PJM, (Jan. 2019), https://www.pjm.com/-/media/library/reports-notices/load-forecast/2019-load-report.ashx.
[13] *Id.*

Table 2: Maryland Customer Forecast (All Customer Classes)[14]

Year	Berlin	BGE	DPL	Easton	Hagers-town	PE	Pepco	SMECO	Thur-mont	William-sport	Total
2021	2,607	1,314,992	209,424	10,868	17,523	277,612	588,336	171,794	2,880	1,017	**2,597,053**
2022	2,607	1,320,906	210,634	10,887	17,578	279,583	594,835	173,704	2,880	1,017	**2,614,631**
2023	2,620	1,331,008	211,491	10,906	17,615	281,779	598,641	175,824	2,880	1,017	**2,633,782**
2024	2,634	1,341,035	212,339	10,925	17,653	283,956	602,068	177,824	2,880	1,017	**2,652,330**
2025	2,647	1,351,125	213,191	10,944	17,690	286,087	605,517	180,084	2,880	1,017	**2,671,181**
2026	2,673	1,361,215	214,047	10,963	17,728	288,165	608,986	182,104	2,880	1,017	**2,689,778**
2027	2,700	1,371,305	214,907	10,982	17,766	290,180	612,476	184,114	2,880	1,017	**2,708,327**
2028	2,727	1,381,395	215,771	11,001	17,804	292,154	615,987	186,144	2,880	1,017	**2,726,881**
2029	2,754	1,391,485	216,639	11,020	17,842	294,097	619,520	188,164	2,880	1,017	**2,745,418**
2030	2,782	1,401,575	217,511	11,039	17,880	296,051	623,075	190,194	2,880	1,017	**2,764,003**
Change (2021-2030)	**174**	**86,583**	**8,088**	**171**	**357**	**18,439**	**34,738**	**18,400**	**-**	**-**	**166,950**
Percent Change (2021-2030)	**6.69%**	**6.58%**	**3.86%**	**1.57%**	**2.04%**	**6.64%**	**5.90%**	**10.71%**	**0.00%**	**0.00%**	**6.43%**
Compound Annual Growth Rate	**0.72%**	**0.71%**	**0.42%**	**0.17%**	**0.22%**	**0.72%**	**0.64%**	**1.14%**	**0.00%**	**0.00%**	**0.69%**

The customer forecasts provided by the utilities are comparable to the forecasts they provided for the 2020 – 2029 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 157,073 customers by 2030, or 94% 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%, or 17,300 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 83,456 residential customers forecasted during this planning period.[15] BGE's projected increase in its residential customer base accounts for 53% of the total number of new residential customers across all service territories during the ten-year planning period.[16] The increase in residential customers for BGE translates into a compound annual growth rate of 0.76%.[17]

Although several 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 0.13% lower than the projections provided during the previous planning period. The most significant percentage change observable in the aggregated

[14] *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 2021 data request for the Ten-Year Plan.
[15] *See* Appendix Table 1(a)(ii).
[16] *Id.*
[17] *Id.*

statewide data between the previous and current Ten-Year Plan forecasts is within the "Industrial" customer class,[18] largely attributable to a decreased projection by BGE.

Table 3: Projected Percentage Increase in the Number of Customers by Class, 2021 – 2030[19]

	All Utilities		
Class	**2020 to 2029**	**2021 to 2030**	**Difference**
Residential	6.83%	6.72%	-0.11%
Commercial	4.11%	3.88%	-0.23%
Industrial	4.69%	2.70%	-1.99%
Other	1.44%	1.16%	-0.28%
Resale	0.00%	0.00%	0.00%
Total Customers	**6.56%**	**6.43%**	**-0.13%**

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."[20] 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 ten-year planning period, as provided by the utilities.

[18] 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.

[19] *See* Appendix Table 1(a)(i)-(vi) for more information.

[20] *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.

Table 4: Maryland Energy Sales Forecast (GWh) (Gross of DSM) [21]

	Berlin	BGE	DPL	Easton	Hagers -town	PE	Pepco	SMECO	Total
Change (2021-2030)	2	1,157	(339)	13	19	1,082	297	349	2,579
Percent Change (2021-2030)	4.98%	4.00%	-7.06%	5.29%	6.32%	13.27%	1.76%	9.77%	4.09%
Compound Annual Growth Rate	0.54%	0.44%	-0.81%	0.57%	0.68%	1.39%	0.19%	1.04%	0.45%

The aggregated forecasts show a compound annual increase of 0.45% across all the Maryland service territories for 2021 – 2030, an increase from the 0.14% annual growth rate reported in the 2020 – 2029 Ten-Year Plan. This result is primarily due to BGE's revised projections of a higher energy sales growth rate in the 2021 – 2030 Ten-Year Plan. The overall growth projected by DPL for this ten-year planning period is the lowest of any Maryland utility in absolute terms, with the Company projecting 339 GWh less in energy sales by 2030.

C. Peak Load Forecasts

PJM's 2021 Load Forecast Report includes long-term projections of peak loads for the entire wholesale market region and each PJM zone.[22,23] 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.[24] According to PJM's 2021 Load Forecast Report, the PJM Regional Transmission Organization ("RTO") will continue to be summer peaking during the next 15 years.[25] In 2021, three of the PJM zones of which Maryland is comprised are projected to experience their peak demands during the month of July,[26] the same month as the broader PJM Mid-Atlantic

[21] *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.
[22] *PJM Load Forecast Report,* PJM, (Jan. 2021) at 33-36, Table B-1, https://www.pjm.com/-/media/library/reports-notices/load-forecast/2021-load-report.ashx.
[23] 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.
[24] *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.
[25] *PJM Load Forecast Report,* PJM, (Jan. 2021) at 1-2, https://www.pjm.com/-/media/library/reports-notices/load-forecast/2021-load-report.ashx.
[26] *Id.* at 45-46, Table B-5.

Region.[27] 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 2019.

Figure 5 Percentage of MD Households Using Fuel for Heating Source[28]

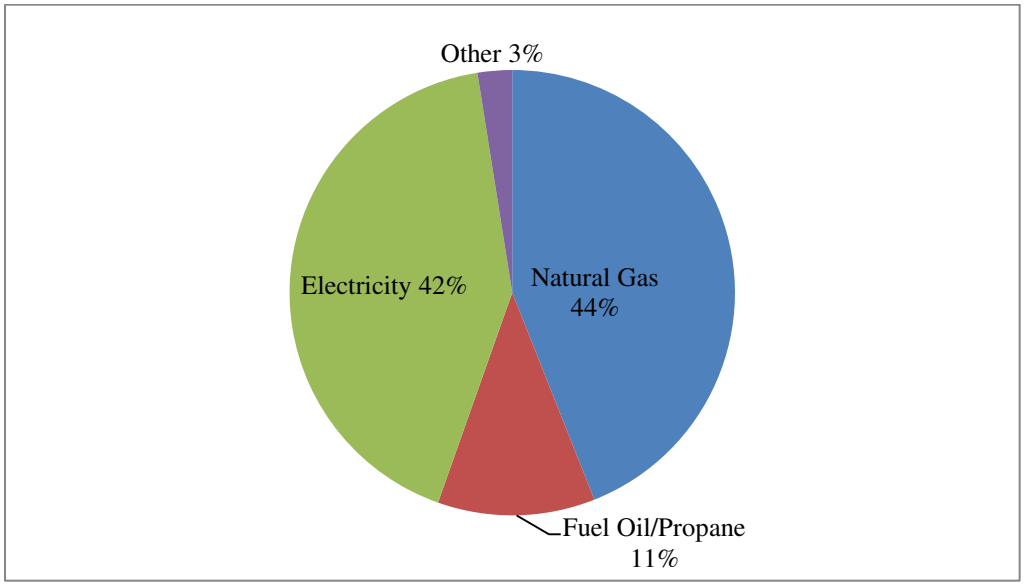
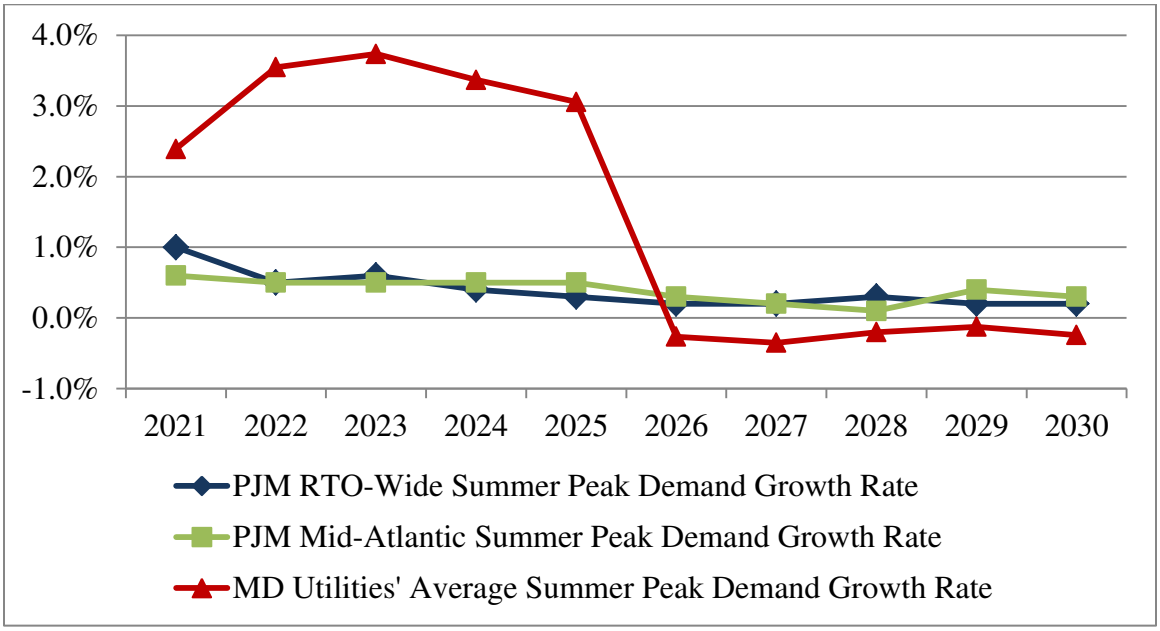


Figure 6 compares the average of the Maryland utilities' forecasted summer peak demands for their Maryland service territories with summer forecasts for the PJM Mid-Atlantic Region and for the PJM RTO as a whole. In the near-term, the Maryland utilities are showing stronger peak demand growth rate than the PJM RTO and the PJM Mid-Atlantic Region. Also reflected in Figure 6 is a drop in the summer peak demand growth rates for the Maryland utilities in 2026, after which time the growth rates generally level off through 2030 and follows a similar path to the PJM RTO and the PJM Mid-Atlantic Region.

[27] *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.
[28] *Maryland State Energy Profile Analysis*, U.S. Energy Information Administration (October 15, 2020). https://www.eia.gov/state/analysis.php?sid=MD , https://www.eia.gov/state/print.php?sid=MD.

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[29,30]



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. A visual comparison of Figure 6 and Figure 7 illustrates that the aggregated Maryland utilities' winter peak demand forecast follows a trajectory comparable to the summer peak demand growth rate projections through 2030.

[29] *PJM Load Forecast Report,* PJM, (Jan. 2021) at 33-36, Table B-1, https://www.pjm.com/-/media/library/reports-notices/load-forecast/2021-load-report.ashx.

[30] 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[31,32]

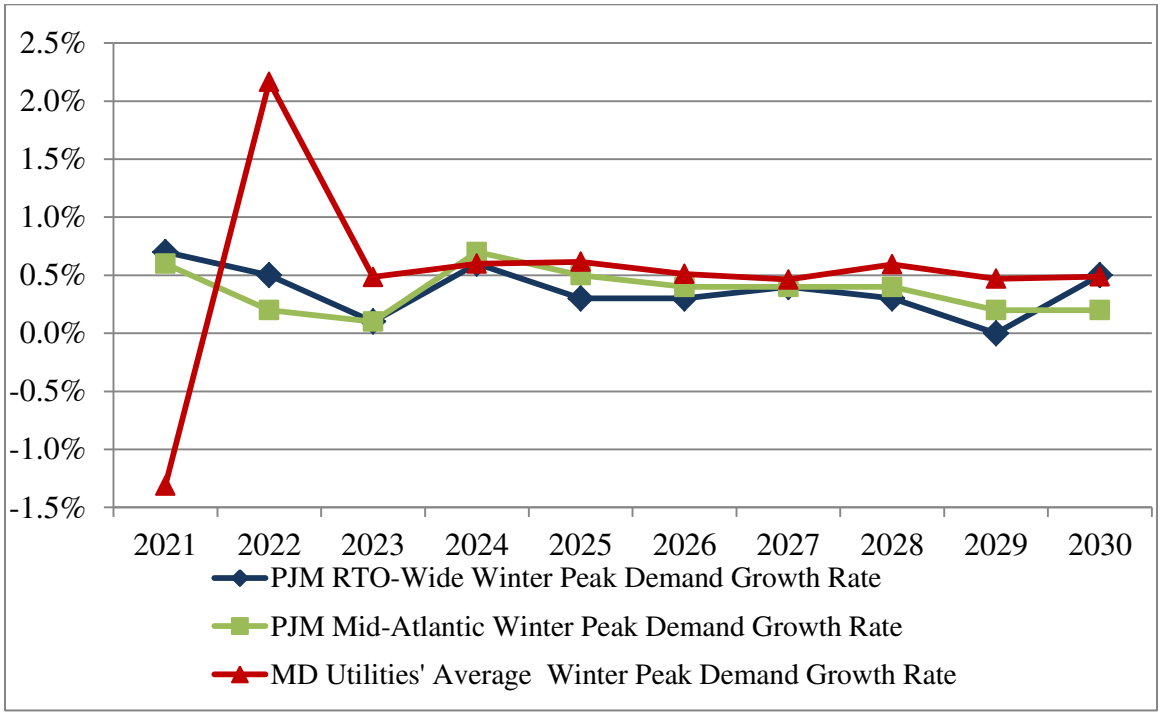
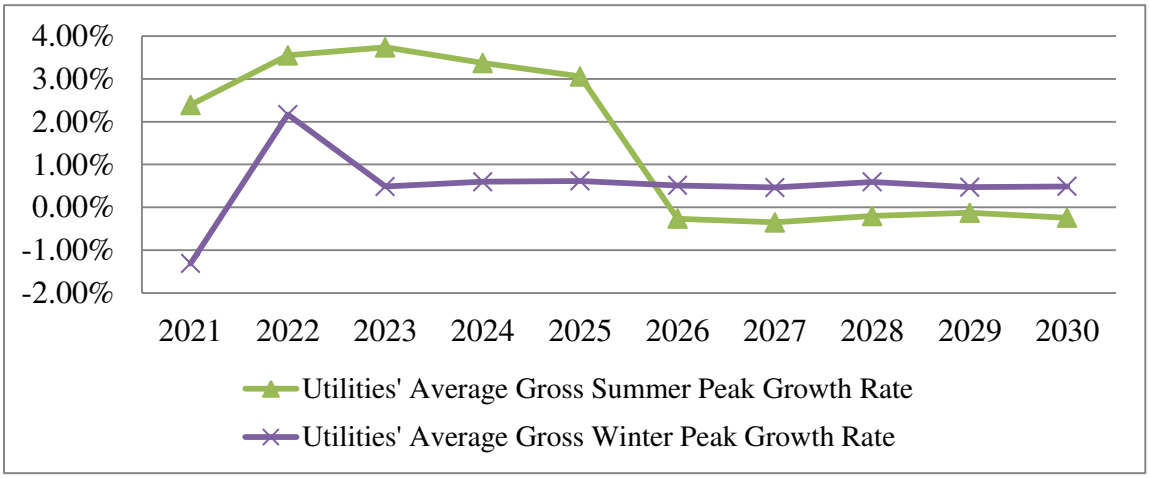


Figure 8 shows that the Utilities' average gross winter peak growth rate rises substantially from 2021 to 2022 and is more stable throughout the ten-year planning period than the average gross summer peak growth rate which drops substantially from 2025 to 2026.

[31] The Utilities' average winter 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)(iii).
[32] *PJM Load Forecast Report,* PJM, (Jan. 2021) at 37-40, Table B-2, https://www.pjm.com/-/media/library/reports-notices/load-forecast/2021-load-report.ashx.

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



As shown in Table 5 and Table 6 below, the ten-year forecasted Maryland growth rates of summer and winter peak demand (gross of DSM) are 1.38% and 0.71%, respectively.[33] In 2030, 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 16,945 MW and an expected winter peak demand load (gross of DSM) for Maryland of 13,323 MW.[34]

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

	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Total
Change (2021-2030)	1	94	484	2	6	60	1,264	48	1,960
Percent Change (2021-2030)	6.69%	1.43%	39.51%	3.94%	10.39%	3.63%	28.00%	5.60%	13.08%
Compound Annual Growth Rate	0.72%	0.16%	3.77%	0.43%	1.10%	0.40%	2.78%	0.61%	1.38%

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

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

	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Total
Change (2021-2030)	6	281	60	3	7	211	(28)	282	821
Percent Change (2021-2030)	37.14%	4.66%	5.80%	4.80%	10.04%	11.92%	-1.00%	39.62%	6.57%
Compound Annual Growth Rate	3.57%	0.51%	0.63%	0.52%	1.07%	1.26%	-0.11%	3.78%	0.71%

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").[39] According to the Participating Utilities' Ten-Year Plan forecasts, the DSM programs will save a total of 53,845 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 2021 to 2024. 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.[40] 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 2021 – 2030 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.

[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 ten-year period.
[39] *See* The EmPOWER Maryland Report to the General Assembly for more information on the energy efficiency and demand response programs associated with EmPOWER Maryland, *available at:* https://www.psc.state.md.us/wp-content/uploads/2021-EmPOWER-Maryland-Energy-Efficiency-Act-Standard-Report.pdf.
[40] 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.

Table 7: Average Annual Increase in Demand Savings due to DSM Programs from 2021 to 2024 for EE&C Programs[41]

Description	BGE	DPL	PE	Pepco	SMECO
Average Annual MW Savings Increase due to DSM Programs	-9.1%	8.5%	7.1%	8.2%	2.0%

Table 8: Average Annual Increase in Demand Savings due to DSM Programs from 2021 to 2024 for All DSM Programs[42]

Description	BGE	DPL	PE	Pepco	SMECO
Average Annual MW Savings Increase due to DSM Programs	-4.3%	8.2%	6.5%	6.6%	2.0%

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 2019, Maryland's net summer generating capacity was 14,609 MW.[43] Maryland's peak demand forecast for 2021, net of utility demand-side management and energy conservation measures, is approximately 12,551 MW.[44] Maryland had the capability to meet over 113.5% of its summer peak demand with in-state generation in

[41] Responses to the Commission's Ten-Year Plan Data Requests.
[42] *Id.*
[43] 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 2019. The next anticipated release date is listed as December 2021.
[44] *See* Appendix Table 3(a)(ii).

2019.[45] 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 [46]

PJM in its 2020 Regional Transmission Expansion Plan ("RTEP") authorized about $514 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.[47]

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 decreased by 9.4% ($54.7 million) between 2019 and 2020.[48]

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

[45] The peak demand net of DSM programs for the summer of 2019 was 12,868 according to the 2019-2028 Ten-Year Plan. 14,609/12,868 = 113.5%.
[46] *See* Appendix Table 4 for a full list of transmission enhancements proposed by Maryland utilities.
[47] *2020 Regional Transmission Expansion Plan.* PJM, (February 28, 2021) at 4, https://www.pjm.com/-/media/library/reports-notices/2020-rtep/2020-rtep-book-1.ashx?la=en.
[48] Monitoring Analytics, *State of the Market Report for PJM - 2020*, PJM, (March 11, 2020) at 530, https://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2020/2020-som-pjm-sec11.pdf.

and mitigate economic concerns. PJM's 2020 RTEP authorized 5 transmission upgrades for Maryland for approximately $152.9 million. [49]

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 32.85 miles of upgrades.

B. Electricity Imports

Maryland continues to be a net importer of electricity, similar to many other states in PJM.[50] As of 2019, 40% of the electricity consumed in the state is imported from other states and internationally.[51] Nine of the 13 PJM states plus the District of Columbia are net importers of electricity. In a nationwide comparison, Maryland is the fifth largest electricity importer based on percentage of electricity sales, importing 40% of its electricity in 2019.[52] 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.[53]

Maryland continues to be a net importer as in-state generation has declined in recent years. In 2007, Maryland resources generated over 50 million MWh in electricity. By 2019, however, in-state resources generated slightly over 39 million MWh.[54] 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 42nd in the country for per capita energy consumption.[55]

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[49] 2020 Maryland and District of Columbia State Infrastructure Report, PJM, at 18-21, (April 2021), *https://www.pjm.com/-/media/library/reports-notices/state-specific-reports/2020/2020-maryland-dc-state-infrastructure-report.ashx?la=en.*

[50] 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.

[51] *State Electricity Profiles 2019*, U.S. Energy Information Administration, (November 2, 2020) at Table 10, https://www.eia.gov/electricity/state/maryland/xls/md.xlsx.

[52] *State Electricity Profiles 2019*, U.S. Energy Information Administration, (November 2, 2020), at Table 10 (for each state, https://www.eia.gov/electricity/state/index.php).

[53] *Id.*

[54] *State Electricity Profiles 2019*, U.S. Energy Information Administration, (November 2, 2020) at Table 5, https://www.eia.gov/electricity/state/maryland/state_tables.php.

[55] *Maryland State Energy Profile*, U.S. Energy Information Administration (October 15, 2020). https://www.eia.gov/state/print.php?sid=MD.

C. Maryland Capacity and Generation Profiles

The capacity and generation profiles of in-state resources must be comprehensively analyzed for both short-term and long-term reliability planning purposes, due to the uncertain future of coal-fired generation.[56] 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.[57]

1. Conventional Capacity and Generation Profiles, 2020

Coal-fired power plants represent 26% of the electric generating capacity in Maryland, of which 75% of such capacity is aged 31 years or older. Within this category, 27% is considered "at-risk," as defined by PJM.[58] Table 9 and Table 10 below depict the electric generating capacity in Maryland, as well as the age of plants by fuel type.[59]

Table 9: Maryland Summer Peak Capacity Profile, 2020[60]

Primary Fuel Type	Capacity	
	Summer (MW)	Percent of Total
Coal	3,633.0	26.3%
Oil	1,169.5	8.5%
Natural Gas	5,990.7	43.4%
Nuclear	1,725.8	12.5%
Hydroelectric	590.0	4.3%
Other and Renewables	701.5	5.1%
Total	**13,810.5**	**100.0%**

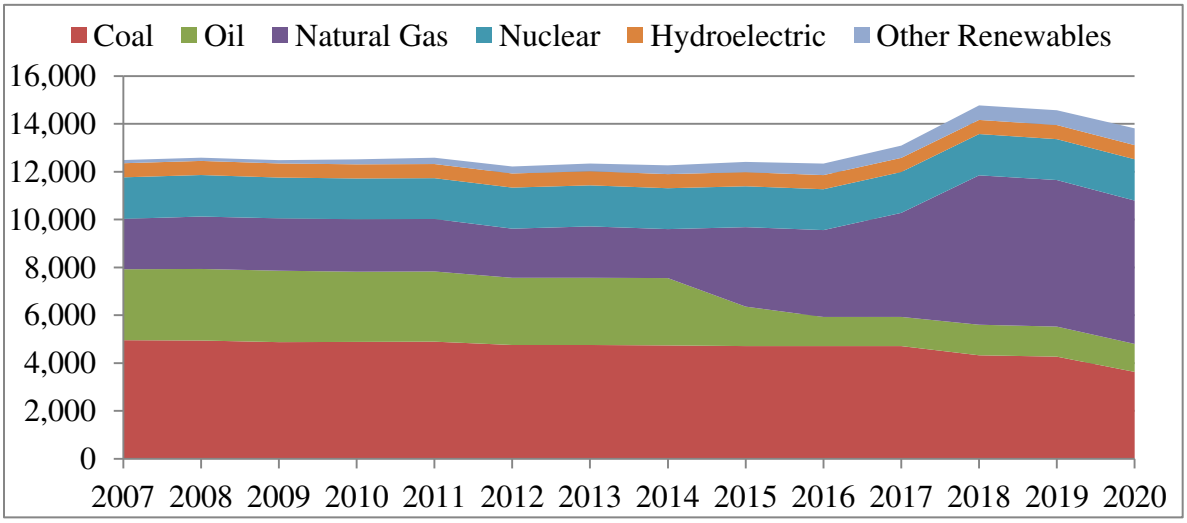
[56] The uncertainty stems from the economic pressure on coal as a result of decreasing natural gas prices, as well as from regulations promulgated by the U.S. Environmental Protection Agency.
[57] Case No. 9214, *In the Matter of Whether New Generating Facilities Are Needed to Meet Long-Term Demand for Standard Offer Service.* Order No. 84815 (April 12, 2012) at 19.
[58] 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.
[59] *See* Appendix Table 5 for a complete list of Maryland generation capacity in 2020.
[60] *Report EIA-860: "3_1_Generator_Y2020"* Excel, U.S. Energy Information Administration (June 3, 2021), https://www.eia.gov/electricity/data/eia860/.

Table 10: Age of Maryland Generation by Fuel Type, 2020[61]

Primary Fuel Type	Age of Plants, By Percent			
	1-10 Years	11-20 Years	21-30 Years	31+ Years
Coal	0%	0%	25%	75%
Oil	6%	6%	12%	77%
Natural Gas	35%	31%	18%	16%
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 756 MW in 2020 compared to 2019, as illustrated in Figure 9. The capacity reduced in 2020 can be largely attributed to decreases in coal.

Figure 9 Maryland Summer Capacity Profile (MW), 2007 – 2020[62]



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.[63] Conversely, oil and certain natural gas facilities, which operate as mid-merit or peaking units that come on-line when needed, generate 37% of the electric energy produced in Maryland while representing 52% of in-state capacity. Table 11 summarizes Maryland's 2019 in-state generation profile according to fuel source.

[61] *Id.*
[62] U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report."
[63] *See supra* Table 9. Coal facilities represented 26.3% of the in-state capacity in 2020, while nuclear facilities represented 12.5% of capacity. Therefore, coal and nuclear facilities combined for 39% of Maryland's generating capacity profile in 2020.

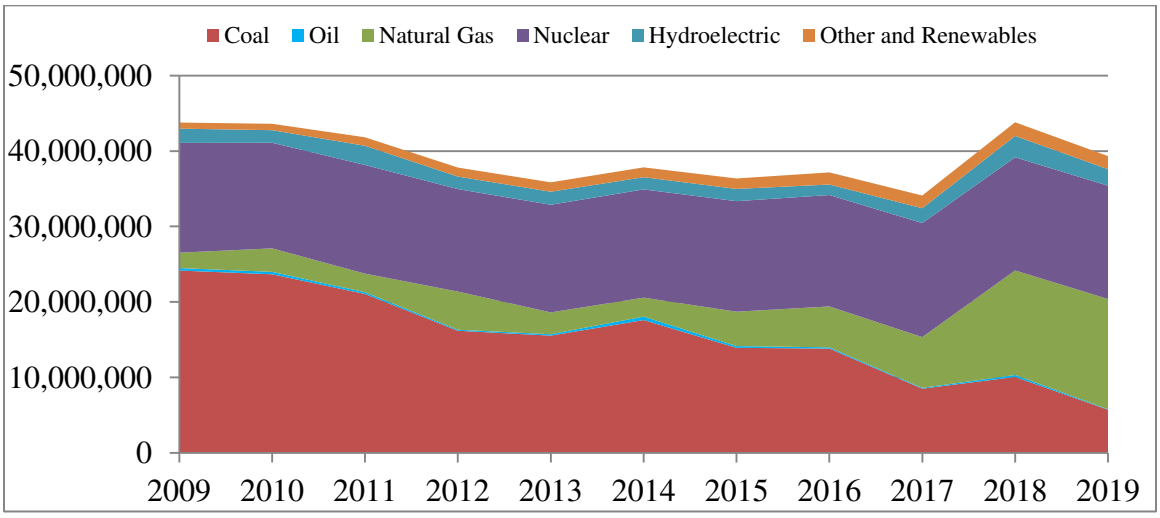
Table 11: Maryland Generation Profile, 2019[64]

Primary Fuel Source	Generation	
	Annual (MWh)	Percent of Total
Coal	5,721,573	14.5%
Oil	67,269	0.2%
Gas	14,605,261	37.1%
Nuclear	15,012,922	38.2%
Hydroelectric	2,188,051	5.6%
Other & Renewables	1,733,613	4.4%
Total	**39,328,689**	**100.0%**

Unlike the stability historically exhibited by Maryland's summer capacity profile, the percentage of in-state generation derived from various fuel sources continues to evolve as illustrated in

Figure 10 below. Between 2009 and 2019, in-state coal generation decreased by 18,441 GWhs. The percentage of coal generation has dropped from 55% in 2009 to 15% in 2019. The decrease in in-state generation can be largely attributed to a drop in coal generation, which decreased by 43% in 2019 compared to 2018.

Figure 10 Maryland Generation Profile, 2009 – 2019[65]



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

[64] *State Electricity Profiles 2019*, U.S. Energy Information Administration, (November 2, 2020) at Table 5, https://www.eia.gov/electricity/state/maryland/state_tables.php.
[65] *Id.*

generation facilities provided 15% of the in-state generation in 2019. If operational extensions for Maryland coal generation units are not requested, the need for additional in-state resources will be further necessitated to avoid potential reliability concerns.

PJM lists thirteen plants retired in 2020--four coal powered plants and nine natural gas fired combustion turbines totaling 921.5 MW in capacity.[66] There are 3 pending deactivation requests in the Pepco service territory with a combined capacity of 1234.9 MWs; while PJM currently registers 7.7 GW of capacity resources requesting deactivation within the RTO.[67] PJM completed a reliability analysis and identified no reliability impacts associated with these deactivation requests in Maryland.

2. Proposed Conventional Generation Additions[68]

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 3,160 MWs of proposed new generation active in the PJM queue, with 54% consisting of solar projects. [69]

3. Renewable Generation and Proposed Additions[70]

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 1,709 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.

[66] Generation Deactivations, PJM, *https://www.pjm.com/planning/services-requests/gen-deactivations.aspx*.
[67] *Id.*
[68] *See* Appendix Table 6 for a complete list of new renewable generation proposed in Maryland.
[69] New Services Queue, PJM (July, 2021), https://www.pjm.com/planning/services-requests/interconnection-queues.aspx.
[70] Maryland's Renewable Portfolio Standard has helped incent new renewable generation capacity in Maryland via Renewable Energy Credits ("RECs") and the Alternative 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. Approximately 20% of the new capacity is located within Maryland and 80% is located in other states. More details can be found at the *Renewable Energy Standard Report;* available at*: https://www.psc.state.md.us/wp-content/uploads/CY19-RPS-Annual-Report-Final-1.pdf.*

Table 12: Proposed New Renewable Generation in Maryland

Utility	Fuel Type	In-Service Date Range	Total Capacity (MW)
APS	Solar	2020-2024	538.9
	Hydro	2023	15.0
BGE	Solar	2022-2024	72.7
DPL	Solar	2017-2024	424.4
Pepco	Solar	2019-2020	624.2
SMECO	Solar	2021-2023	33.4
		Total (MW):	**1,708.6**

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 metering incentives; tax incentives; the community solar pilot program; and grants administered by the Maryland Energy Administration.

On May 11, 2017, the Commission approved two offshore wind projects in compliance with the Maryland Offshore Wind Energy Act of 2013.[71] The two projects total 368 MW in capacity and are projected to being producing energy within the 2020-2029 planning period. Both 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 Clean Energy and Jobs Act of 2019 requires the Commission to begin accepting applications for additional offshore wind projects in 2020, 2021, and 2022 for at least 1,200 MW of additional capacity. 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

[71] Case No. 9431, *In the Matter of the Applications of US Wind, Inc. and Skipjack Offshore Energy, LLC for a Proposed Offshore Wind Project(s) Pursuant to the Maryland Offshore Wind Energy Act of 2013.* Order No. 88192 (May 17, 2017).

Act as the largest carbon-emission free energy generation source in the state at 82% of Maryland's emission-free electricity.[72] The Clean Energy and Jobs Act of 2019 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 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.

Table 13 Proposed New Storage Generation in Maryland PJM Queue Effective Date: July 2021

Transmission Owner	Project Name	County Location	PJM Queue Status	PJM Queue #	Project Capacity (MW)	Projected In-Service Date
APS	Todd 69 kV	Dorchester	Active	AE1-087	16	12/31/2021
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
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	Randle Cliff 13.8 kV	Calvert	Active	AG2-050	0.0	9/13/2021
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
DPL	Colora 230 kV	Cecil	Active	AF2-208	40.3	10/15/2022
DPL	Vienna 138 kV	Dorchester	Active	AF2-409	100	6/1/2022
DPL	Hillsboro-Steele 138 kV II	Queen Anne's	Active	AG1-072	50	12/1/2023
DPL	Walston 12 kV	Wicomico	Active	AG1-397	4.1882	11/1/2021
DPL	Airey-Vienna 69 kV II	Dorchester	Active	AG1-450	25	12/31/2022
DPL	Church 138 kV	Queen Anne's	Active	AG2-281	50	5/1/2024
DPL	Easton - Steele 138 kV III	Talbot	Active	AG2-379	20	9/15/2023
DPL	Carville 138 kV IV	Queen Anne's	Active	AG2-380	20	9/15/2023
DPL	Church - Oil City 138 kV II	Caroline	Active	AG2-381	20	9/15/2023

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

DPL	3 Bridges Rd 34.5 kV	Caroline	Active	AG2-419	20	5/31/2023
PEPCO	Dickerson 230 kV	Montgomery	Active	AG1-483	542.5	6/1/2024
PEPCO	Morgantown 230 kV	Charles	Active	AG2-301	150	12/31/2023
PEPCO	Dickerson 230 kV	Montgomery	Active	AG2-302	150	12/31/2023
				Total	**1997.99**	

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.[73] 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[74] has experienced significant volatility in Net Zonal Load[75] capacity prices as a result of the past ten BRAs. The historical pattern suggests that future BRA results could vary significantly from year to year and must be closely monitored by PJM.

[73] PJM Manual 18: PJM Capacity Market, Section 1: Overview of the PJM Capacity Market Reliability Pricing Model, PJM Markets & Operations (last revised May 26, 2021), https://www.pjm.com/directory/manuals/m18/index.html#Sections/Section%201%20Overview%20of%20the%20PJM%20Capacity%20Market.html.
[74] MAAC includes the South-West MAAC ("SWMAAC") which is the zone serving central Maryland.
[75] 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[76]

Delivery Year	APS ($/MW-day)	BGE ($/MW-day)	DPL ($/MW-day)	PEPCO ($/MW-day)	RTO Price ($/MW-day)
2012/2013	$16.74	$133.42	$171.27	$133.42	$16.46
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	$79.53	$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

V. Conclusion

Electricity sector planning will continue to be effected 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 2021 – 2030 planning horizon. In response to these and other developments, the 2022 – 2031 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 new 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 will be led by an external facilitator and review 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 as appropriate.

[76] *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 (2021 – 2030) 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
2021	2,607	1,314,992	209,424	10,868	17,523	277,612	588,336	171,794	2,880	1,017	**2,597,053**
2022	2,607	1,320,906	210,634	10,887	17,578	279,583	594,835	173,704	2,880	1,017	**2,614,631**
2023	2,620	1,331,008	211,491	10,906	17,615	281,779	598,641	175,824	2,880	1,017	**2,633,782**
2024	2,634	1,341,035	212,339	10,925	17,653	283,956	602,068	177,824	2,880	1,017	**2,652,330**
2025	2,647	1,351,125	213,191	10,944	17,690	286,087	605,517	180,084	2,880	1,017	**2,671,181**
2026	2,673	1,361,215	214,047	10,963	17,728	288,165	608,986	182,104	2,880	1,017	**2,689,778**
2027	2,700	1,371,305	214,907	10,982	17,766	290,180	612,476	184,114	2,880	1,017	**2,708,327**
2028	2,727	1,381,395	215,771	11,001	17,804	292,154	615,987	186,144	2,880	1,017	**2,726,881**
2029	2,754	1,391,485	216,639	11,020	17,842	294,097	619,520	188,164	2,880	1,017	**2,745,418**
2030	2,782	1,401,575	217,511	11,039	17,880	296,051	623,075	190,194	2,880	1,017	**2,764,003**
Change (2021-2030)	**174**	**86,583**	**8,088**	**171**	**357**	**18,439**	**34,738**	**18,400**	**-**	**-**	**166,950**
Percent Change (2021-2030)	**6.69%**	**6.58%**	**3.86%**	**1.57%**	**2.04%**	**6.64%**	**5.90%**	**10.71%**	**0.00%**	**0.00%**	**6.43%**
Compound Annual Growth Rate	**0.72%**	**0.71%**	**0.42%**	**0.17%**	**0.22%**	**0.72%**	**0.64%**	**1.14%**	**0.00%**	**0.00%**	**0.69%**

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
2021	2,137	1,188,065	181,420	8,485	14,927	244,098	538,281	156,200	2,498	856	**2,336,967**
2022	2,138	1,193,569	182,224	8,498	14,964	245,757	544,220	158,000	2,498	856	**2,352,723**
2023	2,148	1,203,331	182,851	8,511	15,002	247,648	547,972	160,000	2,498	856	**2,370,817**
2024	2,159	1,213,018	183,476	8,524	15,039	249,554	551,351	161,900	2,498	856	**2,388,376**
2025	2,170	1,222,769	184,103	8,537	15,077	251,431	554,751	164,000	2,498	856	**2,406,192**
2026	2,192	1,232,519	184,732	8,550	15,115	253,261	558,172	165,900	2,498	856	**2,423,794**
2027	2,213	1,242,270	185,363	8,563	15,152	255,032	561,614	167,800	2,498	856	**2,441,361**
2028	2,236	1,252,020	185,997	8,576	15,190	256,764	565,077	169,700	2,498	856	**2,458,914**
2029	2,258	1,261,771	186,632	8,589	15,228	258,467	568,562	171,600	2,498	856	**2,476,461**
2030	2,280	1,271,521	187,270	8,602	15,266	260,179	572,068	173,500	2,498	856	**2,494,040**
Change (2021-2030)	**144**	**83,456**	**5,850**	**117**	**339**	**16,081**	**33,786**	**17,300**	**-**	**-**	**157,073**
Percent Change (2021-2030)	**6.74%**	**7.02%**	**3.22%**	**1.38%**	**2.27%**	**6.59%**	**6.28%**	**11.08%**	**0.00%**	**0.00%**	**6.72%**
Compound Annual Growth Rate	**0.73%**	**0.76%**	**0.35%**	**0.15%**	**0.25%**	**0.71%**	**0.68%**	**600.00%**	**0.00%**	**0.00%**	**0.73%**

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
2021	322	114,185	27,569	2,383	2,546	30,578	49,916	15,590	337	145	**243,570**
2022	321	114,523	27,974	2,389	2,563	30,907	50,476	15,700	337	145	**245,336**
2023	323	114,784	28,205	2,395	2,563	31,224	50,530	15,820	337	145	**246,326**
2024	325	115,045	28,428	2,401	2,563	31,504	50,578	15,920	337	145	**247,246**
2025	326	115,306	28,653	2,407	2,563	31,765	50,626	16,080	337	145	**248,210**
2026	329	115,612	28,880	2,413	2,563	32,020	50,675	16,200	337	145	**249,174**
2027	333	115,918	29,109	2,419	2,563	32,268	50,723	16,310	337	145	**250,125**
2028	336	116,223	29,340	2,425	2,563	32,513	50,771	16,440	337	145	**251,094**
2029	339	116,529	29,572	2,431	2,563	32,753	50,820	16,560	337	145	**252,049**
2030	343	116,835	29,806	2,437	2,563	32,993	50,868	16,690	337	145	**253,018**
Change (2021-2030)	**21**	**2,650**	**2,237**	**54**	**17**	**2,415**	**952**	**1,100**	**-**	**-**	**9,448**
Percent Change (2021-2030)	**6.60%**	**2.32%**	**8.12%**	**2.27%**	**0.69%**	**7.90%**	**1.91%**	**7.06%**	**0.00%**	**0.00%**	**3.88%**
Compound Annual Growth Rate	**0.71%**	**0.26%**	**0.87%**	**0.25%**	**0.08%**	**0.85%**	**0.21%**	**0.76%**	**0.00%**	**0.00%**	**0.42%**

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
2021	126	12,475	173	0	50	2,616	0	4	8	8	**15,460**
2022	126	12,548	173	0	50	2,600	0	4	8	8	**15,516**
2023	126	12,626	173	0	50	2,588	0	4	8	8	**15,583**
2024	127	12,705	173	0	50	2,577	0	4	8	8	**15,651**
2025	127	12,783	173	0	50	2,568	0	4	8	8	**15,721**
2026	129	12,817	173	0	50	2,560	0	4	8	8	**15,749**
2027	130	12,851	173	0	50	2,555	0	4	8	8	**15,778**
2028	131	12,885	173	0	50	2,551	0	4	8	8	**15,809**
2029	133	12,919	173	0	50	2,548	0	4	8	8	**15,843**
2030	134	12,953	173	0	50	2,548	0	4	8	8	**15,877**
Change (2021-2030)	**8**	**477**	**0**	**0**	**0**	**(68)**	**0**	**0**	**0**	**0**	**417**
Percent Change (2021-2030)	**6.19%**	**3.83%**	**0.00%**	**N/A**	**0.00%**	**-2.60%**	**N/A**	**0.00%**	**0.00%**	**0.00%**	**2.70%**
Compound Annual Growth Rate	**0.67%**	**0.42%**	**0.00%**	**N/A**	**0.00%**	**-0.29%**	**N/A**	**0.00%**	**0.00%**	**0.00%**	**0.30%**

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
2021	23	267	262	0	0	316	139	0	37	8	**1,052**
2022	23	267	262	0	0	316	139	0	37	8	**1,052**
2023	23	267	262	0	0	317	139	0	37	8	**1,053**
2024	23	267	262	0	0	318	139	0	37	8	**1,054**
2025	23	267	262	0	0	319	139	0	37	8	**1,056**
2026	24	267	262	0	0	321	139	0	37	8	**1,057**
2027	24	267	262	0	0	322	139	0	37	8	**1,059**
2028	24	267	262	0	0	324	139	0	37	8	**1,061**
2029	24	267	262	0	0	325	139	0	37	8	**1,063**
2030	25	267	262	0	0	327	139	0	37	8	**1,064**
Change (2021-2030)	**2**	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**0**	**0**	**12**
Percent Change (2021-2030)	**6.69%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**3.37%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**1.16%**
Compound Annual Growth Rate	**0.72%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.37%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.13%**

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; street lighting is an example of a rate class included under "Other."

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

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2021	0	0	0	0	0	3	0	0	0	0	**3**
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**
Change (2021-2030)	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**3**
Percent Change (2021-2030)	**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): 2020 Customer Numbers and Energy Sales

Appendix Table 1(b)(i): Customer Class Breakdown as of December 31, 2020 (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	2,137	320	125	23	0	**2,605**	2,137	320	125	23	0-	**2,605**
BGE	1,185,319	114,220	12,401	266	0	**1,312,205**	1,185,319	114,220	12,401	266	0	**1,312,205**
DPL	470,746	63,077	316	612	0	**534,750**	180,787	27,383	174	263	0	**208,607**
Easton	8,458	2,370	0	0	0	**10,828**	8,458	2,370	**0**	0	0	**10,828**
Hagers-town	14,927	2,546	48	**0**	0	**17,521**	14,927	2,546	48	0	0	**17,521**
PE	369,201	47,927	4,472	610	5	**422,216**	243,036	29,931	2,624	311	3	**275,905**
PEPCO	827,989	77,576	0	165	0	**905,730**	535,301	50,764	0	137	0	**586,203**
SMECO	153,531	15,387	4	418	0	**169,339**	153,531	15,387	4	418	0	**169,339**
Thurmont	2,493	334	8	37	0	**2,873**	2,493	334	8	37	0	**2,873**
William-sport	853	141	12	8	0	**1,014**	853	141	12	8	0	**1,014**
Total	**3,035,653**	**323,899**	**17,386**	**2,138**	**5**	**3,379,081**	**2,326,841**	**243,396**	**15,396**	**1,463**	**3**	**2,587,100**

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' 2020 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	26	3	14	0	0	**44**	26	3	14	0	0	**44**
BGE	12,822	2,699	12,635	212	0	**28,367**	12,822	2,699	12,635	212	0	**28,367**
DPL	5,221	4,913	1,577	43	0	**11,754**	2,085	1,528	362	11	0	**3,986**
Easton	106	132	0	0	0	**237**	106	132	0	0	0	**237**
Hagers-town	158	85	59	0	0	**302**	158	85	59	0	0	**302**
PE	5,058	2,633	2,333	23	989	**11,037**	3,227	1,881	1,391	17	987	**7,502**
PEPCO	8,074	14,271	0	138	0	**22,483**	5,605	7,294	0	60	0	**12,958**
SMECO	2,113	1,139	49	9	0	**3,310**	2,113	1,139	49	9	0	**3,310**
Thurmont	36	16	19	1	0	**71**	36	16	19	1	0	**71**
William-sport	9	3	5	0	0	**18**	9	3	5	0	0	**18**
Total	**33,623**	**25,893**	**16,692**	**426**	**989**	**77,623**	**26,185**	**14,780**	**14,534**	**309**	**987**	**56,795**

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
2021	46	28,906	4,810	239	308	8,154	16,896	3,571	80	20	**63,029**
2022	45	29,169	4,831	240	321	8,400	17,420	3,651	80	20	**64,177**
2023	45	29,235	4,844	241	322	8,651	17,654	3,707	80	20	**64,800**
2024	45	28,866	4,847	243	323	8,725	17,873	3,724	80	20	**64,746**
2025	46	28,901	4,854	244	323	8,793	18,093	3,748	80	20	**65,102**
2026	46	29,050	4,774	246	324	8,857	17,908	3,777	80	20	**65,082**
2027	46	29,230	4,696	247	325	8,929	17,725	3,811	80	20	**65,108**
2028	47	29,462	4,619	248	326	9,022	17,545	3,848	80	20	**65,216**
2029	47	29,735	4,544	250	327	9,127	17,367	3,886	80	20	**65,382**
2030	48	30,063	4,471	251	327	9,236	17,193	3,920	80	20	**65,608**
Change (2021-2030)	**2**	**1,157**	**(339)**	**13**	**19**	**1,082**	**297**	**349**	**0**	**0**	**2,579**
Percent Change (2021-2030)	**4.98%**	**4.00%**	**-7.06%**	**5.29%**	**6.32%**	**13.27%**	**1.76%**	**9.77%**	**0.00%**	**0.00%**	**4.09%**
Compound Annual Growth Rate	**0.54%**	**0.44%**	**-0.81%**	**0.57%**	**0.68%**	**1.39%**	**0.19%**	**1.04%**	**0.00%**	**0.00%**	**0.45%**

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
2021	46	28,189	3,947	239	308	7,098	13,071	3,509	80	20	**56,506**
2022	45	28,422	3,878	240	321	7,215	13,200	3,590	80	20	**57,010**
2023	45	28,469	3,802	241	322	7,336	13,025	3,626	80	20	**56,966**
2024	45	28,619	3,715	243	323	7,439	12,835	3,643	80	20	**56,961**
2025	46	28,653	3,633	244	323	7,507	12,647	3,667	80	20	**56,820**
2026	46	28,803	3,552	246	324	7,571	12,462	3,696	80	20	**56,800**
2027	46	28,982	3,474	247	325	7,643	12,279	3,730	80	20	**56,826**
2028	47	29,214	3,397	248	326	7,736	12,099	3,767	80	20	**56,934**
2029	47	29,487	3,323	250	327	7,841	11,921	3,805	80	20	**57,100**
2030	48	29,815	3,249	251	327	7,950	11,747	3,839	80	20	**57,326**
Change (2021-2030)	**2**	**1,626**	**(698)**	**13**	**19**	**852**	**(1,325)**	**329**	**0**	**0**	**820**
Percent Change (2021-2030)	**4.98%**	**5.77%**	**-17.68%**	**5.29%**	**6.32%**	**12.00%**	**-10.13%**	**9.38%**	**0.00%**	**0.00%**	**1.45%**
Compound Annual Growth Rate	**0.54%**	**0.63%**	**-2.14%**	**0.57%**	**0.68%**	**1.27%**	**-1.18%**	**1.00%**	**0.00%**	**0.00%**	**0.16%**

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
2021	46	28,906	12,774	239	308	15,545	27,764	3,571	80	20	**89,252**
2022	45	29,169	12,916	240	321	15,916	28,827	3,651	80	20	**91,185**
2023	45	29,235	13,010	241	322	16,269	29,110	3,707	80	20	**92,039**
2024	45	28,866	13,097	243	323	16,432	29,379	3,724	80	20	**92,209**
2025	46	28,901	13,192	244	323	16,557	29,688	3,748	80	20	**92,799**
2026	46	29,050	13,158	246	324	16,682	29,348	3,777	80	20	**92,730**
2027	46	29,230	13,125	247	325	16,809	29,012	3,811	80	20	**92,705**
2028	47	29,462	13,095	248	326	16,960	28,682	3,848	80	20	**92,768**
2029	47	29,735	13,067	250	327	17,124	28,357	3,886	80	20	**92,893**
2030	48	30,063	13,040	251	327	17,289	28,037	3,920	80	20	**93,075**
Change (2021-2030)	**2**	**1,157**	**265**	**13**	**19**	**1,745**	**273**	**349**	**0**	**0**	**3,823**
Percent Change (2021-2030)	**4.98%**	**4.00%**	**2.08%**	**5.29%**	**6.32%**	**11.22%**	**0.98%**	**9.77%**	**0.00%**	**0.00%**	**4.28%**
Compound Annual Growth Rate	**0.54%**	**0.44%**	**0.23%**	**0.57%**	**0.68%**	**1.19%**	**0.11%**	**1.04%**	**0.00%**	**0.00%**	**0.47%**

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
2021	46	28,189	11,783	239	308	14,451	22,974	3,509	80	20	**81,599**
2022	45	28,422	11,793	240	321	14,694	23,449	3,590	80	20	**82,654**
2023	45	28,469	11,756	241	322	14,917	23,110	3,626	80	20	**82,586**
2024	45	28,619	11,712	243	323	15,108	22,747	3,643	80	20	**82,540**
2025	46	28,653	11,675	244	323	15,233	22,402	3,667	80	20	**82,344**
2026	46	28,803	11,641	246	324	15,358	22,061	3,696	80	20	**82,276**
2027	46	28,982	11,609	247	325	15,485	21,726	3,730	80	20	**82,250**
2028	47	29,214	11,578	248	326	15,637	21,396	3,767	80	20	**82,313**
2029	47	29,487	11,550	250	327	15,801	21,071	3,805	80	20	**82,438**
2030	48	29,815	11,523	251	327	15,966	20,751	3,839	80	20	**82,621**
Change (2021-2030)	**2**	**1,626**	**(260)**	**13**	**19**	**1,515**	**(2,223)**	**329**	**0**	**0**	**1,022**
Percent Change (2021-2030)	**4.98%**	**5.77%**	**2.21%**	**5.29%**	**6.32%**	**10.48%**	**9.68%**	**9.38%**	**0.00%**	**0.00%**	**1.25%**
Compound Annual Growth Rate	**0.54%**	**0.63%**	**0.25%**	**0.57%**	**0.68%**	**1.11%**	**1.12%**	**1.00%**	**0.00%**	**0.00%**	**0.14%**

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
2021	10	6,582	1,226	57	60	1,658	4,515	859	14	4	**14,985**
2022	10	6,606	1,346	57	65	1,681	4,851	883	14	4	**15,517**
2023	10	6,652	1,467	58	65	1,705	5,233	888	14	4	**16,097**
2024	10	6,688	1,586	58	65	1,703	5,621	890	14	4	**16,639**
2025	10	6,705	1,706	58	65	1,705	5,986	893	14	4	**17,148**
2026	10	6,696	1,707	58	66	1,707	5,944	896	14	4	**17,102**
2027	10	6,680	1,709	59	66	1,709	5,893	898	14	4	**17,042**
2028	11	6,677	1,711	59	66	1,712	5,854	901	14	4	**17,008**
2029	11	6,680	1,712	59	66	1,715	5,821	904	14	4	**16,986**
2030	11	6,676	1,710	59	66	1,718	5,779	907	14	4	**16,945**
Change (2021-2030)	**1**	**94**	**484**	**2**	**6**	**60**	**1,264**	**48**	**-**	**-**	**1,960**
Percent Change (2021-2030)	**6.69%**	**1.43%**	**39.51%**	**3.94%**	**10.39%**	**3.63%**	**28.00%**	**5.60%**	**0.00%**	**0.00%**	**13.08%**
Compound Annual Growth Rate	**0.72%**	**0.16%**	**3.77%**	**0.43%**	**1.10%**	**0.40%**	**2.78%**	**0.61%**	**0.00%**	**0.00%**	**1.38%**

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) [77]

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2021	4	6,094	910	57	60	1,488	3,130	789	14	4	**12,551**
2022	4	6,102	913	57	65	1,492	3,072	813	14	4	**12,536**
2023	4	6,134	918	58	65	1,496	3,061	815	14	4	**12,568**
2024	5	6,269	921	58	65	1,499	3,054	817	14	4	**12,705**
2025	5	6,286	925	58	65	1,501	3,026	820	14	4	**12,703**
2026	5	6,277	926	58	66	1,503	2,983	822	14	4	**12,658**
2027	5	6,261	928	59	66	1,505	2,933	824	14	4	**12,598**
2028	5	6,258	930	59	66	1,508	2,893	827	14	4	**12,563**
2029	5	6,261	931	59	66	1,511	2,860	830	14	4	**12,542**
2030	5	6,257	929	59	66	1,514	2,819	833	14	4	**12,501**
Change (2021-2030)	**1**	**163**	**19**	**2**	**6**	**26**	**(311)**	**44**	**0**	**0**	**(50)**
Percent Change (2021-2030)	**15.26%**	**2.68%**	**2.08%**	**3.94%**	**10.39%**	**1.74%**	**9.94%**	**5.56%**	**0.00%**	**0.00%**	**-0.40%**
Compound Annual Growth Rate	**1.59%**	**0.29%**	**0.23%**	**0.43%**	**1.10%**	**0.19%**	**1.16%**	**0.60%**	**0.00%**	**0.00%**	**-0.04%**

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

[77] 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
2021	16	6,032	1,029	52	69	1,774	2,796	711	19	5	**12,502**
2022	16	6,056	1,032	53	74	1,822	2,774	921	19	5	**12,773**
2023	17	6,075	1,038	53	74	1,866	2,762	925	19	5	**12,835**
2024	18	6,116	1,045	53	74	1,877	2,776	928	19	5	**12,912**
2025	18	6,157	1,051	54	75	1,891	2,781	941	19	5	**12,991**
2026	19	6,189	1,060	54	75	1,903	2,778	956	19	5	**13,057**
2027	20	6,226	1,067	54	75	1,920	2,774	959	19	5	**13,118**
2028	20	6,260	1,075	54	75	1,941	2,774	973	19	5	**13,196**
2029	21	6,288	1,082	55	75	1,962	2,775	977	19	5	**13,258**
2030	22	6,313	1,088	55	75	1,985	2,768	992	19	5	**13,323**
Change (2021-2030)	**6**	**281**	**60**	**3**	**7**	**211**	**(28)**	**282**	**0**	**0**	**821**
Percent Change (2021-2030)	**37.14%**	**4.66%**	**5.80%**	**4.80%**	**10.04%**	**11.92%**	**-1.00%**	**39.62%**	**0.00%**	**0.00%**	**6.57%**
Compound Annual Growth Rate	**3.57%**	**0.51%**	**0.63%**	**0.52%**	**1.07%**	**1.26%**	**-0.11%**	**3.78%**	**0.00%**	**0.00%**	**0.71%**

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
2021	16	5,934	1,029	52	69	1,611	2,796	711	19	5	**12,241**
2022	16	5,952	1,032	53	74	1,642	2,774	921	19	5	**12,489**
2023	17	5,965	1,038	53	74	1,667	2,762	925	19	5	**12,526**
2024	18	6,042	1,045	53	74	1,683	2,776	928	19	5	**12,644**
2025	18	6,083	1,051	54	75	1,697	2,781	941	19	5	**12,723**
2026	19	6,115	1,060	54	75	1,709	2,778	956	19	5	**12,789**
2027	20	6,152	1,067	54	75	1,725	2,774	959	19	5	**12,850**
2028	20	6,186	1,075	54	75	1,747	2,774	973	19	5	**12,928**
2029	21	6,214	1,082	55	75	1,768	2,775	977	19	5	**12,990**
2030	22	6,239	1,088	55	75	1,791	2,768	992	19	5	**13,055**
Change (2021-2030)	**6**	**306**	**60**	**3**	**7**	**179**	**(28)**	**282**	**0**	**0**	**814**
Percent Change (2021-2030)	**37.14%**	**5.15%**	**5.80%**	**4.80%**	**10.04%**	**11.13%**	**1.00%**	**39.62%**	**0.00%**	**0.00%**	**6.65%**
Compound Annual Growth Rate	**3.57%**	**0.56%**	**0.63%**	**0.52%**	**1.07%**	**1.18%**	**0.11%**	**3.78%**	**0.00%**	**0.00%**	**0.72%**

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
2021	10	6,582	4,219	57	60	3,013	7,421	859	14	4	**22,240**
2022	10	6,606	4,354	57	65	3,047	7,726	883	14	4	**22,766**
2023	10	6,652	4,497	58	65	3,080	8,122	888	14	4	**23,390**
2024	10	6,688	4,633	58	65	3,083	8,529	890	14	4	**23,975**
2025	10	6,705	4,772	58	65	3,089	8,899	893	14	4	**24,510**
2026	10	6,696	4,782	58	66	3,094	8,818	896	14	4	**24,439**
2027	10	6,680	4,789	59	66	3,098	8,723	898	14	4	**24,341**
2028	11	6,677	4,797	59	66	3,103	8,648	901	14	4	**24,280**
2029	11	6,680	4,805	59	66	3,109	8,586	904	14	4	**24,238**
2030	11	6,676	4,796	59	66	3,114	8,507	907	14	4	**24,154**
Change (2021-2030)	**1**	**94**	**577**	**2**	**6**	**101**	**1,085**	**48**	**0**	**0**	**1,914**
Percent Change (2021-2030)	**6.69%**	**1.43%**	**13.67%**	**3.94%**	**10.39%**	**3.34%**	**14.63%**	**5.60%**	**0.00%**	**0.00%**	**8.61%**
Compound Annual Growth Rate	**0.72%**	**0.16%**	**1.43%**	**0.43%**	**1.10%**	**0.37%**	**1.53%**	**0.61%**	**0.00%**	**0.00%**	**0.92%**

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)[78, 79]

Year	Berlin	BGE	DPL	Easton	Hagerstown	PE	Pepco	SMECO	Thurmont	Williamsport	Total
2021	4	6,094	3,895	57	60	2,838	5,924	789	14	4	**19,680**
2022	4	6,102	3,906	57	65	2,853	5,814	813	14	4	**19,632**
2023	4	6,134	3,927	58	65	2,866	5,793	815	14	4	**19,679**
2024	5	6,269	3,941	58	65	2,874	5,780	817	14	4	**19,826**
2025	5	6,286	3,958	58	65	2,880	5,727	820	14	4	**19,816**
2026	5	6,277	3,962	58	66	2,885	5,646	822	14	4	**19,739**
2027	5	6,261	3,969	59	66	2,889	5,551	824	14	4	**19,641**
2028	5	6,258	3,977	59	66	2,894	5,476	827	14	4	**19,580**
2029	5	6,261	3,985	59	66	2,900	5,414	830	14	4	**19,538**
2030	5	6,257	3,976	59	66	2,905	5,335	833	14	4	**19,454**
Change (2021-2030)	**1**	**163**	**81**	**2**	**6**	**67**	**(589)**	**44**	**0**	**0**	**(225)**
Percent Change (2021-2030)	**15.26%**	**2.68%**	**2.08%**	**3.94%**	**10.39%**	**2.35%**	**9.94%**	**5.56%**	**0.00%**	**0.00%**	**-1.15%**
Compound Annual Growth Rate	**1.59%**	**0.29%**	**0.23%**	**0.43%**	**1.10%**	**0.26%**	**1.16%**	**0.60%**	**0.00%**	**0.00%**	**-0.13%**

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.

[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.
[79] Choptank's DSM programs include: a voluntary program among the consumers to drop load during "beat-the-peak" alerts; a legacy A/C & 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
2021	16	6,032	3,876	52	69	3,414	5,716	711	19	5	**19,910**
2022	16	6,056	3,891	53	74	3,490	5,670	921	19	5	**20,196**
2023	17	6,075	3,910	53	74	3,557	5,647	925	19	5	**20,283**
2024	18	6,116	3,938	53	74	3,583	5,674	928	19	5	**20,409**
2025	18	6,157	3,959	54	75	3,609	5,686	941	19	5	**20,522**
2026	19	6,189	3,994	54	75	3,631	5,679	956	19	5	**20,620**
2027	20	6,226	4,020	54	75	3,659	5,671	959	19	5	**20,707**
2028	20	6,260	4,050	54	75	3,695	5,670	973	19	5	**20,822**
2029	21	6,288	4,076	55	75	3,730	5,672	977	19	5	**20,918**
2030	22	6,313	4,101	55	75	3,768	5,659	992	19	5	**21,010**
Change (2021-2030)	**6**	**281**	**225**	**3**	**7**	**354**	**(57)**	**282**	**0**	**0**	**1,100**
Percent Change (2021-2030)	**37.14%**	**4.66%**	**5.80%**	**4.80%**	**10.04%**	**10.38%**	**1.00%**	**39.62%**	**0.00%**	**0.00%**	**5.53%**
Compound Annual Growth Rate	**3.57%**	**0.51%**	**0.63%**	**0.52%**	**1.07%**	**1.10%**	**0.11%**	**3.78%**	**0.00%**	**0.00%**	**0.60%**

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
2021	16	5,934	3,876	52	69	3,247	5,716	711	19	5	**19,644**
2022	16	5,952	3,891	53	74	3,305	5,670	921	19	5	**19,906**
2023	17	5,965	3,910	53	74	3,353	5,647	925	19	5	**19,969**
2024	18	6,042	3,938	53	74	3,384	5,674	928	19	5	**20,136**
2025	18	6,083	3,959	54	75	3,409	5,686	941	19	5	**20,249**
2026	19	6,115	3,994	54	75	3,432	5,679	956	19	5	**20,347**
2027	20	6,152	4,020	54	75	3,460	5,671	959	19	5	**20,434**
2028	20	6,186	4,050	54	75	3,496	5,670	973	19	5	**20,549**
2029	21	6,214	4,076	55	75	3,531	5,672	977	19	5	**20,645**
2030	22	6,239	4,101	55	75	3,569	5,659	992	19	5	**20,737**
Change (2021-2030)	**6**	**306**	**225**	**3**	**7**	**322**	**(57)**	**282**	**0**	**0**	**1,093**
Percent Change (2021-2030)	**37.14%**	**5.15%**	**5.80%**	**4.80%**	**10.04%**	**9.92%**	**-1.00%**	**39.62%**	**0.00%**	**0.00%**	**5.56%**
Compound Annual Growth Rate	**3.57%**	**0.56%**	**0.63%**	**0.52%**	**1.07%**	**1.06%**	**-0.11%**	**3.78%**	**0.00%**	**0.00%**	**0.60%**

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**
BGE	115	0.95	2	2017	6/3/2020	6/4/2020	Transmission work for distribution substation	Baltimore County	Northpoint	Baltimore County	Fitzell
PE	138	0.10	2	2013	Suspended		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	0.0	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	0	1	2019	2021	2021	Baseline Transmission Reliability	Allegany	Messick Road	Mineral (WV)	Ridgeley
PE	500	15.3	1	2021	2025	2025	Rebuild Existing Line	Frederick	Doubs	Loudoun (VA)	Goose Creek (DOM)
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, 2020

Appendix 5: List of Maryland Generators, as of December 31, 2020

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%

Appendix 5 (Continued): List of Maryland Generators, as of December 31, 2020

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%
Chalk Point Steam, LLC	Chalk Point LLC	Prince Georges	659.0	597.2	91%
Chalk Point Steam, LLC	Chalk Point LLC	Prince Georges	659.0	585.7	89%
Chalk Point Steam, LLC	Chalk Point LLC	Prince Georges	16.0	20.0	125%
Chalk Point Steam, LLC	Chalk Point LLC	Prince Georges	35.0	26.0	74%
Chalk Point Steam, LLC	Chalk Point LLC	Prince Georges	103.0	87.6	85%
Chalk Point Steam, LLC	Chalk Point LLC	Prince Georges	103.0	87.6	85%
Chalk Point Steam, LLC	Chalk Point LLC	Prince Georges	125.0	112.0	90%
Chalk Point Steam, LLC	Chalk Point LLC	Prince Georges	125.0	114.9	92%
Chalk Point Steam, LLC	Chalk Point LLC	Prince Georges	364.0	333.1	92%
Chalk Point Steam, LLC	Chalk Point LLC	Prince Georges	364.0	336.9	93%
Lanyard Power Holdings, LLC	Dickerson	Montgomery	19.0	18.0	95%
Lanyard Power Holdings, LLC	Dickerson	Montgomery	163.0	147.0	90%
Lanyard Power Holdings, LLC	Dickerson	Montgomery	163.0	147.0	90%
Lanyard Power Holdings, LLC	Morgantown Generating Plant	Charles	65.0	48.0	74%
Lanyard Power Holdings, LLC	Morgantown Generating Plant	Charles	65.0	48.0	74%
Lanyard Power Holdings, LLC	Morgantown Generating Plant	Charles	65.0	48.0	74%
Lanyard Power Holdings, LLC	Morgantown Generating Plant	Charles	65.0	48.0	74%
Lanyard Power Holdings, LLC	Morgantown Generating Plant	Charles	18.0	13.0	72%
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%

Appendix 5 (Continued): List of Maryland Generators, as of December 31, 2020

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	872.0	95%
Exelon Nuclear	Calvert Cliffs Nuclear Power Plant	Calvert	932.4	853.8	92%

Appendix 5 (Continued): List of Maryland Generators, as of December 31, 2020

A & N Electric Coop	Smith Island	Somerset	0.5	0.4	80%
A & N Electric Coop	Smith Island	Somerset	1.2	1.2	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	168.0	84%
Essential Power Rock Springs LLC	Essential Power Rock Springs LLC	Cecil	175.9	164.3	93%
Essential Power Rock Springs LLC	Essential Power Rock Springs LLC	Cecil	198.9	168.9	85%
Essential Power Rock Springs LLC	Essential Power Rock Springs LLC	Cecil	198.9	169.7	85%
Wheelabrator Environmental Systems	Wheelabrator Baltimore Refuse	Baltimore City	60.2	57.0	95%
Wheelabrator Environmental Systems	Wheelabrator Baltimore Refuse	Baltimore City	4.3	4.3	100%
AES WR Ltd Partnership	AES Warrior Run Cogeneration Facility	Allegany	229.0	180.0	79%
Maryland Environmental Service	Eastern Correctional Institute	Somerset	1.9	1.3	68%
Maryland Environmental Service	Eastern Correctional Institute	Somerset	1.9	1.3	68%
Maryland Environmental Service	Eastern Correctional Institute	Somerset	1.0	1.0	100%
Maryland Environmental Service	Eastern Correctional Institute	Somerset	1.0	1.0	100%
Prince George's County	Brown Station Road Plant I	Prince Georges	0.9	0.8	89%
Prince George's County	Brown Station Road Plant I	Prince Georges	0.9	0.8	89%
Prince George's County	Brown Station Road Plant I	Prince Georges	0.9	0.8	89%
Covanta Montgomery, Inc.	Montgomery County Resource Recovery	Montgomery	67.8	54.0	80%
American Sugar Refining, Inc.	Domino Sugar Baltimore	Baltimore City	5.0	5.0	100%
American Sugar Refining, Inc.	Domino Sugar Baltimore	Baltimore City	2.5	2.5	100%
American Sugar Refining, Inc.	Domino Sugar Baltimore	Baltimore City	10.0	10.0	100%
KMC Thermo, LLC	Brandywine Power Facility	Prince Georges	98.7	98.7	100%

Appendix 5 (Continued): List of Maryland Generators, as of December 31, 2020

KMC Thermo, LLC	Brandywine Power Facility	Prince Georges	98.7	98.7	100%
KMC Thermo, LLC	Brandywine Power Facility	Prince Georges	91.4	230.0	252%
CB&I	Montgomery County Oaks LFGE Plant	Montgomery	1.6	1.5	94%
CB&I	Montgomery County Oaks LFGE Plant	Montgomery	0.8	0.8	100%
Prince George's County	Brown Station Road Plant II	Prince Georges	1.0	0.8	80%
Prince George's County	Brown Station Road Plant II	Prince Georges	1.0	0.8	80%
Prince George's County	Brown Station Road Plant II	Prince Georges	1.0	0.8	80%
Prince George's County	Brown Station Road Plant II	Prince Georges	1.0	0.8	80%
Trigen-Cinergy Solutions College Park	UMCP CHP Plant	Prince Georges	11.0	9.4	85%
Trigen-Cinergy Solutions College Park	UMCP CHP Plant	Prince Georges	11.0	9.4	85%
Trigen-Cinergy Solutions College Park	UMCP CHP Plant	Prince Georges	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%

Appendix 5 (Continued): List of Maryland Generators, as of December 31, 2020

Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
Industrial Power Generating Company LLC	Wicomico	Wicomico	0.3	0.3	100%
CPV Maryland LLC	CPV St Charles Energy Center	Charles	223.6	211.2	94%
CPV Maryland LLC	CPV St Charles Energy Center	Charles	223.6	211.5	95%
CPV Maryland LLC	CPV St Charles Energy Center	Charles	328.1	305.7	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 Georges	2.0	2.0	100%
Constellation Solar Horizons LLC	Mount Saint Mary's	Frederick	13.7	13.7	100%
Terraform Arcadia	Perdue Salisbury Photovoltaic	Wicomico	1.0	1.0	100%
IKEA Property Inc	IKEA Perryville 460	Cecil	2.1	2.0	95%
IKEA Property Inc	IKEA College Park 411	Prince Georges	1.0	1.0	100%
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%

Appendix 5 (Continued): List of Maryland Generators, as of December 31, 2020

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 Annes	2.0	2.0	100%
Fourmile Wind Energy, LLC	Fourmile Ridge	Garrett	40.0	40.0	100%
Mayor and City Council of Baltimore City	Back River Waste Water Treatment	Baltimore City	1.1	0.9	82%
Mayor and City Council of Baltimore City	Back River Waste Water Treatment	Baltimore City	1.1	0.9	82%
Mayor and City Council of Baltimore City	Back River Waste Water Treatment	Baltimore City	0.8	0.8	100%
Dominion Cove Point LNG, LP	Cove Point LNG Terminal	Calvert	9.4	8.5	90%
Dominion Cove Point LNG, LP	Cove Point LNG Terminal	Calvert	9.4	8.5	90%
Dominion Cove Point LNG, LP	Cove Point LNG Terminal	Calvert	9.4	8.5	90%
Dominion Cove Point LNG, LP	Cove Point LNG Terminal	Calvert	23.9	21.7	91%
Dominion Cove Point LNG, LP	Cove Point LNG Terminal	Calvert	23.9	21.7	91%
Dominion Cove Point LNG, LP	Cove Point LNG Terminal	Calvert	15.6	12.9	83%
Dominion Cove Point LNG, LP	Cove Point LNG Terminal	Calvert	3.0	3.0	100%
Dominion Cove Point LNG, LP	Cove Point LNG Terminal	Calvert	1.3	1.3	100%

Appendix 5 (Continued): List of Maryland Generators, as of December 31, 2020

Dominion Cove Point LNG, LP	Cove Point LNG Terminal	Calvert	1.7	1.7	100%
Dominion Cove Point LNG, LP	Cove Point LNG Terminal	Calvert	1.0	1.0	100%
Dominion Cove Point LNG, LP	Cove Point LNG Terminal	Calvert	65.0	40.0	62%
Dominion Cove Point LNG, LP	Cove Point LNG Terminal	Calvert	65.0	40.0	62%
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	1.5	1.2	80%
NVT LICENSES, LLC	UMES (MD) - Princess Anne	Somerset	2.2	2.1	95%
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 Georges	359.6	299.0	83%
PSEG Keys Energy Center, LLC	Keys Energy Center	Prince Georges	235.5	231.0	98%
PSEG Keys Energy Center, LLC	Keys Energy Center	Prince Georges	235.5	231.0	98%
SunE DB42, LLC	Cecil County CCVT HS	Cecil	2.0	2.0	100%
Terraform Arcadia	Presbyterian Senior Living Service	Baltimore	1.2	1.2	100%
Tesla Inc.	The Clorox Company	Harford	1.6	1.6	100%
Tesla Inc.	Chesapeake College	Queen Annes	1.5	1.5	100%
Altus Power America Management, LLC	MEBA	Talbot	1.5	1.5	100%

Appendix 5 (Continued): List of Maryland Generators, as of December 31, 2020

Tesla Inc.	Wye Mills VNEM CSG	Queen Annes	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 Annes	6.0	6.0	100%
Tesla Inc.	Montgomery County Correctional Facility	Montgomery	1.4	1.4	100%
Tesla Inc.	Garrett County - DPU Treatment Plant	Garrett	1.2	1.2	100%
UGI Energy Services, LLC	Emmitsburg Solar Arrays	Frederick	1.7	1.7	100%
Terraform Arcadia	Pfeffers	Baltimore	1.0	1.0	100%
US Dept of Army, Garrison, APG	APG Combined Heat and Power Plant	Harford	7.9	6.2	78%
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 Georges	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 Georges	94.0	84.3	90%

Appendix 5 (Continued): List of Maryland Generators, as of December 31, 2020

Terraform Arcadia	Bowie State Solar	Prince Georges	1.3	1.3	100%
IOS II LLC	First Baptist Church of Glenarden	Prince Georges	1.5	1.6	107%
Tesla Inc.	Bd of Educ of Queen Anne's Cnty, Cnty HS	Queen Annes	1.7	1.7	100%
Constellation New Energy Inc.	NIST Solar	Montgomery	4.0	4.0	100%
Northstar Macy's Maryland 2015, LLC	Macy's MD Joppa Solar Project	Harford	1.8	1.8	100%
Altus Power America Management, LLC	Synergen Panorama, LLC CSG	Prince Georges	5.0	5.0	100%
Greenbacker Renewable Energy Corporation	Sol Phoenix	Prince Georges	2.5	2.5	100%
Greenbacker Renewable Energy Corporation	Blue Star	Kent	7.5	7.5	100%
Standard Solar	UMCES Ground Mount	Dorchester	2.0	2.0	100%
Standard Solar	Anne Arundel County Public Schools	Anne Arundel	1.0	1.0	100%
Onyx Asset Services Group	APG Old Bayside	Harford	1.7	1.7	100%
Onyx Asset Services Group	APG New Chesapeake	Harford	2.3	2.3	100%
Chester Woods Point Solar, LLC	Chester Woods Point Solar, LLC CSG	Queen Annes	2.0	2.0	100%
Westbound Solar LLC	Amazon Maryland DCA1	Baltimore	1.3	1.3	100%
Standard Solar	MNCPPC Germantown Solar	Montgomery	1.0	1.0	100%
Greenbacker Renewable Energy Corporation	Solar Hagerstown	Washington	10.0	7.5	75%
Forefront Power, LLC	Kingsville CSG	Baltimore	2.0	2.0	100%
Forefront Power, LLC	Upper Marlboro 1 CSG	Prince Georges	2.0	2.0	100%
Forefront Power, LLC	White CSG	Baltimore	2.0	2.0	100%
Forefront Power, LLC	Gibbons CSG	Worcester	2.0	2.0	100%
Old Court Rd Solar, LLC	Old Court Rd Solar	Howard	2.0	2.0	100%
Francis Scott Key Mall	Francis Scott Key Mall	Frederick	1.6	2.1	131%
White Marsh Mall	White Marsh Mall	Baltimore	1.1	1.1	100%
Bluefin Origination 1, LLC	Bluefin Origination 1	Prince Georges	2.0	2.0	100%
Tesla Inc.	Frederick County - Landfill	Frederick	2.0	2.0	100%

Appendix 5 (Continued): List of Maryland Generators, as of December 31, 2020

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	2	100%
Sheriff Rd Solar LLC	Sheriff Road	Prince Georges	1.1	1.1	100%
Madison Energy Holdings LLC	Pinesburg Solar LLC	Washington	4.3	4.3	100%
Madison Energy Holdings LLC	Timonium Fairgrounds	Baltimore	1.9	1.9	100%
6685 Santa Barbara Ct	6685 Santa Barbara Ct	Howard	1	1	100%
Hartz Solar LLC	7448 Candlewood Road	Anne Arundel	14.9	14.9	100%
Standard Solar	MNCPPC Randall Farm	Prince Georges	1.4	1.4	100%
Nautilus Solar Solutions	Burns Solar One LLC	Baltimore	2	2	100%
Nautilus Solar Solutions	Hostetter Solar One, LLC	Washington	2	2	100%
			15,192.7	13,815.5	91%

Appendix 6: Proposed New Renewable Generation in Maryland PJM Queue

Appendix 6: Proposed New Renewable Generation in Maryland PJM Queue
Effective Date: July 2021

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	Carlos Junction-Lonaconing 34.5 kV	Allegany	Active	AE2-309	Solar; Storage	16.66	10/30/2020
APS	Bedington 138 kV	Frederick	Active	AE2-333	Solar	60	12/1/2022
APS	Oakland-Gorman 69 kV	Garrett	Active	AF2-112	Solar	11.4	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	Carlos Junction 138 kV	Allegany	Active	AG2-615	Solar	64.8	12/31/2023
BGE	Graceton 230 kV	Harford	Active	AG2-587	Solar	36	6/1/2024
BGE	Waugh Chapel 115 kV	Anne Arundel	Active	AG2-617	Solar	33	12/31/2023
BGE	Fitzell 33 kV	Baltimore County	Active	AG2-673	Solar	3.7	12/30/2022
DPL	Church - Oil City 138kV	Caroline	Active	AB2-036	Solar	34.9	11/30/2018
DPL	Keeney-Steele 230kV	Caroline	Active	AB2-037	Solar	76.7	10/31/2019
DPL	East New Market 69kV	Dorchester	Active	AC1-190	Solar	35	12/31/2017
DPL	Hebron 69kV	Wicomico	Active	AC2-023	Solar	26.5	9/30/2019
DPL	Easton-Steele 138 kV	Talbot	Active	AE2-093	Solar	16.72	11/30/2021
DPL	Carville 138 kV II	Queen Anne's	Active	AE2-112	Solar	6.46	11/30/2021
DPL	Easton-Steele 138 kV II	Talbot	Active	AF1-015	Solar	6.3	11/30/2021
DPL	Carville 138 kV III	Queen Anne's	Active	AF1-036	Solar	8.4	11/30/2021
DPL	Edgewood 12 kV III	Wicomico	Active	AF2-250	Solar	1.1	6/1/2020
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	Costen 25 kV	Somerset	Active	AG1-360	Solar	0	9/30/2021
DPL	Walston 12 kV	Wicomico	Active	AG1-397	Solar; Storage	4.1882	11/1/2021
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	Price 25 kV	Queen Anne's	Active	AG2-295	Solar	9.3	10/1/2023
DPL	3 Bridges Rd 34.5 kV	Caroline	Active	AG2-419	Solar; Storage	20	5/31/2023

Appendix 8 (Continued): Proposed New Renewable Generation in Maryland PJM Queue

DPL	Price 69 kV	Queen Anne's	Active	AG2-586	Solar	18.6	6/1/2024
DPL	West Cambridge - Vienna 69 kV	Dorchester	Active	AG2-592	Solar	16.8	6/1/2024
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	71.5	12/31/2023
PPL	Columbia-Geisinger Tap #1 69 kV	Anne Arundel	Active	AF2-434	Solar	12	6/1/2022
SMECO	Hughesville 69 kV	Charles	Active	AE1-231	Storage; Solar	9.4	7/31/2020
SMECO	Hawkins Gate-Billingsley Rd 69 kV	Charles	Active	AF1-003	Solar	9.5	7/30/2021
SMECO	Charles County Solar I	Charles	Active	AF1-005	Solar	9.9	7/30/2021
SMECO	Bolton - Bennsville 69 kV	Charles	Active	AG2-647	Solar	4.6	3/31/2023
					Total	**1705.60**	