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2021-02-17

Case Number (if already assigned) PUR-2021-00206

Case Name (if known) Petition of Appalachian Power Company
For approval of its 2021 RPS Plan
under § 56-585.5 of the Code of Virginia and related
requests

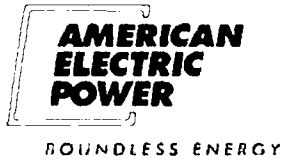
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American Electric Power
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Richmond, Virginia 23219
63022

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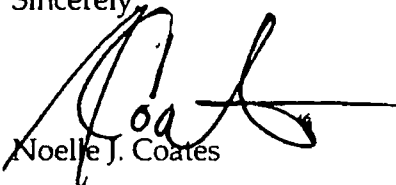
Noelle J. Coates
Senior Counsel Regulatory
Services
(804) 698-5541 (P)
(804) 698-5526 (F)
njcoates@aep.com

**Re: Petition of Appalachian Power Company
For approval of its 2021 RPS Plan
under § 56-585.5 of the Code of Virginia
and related requests
Case No. PUR-2021-00206**

Dear Mr. Logan:

Enclosed for filing is Corrected Attachment 1, the 2021 RPS Plan, to the Petition that was filed in the above-referenced case on December 30, 2021. After the filing of the 2021 RPS Plan, the Company noted that Tables 22 and 23 contained incorrect information, which has been corrected in this version. In addition, the Plan's original Appendix B had two tables numbered 29, which has also been corrected and all tables past Table 29 have been renumbered. Lastly, the information in Appendix C has been removed, as it was inadvertently included in the report.

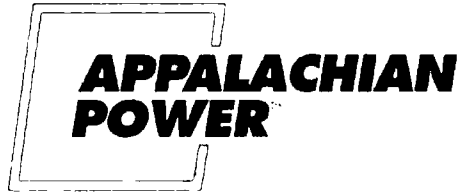
Sincerely,



Noelle J. Coates

Enclosure

cc: William H. Chambliss, Esq.
Kiva B. Pierce, Esq.
C. Meade Browder, Jr., Esq.



An **AEP** Company

BOUNDLESS ENERGY™

RENEWABLE PORTFOLIO STANDARD PLAN

CASE NO. PUR-2021-00206

December 30, 2021

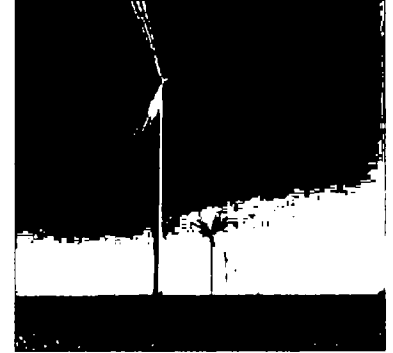
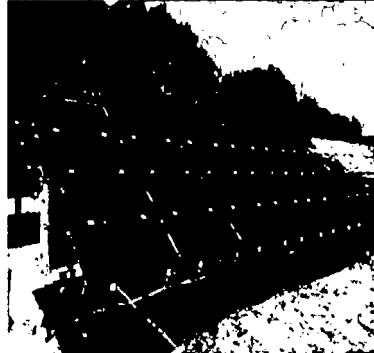


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1.0 Virginia Clean Economy Act Compliance Plan Overview

Consistent with the requirements of Virginia Code Section 56.585.5.D.4, Appalachian Power Company (Appalachian, APCo, or the Company) submits the second of its annual plans to meet the requirements in the Virginia Clean Economy Act (VCEA).

This year's report includes six separate VCEA compliant plans for informational purposes. Descriptions of the six Portfolios are provided in Table 1. Four of the plans, Portfolios 1-4, assume only the minimum level of renewable resources needed to meet the annual VCEA energy targets are added. These plans were prepared under varying scenarios in which the Company's two coal plants were retired in either 2028 or 2040, and replaced with either a combination of renewable and gas fired resources or 100% renewable resources. The fifth plan (Portfolio 5) was prepared under the assumption that 1,000 MW of additional wind above the minimum VCEA requirements is available and can be added based on favorable economics in time to capture production tax credits before they expire in 2026. The sixth plan (Portfolio 6) is a sensitivity case prepared as a result of a requirement in the Commission's order on the Company's 2020 VCEA filing,¹ in which future wind resources are assumed to have a capacity factor that is consistent with the Company's current wind PPA resources.

TABLE 1: PORTFOLIO DESCRIPTIONS

Portfolios					
1	2	3	4	5	6
RGGI Only CO2 2040 AM & MNTR Ret. Gas Options Available	RGGI to \$15 CO2 2040 AM & MNTR Ret. No Gas Option Available	RGGI Only CO2 2028 AM & MNTR Ret. Gas Options Available	RGGI to \$15 CO2 2028 AM & MNTR Ret. No Gas Option Available	RGGI to \$15 CO2 2040 AM & MNTR Ret. No Gas Option Available Higher Wind Limits	RGGI to \$15 CO2 2040 AM & MNTR Ret. No Gas Option Available Current Wind Project Cap Factors

For the purposes of this report, the Company's base case assumption is that the coal plants will operate through 2040 and fossil fueled resources will not be used to replace them at that time. Portfolio 2 presents that scenario and will be referred to in this report as the VCEA Plan or the Plan. Nevertheless, APCo intends to issue Request for Proposals (RFPs) in the near

¹ Final Order at 5, *Commonwealth of Virginia, ex rel. State Corporation Commission Ex Parte: Establishing 2020 RPS Proceeding for Appalachian Power Company*, Case No. PUR-2020-00135, Doc. Con. Cen. No. 210440238 (April 30, 2021) ("Order on 2020 Filing").

term based on Portfolio 5, and seek approval of those resources based on the results of APCo's economic analyses. The Company's 2021 VCEA Plan includes a geographically varied portfolio of storage, solar and wind resources, both Company and third party owned, as well as market REC purchases. In the filing associated with this Plan, the Company is seeking a prudence determination of the acquisition of one 150 MW solar facility and the agreements to purchase the output of three solar facilities via power purchase agreements (PPAs) totaling approximately 89 MW; approval to recover the costs of 50 MW of owned West Virginia solar and 204 MW of Illinois wind resources. In addition, APCo is seeking cost recovery for RECs associated with 40 MW of Virginia solar contracted through its Cogen/SPP rate schedule; 15 MW of contracted solar located in Virginia; 5 MW owned solar in Virginia; as well as market REC purchases necessary for annual compliance.

The Company developed these VCEA compliant plans in a way that is similar to how Integrated Resource Plans are developed, using the same general methods, commodity price forecasts, optimization software, load forecasts, and resource cost assumptions. The amount and timing of the resource additions were determined with Plexos[®] optimization software, adjusted as needed to include resource additions that were necessary to meet certain annual requirements associated with energy efficiency targets and Virginia-domiciled renewable and storage.

In addition to determining the type and timing of resource additions, this report provides an estimate for the rate impacts associated with compliance, consistent with the Commission's requirement in the Order on the 2020 Filing.

1.1 VCEA Expected Resource Additions

APCo issued a series of RFPs for renewable resources and RECs in 2021 to meet the VCEA requirements and is seeking approval in both Virginia and West Virginia for several projects that resulted from that process. It is assumed for purposes of this Plan that both Virginia and West Virginia commissions will approve those investments and that each retail jurisdiction will receive its allocated share of costs and attributes. All other identified renewable resource additions are assumed to accrue exclusively to Virginia retail customers.

In the short term, APCo expects to acquire or contract for 498 MW of resources. These specific resources, which are the subject of the petition filed simultaneously with this report, are shown in Table 2.

TABLE 2 APCO PLANNED NEAR-TERM RESOURCE ADDITIONS

Facility	Nameplate Capacity MW	Owned / PPA	State	Resource Type	Operation
Firefly	150.0	Owned	Virginia	Solar	July 2024-June 2059
Amherst*	4.9	Owned	Virginia	Solar	Jan 2023 - Dec 2057
Horsepen	20.0	PPA	Virginia	Solar	Jan 2025 - Dec 2054
Dogwood*	18.9	PPA	Virginia	Solar	Jan 2025 - Dec 2054
Sun Ridge	50.0	PPA	Virginia	Solar	Jan 2025 - Dec 2054
Virginia Domiciled	243.8				
Top Hat	204.0	Owned	Illinois	Wind	Jan 2025 - Dec 2054
Bedington	50.0	Owned	West Virginia	Solar	Oct 2023 - Sep 2058
TOTAL	498				

*Distribution Resource

In addition, the Company expects the Depot (15 MW) and Wytheville (20 MW) solar facilities to be operational in late 2021-early 2022. The Leatherwood (20 MW) solar facility was placed in-service in September 2021. All of the renewable attributes of the Leatherwood and Wytheville facilities, which are PURPA projects, are being attributed to Virginia. Finally, the Company is proposing to add approximately 8 MW of energy storage for the purposes of improving reliability along its Glade Station – White Top circuit.

The RFP issued for RECs in May 2021 resulted in one bid. The Company elected not to pursue this bid based on its economic analysis, and will continue to issue RFPs for RECs from time to time to evaluate the cost effectiveness and level of availability of REC contracts as a compliance option.

As shown in Table 3 below, the Company will satisfy the 2023 interim wind and solar requirements of Section 56-585.5 D.1 by petitioning the Commission for approval to acquire approximately 155 MW of owned Virginia-domiciled solar facilities (Firefly and Amherst), and approximately 144 MW of contracted, third-party owned, Virginia-domiciled solar facilities (Wytheville, Leatherwood, Depot, Horsepen, Sun Ridge, and Dogwood). Progress towards the Virginia-domiciled resources that will be used for compliance with the 2023 petition requirement are listed in Table 3.

TABLE 3: APCO PROGRESS TOWARDS 56-585.5 D. WIND/SOLAR REQUIREMENTS

56-585.5.D Requirement	PPA	Owned	Total
YE 2023	70	130	200
YE 2027	140	260	400
YE 2030	210	390	600
2021 Plan	144	155	299

The VCEA section 56-585.5 E also contains interim storage resource requirements. See Table 4 for the Company's Progress towards these requirements. The Company expects to solicit bids for qualifying storage resources in a future RFP in 2022.

TABLE 4: APCO PROGRESS TOWARDS 56-585.5 E. STORAGE REQUIREMENTS

56-585.5.E Requirement	PPA	Owned	Total
YE 2025	9	16	25
YE 2030	53	98	150
YE 2035	140	260	400
2021 Plan	0	0	0

1.2 Virginia Clean Economy Act Near-Term Compliance

The Company met the RPS requirements of Section 56-585.5 C for 2021 largely with its current supply of renewable resources. In Table 5, the Company has prepared a projection of its expected position in terms of VCEA qualifying energy production versus each year's energy targets through 2025. Given the assumed production of the existing and planned energy resources, the Company projects a deficit in each year. It is anticipated this deficit will be addressed through the tactical purchase of RECs, when market conditions are favorable.

TABLE 5: APCO NEAR TERM VCEA ENERGY COMPLIANCE
Projected REC production and forecast requirements (MWh)

	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>
<u>Current Resources</u>					
Hydro - owned	478,739	478,739	478,739	478,739	478,739
Hydro (PPA)	70,366	70,366	70,366	70,366	70,366
Bluff Point Wind (PPA)	189,720	189,720	189,720	189,720	189,720
Camp Grove Wind (PPA)	99,893	99,893	99,893	99,893	99,893
Fowler Ridge (PPA)	114,235	114,235	114,235	114,235	114,235
Leatherwood (PPA)	13,039	45,153	44,927	44,703	44,479
Sub-total Current Resources	965,993	998,107	997,881	997,656	997,433
<u>Projected Resources</u>					
Wytheville (PPA)	0	42,968	42,753	42,539	42,327
Depot (PPA)	0	13,285	15,475	15,398	15,321
Amherst - owned	0	314	5,290	5,264	5,237
Horsepen (PPA)					21,765
Dogwood (PPA)					16,446
Sun Ridge (PPA)					58,200
Top Hat - owned					381,979
Firefly - owned				111,428	167,142
Bedington - owned			10,962	52,225	51,964
Subtotal - Projected Resources	0	56,567	74,481	226,854	760,381
Total - Current and Projected	965,993	1,054,674	1,072,361	1,224,510	1,757,814
less APCo Renewable Riders	(80,342)	(80,342)	(80,342)	(80,342)	(80,342)
Production Available for Compliance	885,651	974,332	992,019	1,144,168	1,677,472
Virginia Retail Load (forecast)(MWh)	15,040,556	15,017,019	15,002,519	14,989,673	14,998,772
RPS % Requirement	6%	7%	8%	10%	14%
RPS REC Requirement	902,433	1,051,191	1,200,202	1,498,967	2,099,828
REC Deficit	(16,783)	(76,859)	(208,182)	(354,799)	(422,356)
Cumulative REC Surplus/(Deficit)		(93,642)	(301,824)	(656,623)	(1,078,979)
Embedded Jurisdictional Split	0.501				
New Asset Split	0.501				
	2021	2022	2023	2024	2025
Requirement	902,433	1,051,191	1,200,202	1,498,967	2,099,828
WV Approves	871,923	953,166	959,959	1,002,627	1,657,979
Only Virginia Approves	965,993	1,054,674	1,072,361	1,224,510	1,757,814

1.3 APCo's Coal Units

The Company is required to make certain environmental investments in its two coal plants (2,930 MW Amos, St. Albans, WV; 1,336 MW Mountaineer, New Haven, WV) in order for them to operate past 2028. In Case No. PUR-2020-00258, the Virginia SCC did not approve cost recovery for the Virginia jurisdictional share of the investment necessary to comply with the Effluent Limitation Guidelines (ELG) rule. As a result, the Company modeled two sets of scenarios: one with the two plants retiring at the end of 2028 and one with the plants retiring in 2040. During the performance of the analyses in this report, the Public Service Commission of West Virginia (WVPSC) ordered (Case No. 20-1040-E-CN) APCo to proceed with the investments necessary to keep the plants operational past 2028 and held that West Virginia customers will, if necessary, pay for the entire investment. There are unresolved issues associated with the sharing of capacity and energy benefits of these plants between the states if the Virginia SCC ultimately denies cost recovery of the ELG investment and the coal plants remain operational past 2028. For the purposes of discussion of the VCEA Plan (Portfolio 2) in this report, it is assumed that Virginia will continue to have the benefit of the two coal plants through 2040.

1.4 Environmental Justice

Appalachian is committed to the tenets of the Commonwealth's Policy on Environmental Justice and considers it in all prospective transactions for renewable resources. Identification and remediation of potential concerns are made during the RFP process, as discussed in the petition. Because Environmental Justice is specific to the communities immediately surrounding resources, meaningful screening can only be accomplished once potential sites have been identified. The Plexos® selected resource additions identified in this Plan are generic in nature and are not site specific and thus cannot be evaluated for potential Environmental Justice issues.

1.5 Reliability Impacts

Through Plexos®, the Company models reliability at a system level by ensuring that sufficient resources are available to meet customer load based on the hourly profile of both load and resources. Because the Company is a member of PJM, Plexos® has the option to fill energy deficits in any specific hour with market purchases. At this time, the Company expects that supply of energy from PJM will be available through at least 2030 when needed with pricing

based upon scarcity. The Company will continue to evaluate and identify potential reliability concerns and mitigation as renewable penetration increases in APCo's service territory, Virginia, and PJM.

2.0 VCEA Summary

In 2020, the General Assembly passed the VCEA, which was signed into law by Governor Northam. The VCEA is a transformative law that seeks to end carbon dioxide emissions from the electric utility industry in Virginia.²

2.1 VCEA Requirements

There are four primary requirements of the VCEA related to resource acquisition:

1. Annual RPS requirement. For APCo, this requirement is reproduced in Table 6 and begins at 6% in 2021 and escalates to 100% by 2050.

TABLE 6: APCO VCEA RPS REQUIREMENTS BY YEAR

Year	APCo RPS Requirement (%)	Year	APCo RPS Requirement (%)
2021	6	2036	53
2022	7	2037	53
2023	8	2038	57
2024	10	2039	61
2025	14	2040	65
2026	17	2041	68
2027	20	2042	71
2028	24	2043	74
2029	27	2044	77
2030	30	2045	80
2031	33	2046	84
2032	36	2047	88
2033	39	2048	92
2034	42	2049	96
2035	45	2050 and thereafter	100%

2. Development of Virginia domiciled solar and wind resources. APCo is required to petition the Commission for 600 MW solar or wind resources by December 31, 2030, with interim targets beginning December 31, 2023; 35% of those resources are required to be contracted via PPA. The Company is using nameplate capacity to determine compliance with these requirements.

² Appalachian is a "Phase I" utility as defined in Section 56.585.1. A.1. of the Code of Virginia. As such, this report will refer to the requirements in the VCEA that only apply to Appalachian.

3. Development of Energy Storage resources. By December 31, 2035, the VCEA requires APCo to have petitioned the Commission for necessary approvals to construct or acquire 400 MW of energy storage capacity, or more with Commission approval. These resources must meet the same 35% PPA requirement that applies to the Virginia domiciled solar and wind resources. Further, 10% of the battery installations are required to be behind the meter (BTM) installations.

The Commission opened Case No. PUR-2020-00120 to establish rules and regulations for the required addition of storage and subsequently issued regulations to determine the appropriate timing of storage additions on December 18, 2020. The Company is working to identify the preferred location and size of storage resources, and will issue an RFP in 2022 for storage resources. See Table 7 for those interim storage addition minimums³.

TABLE 7: VCEA REQUIRED STORAGE ADDITIONS

Date	New Storage Additions (MW)	Cumulative Storage Additions (MW)
12-31-2025	25	25
12-31-2030	125	150
12-31-2035	250	400

4. Energy Efficiency requirement. APCo must implement energy efficiency measures that achieve energy savings equivalent to at least 2% of the Company’s 2019 retail sales by 2025. The VCEA also specifies that the Commission shall establish new EE requirements for the period of 2026 to 2028, and for every three year period thereafter. Due to the uncertain nature of any future proceeding regarding the efficacy or cost-effectiveness of additional EE, the amount of EE requirements set by the Commission was assumed to remain constant beyond 2025, with any additional EE in future years only being selected for economic purposes.

³ Order for Notice and Comment, *Commonwealth of Virginia, ex rel., State Corporation Commission Ex Parte: In the matter of establishing rules and regulations pursuant to §56-585.5 E 5 of the Code of Virginia related to the deployment of energy storage*, Case No. PUR-2020-00120, Doc. Con. Cen. No. 200910238 (Sept. 11, 2020).

2.1.1 Commission Filing Requirements

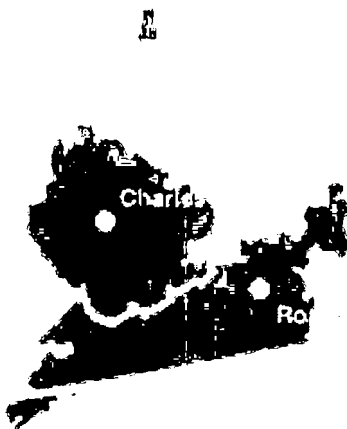
In the Attachment to its July 10, 2020 *Order Establishing 2020 RPS Proceedings*, the Commission set forth certain filing requirements. In addition, in the Order on the 2020 Filing, the Commission imposed certain requirements for this 2021 VCEA filing. The requirements of each of these orders, along with a description of where they are addressed in this report, are contained in Appendix E.

3.0 APCo Company Summary and Assumptions Overview

3.1 Overview of APCo

APCo's customers are retail and sales-for-resale (wholesale) customers located in the states of Virginia, West Virginia and Tennessee (see Figure 1). Currently, APCo serves nearly 1 million customers, with nearly 540,000 of those customers being in Virginia. The peak load requirement of APCo's total retail and wholesale customers is seasonal in nature, with distinctive peaks occurring in the summer and winter seasons. APCo's all-time highest recorded peak demand was 8,708 MW, which occurred in February 2015, and the highest recorded summer peak was 6,755 MW, which occurred in August 2007. The most recent (summer 2021 and winter 2020/21) actual APCo summer and winter peak demands were 5,348 MW and 5,975 MW, occurring on August 24, 2021 and February 8, 2021, respectively.

FIGURE 1: APCO'S SERVICE TERRITORY



3.2 APCo's existing resources

APCo serves its customers through owned generation resources and PPAs for renewable resources. See Table 8 and Table 9 for a summary of these owned and contracted resources, respectively.

TABLE 8: APCO OWNED GENERATION RESOURCES

Plant	Capacity [MW] ¹	No. of Units	Location	Fuel	First Unit Commissioned	Retirement Date
John E. Amos	2930	3	Winfield, WV	Coal	1971	2040*
Mountaineer	1305	1	New Haven, WV	Coal	1980	2040
Ceredo	450	6	Ceredo, WV	Natural Gas	2001	2041
Clinch River	455	2	Carbo, VA	Natural Gas	1958	2025
Dresden	570	3	Dresden, OH	Natural Gas	2012	2047
Buck	1.5	3	Ivanhoe, VA	Hydro	1912	2024
Byllesby	4.2	4	Byllesby, VA	Hydro	1912	2024
Claytor	75.5	4	Radford, VA	Hydro	1939	2041
Leesville	50	2	Leesville, VA	Hydro	1964	2040
London	6.5	3	Montgomery, WV	Hydro	1935	2044
Marmet	5.8	3	Marmet, WV	Hydro	1935	2044
Niagara	2.4	2	Roanoke, VA	Hydro	1906	2024
Smith Mountain	585	5	Penhook, VA	Hydro	1965	2040
Winfield	10	3	Winfield, WV	Hydro	1938	2044
TOTAL	1310.9	32				

¹ Nameplate rating. For capacity planning purposes, PJM UCAP ratings are used.

*Retirement date for planning purposes. May differ from retirement dates for depreciation purposes

TABLE 9: APCO CONTRACTED GENERATION RESOURCES

Facility	Nameplate Capacity MW	State	Resource Type	Contract Expiration
Ohio Valley Electric Corporation	332	Ohio	Coal	2040
Summersville I and II	80	West Virginia	Hydro	2027
Bluff Point	120	Indiana	Wind	2037
Camp Grove	75	Illinois	Wind	2028
Beech Ridge	101	West Virginia	Wind	2030
Fowler Ridge III	99	Indiana	Wind	2029
Grand Ridge II and III	101	Illinois	Wind	2029
Depot Solar	15	Virginia	Solar	2041
Wytheville*	20	Virginia	Solar	2036
Leatherwood*	20	Virginia	Solar	2036
TOTAL	963			

*Behind the Meter Resources

3.3 Key Modeling Assumptions

Key assumptions included in the VCEA Plan

1. Appalachian Power operates in both Virginia and West Virginia and is subject to regulation in both states, with resource acquisition determinations made by regulators

Corrected Attachment 1

in both states and resource costs allocated between the jurisdictions. The Company assumes, for the purposes of this Plan, that all of the specific resources in Table 4 will be approved by both Virginia and West Virginia. Subsequent renewable resources will accrue entirely to Virginia retail customers. There is not currently a renewable portfolio standard in place in West Virginia.

2. The Company's base case assumption is that Amos and Mountaineer coal-fired plants will run through 2040 consistent with the WVPSC's order in Case No. 20-1040-E-CN. After 2040, the Company has assumed, in the VCEA Plan, that capacity shortfalls will be met with a combination of renewable generators and energy storage. In other cases where the Company modeled fossil additions for informational purposes, it is understood that those resources would necessarily be located outside of Virginia.
3. The Company will sell the REC bank that it accumulated through the end of the Voluntary RPS in 2020 during 2021 for the benefit of customers that were subject to the voluntary RPS. As a consequence, the Company's starting REC position for the VCEA is zero.
4. RECs were made available to the Plexos® model as a resource option that could be selected if they were a less costly VCEA compliance option than other renewable resources, based on an assumed REC price curve. Projected RECs in excess of any one year's VCEA energy requirement were assumed to be sold the following year in order to reduce overall compliance costs.
5. Any capacity additions resulting in excess capacity above the Company's minimum PJM UCAP capacity requirement were modeled to be sold to either the PJM capacity market or to a third party under a bilateral purchased power agreement beginning in 2026, at the Company's fundamental PJM capacity price forecast.
6. The Company's existing renewable resources are contributing to the VCEA renewable energy goals. Existing renewable resources are allocated based on the ratio of APCo Virginia retail load (including Public Authority and Commonwealth customers) to total company load, which is estimated to be 50.1%. Existing contracts are modeled as ending on their expiration date and are not expected to be renewed.

3.4 APCo Load Forecast

The APCo load forecast was developed by the American Electric Power Service Corporation (AEPSC) Economic Forecasting organization and completed in June 2021.⁴ The load forecast is the culmination of a series of underlying forecasts that build upon each other. The economic forecast provided by Moody's Analytics is used to develop the customer forecast,

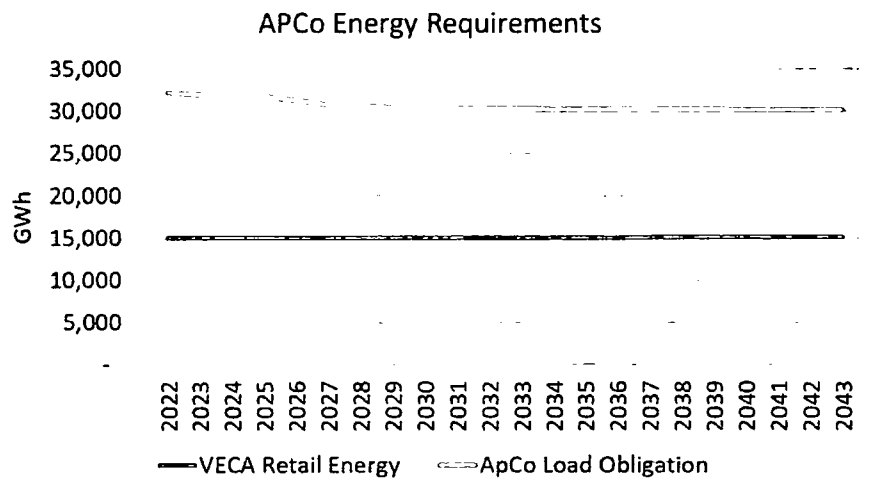
⁴ The load forecasts (as well as the historical loads) integral to this Plan reflect the traditional concept of internal load, i.e., the load that is directly connected to the utility's transmission and distribution system and that is provided with bundled generation and transmission service by the utility. Such load serves as the starting point for the load forecasts used for generation planning. Internal load is a subset of *connected load*, which also includes directly connected load for which the utility serves only as a transmission provider. Connected load serves as the starting point for the load forecasts used for transmission planning.

which is then used to develop the sales forecast, which is ultimately used to develop the peak load and internal energy requirements forecast.

Over the next 15-year period (2022-2036),⁵ APCo’s service territory is expected to see population to decline at 0.3% per year and non-farm employment growth 0.3% per year, and APCo is projected to see its customer count decline by 0.1% over this period. Over the same forecast period, APCo’s retail sales are projected to decline at 0.2% per year, with growth expected from the industrial class (+0.2% per year) while the residential class is projected to decline at a compounded annual growth rate (CAGR) of 0.4% per year. Finally, APCo’s internal energy is expected to decline by 0.4% per year and peak demand is expected to decline by 0.6% per year through 2036. For this forecast, it has been assumed that APCo’s current wholesale customers will not renew their contracts beyond the current contract expiration dates, resulting in removal of their load from the forecast.

Figure 2 shows both the total load forecast for APCo and the Virginia retail sales applicable to the VCEA. The Company understands “retail” as defined in the Code to include the Public Authority and Commonwealth customers in Virginia, for the purposes of determining VCEA RPS requirements. These forecasted retail sales along with the annual VCEA energy targets provided a key input into the development of the proposed VCEA Plan.

FIGURE 2: APCO ENERGY REQUIREMENTS



3.5 The Fundamentals Forecast

The Fundamentals Forecast is a long-term, weather-normalized commodity market forecast principally based upon the assumptions contained in the Energy Information Administration's Annual Energy Outlook (AEO). It is provided to AEPSC and all AEP operating companies for purposes such as resource planning, capital improvement analyses, fixed asset impairment accounting, and others. These projections cover the electricity market within the Eastern Interconnect, the Electric Reliability Council of Texas, and the Western Electricity Coordinating Council. The Fundamentals Forecast includes, among other factors: 1) hourly, monthly and annual regional power prices (in both nominal and real dollars); 2) prices for various qualities of coals; 3) monthly and annual locational natural gas prices, including the benchmark Henry Hub; 4) nuclear fuel prices; 5) SO₂, NO_x, and CO₂ burden values; 6) locational implied heat rates; 7) electric generation capacity values; 8) renewable energy subsidies; and 9) inflation factors; 10) VCEA compliance for Virginia utilities among others.

Table 10 below describes the Fundamentals Forecast components, which are sourced directly from the EIA AEO, from third party energy consultancies, or were sourced internally. As the EIA AEO does not provide the granularity for most regulatory applications, the Aurora energy market simulation model was utilized to create a reasonable proxy for the EIA AEO while providing the level of detail necessary for downstream consumption.

TABLE 10: FUNDAMENTALS FORECAST COMPONENTS

Forecast Components	EIA	Other	Source
Economy; Inflation/GDP deflators	✓		EIA Reference case
Generating Reserve Margins		✓	RTO Requirements
Electric Load		✓	AEP Load Forecasting
Electric Load shapes		✓	AEP Fundamentals
Solar/Wind production shapes by area		✓	NREL
Coal; Delivered price to EIA regions	✓	✓	EIA Reference case FOB prices + AEP Fundamentals
Natural gas price; Henry Hub	✓		EIA Reference case
Natural gas price; Locational values	✓	✓	EIA Reference case - Henry Hub + AEP Fundamentals
Natural gas supply; Lower 48 production	✓		EIA Reference case
Natural gas demand (incl. losses)	✓		EIA Reference case
Natural gas; net pipeline/LNG exports	✓		EIA Reference case
Oil price, WTI	✓		EIA Reference case
Fuel Oil price; locational values	✓	✓	EIA Reference case - WTI + AEP Fundamentals
Uranium prices		✓	AEP Fundamentals
Other Fuel (Biofuel, etc...)	✓		EIA Reference case
New gen unit options and capital costs	✓		EIA Reference case
Existing gen units	✓		EIA Reference case
Announced new gen units	✓		EIA Reference case
Aged-out retirements of existing gen units	✓		EIA Reference case
Gen unit maintenance schedule		✓	AEP Fundamentals
Gen unit outages		✓	AEP Fundamentals
Unit-level emission rates; CO ₂ , SO ₂ , NO _x		✓	US EPA CEMS data
Application of a CO ₂ burden		✓	AEP Environmental
REC		✓	AEP Regulatory Forecast
PTC	✓		EIA Reference case
ITC	✓		EIA Reference case
State-mandated Renewable Portfolio Standards		✓	AEP Environmental
Reporting parameters; Peak/Off-Peak/NERC Holidays		✓	PJM/SPP/other RTO and/or internal guidelines
Transmission/links between Zones		✓	AEP Fundamentals

The Fundamentals Forecasts incorporates requirements of the Virginia Clean Energy Act and the Regional Greenhouse Gas Initiative (RGGI) for both APCo and Dominion:

- Including Virginia in the RGGI, applying RGGI CO₂ prices through 2027 before switching to an assumption of a higher \$15/metric ton national standard in 2028
- Applying the Virginia RPS program to Phase I and Phase II utilities within the state
- Retiring all fossil units named in the VCEA law by stated retirement dates
- Retiring all remaining Phase I fossil units by 2050 and Phase II fossil units by 2045
- Including the resource additions required for Dominion under the VCEA based upon the Company's understanding of those requirements

The Aurora model iteratively generates zonal, but not company-specific, long-term capacity expansion plans, annual energy dispatch, fuel burns and emission totals from inputs including fuel, load, emissions, and capital costs, among others. Ultimately, Aurora creates a weather-normalized, long-term forecast of the market in which a utility would be operating. AEPSC also has ample energy market research information available for its reference, which includes third-party consultants, industry groups, governmental agencies, trade press, investment community, AEP-internal expertise, various stakeholders, and others. The Aurora model is widely used by utilities for integrated resource and transmission planning, power cost analysis

and detailed generator evaluation. The database includes approximately 25,000 electric generating facilities in the contiguous United States, Canada, and Baja Mexico. These generating facilities include wind, solar, biomass, nuclear, coal, natural gas, and oil. A licensed online data provider, ABB Velocity Suite, provides up-to-date information on markets, entities and transactions along with the operating characteristics of each generating facility, which are subsequently exported to the Aurora model.

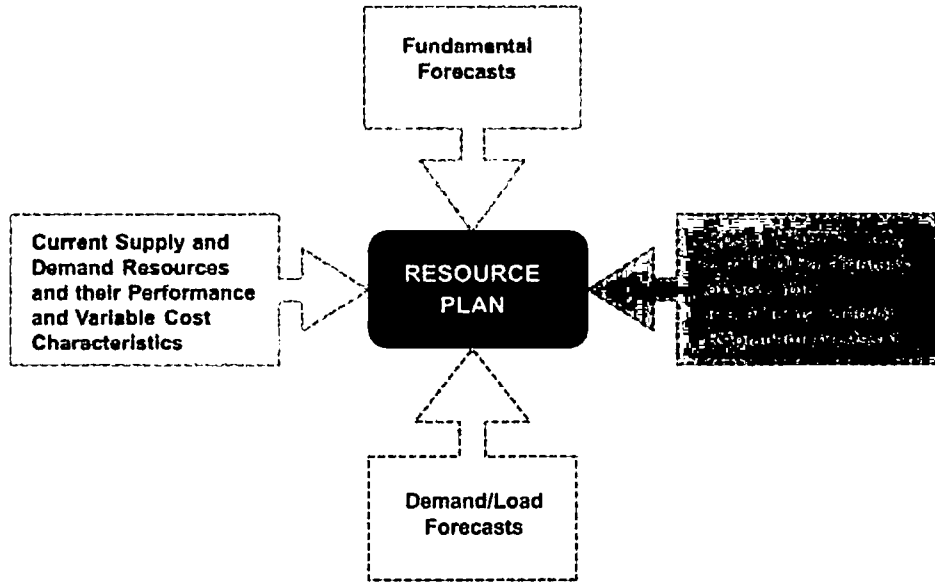
The annual results from each scenario developed are shown in Appendix A and include on-peak and off-peak energy prices, natural gas prices, coal prices, CO₂ prices and capacity prices.

3.6 Determining Compliant VCEA Plans

For the purposes of modeling compliance with the VCEA, APCo used a process nearly identical to its typical IRP process, which used the Plexos® model to address the gap between resource needs and current resources, while also including minimums related to the requirements established under the VCEA for energy from renewable resources, energy savings from energy efficiency resources and capacity from energy storage resources.

Given the cost and performance parameters around sets of potentially available proxy resources—both supply and demand side—and a scenario of economic conditions that include long-term fuel prices, capacity costs, energy costs, emission-based pricing proxies including CO₂, as well as projections of energy usage and peak demand, Plexos® will return the optimal suite of proxy resources (portfolio) that meet the resource need. Portfolios created under similar pricing scenarios may be ranked on the basis of cost, or the net present value of the resulting stream of revenue requirements. The least cost option is considered the optimum portfolio for that unique input parameter scenario.

FIGURE 3: RESOURCE PLANNING DIAGRAM



4.0 Supply- and Demand-side Resource Options

Supply-side resource options including natural gas base/intermediate and peaking generating technologies and intermittent renewable resources including large-scale solar, wind and battery storage were selectively made available in different scenarios to develop compliant plans.⁶ To reduce the computational problem size within Plexos[®], the number of alternatives explicitly modeled was reduced through an economic screening process that analyzed various supply options and developed a quantitative comparison levelized over technologies life cycle. It is important to note that alternative technologies with comparable cost and performance characteristics, subject to limitations included in Section 56-585.5, can ultimately be substituted, should technological or market-based profile changes warrant.

Table 11 includes a summary of the technologies made available to the model, depending upon scenario, and their associated performance parameters. These generation technologies were intended to represent reasonable proxies for each capacity type (base-load, intermediate, peaking). Subsequent substitution of specific technologies could occur in any later plan, based on emerging economic or non-economic factors not yet identified.

Other generation resource technologies were not made available to Plexos[®] due to their respective costs, and to improve modeling process time. Technologies such as natural gas resources with carbon capture and storage, hydrogen-capable combustion turbines, long duration storage, and small modular nuclear reactors were evaluated and found not to be competitive on cost when compared to the resource types shown in Table 11 which were made available to Plexos[®]. APCo will continue to monitor developments in these and other technologies and including cost, availability, and the availability of federal tax credits, which could make these resources more attractive options in the future.

⁶ The Company referred to the EIA ANNUAL ENERGY OUTLOOK 2020 report (<https://www.eia.gov/outlooks/aeo/pdf/aeo2020.pdf>) and the associated EIA Capital Cost and Performance Characteristic Estimate for Utility Scale Electric Power Generating Technologies (https://www.eia.gov/analysis/studies/powerplants/capitalcost/pdf/capital_cost_AEO2020.pdf) to inform the analysis process.

TABLE 11: GENERATION TECHNOLOGY OPTIONS (2021\$)

AEP System
New Generation Technologies
Key Supply-Side Resource Option Assumptions (a)(b)(d)

Type	Capacity (MW) (e)			Installed Cost (d,f) (\$/kW)	Capacity Factor (%)	LCOE (g) (\$/MWh)
	Std. ISO	Summer	Winter			
Base Load						
COMB TURBINE H CLASS, 1100-MW COMBINED CYCLE (c)	1,030	1,010	1,070	1,100	75	55.5
COMB TURBINE H CLASS, COMBINED-CYCLE SINGLE SHAFT, 430 MW (c)	420	410	440	1,200	75	58.9
Peaking						
COMB TURBINE F CLASS, 240-MW SIMPLE CYCLE (c)	230	230	250	800	25	95.0
COMB TURBINES AERODERIVATIVE, 100-MW SIMPLE CYCLE (c)	110	100	110	1,300	25	128.4
INTERNAL COMBUSTION ENGINES, 20 MW (c)	20	20	20	2,100	25	173.9
Intermittent						
BATTERY ENERGY STORAGE SYSTEM, 50 MW / 200 MWh (c)	50	50	50	1,472	25	156.7
SOLAR PHOTOVOLTAIC WITH BATTERY ENERGY STORAGE SYSTEM, 150 MWx200 MWh (h)	150	150	150	2,041	20	101.7
ONSHORE WIND, LARGE PLANT FOOTPRINT, 200 MW (i)	200	200	200	1,505	35	40.3
SOLAR PHOTOVOLTAIC, 150 MWAC (h)	150	150	150	1,469	24	57.1

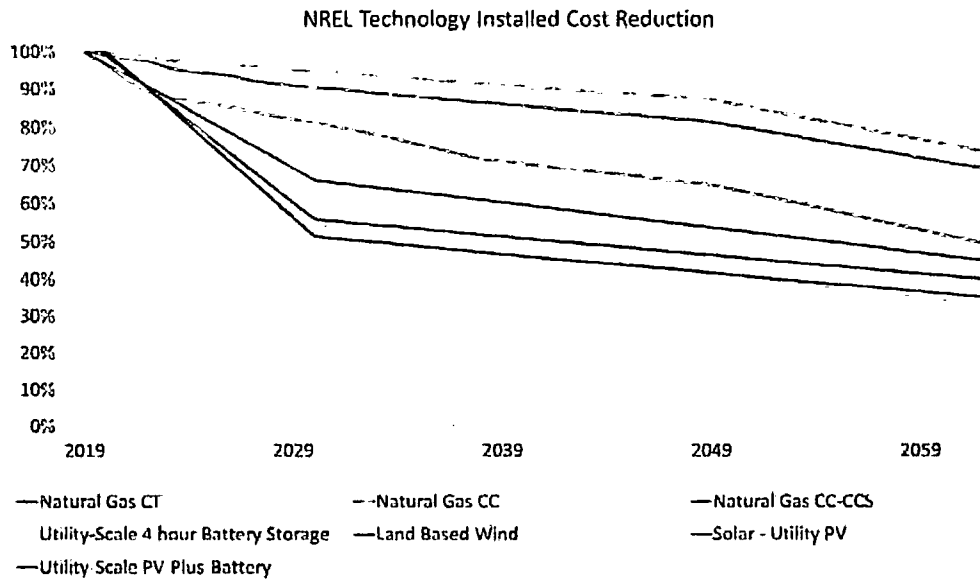
- Notes:
- (a) Costs and performance data informed by EIA report Capital Cost and Performance Characteristic Estimates for Utility Scale Electric Power Generating Technologies (Feb 2020)
 - (b) Installed cost, capability and heat rate numbers have been rounded
 - (c) All costs in 2021 dollars, except as noted. Costs adjustments made based on EIA report Cost and Performance Characteristics of New Generating Technologies, Annual Energy Outlook 2020 - Region 11 (PJM)
 - (d) \$/kW costs are based on summer capability
 - (e) All Capabilities adjusted by the Performance Adjustment Factors defined in the reference report (a)
 - (f) Total Plant Investment Cost w/AFUDC (AEP rate of 6.41%, site rating \$/kW)
 - (g) Levelized cost of energy based on capacity factors shown in table
 - (h) Dollars are in 2023 informed by ApCo RFP
 - (i) Dollars are in 2023 informed by Bloomberg New Energy Finance's (BNEF) 2H 2020 U.S. Renewable Energy Market Outlook

For this analysis, the Company adopted “learning curve” forecasts published by the National Renewable Energy Laboratory (NREL) in its 2021 Annual Technology Baseline (ATB)⁷ for capital costs for all resource types and for wind and solar O&M costs. The notion behind learning curve forecasts is that over time real costs will come down due to economies of scale, technology improvements, manufacturing improvements, and other factors. NREL forecasts that overnight installed capital costs will decline over time for all of these resource options. These effects of the cost reduction rates as a percentage of 2019 price are illustrated in Figure 4 and applied to the technology installed cost forecasts used in the Plexos[®] modeling. For a table of the overnight installed cost per technology in 2019 real dollar terms with the NREL learning rates, please see Appendix E: Overnight Installed Cost of Technologies in 2019 Real Dollars (\$/kW) The Company then applied a forecasted inflation rate to these real dollar

⁷ <https://atb.nrel.gov/>

amounts to convert them to the nominal dollars over the 30 year forecast period, for the purposes of determining the actual future installation costs for each resource type.

FIGURE 4: NREL CAPITAL COST LEARNING CURVES (2019\$)



4.1 Power Purchase Agreement (PPA) Options

Consistent with the requirements in Section 56-585.5.D.4, the Plan reflects, in the aggregate and over its duration, a 35% PPA – 65% ownership split for the Virginia jurisdictional share of new Solar and Wind resources. The modeling attempted to maintain approximately this ownership to PPA ratio over a period of years, not in each individual year. In practice, the amount of PPA versus owned wind and solar added in any one year will be the result of competitive solicitations subject to regulatory approval.

PPA resource costs were informed from the results of the RFPs APCo issued in 2021. The PPA bids in response to those RFPs were on average 8% less expensive than owned asset bids. This difference was used as an initial proxy for this analysis to determine the levelized PPA costs relative to levelized owned costs for solar, wind and hybrid solar resources and are not reflective of long-term pricing differences including tax credit effects. This does not necessarily reflect the results of future RFPs and does not include other factors both explicit and implicit regarding ownership benefits. Actual owned and PPA resource costs will be identified in future solicitations for specific resources and may depend on multiple factors including federal tax policy.

4.2 Baseload & Peaking Resource Options

For Baseload resources, the Company modeled two natural gas combined cycle configurations shown in Table 11, the multi-shaft 1,100 MW resource and the single shaft, 430 MW resource. For Peaking resource options, the Company modeled the three resources including a 240 MW combustion turbine (CT), a 105 MW aero-derivative engine (AD) and a 20 MW Reciprocating Internal Combustion Engine (RICE).

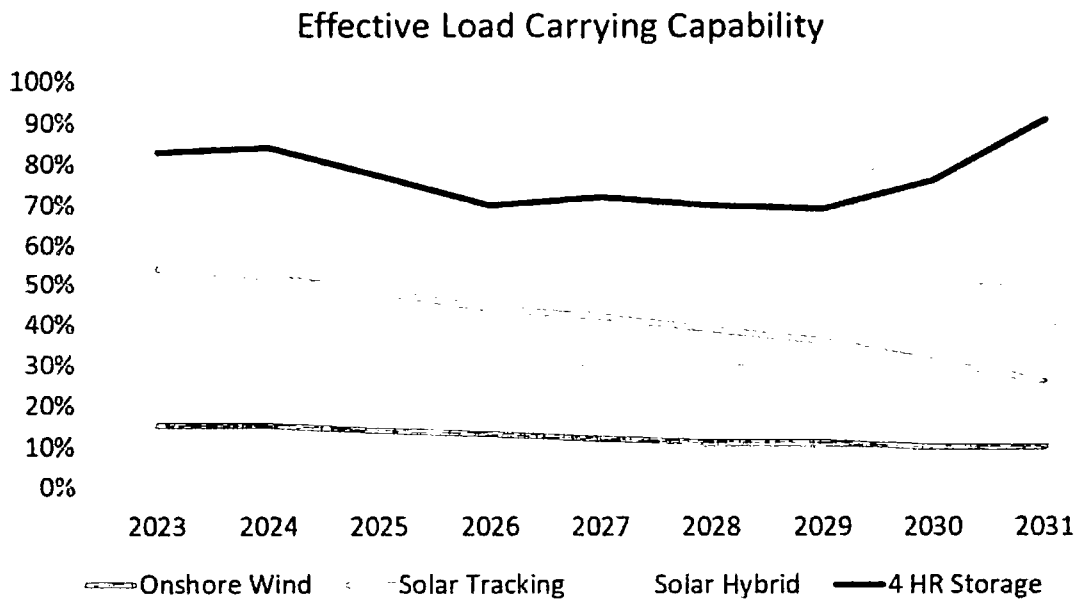
4.3 Intermittent and Renewable Resource Options

Various intermittent and renewable generating technologies were available for selection by the model, with constraints for each year equivalent to the requirements of the VCEA for Scenarios 1-4. Development of these resources continue to grow as advancements in both solar photovoltaics and wind turbine manufacturing have reduced both installed and ongoing costs.

Renewable energy resources, because of their intermittent nature, typically provide more energy value than capacity value, and PJM continues to refine its guidance on the Effective Load Carrying Capability (ELCC) for intermittent resources. In general, under the current PJM draft guidance, as intermittent resources continue to increase in relation to the total of all PJM resources, the planning capacity credit of new renewable resources added to the system will decline. The Company referred to PJM's July 2021 ELCC Report⁸ to inform the plan for intermittent resource contributions to the Company's capacity obligations. A summary chart of the ELCC levels assumed in this plan is shown in Figure 5. PJM's July 2021 ELCC Report did not produce projections beyond 2031. For the Company's analysis, the 2031 ELCC values were held constant until the end of the planning horizon.

⁸ <https://www.pjm.com/-/media/planning/res-adeq/elcc/elcc-report-for-july-2021-results.ashx>

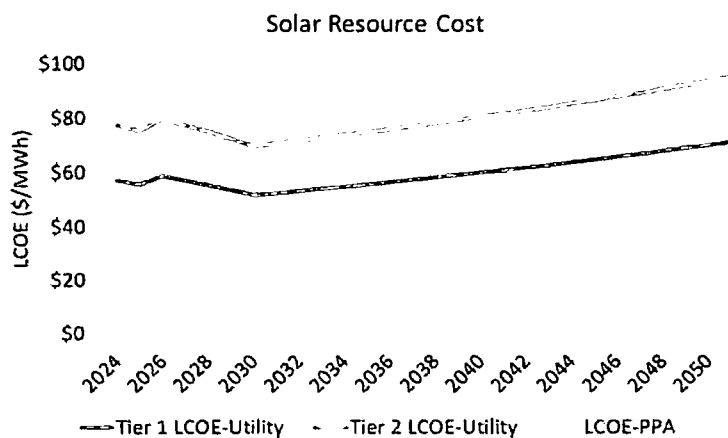
FIGURE 5: PJM EFFECTIVE LOAD CARRYING CAPABILITY (ELCC)



4.3.1 Solar

Large-scale solar resources were available starting in 2025. The Company relied on information from the RFP of owned assets for APCo to model prospective owned solar costs for assets to be placed in service in early 2025. Tier 1 build cost was based upon the top bid in the RFP and Tier 2 based upon the average of bids excluding winning bid. Figure 6 illustrates the forecasted Utility Tier 1, Tier 2, and PPA Solar levelized cost of energy (LCOE) through time. The costs included in these estimates include all costs that would be expected, including a return on rate base, depreciation, land leases, operations and maintenance expense, property taxes, insurance, asset retirement costs, and normalization of the solar investment tax credit (ITC). The property tax and land lease assumptions are tailored to this analysis based on the Company’s experience with tax rates in its service territory, and from evaluating specific resources located in both Virginia and in other PJM states.

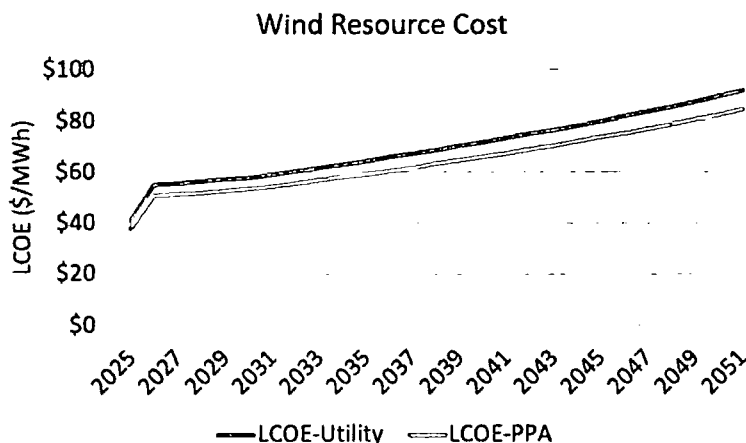
FIGURE 6: SOLAR RESOURCE LCOE



4.3.2 Large-Scale Wind

For Portfolios 1-5, the Company assumed a 35% capacity factor for the new wind resource. Additionally, the Company prepared Portfolio 6 in which the wind capacity factors were assumed to be equivalent to historical 30.4% capacity factor of APCo’s existing wind resources. The build cost was based on Bloomberg New Energy Finance’s (BNEF) 2H 2020 U.S. Renewable Energy Market Outlook. Figure 7 illustrates the forecasted Utility and PPA Wind LCOEs. The increase from 2025 to 2026 in this figure is due to the expiration of the currently available wind Federal production tax credits. Increases after 2026 are inflation driven.

FIGURE 7: WIND RESOURCE LCOE



4.3.3 Energy Storage

The stand-alone Energy Storage resource modeled in this plan is a Lithium-ion storage technology and has a nameplate rating of 50 MW/200 MWh, with a round trip efficiency of

82.3%. The modeling of Energy Storage utilized the values shown in Table 12, with the nameplate rating adjusted from 50 MW to 25 MW to align with the storage levels in the Commission's order regarding the interim requirements. A Storage PPA option was not modeled as separate resource from an owned storage resource, under the assumption that the cost of the solar resource included in the model represents a blend of owned and PPA. Both PPA and owned storage resources will be considered in future RFPs.

4.3.4 Hybrid Solar / Storage

Hybrid Solar systems include a Solar PV plant with a 4 hour closed loop battery storage system associated with it. For this analysis, a 150 MW_{ac} solar plant was modeled, coupled with a 50 MW (200 MWh) Li-Ion Battery Energy Storage system.

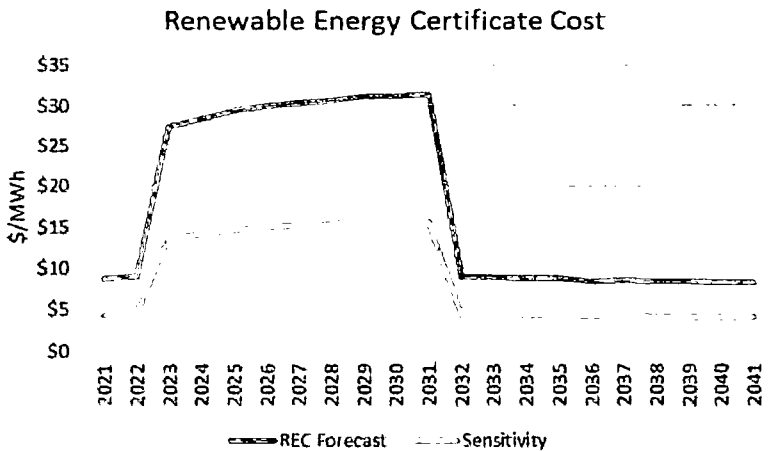
4.3.5 Renewable Energy Certificates (RECs)

The Company included RECs as a RPS energy compliance option in the Plexos® modeling, allowing the model to choose whether to build physical resources or purchase RECs based on economics. In this analysis a 150 MW block of utility solar with an assumed ~350 GWh set the size for a single REC addition in the model. The first year when RECs could be added was assumed to be 2025. A third party forecast provided by S&P Global⁹, as shown in Figure 8, was used for the base REC price forecast in all portfolios. The number of RECs selected by the model in each portfolio is presented in Appendix B. Higher and lower priced REC sensitivity cases were also prepared.

A lower priced REC sensitivity case was also prepared, based on an assumption that RECs would be available of 50% of the cost of the base REC forecast curve. That price curve is also shown in Figure 8. The results of that sensitivity analysis are presented in Section 5.

⁹ S&P Global, SPGlobalMI_RECForecast_2021Q2_06302031, available by subscription.

FIGURE 8: REC PRICE FORECAST



4.3.6 Annual and Cumulative Resource Limits

For each portfolio, annual and cumulative intermittent and renewable resource limits were determined based on simultaneous consideration of multiple regulatory requirements. All six portfolios are VCEA-compliant. Different limits were necessarily applied to each portfolio based on the unique assumptions of each portfolio, such as the assumed retirement date of Amos and Mountaineer, as well as whether gas-fired options were available. Table 12 contains a summary of the limits for the wind, solar, storage, and REC options included in the modeling for each portfolio.

TABLE 12: NEW RESOURCE LIMITATIONS

New Resource Assumptions							
Resource Type	First Year Available	Life	Portfolio 1,2,6	Portfolio 3 & 4	Portfolio 5	Individual Technology Total	Cumulative Technology Total
Solar PPA	1/1/2025	35 years	150 MW/yr	300 MW/yr	150 MW/yr	900 MW	3,150 MW
Solar Utility T1		35 years	300 MW/yr	600 MW/yr	300 MW/yr	2,100 MW	
Solar Utility T2		35 years	150 MW/yr	300 MW/yr	150 MW/yr		
Solar Hybrid		35 years	150 MW Block 450 MW/yr			1,050 MW	
Wind PPA Limits	1/1/2026	30 years	100 MW/yr	300 MW/yr	100 MW/yr	350 MW Total	950 MW
Wind Owned Limits	1/1/2026	30 years	200 MW/yr	600 MW/yr	-	600 MW Total	
Wind Owned Limits	1/1/2026	30 years	-	-	2026 1,200 MW 2028 2,600 MW 2030 3,600 MW 2032 4,600 MW 2035 5,000 MW	5,000 MW Total	5,350 MW
Renewable Energy Certificates	1/1/2025	5 years	20 Blocks/yr			~7,000 GWh	~7,000 GWh
Stand Alone Storage	1/1/2025	10 years	2,500 MW/yr			12,500 MW	12,500 MW
NG 240 MW Combustion Turbine	1/1/2026	30 years	P1 unlimited P2 N/A	P3 unlimited P4 N/A	N/A	Unlimited	Unlimited
NG 1,100 MW Combined Cycle	1/1/2026	30 years	P1 unlimited P2 N/A	P3 unlimited P4 N/A	N/A	Unlimited	Unlimited

The primary regulatory constraints considered in setting the annual and cumulative resource limits were 1) PJM minimum capacity requirements; 2) VCEA annual Virginia-jurisdictional renewable energy targets; 3) VCEA 35% wind and solar PPA requirements; and 4) near term (prior to 2030) VCEA wind, solar, and storage new resource requirements. All of these constraints must be applied simultaneously. Compliance with the minimum obligations under any one of these requirements, such as the VCEA annual energy targets, could and did lead to substantial over-compliance with other requirements, such as PJM's minimum capacity requirement, in some portfolios. In addition, to the extent possible, the Company spread out resource additions gradually over time, rather than all at once, to help mitigate near-term rate increases that can result from adding required resources. This can result in the addition of resources earlier than the year in which one of these regulatory obligations requires them. Finally, there are practical limits regarding the absolute levels of cost-effective renewable capacity that are available in Virginia and more broadly across PJM.

The timing of the assumed retirement of Amos and Mountaineer also impacted the resource limitations. This resulted in higher annual wind and solar limits in Portfolios 3 and 4 than in Portfolios 1 and 2 in order to allow more resources to be constructed during the period prior to Amos and Mountaineer retiring in 2028. This constraint also resulted in a high annual limit for storage resources in all portfolios in order to allow enough storage to be selected for its capacity to replace a substantial share of the capacity that would be lost when Amos and

Mountaineer retire. This also drives a high cumulative lifetime storage limit, if storage is selected again at the end of its 10-year useful life, if the model deemed it to be the most economic option available.

Lastly, the near-term availability of Virginia domiciled wind and solar resources was considered. Based on the numbers of bids received of each resource type in the two RFP's issued in 2021, solar resources are expected to be more widely available than wind, and the quantity of wind MW available in Virginia could be quite limited. As a result, higher limits were allowed for solar than wind.

By choosing these limits for the various scenarios, the Company is not expressing an opinion regarding whether these levels of resources are in fact available, or whether adding that level of a given resource is desired. The assumption that 2,500 MW of storage could be added to a Company the size of APCo in any one year, or even cumulatively prior to 2030, is particularly aggressive. These limits are simply an attempt to give the model enough available capacity and energy options to meet the necessary PJM and VCEA requirements in all years of the analysis from a portfolio of all of the available resource types under each scenario.

4.4 Demand-Side Resource Options

4.4.1 Energy Efficiency

The Company included both Residential and Commercial/Industrial energy efficiency bundles as demand-side resource options to consider. Table 13 shows the Residential Bundles cost and potential by year, and Table 14 shows the Commercial/Industrial Bundles included in the model.

TABLE 13: RESIDENTIAL EE BUNDLES

Bundle	Installed Cost (\$/kWh)	Yearly Potential Savings (MWh) 2022-2026	Yearly Potential Savings (MWh) 2027-2031	Yearly Potential Savings (MWh) 2032-2036	Yearly Potential Savings (MWh) 2037-2041	Bundle Life
Thermal Shell - AP	\$0.21	6,621	2,794	3,120	2,824	10
Thermal Shell - HAP	\$0.31	20,514	54	0	0	10
Heating/Cooling - AP	\$0.68	49,323	7,365	0	0	18
Heating/Cooling - HAP	\$0.96	7,576	0	0	0	18
Water Heating - AP	\$0.24	34,877	11,711	13,000	6,265	14
Water Heating - HAP	\$0.35	82,827	10,498	10,391	0	14
Appliances - AP	\$0.22	33,242	3,018	3,133	2,460	13
Appliances - HAP	\$0.31	7,449	0	0	0	13
Lighting - AP	\$0.08	1,669	0	0	0	31
Lighting - HAP	\$0.13	1,103	0	0	0	30
Behavioral Programs	\$0.04	23,137	0	0	0	2

TABLE 14: COMMERCIAL EE BUNDLES

Bundle	Installed Cost (\$/kWh)	Yearly Potential Savings (MWh) 2022-2026	Yearly Potential Savings (MWh) 2027-2031	Yearly Potential Savings (MWh) 2032-2036	Yearly Potential Savings (MWh) 2037-2041	Bundle Life
Heat Pump - AP	\$9.00	2,985	0	0	0	15
Heat Pump - HAP	\$13.49	199	0	0	0	15
HVAC Equipment - AP	\$0.16	2,718	0	0	0	15
HVAC Equipment - HAP	\$0.24	1,624	0	0	0	15
Indoor Screw-In Lighting - AP	\$0.01	2,345	0	0	0	6
Indoor Screw-In Lighting - HAP	\$0.02	995	0	0	0	6
Indoor HID/Fluor. Lighting - AP	\$0.11	15,646	1,409	0	0	14
Indoor HID/Fluor. Lighting - HAP	\$0.16	1,738	0	0	0	14
Outdoor Lighting - AP	\$0.38	3,946	567	0	0	15
Outdoor Lighting - HAP	\$0.57	4,384	0	0	0	15

4.4.2 Demand Response

The Company included one Demand Response resource option to be considered, which is based on a Residential Bring-Your-Own-Thermostat program. Table 15 shows the characteristics of this resource.

TABLE 15: APCO DEMAND RESPONSE

Sector	Participants	Demand Savings (kW)	Energy Savings (kWh)	Enrollment Cost	Annual Cost	Total First Year Cost	Service Life (Years)
Residential	2,500	3,375	70,000	\$165,000	\$950,500	\$1,115,500	7

4.4.3 Volt VAR Optimization

The Company included Volt VAR Optimization (VVO), which represents a form of voltage control that allows the grid to operate more efficiently as a resource option. VVO sensors and intelligent controllers monitor load flow characteristics and direct controls on capacitor and voltage regulating equipment in order to optimize power factor and voltage levels. Power factor is the ratio of real or active power (MW) to apparent power (MVA), and is a characteristic of electric power flow that is controlled to optimize power flow on an electric network. Power factor optimization also improves energy efficiency by reducing losses on the system. VVO enables Conservation Voltage Reduction (CVR) on a utility’s system. CVR is a process by which the utility systematically reduces voltages in its distribution network, resulting in a proportional reduction of load on the network. Voltage optimization can allow a reduction of system voltage that still maintains minimum levels needed by customers, thereby allowing customers to use less energy without any changes in behavior or appliance efficiencies.

Although there are no “embedded” incremental VVO load reduction impacts implicit in the load forecast, VVO has been modeled as a unique EE resource. Table 16 below shows the resource characteristics of the VVO resources made available to the model in all portfolios.

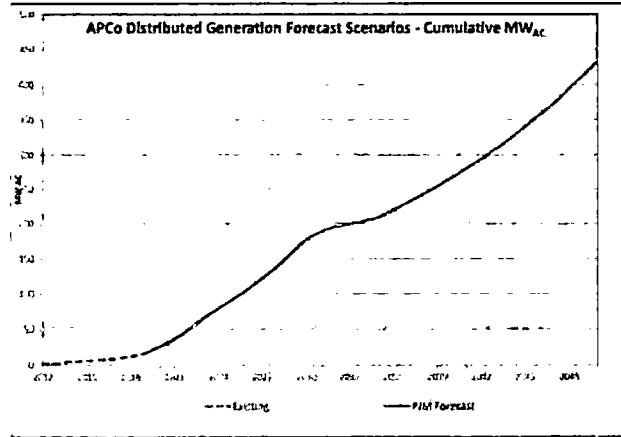
TABLE 16: VVO RESOURCES

Tranche	No. of Circuits	Capital Investment	Annual O&M	Demand Reduction (kW)	Energy Reduction (MWh)
1	36	\$12,600,000	\$378,000	11,172	45,996
2	36	\$12,600,000	\$378,000	9,639	39,684
3	36	\$12,600,000	\$378,000	8,799	36,227
4	36	\$12,600,000	\$378,000	8,298	34,163
5	36	\$12,600,000	\$378,000	7,826	32,222
6	36	\$12,600,000	\$378,000	7,458	30,705
7	36	\$12,600,000	\$378,000	7,126	29,340
8	36	\$12,600,000	\$378,000	6,884	28,343
9	36	\$12,600,000	\$378,000	6,629	27,292
10	36	\$12,600,000	\$378,000	6,435	26,493
11	36	\$12,600,000	\$378,000	6,186	25,470
12	36	\$12,600,000	\$378,000	5,909	24,329
13	36	\$12,600,000	\$378,000	5,849	24,081
14	36	\$12,600,000	\$378,000	5,473	22,532

4.4.4 Distributed Generation

The Company included both the capacity and energy associated with Distributed Generation in all six portfolios. Figure 9 shows the cumulative nameplate DG MW forecasted to be installed. For capacity planning purposes, the Company referred to the PJM ELCC report discussed in Section 4.3, beginning at 38% of the nameplate value in 2023. The associated energy produced from this customer-owned DG was assumed to not be part of the Company’s achievement of the VCEA RPS requirement.

FIGURE 9: DISTRIBUTED GENERATION



5.0 VCEA Compliance Plan Portfolios and Results

5.1 Modeled Portfolios

As previously stated, the Company modeled six VCEA compliant portfolios in order to evaluate compliance strategies under a wide range of assumptions. Modeling was performed under fundamental forecasts based on two different CO₂ tax assumptions, as described in Section 3. Portfolios were also modeled to evaluate how resources needed for VCEA compliance would be impacted by the availability of the Amos and Mountaineer resources and natural gas resources. Table 17 summarizes the portfolio variations for each scenario.

TABLE 17: PORTFOLIO ASSUMPTIONS MATRIX

Description	Portfolios					
	1	2	3	4	5	6
	RGGI Only CO2 2040 AM & MNTR Ret. Gas Options Available	RGGI to \$15 CO2 2040 AM & MNTR Ret. No Gas Option Available	RGGI Only CO2 2028 AM & MNTR Ret. Gas Options Available	RGGI to \$15 CO2 2028 AM & MNTR Ret. No Gas Option Available	RGGI to \$15 CO2 2040 AM & MNTR Ret. No Gas Option Available Higher Wind Limits	RGGI to \$15 CO2 2040 AM & MNTR Ret. No Gas Option Available Actual Wind Cap Factors
Coal retires 2040	•	•			•	•
Coal retires 2028			•	•		
RGGI CO2 Commodity Forecast	•		•			
RGGI to \$15 Federal CO2 Commodity Forecast		•		•	•	•
Include Gas resource options	•		•			
RFP REC prices	-	-	-	-	-	-
S&P REC prices	•	•	•	•	•	•
PJM ELCC	•	•	•	•	•	•
Dynamic ELCC	-	-	-	-	-	-
NREL Wind Cap Factors	•	•	•	•	•	-
Existing Wind Cap Factors	-	-	-	-	-	•
Higher Wind Limits	-	-	-	-	•	-

5.2 REC Price Sensitivities

The Company performed a lower cost sensitivity on the REC price using Plexos®. The sensitivity analysis reflected a 50% lower price than the base REC forecast. That sensitivity price curve was presented in Figure 8. The VCEA Plan (Portfolio 2) assumptions were used with the exception of a lower REC price forecast. The 30-year Net Present Value of Revenue Requirements for the lower REC sensitivity build plan was projected to be lower by 0.44% than Portfolio 2. Lowering the cost of RECs by 50% resulted in only two changes to the VCEA Plan. The changes were that the model selected RECs in 2036 which allowed 300 MW of solar to be delayed from 2035 to 2037, and that 95 MW of solar hybrid facilities previously added in 2038 were delayed until 2041 and reduced to 69 MW. By the end of the forecast horizon, the total amount of renewables (solar and wind) selected to be built under the lower REC price sensitivity case was unchanged from the VCEA Plan.

In addition to a lower priced REC sensitivity case, the Company evaluated higher REC prices. Based on the fact that RECs were not economically selected by the model in any of the six portfolios results displayed in the REC purchase table in Appendix B until 2036 or later, the Company did not use Plexos® to perform a higher priced REC sensitivity. That result would indicate that if RECs were not selected based on economics compared to physical resources at the base REC price, they would also not be selected at any higher REC price.

5.3 Portfolio Analysis and Economic Analysis Summary

Table 18 summarizes the net present value of the expected revenue requirement (NPVRR) for each compliant portfolio computed over 30 years. Total costs of each portfolio reflect a combination of fixed and variable costs and energy revenues from the Plexos® model, and certain other fixed costs and revenues, including capacity revenues and REC sales revenues calculated outside of Plexos®. The top half of the table displays each scenario's NPVRR broken down over four time periods which help to display the impacts of the assumed timing of the coal plant retirements. The 2028-2039 period is the period which will be most impacted by retirement of the coal plants in 2028 rather than their currently planned 2040 retirement dates.

The bottom half of the table under Column 3 displays the incremental cost of Portfolio 3 in which the coal plants retire in 2028 over Portfolio 1 in which the coal plants retire in 2040 assuming gas-fired resources are available to replace the plants. Column 4 in the bottom half of the table displays the incremental cost of Portfolio 4 in which the coal plants retire in 2028 over

Portfolio 2 in which the coal plants retire in 2040 assuming gas-fired resources are not available to replace the plants.

TABLE 18: NPV OF PORTFOLIO REVENUE REQUIREMENTS

Column	1	2	3	4	5	6
	Portfolio 1	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	Portfolio 6
	2040 AM+MNTR Ret. RGGI CO2 Gas Option	2040 AM+MNTR Ret. RGGI-\$15 CO2 No Gas Option	2028 AM+MNTR Ret. RGGI CO2 Gas Option	2028 AM+MNTR Ret. RGGI-\$15 CO2 No Gas Option	2040 AM+MNTR Ret. RGGI-\$15 CO2 No Gas Option High Wind Limits	2040 AM+MNTR Ret. RGGI-\$15 CO2 No Gas Option Historical Wind CF
Customer Revenue Requirements						
Net Present Value \$M						
Utility NPV 2021-2027	\$4,837	\$4,839	\$4,823	\$5,018	\$4,894	\$4,850
Utility NPV 2028-2039	\$7,047	\$8,132	\$8,615	\$10,643	\$8,041	\$8,218
Utility NPV 2040-2051	\$5,242	\$6,078	\$4,869	\$5,878	\$5,980	\$6,435
NPV of End Effects beyond 2051	\$4,494	\$5,662	\$4,556	\$5,706	\$5,276	\$5,762
TOTAL Utility Cost, Net Present Value	\$21,620	\$24,710	\$22,863	\$27,245	\$24,191	\$25,266

Incremental Cost/ (Savings) of Early Coal Retirement		
	Portfolio 3-Portfolio 1	Portfolio 4-Portfolio 2
	2028-2040 RGGI CO2 Gas Option	2028-2040 RGGI-\$15 CO2 No Gas Option
Customer Revenue Requirements		
Net Present Value \$M		
	Incremental Cost/ (Savings)	
Utility NPV 2021-2027	(\$14)	\$179
Utility NPV 2028-2039	\$1,568	\$2,511
Utility NPV 2040-2051	(\$373)	(\$199)
NPV of End Effects beyond 2051	\$62	\$45
TOTAL Utility Cost, Net Present Value	\$1,242	\$2,535

5.4 Economic Analysis Conclusions

High-level conclusions from Table 18 include:

- The Scenarios that retired Amos and Mountaineer in 2040 would be less costly for customers than the scenarios (Portfolio 3 and 4) that retired them in 2028;
- Allowing gas-fired resources to replace a portion of the capacity of Amos and Mountaineer when they retire, whenever that is, is likely to be less costly than replacing them with 100% renewable resources. This does not reflect that additional technologies, particularly non-emitting technologies such as small modular nuclear reactors, hydrogen, carbon capture, advanced battery concepts, and renewables, will be available in the future, particularly when considering a 2040 retirement date for these units; and
- Portfolio 5 with 1,000 MW more near term wind has a lower NPVRR than the minimally compliant Portfolio 2 VCEA Plan, which indicates that the Company should seek to acquire more wind while PTCs are available than the minimum required for VCEA compliance. In addition, Portfolio 6, which was a lower wind capacity factor sensitivity case, indicates that the results are not very sensitive to

wind capacity factor. The capacity factor in that scenario was assumed to be 30.4% instead of the base case assumed 35%. Comparing the NPVRR to Portfolio 2, which is the other comparable “2040 retirement, no gas” case, reveals that the results are only 2.2% more expensive when viewed over 30 years.

5.5 Capital Investment Requirements

The six portfolios resulted in a wide range of potential capital investment in resources necessary to maintain both the required amount of capacity and meet the VCEA renewable energy targets. Total expected capital investment for all resources is summarized in Table 19.

TABLE 19: PORTFOLIO NEW RESOURCE CAPITAL INVESTMENT REQUIREMENTS

	Total 2025-2028 Capital Investment (\$ Millions)		
	Total All Resources	Total Owned Resources	Total PPA Resources
	Portfolio 1 2040 Ret With Gas	\$628	\$317
Portfolio 2 2040 Ret No Gas	\$628	\$317	\$311
Portfolio 3 2028 Ret With Gas	\$4,230	\$3,918	\$311
Portfolio 4 2028 Ret No Gas	\$5,746	\$4,619	\$1,127
Portfolio 5 2040 Ret No Gas High Wind	\$2,039	\$171	\$1,868
Portfolio 6 2040 Ret No Gas Hist Wind CF	\$700	\$389	\$311

	Total 30 year Capital Investment (\$ Million)		
	Total All Resources	Total Owned Resources	Total PPA Resources
	Portfolio 1 2040 Ret With Gas	\$10,137	\$8,057
Portfolio 2 2040 Ret No Gas	\$12,841	\$10,771	\$2,071
Portfolio 3 2028 Ret With Gas	\$9,946	\$7,652	\$2,294
Portfolio 4 2028 Ret No Gas	\$16,712	\$13,945	\$2,767
Portfolio 5 2040 Ret No Gas High Wind	\$16,157	\$10,367	\$5,790
Portfolio 6 2040 Ret No Gas Hist Wind CF	\$13,178	\$10,654	\$2,524

The analysis summarized in Table 19 shows that retiring Amos and Mountaineer in 2028 would result in \$4-6 billion of investment between the Company and PPA providers between 2025 and 2028 to replace those plants. This level of investment is unprecedented, and is quite large relative to the overall size of APCo in a relatively short time frame, leading to large rate

increases in a short period of time. The VCEA Plan (Portfolio 2) would delay the required capital investment in replacing Amos and Mountaineer, with very modest capital expense requirements in the 2025-2028 period for the resources required by the VCEA. Over the full 30-year period, the VCEA Plan would require the third highest amount of capital investment of the six portfolios. This is largely due to the high cost of storage which would be required in the event gas options are not available to replace the retiring coal plants in 2040.

The underlying construction costs of each resource type over the period on a real dollar cost per KW basis are presented in Appendix E. Based on projections by NREL that were adopted by the Company in this analysis and reflected in Appendix E, costs are expected to decline in real dollars terms over the near term on most resource types for several years before beginning to increase again towards the end of the 30-year period.

5.6 VCEA Plan Resource Additions

Figure 10 and Figure 11 illustrate the timing of new renewable and storage resources included in the VCEA Plan to meet the requirements. Additions of new renewable and intermittent resources to the fleet begin in 2021 and continue periodically through the planning period. Storage resources, are added beginning in 2025 and include gradual increases until meeting the 400 MW VCEA RPS minimum. Further details of the resource additions by resource type for all portfolios are presented in Appendix B.

FIGURE 10: VCEA COMPLIANT WIND AND SOLAR ADDITIONS

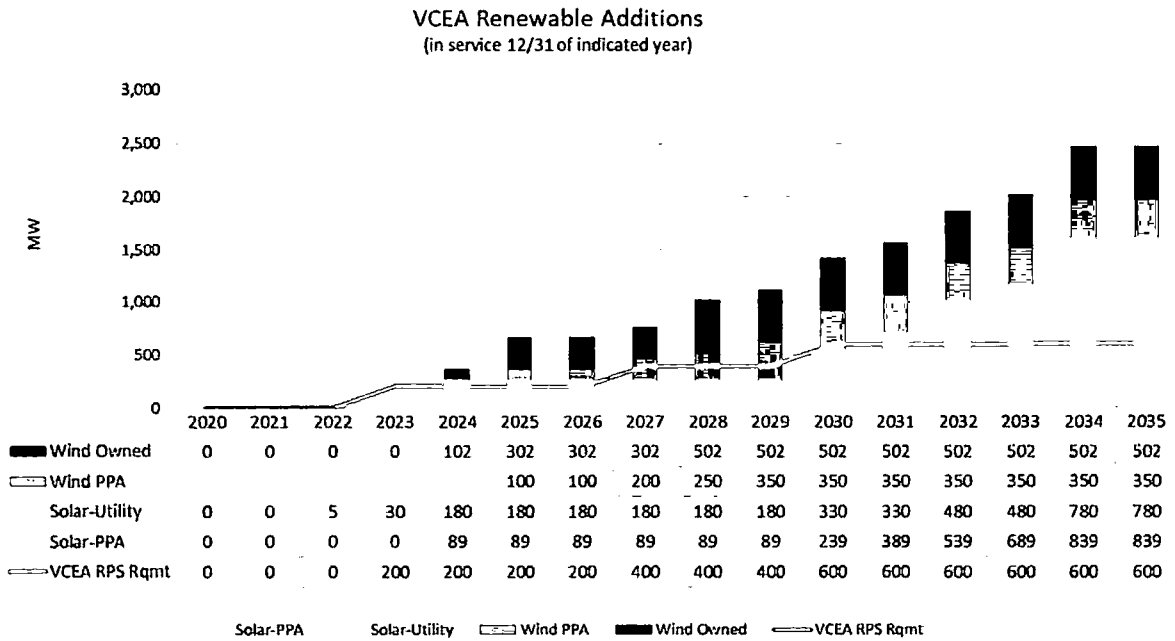


FIGURE 11 VCEA COMPLIANT STORAGE ADDITIONS

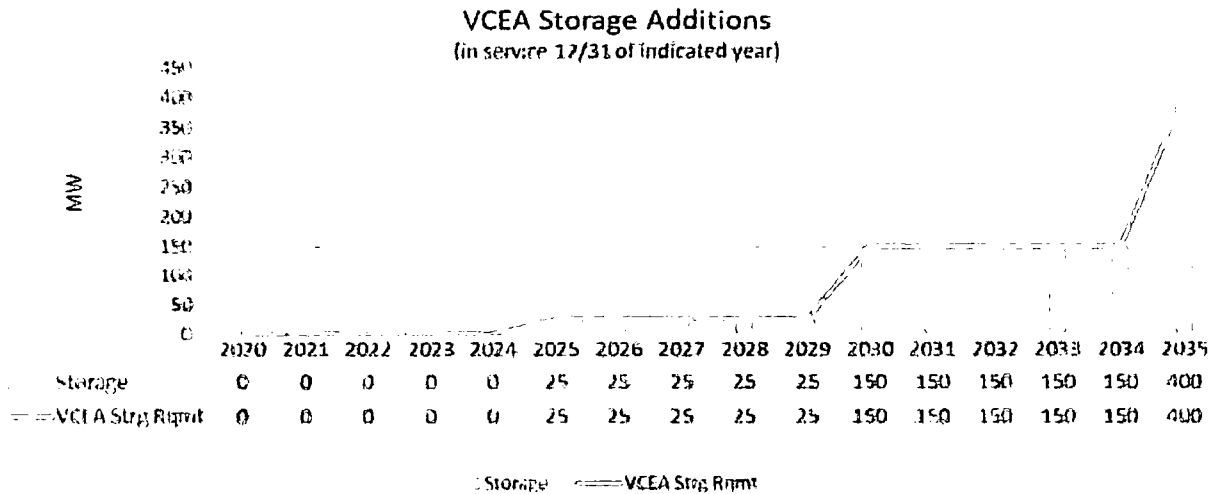


Table 20 lists the cumulative Energy Efficiency additions in the VCEA plan through 2025 to meet the VCEA requirements.

TABLE 20: VCEA PLAN ENERGY EFFICIENCY ADDITIONS

Portfolios	Portfolio 2		
	2040 AM+MNTR Ret. RGGI-\$15 CO2 No Gas Option		
Descriptions	RES GWh	COM GWh	Surplus/ (Deficit) GWh
VCEA EE Trgt Svgs			
Tgt %			
GWh			
2022	0.5%	72	48
2023	1.0%	145	99
2024	1.5%	217	144
2025	2.0%	289	197

5.7 VCEA Plan Compliance Plan Summary

The composition of APCo’s generation fleet, including existing and new resources modeled in the VCEA Plan (Portfolio 2) to meet the RPS requirements is illustrated in terms of nameplate capacity MW in Figure 12. APCo’s capacity position versus its PJM UCAP capacity obligation is shown in tabular format in Table 21. In response to requirement (5) in the Order on the 2020 Filing, the Company, a multi-jurisdictional utility, is meeting its PJM capacity obligations through the use of all resource types, including fossil resources, where appropriate.

FIGURE 12: APCO VCEA PLAN 2021-2050 CAPACITY

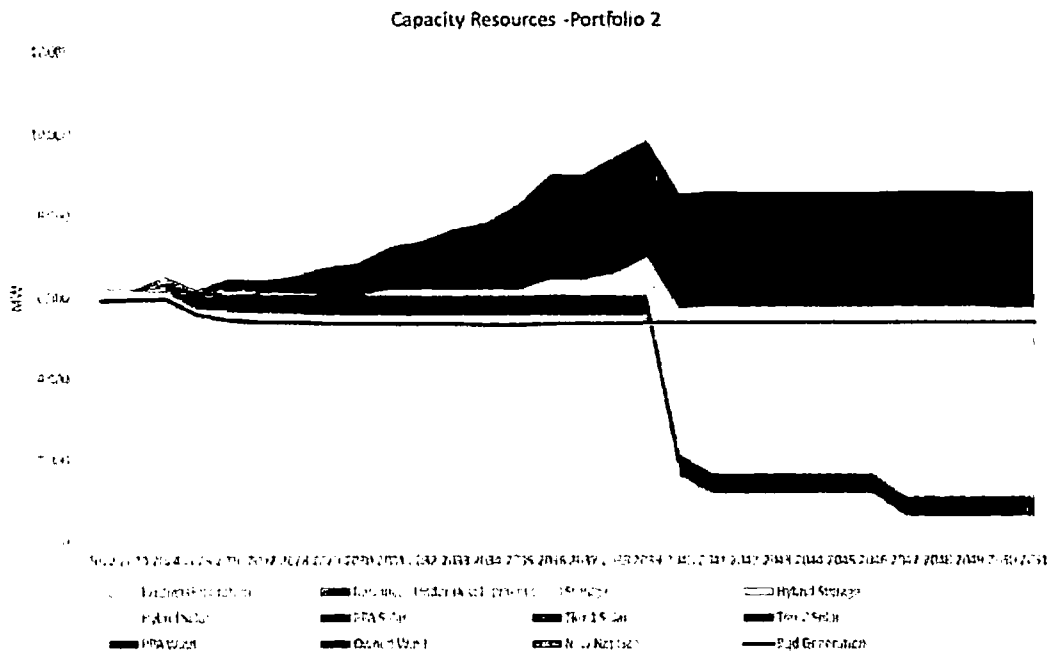


TABLE 21: VCEA PLAN (PORTFOLIO 2) RESOURCE ADDITIONS AND CAPACITY POSITION

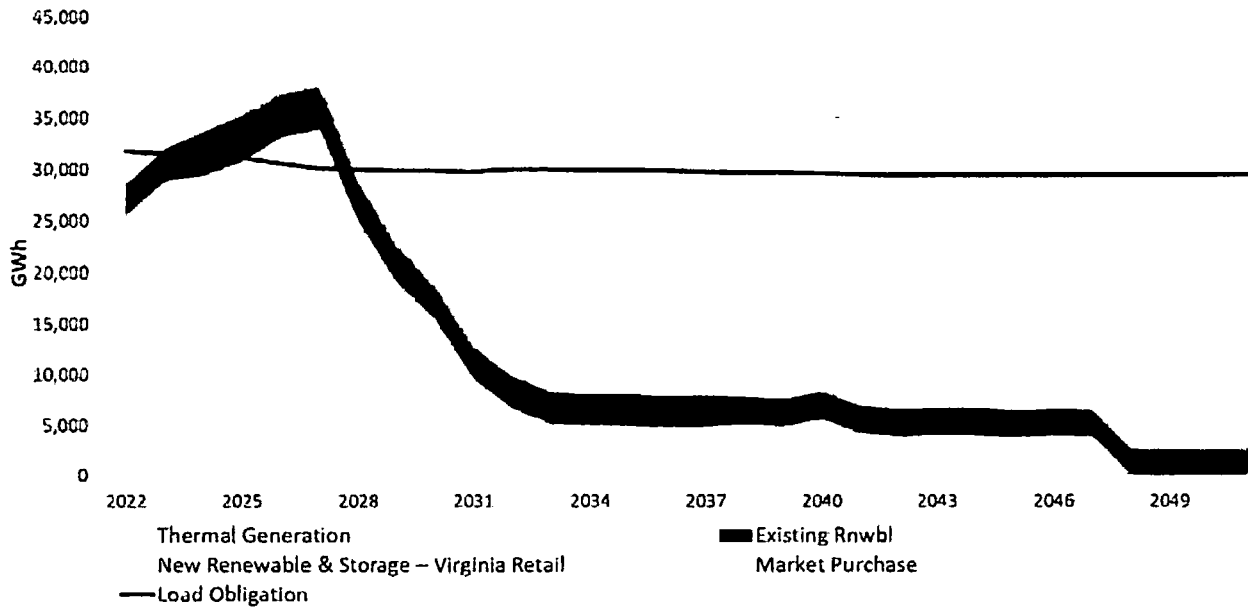
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Portfolio 2																			
Resources under Development (NmPit)	15	65	418	507	507	507	507	507	507	507	507	507	507	507	507	507	507	507	507
Resources under Development (Firm)	8	35	135	163	148	132	117	117	117	117	117	117	117	117	117	117	117	117	117
New Nat. Gas-CC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Nat. Gas-CT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Utility Solar (NmPit)	0	0	0	0	0	0	0	0	150	150	150	300	300	600	900	900	1,200	1,200	1,200
New Utility Solar (Firm)	0	0	0	0	0	0	0	0	39	39	39	78	78	156	234	234	312	312	312
New PPA Solar (NmPit)	0	0	0	0	0	0	0	0	150	300	300	450	600	750	900	900	900	900	900
New PPA Solar (Firm)	0	0	0	0	0	0	0	0	39	78	78	117	156	195	234	234	234	234	234
New Paired Solar (NmPit)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	111	411	636
New Paired Solar (Firm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	107	165
New Wind (Nameplate)	0	0	0	0	200	200	200	200	400	400	400	400	400	400	400	400	400	400	400
New Wind (Firm)	0	0	0	0	26	24	22	44	40	40	40	40	40	40	40	40	40	40	40
New Wind PPA (NmPit)	0	0	0	0	100	100	200	250	350	350	350	350	350	350	350	350	350	350	350
New Wind PPA (Firm)	0	0	0	0	13	12	22	28	35	35	35	35	35	35	35	35	35	35	35
Storage Capacity (NmPit)	0	0	0	0	25	25	25	25	25	150	150	150	150	150	400	400	400	400	2,725
Storage Capacity (Firm)	0	0	0	0	18	18	18	17	19	137	137	137	137	137	364	364	364	364	2,480
Storage Paired (NmPit)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37
Storage Paired (Firm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	137
New EE	14	29	44	57	75	71	68	16	13	10	8	6	5	4	6	7	8	9	10
New VVO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	16	20	38	47
New DG	0	0	0	35	40	46	52	59	67	72	74	76	77	79	83	88	92	96	101
Total Additions (Firm & Degraded)	22	64	179	255	319	303	298	281	251	488	577	605	644	769	1,129	1,146	1,303	1,451	3,751
Capacity Reserves (MW) without new additions	290	198	193	121	204	194	195	205	204	208	212	214	216	216	207	186	186	185	173
Capacity Reserves (MW) with new additions	312	262	312	376	523	498	493	486	495	696	799	819	850	985	1,337	1,332	1,488	1,675	20

The transition to more intermittent and renewable resources will impact the Company's anticipated energy output from its fleet. The Company will maintain appropriate capacity

reserves, however, energy delivered to APCo's non-Virginia customers is expected to be purchased from the market and from fossil resources as shown in Figure 13.

FIGURE 13: VCEA PLAN SOURCES OF ENERGY – TOTAL COMPANY

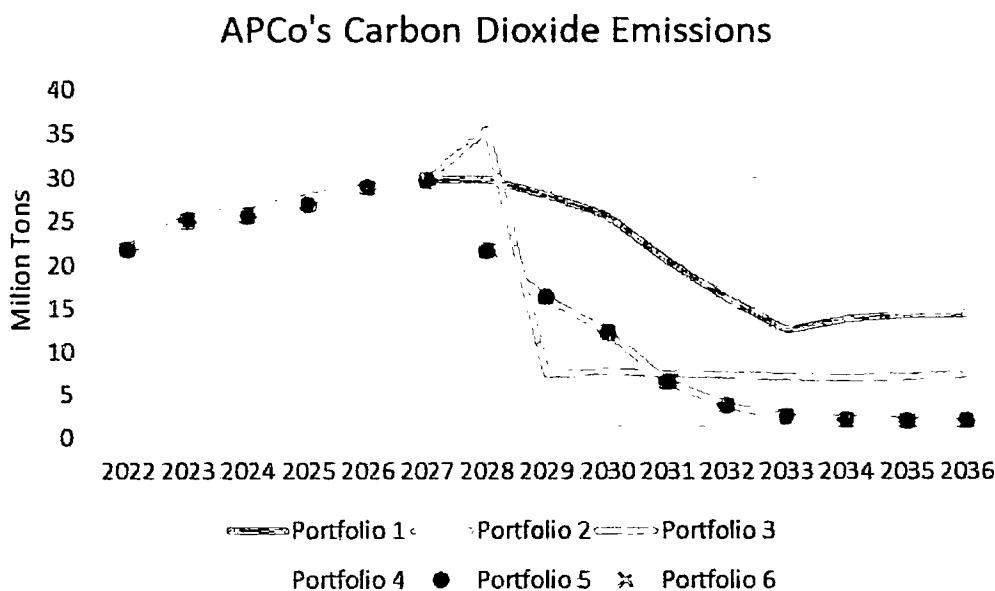
Portfolio 2 - 2040 AM/MT Retirement RGGI \$15 CO2 - No New Gas Resources Allowed



5.8 Carbon Dioxide Reduction Requirements

The Company’s six modeled portfolios reflect a forecasted reduction of CO₂ emissions. Figure 14 illustrates the 2022-2036 reduction of CO₂ from associated with the modeled portfolios. Portfolios 1 and 3 reflect a RGGI-only carbon view, and Portfolios 2, 4, 5 and 6 reflect a RGGI plus \$15/ton national carbon burden and show a quicker reduction of CO₂.

FIGURE 14: CARBON DIOXIDE EMISSIONS – TOTAL COMPANY



6.0 Rate Impacts

The Company prepared estimated rate impacts associated with the implementation of the VCEA under Portfolio 2. In order to estimate rate impacts, the Company assumed a consistent class allocation for the period 2022-2035, based on a 2020 test year. The class allocation methodology splits costs 85-15% between a 6-cp and an energy allocation methodology. The actual cost allocation methodology could vary from the Company’s assumption in this proceeding.

6.1 VCEA Lifetime Revenue Requirement - Gross

The lifetime revenue requirement includes the costs of the renewables and storage, including financing costs. It is undiscounted, meaning that \$100 in 2050 is not distinguished from \$100 spent in 2021. This number is not particularly meaningful and can be misleading as it

does not include the value of the energy or capacity generated by these renewable, efficiency and storage resources. Table 22 shows the gross revenue requirement by year and by component.

TABLE 22 JURISDICTIONAL GROSS REVENUE REQUIREMENT

Virginia Jurisdictional Gross Revenue Requirement By Year - No Offsets (\$000)									
	Specific Resources Under Development			Generic Resources				REC Purchases	Total \$000
	Wind	Solar	QF PPA's	Wind	Solar	Storage	EE / DR/ VVO		
2021	-	-	278	-	-	-	-	140	418
2022	-	-	1,910	-	-	-	8,323	664	10,897
2023	472	-	1,935	-	-	-	8,589	5,673	16,668
2024	9,938	3,775	1,961	-	-	-	6,613	-	22,288
2025	8,661	21,817	1,989	-	-	-	5,061	-	37,528
2026	9,458	21,094	2,018	36,913	-	4,546	4,989	-	79,018
2027	9,822	21,260	2,048	36,913	-	4,541	120	-	74,704
2028	9,492	20,121	2,080	52,661	-	4,537	226	-	89,118
2029	9,860	18,742	2,114	95,325	-	4,530	211	-	130,783
2030	10,260	18,641	2,149	111,476	-	4,524	194	-	147,245
2031	10,148	18,261	2,186	111,476	31,345	26,015	262	-	199,693
2032	10,038	17,574	2,225	111,476	46,597	26,038	802	-	214,752
2033	9,963	17,146	2,266	111,476	78,906	26,049	1,013	-	246,819
2034	9,830	16,532	2,309	111,476	94,612	26,065	945	-	261,768
2035	9,716	25,297	2,354	111,476	145,194	26,081	2,133	-	322,251
2036	9,603	24,864	2,342	111,476	196,517	70,880	8,327	-	424,009
2037	9,536	24,370	-	111,476	196,517	70,905	9,771	-	422,575
2038	9,485	23,930	-	111,476	251,301	70,949	13,254	-	480,395
2039	9,358	23,527	-	111,476	302,215	70,993	16,750	-	534,320
2040	9,272	22,987	-	111,476	340,916	235,730	20,465	-	740,846
2041	9,186	22,512	-	111,476	347,725	276,075	25,729	-	792,703
2042	9,103	22,109	-	111,476	347,725	276,252	24,701	34,151	825,517
2043	9,062	21,648	-	111,476	347,725	276,417	24,860	35,089	826,277
2044	8,936	21,287	-	111,476	347,725	276,671	25,041	72,346	863,482
2045	8,854	20,736	-	111,476	347,725	276,782	25,189	93,737	884,498
2046	8,777	20,261	-	111,476	347,725	283,795	25,359	136,329	933,722
2047	8,683	19,839	-	111,476	347,725	347,551	27,135	161,822	1,024,230
2048	8,615	19,476	-	111,476	347,725	347,879	25,738	212,632	1,073,542
2049	8,459	19,030	-	111,476	347,725	348,020	25,901	265,167	1,125,779
2050	8,349	18,505	-	111,476	347,725	405,056	26,424	295,608	1,213,144
Lifetime (000)	\$ 252,938	\$ 545,341	\$ 32,162	\$ 2,562,814	\$ 5,161,368	\$ 3,786,882	\$ 364,125	\$ 1,313,360	\$ 14,018,990

6.2 Rate Impacts

The Company has prepared the rate impacts of the VCEA relative to current rates. The increases are the result of multiple factors including the addition of resources required to meet the VCEA, assumptions about the start of a national carbon tax in 2028, the need to replace the Company's retiring coal and gas plants, and an assumption of general commodity price inflation. For illustrative purposes, the Company shows the estimated impact on a residential customer using 1,000 kWh, and SGS customer using 5,000 kWh, and a 1 MW customer with an 80% load factor in Table 23. Please note that the rate impacts show in table 23 are not solely the cost of VCEA RPS compliance. To show that impact the Company would need to model a non-RPS compliant plan and compare it to RPS compliant plans. The Company was instructed in the Commission's 2021 VCEA Order to no longer model non-RPS compliant plans.

TABLE 23 MONTHLY RATE IMPACTS

Estimated Monthly Rate Impacts - Selected Rate Schedules																
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Residential Customer Gross (1000 kWh)	\$ 117.09	\$ 117.09	\$ 117.09	\$ 123.38	\$ 126.83	\$ 138.20	\$ 149.96	\$ 155.72	\$ 165.51	\$ 174.80	\$ 163.31	\$ 150.41	\$ 143.78	\$ 144.85	\$ 148.43	\$ 155.40
Offsets		0.04	0.25	(5.64)	(7.57)	(13.95)	(22.79)	(26.23)	(38.73)	(23.48)	(11.71)	5.76	15.69	18.68	18.87	16.39
Net Impact	\$ 117.09	\$ 117.13	\$ 117.34	\$ 117.75	\$ 119.26	\$ 124.24	\$ 127.17	\$ 129.49	\$ 146.78	\$ 151.32	\$ 153.60	\$ 156.17	\$ 159.47	\$ 163.53	\$ 167.30	\$ 171.79
% Increase (cumulative)		0%	0%	1%	2%	6%	9%	11%	25%	29%	31%	35%	36%	40%	43%	47%
S&S Customer Gross (5,000 kWh)	\$ 495.99	\$ 495.99	\$ 495.99	\$ 522.65	\$ 537.27	\$ 585.40	\$ 652.23	\$ 659.63	\$ 785.82	\$ 740.44	\$ 700.26	\$ 637.13	\$ 689.05	\$ 613.57	\$ 628.76	\$ 658.27
Offsets		\$ 0.14	\$ 1.02	\$ (24.01)	\$ (32.53)	\$ (60.63)	\$ (98.68)	\$ (113.73)	\$ (170.34)	\$ (106.70)	\$ (57.34)	\$ 16.12	\$ 57.50	\$ 69.29	\$ 69.29	\$ 57.86
Net Impact	\$ 495.99	\$ 496.13	\$ 497.01	\$ 498.64	\$ 504.73	\$ 524.77	\$ 556.56	\$ 545.90	\$ 615.48	\$ 633.74	\$ 642.92	\$ 653.25	\$ 666.54	\$ 682.86	\$ 698.06	\$ 716.13
% Increase (cumulative)		0%	0%	1%	2%	6%	8%	10%	24%	28%	30%	32%	34%	38%	41%	44%
UPS, 1 MW, 80% load factor Gross	\$ 37,788.21	\$ 37,788.21	\$ 37,788.21	\$ 39,819.19	\$ 40,933.04	\$ 44,599.80	\$ 48,396.67	\$ 50,255.53	\$ 59,869.42	\$ 56,412.28	\$ 53,351.09	\$ 48,541.16	\$ 46,401.60	\$ 46,746.16	\$ 47,903.83	\$ 50,151.81
Offsets		\$ 37.88	\$ 127.97	\$ (1,699.04)	\$ (2,048.28)	\$ (3,202.86)	\$ (5,521.31)	\$ (6,208.72)	\$ (7,097.16)	\$ (1,948.97)	\$ 2,862.50	\$ 8,968.31	\$ 12,775.09	\$ 14,475.96	\$ 15,224.71	\$ 15,424.81
Net Impact	\$ 37,788.21	\$ 37,826.09	\$ 37,916.18	\$ 38,120.15	\$ 38,884.76	\$ 41,396.94	\$ 42,875.36	\$ 44,046.81	\$ 52,772.26	\$ 55,463.30	\$ 56,213.60	\$ 57,509.47	\$ 59,176.68	\$ 61,222.12	\$ 63,128.53	\$ 65,594.63
% Increase (cumulative)		0%	0%	1%	3%	10%	13%	17%	40%	46%	49%	52%	57%	62%	67%	73%
Total Net Annual Increases		0.0%	0.2%	0.4%	1.5%	4.9%	2.7%	2.1%	15.6%	3.5%	1.7%	1.9%	2.4%	2.9%	2.6%	3.0%

7.0 RFP Process

The Company, by itself and through its support from AEPSC, has extensive RFP experience for the procurement of the resources required under the VCEA. AEPSC has previously performed RFPs in Virginia on behalf of APCo, and has also performed RFPs for AEP's other vertically-integrated utilities including KPCo, I&M, SWEPCO, PSO that have resulted in the procurement, or currently planned procurement, of thousands of megawatts of renewable resources. The Company has extensive experience analyzing purchase and sale agreements for both utility-owned and contracted renewables.

As reflected in Section 56.585.5, the Company is required to issue annual RFPs in order to meet the resource acquisition and RPS standards. The Company expects to procure materially all resources through this process, whether through acquisition or contracts for energy, capacity, and environmental attributes. The RFP process will be open to interested and qualified parties including, potentially, its own affiliates. The Company may also submit a "self-build" proposal.

In order to meet the 35% non-utility resource requirement, annual RFPs will allow for the procurement of both utility and non-utility owned resources. The Company does not expect to be able to meet the 35% PPA requirement included in Sections 56.585.5. D and 56.585.5. E with precision each year, as the most economic project sizes may not fit this metric in any given year. Nevertheless, it is the Company's intention to continue to adjust the RFP to target resources that will meet this requirement over time.

If the Company's competitive affiliates have the opportunity to participate in the RFP process, the Company will ensure that proper controls are in place to guarantee all bids are considered on an even basis. The Company and AEPSC have experience with monitoring bids from affiliates, and can ensure that all necessary protections to maintain an equitable and reasonable review process occur considering all bids on an equal basis.

Finally, the Company expects to issue its annual RFPs in the first quarter of each year.

8.0 Summary

The Company's 2021 VCEA plan includes a geographically varied portfolio of storage, solar and wind resources, both Company and third-party owned, as well as market REC purchases. In the petition accompanying this filing associated with this Plan, the Company is proposing a variety of resources to meet the mandates of the VCEA.

The Company has produced six portfolios for stakeholders' consideration that give an indication of the costs of compliance with the VCEA under various future resource assumptions.

Corrected Attachment 1

Portfolio 2 is the Company's base plan, while Portfolio 5 is a modified Portfolio 2 that represents a lower cost option for customers, should the resources prove to be available. The Company's short-term Action Plan is as follows:

- Issue RFPs early in 2022 in support of Portfolio 5.
- Seek competitive offers for energy storage in support of non-wires alternatives and the storage requirements in Subsection E.
- Utilize 100% of the Company's hydro resources for VCEA compliance beginning in 2025 through intra-Company transactions at market value.
- Monitor federal and state regulatory developments related to continued operation of the Amos and Mountaineer plants
- Monitor developments in REC markets to evaluate RECs as a compliance option

APPENDIX

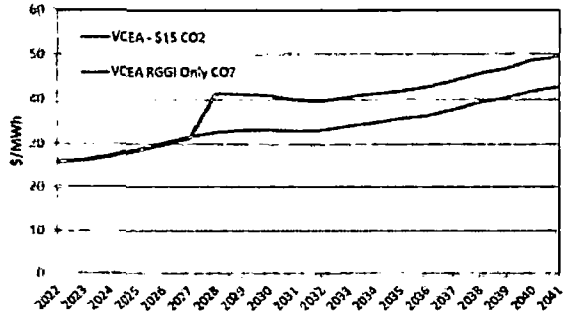
Corrected Attachment 1

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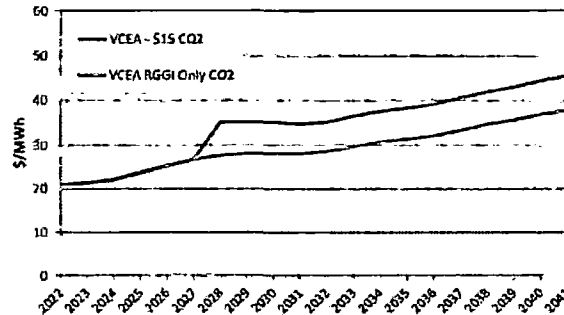
Appendix A: Fundamentals

FUNDAMENTALS

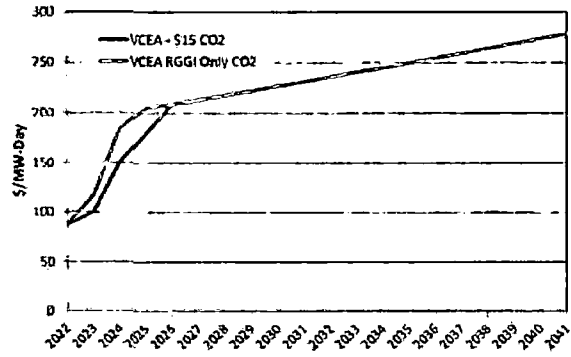
PJM AEP On-Peak Energy Prices - (Nominal \$/MWh)



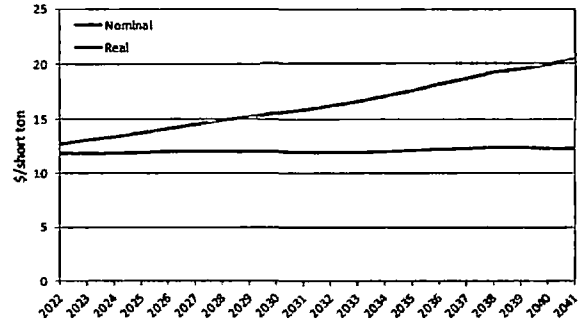
PJM AEP Off-Peak Energy Prices - (Nominal \$/MWh)



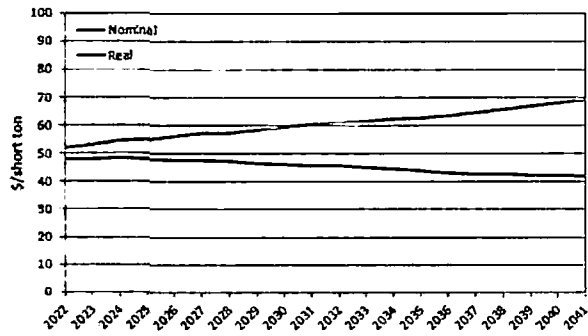
PJM AEP Capacity Prices (Nominal \$/MW-day)



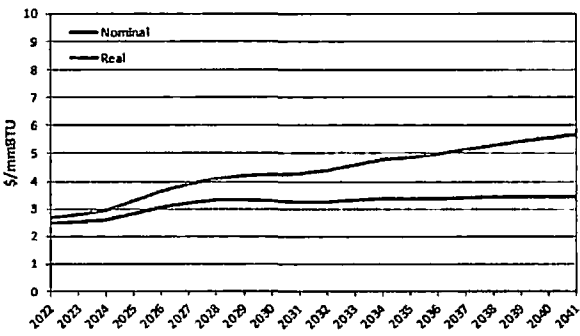
PRB 8800 Coal Prices - (\$/ton, FOB Origin)



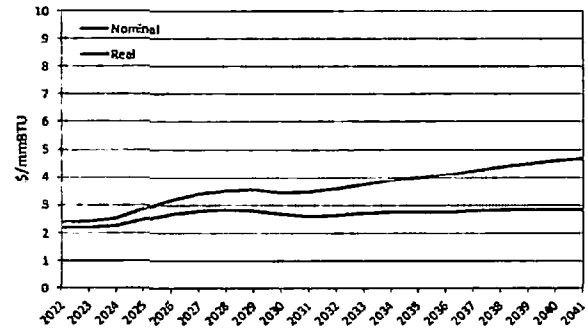
NAPP Coal Prices - (\$/ton, FOB Origin)

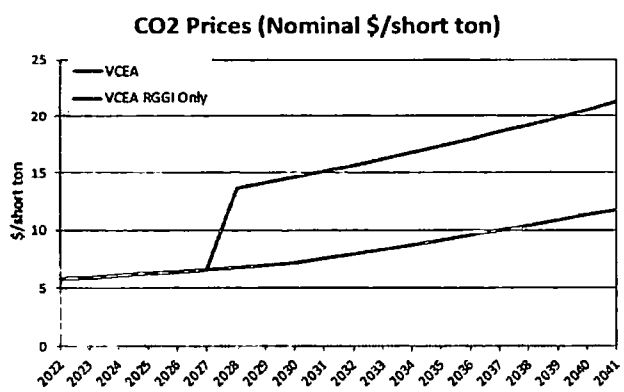


Henry Hub Gas Prices



Dominion South Delivered Gas Prices





Appendix B: Scenario Resource Plan Details

TABLE 24 PORTFOLIO I NAMEPLATE AND FIRM (UCAP) RESOURCE ADDITIONS AND CAPACITY

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Portfolio 1																			
Resources under Development (NmPt)	15	65	418	506.9	506.9	506.9	506.9	506.9	506.9	506.9	506.9	506.9	506.9	506.9	506.9	506.9	506.9	506.9	506.9
New Nat. Gas-CC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,390
New Nat. Gas-CT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	714
New Utility Solar (NmPt)	0	0	0	0	0	0	0	0	0	150	150	300	300	300	600	900	1,200	1,200	1,200
New Utility Solar (Firm)	0	0	0	0	0	0	0	0	0	39	39	78	78	78	156	234	312	312	312
New PPA Solar (NmPt)	0	0	0	0	0	0	0	0	0	150	300	450	600	750	900	900	900	900	900
New PPA Solar (Firm)	0	0	0	0	0	0	0	0	0	39	78	117	156	195	234	234	234	234	234
New Paired Solar (NmPt)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	219	669
New Paired Solar (Firm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57	174
VCEA Compliant																			
New Wind (Nameplate)	0	0	0	0	200	200	200	400	400	400	400	400	400	400	400	400	400	400	400
New Wind (Firm)	0	0	0	0	26	24	22	44	40	40	40	40	40	40	40	40	40	40	40
New Wind PPA (NmPt)	0	0	0	0	100	100	200	250	350	350	350	350	350	350	350	350	350	350	350
New Wind PPA (Firm)	0	0	0	0	13	12	22	28	35	35	35	35	35	35	35	35	35	35	35
Storage Capacity (NmPt)	0	0	0	0	25	25	25	25	25	150	150	150	150	150	400	400	400	400	400
Storage Capacity (Firm)	0	0	0	0	18	18	18	17	19	137	137	137	137	137	364	364	364	364	364
Storage Paired (NmPt)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	223
Storage Paired (Firm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
New EE	14	29	44	57	71	68	65	13	11	8	6	4	2	1	0	0	0	1	2
New VVO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	41
New DG	0	0	0	35	40	46	52	59	67	72	74	76	77	79	83	88	92	96	101
Total Additions (Firm & Degraded)																			
Capacity Reserves (MW) without new additions	290	198	133	121	675	675	685	669	679	876	916	993	1,032	1,072	1,420	1,513	1,605	1,745	4,126
Capacity Reserves (MW) with new additions	312	262	312	376	519	494	490	483	493	694	737	817	858	898	1,237	1,308	1,400	1,539	5

Table 25 Portfolio 2 Nameplate and Firm (UCAP) Resource Additions And Capacity Position

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Portfolio 2																			
Resources under Development (NmPit)	15	65	418	507	507	507	507	507	507	507	507	507	507	507	507	507	507	507	507
Resources under Development (Firm)	8	35	135	163	148	132	117	117	117	117	117	117	117	117	117	117	117	117	117
New Nat. Gas-CC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Nat. Gas-CT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Utility Solar (NmPit)	0	0	0	0	0	0	0	0	0	150	150	300	300	600	900	900	1,200	1,200	1,200
New Utility Solar (Firm)	0	0	0	0	0	0	0	0	0	39	39	78	78	156	234	234	312	312	312
New PPA Solar (NmPit)	0	0	0	0	0	0	0	0	0	150	300	450	600	750	900	900	900	900	900
New PPA Solar (Firm)	0	0	0	0	0	0	0	0	0	39	78	117	156	195	234	234	234	234	234
New Paired Solar (NmPit)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Paired Solar (Firm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Wind (Nameplate)	0	0	0	0	200	200	200	200	400	400	400	400	400	400	400	400	400	400	400
New Wind (Firm)	0	0	0	0	26	24	22	44	40	40	40	40	40	40	40	40	40	40	40
New Wind PPA (NmPit)	0	0	0	0	100	100	200	250	350	350	350	350	350	350	350	350	350	350	350
New Wind PPA (Firm)	0	0	0	0	13	12	22	28	35	35	35	35	35	35	35	35	35	35	35
Storage Capacity (NmPit)	0	0	0	0	25	25	25	25	25	150	150	150	150	150	400	400	400	400	2,725
Storage Capacity (Firm)	0	0	0	0	18	18	18	17	19	137	137	137	137	137	364	364	364	364	2,480
Storage Paired (NmPit)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	212
Storage Paired (Firm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	201
New EE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New VVO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New DG	0	0	0	35	40	46	52	59	67	72	74	76	77	79	83	88	92	96	101
Total Additions (Firm & Degraded)	22	64	179	255	319	303	298	281	291	488	527	605	644	769	1,129	1,146	1,303	1,491	3,751
Capacity Reserves (MW) without new additions	290	198	133	121	204	194	195	205	204	208	212	214	216	216	207	186	186	185	173
Capacity Reserves (MW) with new additions	312	262	312	376	523	498	493	486	495	696	739	819	860	985	1,337	1,332	1,489	1,675	20

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TABLE 26 PORTFOLIO 3 NAMEPLATE AND FIRM (UCAP) RESOURCE ADDITIONS AND CAPACITY POSITION

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Portfolio 3																			
Resources under Development (NmPt)	15	65	418	507	507	507	507	507	507	507	507	507	507	507	507	507	507	507	507
Resources under Development (Firm)	8	35	135	163	148	132	117	117	117	117	117	117	117	117	117	117	117	117	117
New Nat. Gas-CC	0	0	0	0	0	0	2,780	2,780	2,780	2,780	2,780	2,780	2,780	2,780	2,780	2,780	2,780	2,780	2,780
New Utility Solar (NmPt)	0	0	0	0	0	0	0	0	0	150	150	150	300	450	750	1,050	1,050	1,050	1,050
New Utility Solar (Firm)	0	0	0	0	0	0	0	0	0	39	39	39	78	117	156	234	273	273	273
New PPA Solar (NmPt)	0	0	0	0	150	150	300	450	600	750	750	900	900	900	900	900	900	900	900
New PPA Solar (Firm)	0	0	0	0	66	63	117	162	186	195	195	234	234	234	234	234	234	234	234
New Paired Solar (NmPt)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Paired Solar (Firm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Wind (NmPt)	0	0	0	0	200	200	200	200	200	200	200	400	400	400	400	400	400	400	400
New Wind (Firm)	0	0	0	0	26	24	22	21	20	20	40	40	40	40	40	40	40	40	40
New Wind PPA (NmPt)	0	0	0	0	100	100	150	150	150	150	150	200	250	250	250	300	300	300	300
New Wind PPA (Firm)	0	0	0	0	13	12	17	17	15	15	20	25	25	25	25	30	30	30	30
Storage Capacity (NmPt)	0	0	0	0	25	25	300	300	300	425	425	425	425	425	425	425	425	425	425
Storage Capacity (Firm)	0	0	0	0	18	18	210	207	228	387	387	387	387	387	387	387	387	387	387
Storage Paired (NmPt)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Storage Paired (Firm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New VVO	16	31	49	75	106	102	89	44	38	30	23	16	11	7	4	2	2	1	0
New VVO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Additions (Firm & Degraded)	23	66	184	273	417	409	3,431	3,474	3,474	3,677	3,672	3,731	3,771	3,828	4,115	4,200	3,974	3,977	3,982
Capacity Reserves (MW) without new additions	290	188	133	121	204	194	(8,417)	(8,400)	(8,402)	(8,396)	(8,388)	(8,385)	(8,382)	(8,381)	(8,358)	(8,422)	(8,423)	(8,424)	(8,751)
Capacity Reserves (MW) with new additions	313	264	317	395	621	603	29	30	72	281	303	345	389	427	718	778	550	553	250

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TABLE 27 PORTFOLIO 4 NAMEPLATE AND FIRM (UCAP) RESOURCE ADDITIONS AND CAPACITY POSITION

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Portfolio 4																			
Resources Under Development (NmPit)	15	65	418	507	507	507	507	507	507	507	507	507	507	507	507	507	507	507	507
Resources Under Development (Firm)	8	35	135	163	144	132	117	117	117	117	117	117	117	117	117	117	117	117	117
New Nat. Gas-CC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Nat. Gas-CT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Utility Solar (NmPit)	0	0	0	300	600	600	600	600	600	600	600	600	600	1,050	1,350	1,350	1,650	1,950	1,951
New Utility Solar (Firm)	0	0	0	144	264	232	234	216	186	156	156	234	234	273	351	351	429	507	507
New PPA Solar (NmPit)	0	0	0	150	300	300	300	300	300	300	300	450	450	600	900	900	900	900	900
New PPA Solar (Firm)	0	0	0	72	132	126	117	108	93	78	78	117	117	156	234	234	234	234	234
New Paired Solar (NmPit)	0	0	0	0	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148
New Paired Solar (Firm)	0	0	0	0	66	62	58	53	45	39	39	39	39	39	39	39	39	39	39
New Wind (Nameplate)	0	0	0	0	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
New Wind (Firm)	0	0	0	0	25	24	22	22	20	20	20	20	20	20	20	20	20	20	20
New Wind PPA (NmPit)	0	0	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
New Wind PPA (Firm)	0	0	0	0	13	12	11	11	10	10	10	10	10	10	10	10	10	10	10
Storage Capacity (NmPit)	0	0	0	0	25	1,075	3,575	3,725	3,725	3,650	3,650	3,650	3,650	3,850	4,100	3,650	2,600	2,500	2,821
Storage Capacity (Firm)	0	0	0	0	18	774	2,503	2,570	2,831	3,504	3,504	3,504	3,504	3,504	3,731	2,776	2,366	2,275	2,571
Storage Paired (NmPit)	0	0	0	0	0	49	49	49	49	49	49	49	49	49	49	49	49	49	49
Storage Paired (Firm)	0	0	0	0	31	34	35	36	42	46	46	46	46	46	46	46	46	46	46
New EE	28	58	107	163	224	206	188	121	98	75	55	39	25	16	10	9	9	9	10
New VVO	0	10	20	29	38	50	57	65	65	65	65	65	65	65	71	79	79	79	79
New DG	0	0	0	35	40	46	52	59	67	72	74	76	77	79	83	88	92	96	101
Total Additions (Firm & Degraded)	36	104	262	606	998	1,718	3,394	3,378	3,575	4,181	4,164	4,165	4,253	4,324	4,712	3,767	3,440	3,432	3,731
Capacity Reserves (MW) without new additions	290	198	135	121	204	194	(3,417)	(3,400)	(3,407)	(3,396)	(3,383)	(3,365)	(3,352)	(3,381)	(3,396)	(3,422)	(3,423)	(3,434)	(3,434)
Capacity Reserves (MW) with new additions	326	302	395	726	1,202	1,913	5	6	201	814	809	808	900	963	1,316	345	17	7	2

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TABLE 28 PORTFOLIO 5 NAMEPLATE AND FIRM (UCAP) RESOURCE ADDITIONS AND CAPACITY POSITION

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Portfolio 5																			
Resources under Development (NmPit)	15	65	418	507	507	507	507	507	507	507	507	507	507	507	507	507	507	507	507
Resources under Development (Firm)	8	35	135	163	148	132	117	117	117	117	117	117	117	117	117	117	117	117	117
New Nat. Gas-CC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Nat. Gas-CT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Utility Solar (NmPit)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	300	600	900	1,200
New Utility Solar (Firm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	156	234	312
New PPA Solar (NmPit)	0	0	0	0	0	0	0	0	0	150	300	450	600	750	900	900	900	900	900
New PPA Solar (Firm)	0	0	0	0	0	0	0	0	0	39	78	117	156	195	234	234	234	234	234
New Paired Solar (NmPit)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	450	900
New Paired Solar (Firm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	117	234
New Wind (Nameplate)	0	0	0	0	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	2,400
New Wind (Firm)	0	0	0	0	156	144	132	132	120	120	120	120	120	120	120	120	120	120	240
New Wind PPA (NmPit)	0	0	0	0	100	100	100	100	100	100	100	100	100	100	150	250	350	350	350
New Wind PPA (Firm)	0	0	0	0	13	12	11	11	10	10	10	10	10	10	15	25	35	35	35
Storage Capacity (NmPit)	0	0	0	0	25	25	25	25	25	150	150	150	150	150	400	400	400	400	2,325
Storage Capacity (Firm)	0	0	0	0	18	18	18	17	19	137	137	137	137	137	364	364	364	364	2,116
Storage Paired (NmPit)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	148
Storage Paired (Firm)	14	29	44	57	75	71	68	16	13	10	7	5	3	1	1	2	4	6	8
New EE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New VVO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New DG	0	0	0	35	40	46	52	59	67	72	74	76	77	79	83	88	92	96	101
Total Additions (Firm & Degraded)	22	64	179	255	449	423	397	352	346	504	543	581	619	659	939	1,044	1,147	1,498	3,722
Capacity Reserves (MW) without new additions	290	158	133	121	204	194	195	205	204	208	212	214	216	216	207	186	186	185	(3,731)
Capacity Reserves (MW) with new additions	312	262	312	376	653	618	592	557	550	712	754	794	835	875	1,147	1,230	1,333	1,683	2

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TABLE 29 PORTFOLIO 6 NAMEPLATE AND FIRM (UCAP) RESOURCE ADDITIONS AND CAPACITY POSITION

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Portfolio 6																			
Resources under Development (NmPkt)	15	65	418	507	507	507	507	507	507	507	507	507	507	507	507	507	507	507	507
Resources under Development (Firm)	8	35	135	163	148	132	117	117	117	117	117	117	117	117	117	117	117	117	117
New Nat. Gas-CC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Nat. Gas-CT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Utility Solar (NmPkt)	0	0	0	0	0	0	0	0	150	300	300	300	600	900	1,200	1,200	1,200	1,200	1,200
New Utility Solar (Firm)	0	0	0	0	0	0	0	0	47	78	78	78	156	234	312	312	312	312	312
New PPA Solar (NmPkt)	0	0	0	0	0	0	0	150	300	450	600	750	900	900	900	900	900	900	900
New PPA Solar (Firm)	0	0	0	0	0	0	0	54	93	117	156	195	234	234	234	234	234	234	234
New Paired Solar (NmPkt)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	141	291	441
New Paired Solar (Firm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	76	115
VCEA Compliant w/REGI \$15 CO2	0	0	0	0	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
New Wind (Nameplate)	0	0	0	0	26	24	22	22	20	20	20	20	20	20	20	20	20	20	20
New Wind (Firm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Wind PPA (NmPkt)	0	0	0	0	100	150	250	350	350	350	350	350	350	350	350	350	350	350	350
New Wind PPA (Firm)	0	0	0	0	13	18	28	39	35	35	35	35	35	35	35	35	35	35	35
Storage Capacity (NmPkt)	0	0	0	0	25	25	25	25	25	150	150	150	150	150	400	400	400	400	2,800
Storage Capacity (Firm)	0	0	0	0	18	18	18	17	19	137	137	137	137	137	364	364	364	364	2,548
Storage Paired (NmPkt)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Storage Paired (Firm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New EE	14	29	44	57	75	71	88	16	13	10	9	7	6	5	9	9	10	11	11
New VVO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New DG	0	0	0	35	40	46	52	59	67	72	74	76	77	79	83	88	92	96	101
Total Additions (Firm & Degraded)	22	64	179	255	319	309	303	324	410	585	625	664	781	866	1,192	1,207	1,309	1,423	3,728
Capacity Reserves (MW) without new additions	290	198	133	121	204	194	195	205	204	208	212	214	216	216	207	186	186	185	13,741
Capacity Reserves (MW) with new additions	312	262	312	376	523	504	499	529	614	793	837	878	997	1,083	1,399	1,393	1,488	1,608	1

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TABLE 30 CAPACITY RESERVE MARGIN

Capacity Reserve Margin
with new additions %

	Portfolio 1	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	Portfolio 6
	2040		2028		2040 AM+MNTR	2040
	AM+MNTR	AM+MNTR	AM+MNTR	AM+MNTR	Ret.	AM+MNTR Ret.
	Ret.	Ret.	Ret.	Ret.	Ret.	Ret.
	RGGI-\$15	RGGI-\$15	RGGI-\$15	RGGI-\$15	RGGI-\$15 CO2	RGGI-\$15 CO2
	CO2	CO2	CO2	CO2	No Gas Option	No Gas Option
	Gas Option	Gas Option	Gas Option	Gas Option	High Wind	Historical
		No Gas	No Gas	No Gas	Limits	Wind CF
		Option	Option	Option		
2022	14.3	14.3	14.4	14.6	14.3	14.3
2023	13.4	13.4	13.4	14.1	13.4	13.4
2024	14.3	14.3	14.4	15.8	14.3	14.3
2025	15.9	15.9	16.3	22.8	15.9	15.9
2026	19.0	19.1	21.0	32.6	21.7	19.1
2027	18.5	18.6	20.7	47.1	21.0	18.7
2028	18.5	18.5	9.0	8.7	20.5	18.6
2029	18.4	18.4	9.2	8.7	19.9	19.3
2030	18.6	18.6	10.1	12.7	19.8	21.1
2031	22.7	22.7	14.3	25.1	23.1	24.7
2032	23.6	23.6	14.8	24.9	23.9	25.6
2033	25.2	25.3	15.6	27.1	24.8	26.5
2034	26.1	26.1	16.5	26.9	25.6	28.9
2035	26.9	28.7	17.3	27.8	26.4	30.7
2036	33.7	35.8	23.2	35.3	31.9	37.0
2037	35.1	35.6	24.4	15.6	33.5	36.8
2038	37.0	38.8	19.8	8.9	35.6	38.8
2039	39.8	42.5	19.8	8.7	42.7	41.2
2040	8.7	9.0	13.7	8.6	8.7	8.6
2041	8.7	9.0	8.7	8.7	8.7	8.6
2042	8.7	9.1	8.7	8.9	8.7	8.6
2043	8.9	9.2	8.7	8.8	8.8	8.7
2044	9.0	9.3	8.8	8.8	8.8	8.8
2045	9.1	9.4	9.0	8.9	9.0	8.9
2046	9.2	9.5	9.9	9.0	9.1	9.0
2047	8.7	9.0	8.7	8.8	8.7	8.8
2048	8.8	9.1	8.9	8.7	8.7	8.9
2049	8.9	9.2	9.0	8.8	8.9	9.0
2050	9.0	8.8	9.1	8.9	9.0	8.7
2051	8.8	9.0	8.9	9.1	8.7	8.6

TABLE 31 VCEA ENERGY TARGET POSITION

VCEA TGT	VCEA %	VCEA GWh	VCEA Annual Energy Target Over/(Under) (GWh)					
			Portfolio 1	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	Portfolio 6
			2040 AM+MNTR Ret. RGGI CO2 Gas Option	2040 AM+MNTR Ret. RGGI-\$15 CO2 No Gas Option	2028 AM+MNTR Ret. RGGI CO2 Gas Option	2028 AM+MNTR Ret. RGGI-\$15 CO2 No Gas Option	2040 AM+MNTR Ret. RGGI-\$15 CO2 No Gas Option High Wind Limits	2040 AM+MNTR Ret. RGGI-\$15 CO2 No Gas Option Historical Wind CF
2022	7%	1,051	210	210	210	210	210	210
2023	8%	1,200	112	112	112	112	112	112
2024	10%	1,499	557	557	557	557	557	557
2025	14%	2,100	181	181	181	1,115	181	181
2026	17%	2,546	1,017	1,017	1,328	3,194	4,083	1,017
2027	20%	2,999	489	489	800	2,666	3,555	642
2028	24%	3,601	135	135	604	2,006	2,895	289
2029	27%	4,055	336	336	350	1,440	2,329	341
2030	30%	4,505	61	61	78	858	1,747	380
2031	33%	4,956	174	174	192	349	1,549	494
2032	36%	5,406	61	61	381	(74)	1,437	381
2033	39%	5,861	254	254	417	429	1,319	263
2034	42%	6,314	139	139	455	3	1,203	770
2035	45%	6,772	18	640	334	193	1,083	960
2036	53%	7,985	(20)	251	334	115	225	260
2037	53%	7,994	170	170	328	34	1,072	529
2038	57%	8,608	215	448	364	79	1,424	599
2039	61%	9,219	101	504	490	127	2,414	252
2040	65%	9,829	472	403	267	(96)	7,086	607
2041	68%	10,301	667	42	105	162	6,957	179
2042	71%	10,761	203	279	32	48	6,494	69
2043	74%	11,227	116	(159)	(40)	(38)	6,056	(18)
2044	77%	11,694	29	104	(128)	(126)	5,618	(106)
2045	80%	12,171	282	8	126	128	5,171	148
2046	84%	12,798	44	120	23	(111)	4,583	(90)
2047	88%	13,427	312	(120)	26	0	3,993	21
2048	92%	14,053	76	(6)	141	114	3,406	135
2049	96%	14,695	174	92	(112)	(138)	2,803	(117)
2050	100%	15,325	283	(148)	(2)	(28)	2,212	(8)
2051	100%	15,349	280	199	(5)	(32)	2,209	(11)

TABLE 32 ANNUAL REC PURCHASES

Annual REC Purchases (GWh)

	Portfolio 1	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	Portfolio 6
VCEA Energy Requirement GWh	2040 AM+MNTR Ret. RGGI CO2 Gas Option	2040 AM+MNTR Ret. RGGI-\$15 CO2 No Gas Option	2028 AM+MNTR Ret. RGGI CO2 Gas Option	2028 AM+MNTR Ret. RGGI-\$15 CO2 No Gas Option	2040 AM+MNTR Ret. RGGI-\$15 CO2 No Gas Option High Wind Limits	2040 AM+MNTR Ret. RGGI-\$15 CO2 No Gas Option Historical Wind CF
2022	1,051	0	0	0	0	0
2023	1,200	0	0	0	0	0
2024	1,499	0	0	0	0	0
2025	2,100	0	0	0	0	0
2026	2,546	0	0	0	0	0
2027	2,999	0	0	0	0	0
2028	3,601	0	0	0	0	0
2029	4,055	0	0	0	0	0
2030	4,505	0	0	0	0	0
2031	4,956	0	0	0	0	0
2032	5,406	0	0	0	0	0
2033	5,861	0	0	0	0	0
2034	6,314	0	0	0	0	0
2035	6,772	0	0	0	0	0
2036	7,985	351	0	703	0	0
2037	7,994	0	0	0	0	350
2038	8,608	0	0	0	0	701
2039	9,219	0	0	701	0	0
2040	9,829	0	0	1,054	351	0
2041	10,301	0	0	701	1,051	0
2042	10,761	0	701	1,051	1,402	350
2043	11,227	350	701	1,402	1,752	701
2044	11,694	703	1,405	1,757	2,108	1,054
2045	12,171	1,402	1,752	2,453	2,803	1,752
2046	12,798	1,752	2,453	2,803	3,154	2,102
2047	13,427	2,453	2,803	2,453	3,854	2,803
2048	14,053	2,811	3,514	3,162	4,568	3,514
2049	14,695	3,504	4,205	3,504	4,906	3,854
2050	15,325	4,205	4,555	4,205	5,606	4,555
2051	15,349	4,555	5,256	4,555	5,957	4,906

TABLE 33 ENERGY EFFICIENCY RESOURCE ADDITIONS

Annual Energy Efficiency added for VCEA Compliance

Portfolios	Descriptions	VCEA EE Trgt Svgs Tgt %	Portfolio 1			Portfolio 2			Portfolio 3			Portfolio 4			Portfolio 5			Portfolio 6		
			RES GWh	COM GWh	Surplus/ (Deficit) GWh	RES GWh	COM GWh	Surplus/ (Deficit) GWh	RES GWh	COM GWh	Surplus/ (Deficit) GWh	RES GWh	COM GWh	Surplus/ (Deficit) GWh	RES GWh	COM GWh	Surplus/ (Deficit) GWh	RES GWh	COM GWh	Surplus/ (Deficit) GWh
2022		0.5%	48	24	(0)	48	24	(0)	48	26	2	107	26	61	48	24	(0)	48	24	(0)
2023		1.0%	99	47	1	99	47	1	99	51	5	223	51	130	99	47	1	99	47	1
2024		1.5%	144	73	(0)	144	73	(0)	160	76	19	424	76	284	144	73	(0)	144	73	(0)
2025		2.0%	197	93	1	197	93	1	256	102	69	659	102	472	197	93	1	197	93	1

L E T O T O G E

TABLE 34 RENEWABLE PORTFOLIO 2021 VCEA ORDER COMPLIANCE

Virginia Clean Economy Act Analysis
Renewable Portfolio Compliance

All Values in MWhs

Year	Virginia Clean Energy Act Renewable Energy Requirement	Order Rqmt		Order Rqmt		Order Rqmt		Order Rqmt		Order Rqmt		Order Rqmt		Order Rqmt		Order Rqmt		Order Rqmt		
		1.a.i	1.a.ii	1.a.iii	1.b.i	1.b.ii	1.b.iii	1.b.iv	1.b.v	1.b.vi	1.b.vii	1.b.viii	1.b.ix	1.b.x	1.b.xi	1.b.xii	1.b.xiii	1.b.xiv	1.b.xv	1.b.xvi
2022	983,734	83,607	-	807,050	70,094	408,816	398,234	-	-	-	-	398,234	-	-	-	-	108,077	83,607	-	-
2023	1,133,611	91,954	-	807,050	74,027	408,816	398,234	-	-	-	-	398,234	-	-	-	-	234,607	87,675	4,279	-
2024	1,415,226	130,915	-	807,050	113,076	408,816	398,234	-	-	-	-	398,234	-	-	-	-	477,261	87,237	4,258	-
2025	1,982,091	786,160	-	807,050	387,989	408,816	398,234	-	-	-	-	398,234	-	-	-	-	388,681	182,388	170,790	-
2026	2,402,968	1,705,069	-	807,050	396,049	1,329,754	734,399	-	-	-	-	734,399	-	-	-	-	-	488,455	783,065	-
2027	2,829,432	1,703,051	-	807,050	384,119	1,329,754	734,399	-	-	-	-	734,399	-	-	-	-	-	487,548	783,045	-
2028	3,397,617	2,012,997	-	807,050	382,198	1,641,709	734,399	-	-	-	-	734,399	-	-	-	-	-	796,112	784,687	-
2029	3,824,956	2,773,472	-	703,343	380,287	2,300,475	734,399	-	-	-	-	734,399	-	-	-	-	-	946,216	1,365,317	-
2030	4,248,749	3,078,463	-	586,109	378,386	2,490,220	734,399	-	-	-	-	734,399	-	-	-	-	-	1,252,301	1,394,480	-
2031	4,673,752	3,707,376	-	586,109	1,007,385	2,490,220	734,399	-	-	-	-	734,399	-	-	-	-	-	1,566,858	1,709,093	-
2032	5,096,612	4,030,215	-	586,109	1,323,982	2,499,549	734,399	-	-	-	-	734,399	-	-	-	-	-	1,887,794	1,714,251	-
2033	5,525,244	4,647,279	-	586,109	1,947,460	2,490,220	734,399	-	-	-	-	734,399	-	-	-	-	-	2,194,480	2,021,883	-
2034	5,950,984	4,953,406	-	586,109	2,258,673	2,490,220	734,399	-	-	-	-	734,399	-	-	-	-	-	2,507,383	2,020,440	-
2035	6,382,261	5,902,008	-	586,109	3,202,359	2,490,220	734,399	-	-	-	-	734,399	-	-	-	-	-	2,821,976	2,649,619	-
2036	7,524,059	6,885,143	-	586,109	4,157,250	2,499,549	734,399	-	-	-	-	734,399	-	-	-	-	-	3,146,622	3,289,558	-

Notes:
A VA Allocation of Existing Renewables = 50.10%
B VA Allocated 100% of Existing Hydro In 2026
C Assumes Summersville Hydro contract is extended for 15 years in 2027

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Appendix C: Intentionally Left Blank

Corrected Attachment 1

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Appendix D: Overnight Installed Cost of Technologies in 2019 Real Dollars (\$/kW)

TABLE 35 OVERNIGHT COSTS

Year	COMBUSTION TURBINE H CLASS, 1100-MW COMBINED CYCLE	COMBUSTION TURBINE H CLASS, COMBINED-CYCLE SINGLE SHAFT, 430 MW	COMBUSTION TURBINE F CLASS, 240-MW SIMPLE CYCLE	COMBUSTION TURBINES AERODERIVATIVE, 100-MW SIMPLE CYCLE	INTERNAL COMBUSTION ENGINES, 20 MW	ONSHORE WIND, LARGE PLANT FOOTPRINT, 200 MW	SOLAR PHOTOVOLTAIC, 150 MWAC, Tier 1	SOLAR PHOTOVOLTAIC, 150 MWAC, Tier 2	BATTERY ENERGY STORAGE SYSTEM, 50 MW / 200 MWH
2019	\$1,063	\$1,131	\$763	\$1,262	\$1,958	\$1,484	\$1,550	\$1,969	\$1,450
2020	\$1,059	\$1,126	\$756	\$1,250	\$1,939	\$1,449	\$1,534	\$1,948	\$1,379
2021	\$1,053	\$1,120	\$749	\$1,238	\$1,921	\$1,414	\$1,467	\$1,863	\$1,296
2022	\$1,051	\$1,118	\$745	\$1,232	\$1,912	\$1,379	\$1,400	\$1,778	\$1,214
2023	\$1,039	\$1,105	\$730	\$1,207	\$1,873	\$1,366	\$1,333	\$1,693	\$1,131
2024	\$1,034	\$1,100	\$722	\$1,194	\$1,852	\$1,352	\$1,266	\$1,608	\$1,049
2025	\$1,034	\$1,100	\$719	\$1,189	\$1,845	\$1,338	\$1,199	\$1,523	\$967
2026	\$1,030	\$1,096	\$714	\$1,180	\$1,832	\$1,319	\$1,132	\$1,438	\$932
2027	\$1,021	\$1,086	\$703	\$1,163	\$1,804	\$1,299	\$1,066	\$1,353	\$897
2028	\$1,017	\$1,082	\$698	\$1,154	\$1,790	\$1,283	\$999	\$1,268	\$862
2029	\$1,012	\$1,077	\$693	\$1,146	\$1,779	\$1,267	\$932	\$1,183	\$828
2030	\$1,008	\$1,072	\$690	\$1,140	\$1,770	\$1,252	\$865	\$1,098	\$793
2031	\$1,005	\$1,069	\$687	\$1,136	\$1,763	\$1,252	\$857	\$1,088	\$783
2032	\$1,000	\$1,064	\$683	\$1,129	\$1,751	\$1,252	\$849	\$1,078	\$773
2033	\$994	\$1,057	\$678	\$1,121	\$1,740	\$1,252	\$842	\$1,069	\$763
2034	\$990	\$1,053	\$674	\$1,115	\$1,731	\$1,252	\$834	\$1,059	\$753
2035	\$986	\$1,049	\$671	\$1,109	\$1,722	\$1,252	\$826	\$1,049	\$743
2036	\$980	\$1,043	\$666	\$1,102	\$1,710	\$1,252	\$818	\$1,039	\$733
2037	\$976	\$1,038	\$663	\$1,096	\$1,701	\$1,252	\$811	\$1,030	\$724
2038	\$973	\$1,035	\$659	\$1,090	\$1,692	\$1,252	\$803	\$1,020	\$714
2039	\$968	\$1,030	\$657	\$1,086	\$1,685	\$1,252	\$795	\$1,010	\$704
2040	\$964	\$1,025	\$652	\$1,078	\$1,673	\$1,252	\$788	\$1,000	\$694
2041	\$959	\$1,020	\$649	\$1,072	\$1,664	\$1,252	\$780	\$990	\$684
2042	\$955	\$1,016	\$645	\$1,067	\$1,655	\$1,252	\$772	\$981	\$674
2043	\$952	\$1,012	\$641	\$1,061	\$1,646	\$1,252	\$765	\$971	\$664
2044	\$947	\$1,007	\$638	\$1,055	\$1,637	\$1,252	\$757	\$961	\$654
2045	\$944	\$1,004	\$635	\$1,050	\$1,630	\$1,252	\$749	\$951	\$644
2046	\$940	\$1,000	\$632	\$1,044	\$1,621	\$1,252	\$741	\$941	\$634
2047	\$936	\$996	\$628	\$1,039	\$1,612	\$1,252	\$734	\$932	\$624
2048	\$930	\$990	\$624	\$1,033	\$1,602	\$1,252	\$726	\$922	\$614
2049	\$926	\$985	\$620	\$1,025	\$1,591	\$1,252	\$718	\$912	\$605
2050	\$915	\$973	\$613	\$1,013	\$1,573	\$1,252	\$711	\$902	\$595
2051	\$904	\$962	\$606	\$1,002	\$1,554	\$1,252	\$703	\$893	\$585

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Appendix E: Filing Requirements

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Requirement	Citation	Development Plan/Testimony Location	Company Witness Sponsor
Submit an annual plan that (i) reflects, in the aggregate and over the duration, the Subsection D requirements for allocation between utility-owned facilities and PPAs, and (ii) includes a plan to meet energy storage development targets under Subsection E, including the goal of installing at least 10% behind the meter.	Va. Code§ 56-585.5 D 4	2021 RPS Development Plan	Witness Martinez
Consider the promotion of new renewable generation and energy storage resources within the Commonwealth, and associated economic development.	Va. Code§ 56-585.5 D 4	2021 RPS Development Plan	Witness Martinez
Consider the fuel savings projected to be achieved by the plan.	Va. Code§ 56-585.5 D 4	2021 RPS Development - Table 23 and Appendix C	Witness Castle
Report on the plan to meet and progress toward the interim targets set forth in the storage regulations.	20 VAC 5-335-30	2021 RPS Development Plan-Table 3	Witness Martinez
Report annually on any competitive solicitations for energy storage	20 VAC 5-335-40		Witness Casablanca
Address behind-the meter incentives related to energy storage projects	20 VAC 5-335-50		Witness Casablanca
Address non-wires alternative programs related to energy storage.	20 VAC 5-335-60		Witness Casablanca
Address peak demand reduction programs related to energy storage.	20 VAC 5-335-70		Witness Casablanca

Requirement	Citation	Development Plan/Testimony Location	Company Witness Sponsor
Analyze how the Company's plan and petition requests address and implement the RPS and carbon dioxide reduction requirements in Code§ 56-585.5, including but not necessarily limited to Code 56-585.5c.	PUR-2020-00135 Final Order at 4	Sec 5.8 Carbon Dioxide Reduction Requirements	Witness Martinez
Include a least cost plan consistent with the requirements of the 2020 IRP Final Order that meets (i) applicable carbon regulations and (ii) the mandatory RPS Program.	PUR-2020-00135 Final Order at 5	2021 RPS Development Plan-Table 19	Witness Martinez
Include an evaluation of RECs from all sources (with both high and low-price sensitivities), including utility-owned, third-party PPAs and unbundled REC purchases.	PUR-2020-00135 Final Order at 5	2021 RPS Development Plan-Figure 8, Section 5.3	Witness Martinez
Provide modeling of the Company's actual wind capacity factor and Virginia-specific or PJM-specific solar capacity factor.	PUR-2020-00135 Final Order at 5	See Portfolio 6 of the 2021 RPS Development Plan	Witness Martinez
Provide distributed generation sensitivities for unbundled REC purchases through Requests for Proposals ("RFPs"), fixed price offers and over-the-counter purchases.	PUR-2020-00135 Final Order at 5	2021 RPS-Development Plan-Figure 8 and Section 5.3	Witness Castle
Modeling of reliability impacts	PUR-2020-00135 Final Order at 5	Section 1.5	Witness Martinez
Provide updated fundamentals forecasts and commodity pricing that reflects the VCEA requirements.	PUR-2020-00135 Final Order at 5	Sec 3.4 Fundamentals Forecast	Witness Martinez
Provide a detailed chart showing how APCo has complied to date with the VCEA's RPS requirements.	PUR-2020-00135 Final Order at 5	2021 RPS Development Plan- Section 1.3	Witness Castle
The Company's bill analysis should include the effects of retirements, the effects of tax credits, offsets related to outside model additions, and any changes to customer class allocation factors. ¹	PUR-2020-00135 Final Order at 6	2021 RPS Development Plan Table 18	Witness Castle
Ensure modeling inputs and assumptions are consistent between IRP and RPS Development Plan proceedings and explain the reason behind any deviation in the assumptions and modeling used.	PUR-2020-00135 Final Order at 9	2021 RPS Development Plan Section 2.6	Witness Martinez

¹ This requirement initially included a requirement to file a bill analysis. The Company has filed a consolidated bill analysis consistent with the Order on the 2020 Filing which modified the bill analysis-related requirements.

Requirement	Citation	Development Plan/Testimony Location	Company Witness Sponsor
Provide the complete results of RPS-related RFPs must be included in each of the Company's RPS filings. In addition to the specific requirements set forth in Code § 56-585.5 D 3, the Company's RFPs shall address environmental justice considerations by assessing the impacts of proposed projects on underserved communities. The Company's RPS filing should identify how the RFP assessed environmental justice considerations, including any non-price considerations that were included in the Company's RFP analysis.	PUR-2020-00135 Final Order at 8	Testimony	Witness Jeffries/Witness Castle
The Company will propose reporting metrics, and any needed protocols, associated with RPS Program certification in its 2021 RPS filing.	PUR-2020-00135 Final Order at 6	Testimony	Witness Castle
Provide information related to accelerated renewable energy buyers ("ARBs")	PUR-2020-00135 Final Order at 7	Testimony Exhibit	Witness Sebastian
Present the Company proposed cost allocation methodology, along with the results of alternative cost allocation methodologies.	PUR-2020-00135 Final Order at 9	Testimony	Witness Spaeth/Witness Sebastian
Report each RPS-associated cost or benefit by type, month, general ledger account, rate mechanism and whether such cost or revenue is bypassable or non-bypassable.	PUR-2020-00135 Final Order at 10		Witness Spaeth/Witness Thomas/Witness Sebastian
(1) For each year, 2021 through 2035, provide an estimate of the yearly RPS Program requirement expressed in MWh in accordance with the schedule provided in § 56-585.5 C.	PUR-2020-00135 Order Establishing Proceeding Attachment	2021 RPS Development Plan Appendix B	Witness Martinez
(1) (a) For each year, 2021 through 2035, provide an estimate (MWhs or RECs) of the RPS Program requirement that is expected to be met from generation located: (i) in Virginia; (ii) off the coast of the Commonwealth; or (iii) otherwise located in PJM.	PUR-2020-00135 Order Establishing Proceeding Attachment	2021 RPS Development Plan Appendix B	Witness Martinez
(1) (b) For each year, 2021 through 2035, provide an estimate (MWhs or RECs) of the RPS Program requirement that is expected to be met from the following sources: (i) solar; (ii) on- shore wind; (iii) off-shore wind; (iv) falling water; (v) waste-to- energy or landfill gas; (vi) biomass; or (vii) any other qualifying resource.	PUR-2020-00135 Order Establishing Proceeding Attachment	2021 RPS Development Plan Appendix B	Witness Martinez

Requirement	Citation	Development Plan/Testimony Location	Company Witness Sponsor
(1) (c) For each year, 2021 through 2035, provide an estimate, expressed in MWhs, of the RPS Program requirement that must be provided by non-utility sources.	PUR-2020-00135 Order Establishing Proceeding Attachment	2021 RPS Development Plan Appendix B	Witness Martinez
(2) Provide the lifetime revenue requirement for the proposed RPS Program by component, including supporting calculations on an annual basis.1	PUR-2020-00135 Order Establishing Proceeding Attachment	2021 RPS Development Plan Appendix B	Witness Martinez
(3) State whether the utility in its RPS Filing will treat the term "capacity" referenced in § 56-585.5 as nameplate capacity, or in some other way to be identified and described by the utility.	PUR-2020-00135 Order Establishing Proceeding Attachment	2021 RPS Development Plan Section 2.1	Witness Martinez
(4) Estimate the nameplate capacity of all renewable resources the utility will be required to procure to meet its capacity obligations in PJM, following the utility's full transition to renewable resources by 2045 (Phase II Utility), and 2050 (Phase I Utility), as required by § 56-585.5.	PUR-2020-00135 Order Establishing Proceeding Attachment	2021 RPS Development Plan Table 21	Witness Martinez
(5) Regarding the tranches described in § 56-585.5 D 1 a, b, and c for a Phase I utility, (i) describe how the utility will obtain the requisite 35% of energy, capacity and environmental attributes from non-utility sources as required by the statute, and (ii) state, in detail, whether affiliates of the utility may potentially provide any of that energy, capacity or environmental attributes.	PUR-2020-00135 Order Establishing Proceeding Attachment		Witness Castle