COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

PREFILED STAFF TESTIMONY

APPALACHIAN POWER COMPANY

For approval of its 2025 RPS Plan under § 56-585.5 of the Code of Virginia and related requests

Volume II of III

Public Version Only

PUR-2025-00049

July 16, 2025

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My testimony provides the following conclusions related to Appalachian Power Company's ("Company") 2025 Renewable Energy Portfolio Standard ("RPS") Plan:

1. The Company developed its Portfolios in a way that is materially the same as how Integrated Resource Plans are developed, using the same general methods, optimization software, inputs, and resource assumptions.

2. The Company's preferred plan, Portfolio A, has a Net Present Value ("NPV") of approximately $22.268 billion. Including the resource additions and relevant retirements under Portfolio A, the Company expects to have capacity and energy in excess of its obligations through 2044. In Portfolio A, the Company began 2025 with a surplus number of Renewable Energy Certificates ("RECs") relative to the minimum RPS requirement. The Company's modeling applied these surplus RECs through 2025 and then purchased RECs in years 2026 through 2028.

3. The Company's least-cost plan, Portfolio B, has a NPV of approximately $22.240 billion. Including the resource additions and relevant retirements under Portfolio B, the Company expects to have capacity and energy in excess of its obligations through 2044. In Portfolio B, the Company began 2025 with a surplus number of RECs relative to the minimum RPS requirement. The modeling applied these surplus RECs through 2025 and then purchased RECs in years 2026 through 2028.

PREFILED TESTIMONY

OF

ANDREW T. BOEHNLEIN

PETITION OF APPALACHIAN POWER COMPANY

FOR APPROVAL OF ITS 2025 RPS PLAN UNDER

§ 56-585.5 OF THE CODE OF VIRGINIA AND RELATED REQUESTS

Case No. PUR-2025-00049

July 16, 2025

Q. PLEASE STATE YOUR NAME AND POSITION WITH THE STATE CORPORATION COMMISSION ("COMMISSION").

A. My name is Andrew T. Boehnlein and in the Commission's Division of Public Utility Regulation ("PUR"), I am a Manager.

Q. WHAT ARE YOUR PRESENT RESPONSIBILITIES?

A. My duties as a Manager include analyzing public utility renewable energy portfolio standard ("RPS") plans; integrated resource plan ("IRP") applications; energy efficiency ("EE") programs and measures; and applications for certificates of public convenience and necessity. I am also responsible for presenting testimony as a Commission Staff ("Staff") witness and making alternative proposals to the Commission when appropriate.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. My testimony addresses Appalachian Power Company's ("APCo" or "Company") annual plan and petition for approval of its 2025 RPS Plan ("Petition") filed on May 14, 2025, pursuant to § 56-585.5 of the Code of Virginia ("Code"). Specifically, I will discuss the

modeled resource portfolios ("Portfolios") that the Company considered to fulfill its capacity and energy obligations, as well as the Company's need for renewable energy certificates ("RECs") pursuant to Code § 56-585.5 C.

MODELING RESULTS

Q. PLEASE PROVIDE A BRIEF OVERVIEW OF THE COMPANY'S MODELING PROCESS.

A. The Company developed the Portfolios in a way that is materially the same as how IRPs are developed, using the same general methods, optimization software, inputs, and resource assumptions.[1] 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 annual requirements associated with Virginia-domiciled renewable and storage targets.[2] PLEXOS selects the optimal suite of supply-side and demand-side resources while considering the cost and performance parameters and economic conditions, including long-term fuel prices, capacity costs, energy costs, and projections of energy usage and peak demand.[3] For the purposes of modeling compliance with the VCEA,[4] APCo used PLEXOS to model portfolios that meet the PJM[5] capacity obligation,

[1] Petition at Attachment 1 ("2025 RPS Plan") at 6.

[2] *Id.*

[3] *Id.* at 41.

[4] The Virginia Clean Economy Act ("VCEA"), 2020 Va. Acts of Assembly, Ch. 1193.

[5] PJM Interconnection Inc. ("PJM") is the regional transmission organization of which APCo is a member.

the energy constraint, the applicable EPA 2024 rules,[6] and the VCEA requirements.[7] Further details regarding resource inputs and assumptions made in the Company's modeling can be found in the direct testimony of Staff witnesses Davis Little and Kenneth Curtis.

Q. DID THE COMPANY INCLUDE A LEAST-COST PLAN FOR COMPLIANCE WITH THE RPS PROGRAM?

A. Yes. Pursuant to the Commission's directive in the 2020 RPS Order,[8] the Company identified Portfolio B as the "least-cost" portfolio as required by the Commission.[9]

Q. HAS THE COMPANY IDENTIFIED A PORTFOLIO THAT IT CONSIDERS ITS PREFERRED PLAN OR ITS INTENDED PATH FORWARD TOWARDS MEETING THE REQUIREMENTS OF THE VCEA?

A. Yes.[10] The Company identified Portfolio A, otherwise known as the Company's VCEA Portfolio Plan, to be its preferred plan and to serve as its intended path forward for compliance with the requirements of the VCEA.[11]

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[6] The Environmental Protection Agency's ("EPA") 2024 rules included its Greenhouse Gas ("GHG") emissions standards finalized in May 2024, pursuant to Section 111(b) and Section 111(d) of the Clean Air Act and the April 2024 final revisions to the Effluent Limitation Guidelines ("ELG") rule that establishes a zero liquid discharge ("ZLD") standard for Flue-Gas Desulfurization ("FGD") wastewater, bottom ash transport water, and managed combustion residual leachate, as well as more stringent discharge limits for unmanaged combustion residual leachate.

[7] 2025 RPS Plan at 41.

[8] *See Commonwealth of Virginia,* ex rel. *State Corporation Commission, Ex Parte: Establishing 2020 RPS Proceeding for Appalachian Power Company*, Case No. PUR-2020-00135, 2021 S.C.C. Ann. Rept. 254, 255-56, Final Order (Apr. 30, 2021) ("2020 RPS Order").

[9] Company's Response to Staff Interrogatory No. 1-41. *See* Attachment ATB-1.

[10] Company's Response to Staff Interrogatory No. 1-33. *See* Attachment ATB-1.

[11] *Id.*

Q. DOES STAFF HAVE ANY GENERAL COMMENTS REGARDING THE COMPANY'S MODELING?

A. Yes. My testimony will focus on six portfolios: (i) Portfolio A, the Company's Reference Portfolio or VCEA Portfolio Plan; (ii) Portfolio B, the low REC and least-cost option; (iii) Portfolio C, the no capacity benefit plan; (iv) Portfolio D, the no new natural gas resources plan; (v) Portfolio 1S, the high load forecast; and (vi) Portfolio 2S, the high load forecast and no new gas plan.[12]

Q. PLEASE BRIEFLY DESCRIBE PORTFOLIO A.

A. Portfolio A reflects the model's selection of the most economic resource additions using reference forecast assumptions and recognizing capacity revenue benefit in the PJM market. This portfolio also included two REC alternatives including the Company's Base REC price along with a High REC price.[13]

Q. PLEASE BRIEFLY DESCRIBE WHAT RESOURCE ADDITIONS ARE INCLUDED IN THE COMPANY'S PORTFOLIO A.

A. In Portfolio A, REC resources were selected in years 2026 through 2028 to meet the RPS Requirement until supply-side resources became available in 2029.[14] In 2029, onshore wind and solar resources were selected, with solar resource selections increasing throughout the planning horizon.[15] In the early 2030s, owned co-located solar with energy

[12] 2025 RPS Plan at Table 17.

[13] *Id.* at 42.

[14] *Id.*

[15] *Id.*

storage, natural gas combined cycle generators ("CCs") and combustion turbine generators ("CTs") are selected. Capacity additions of new CCs increased over the planning horizon to support the energy needs. In 2037, 300 megawatts ("MW") of nuclear small modular reactors ("SMRs") was selected.[16] The resource additions for Portfolio A are displayed in Attachment ATB-2 of my testimony.[17] The resource additions are also displayed in the Company's RPS Plan at page 43, Table 18.

Q. HOW DOES PORTFOLIO A PROVIDE FOR THE COMPANY'S REC NEEDS?

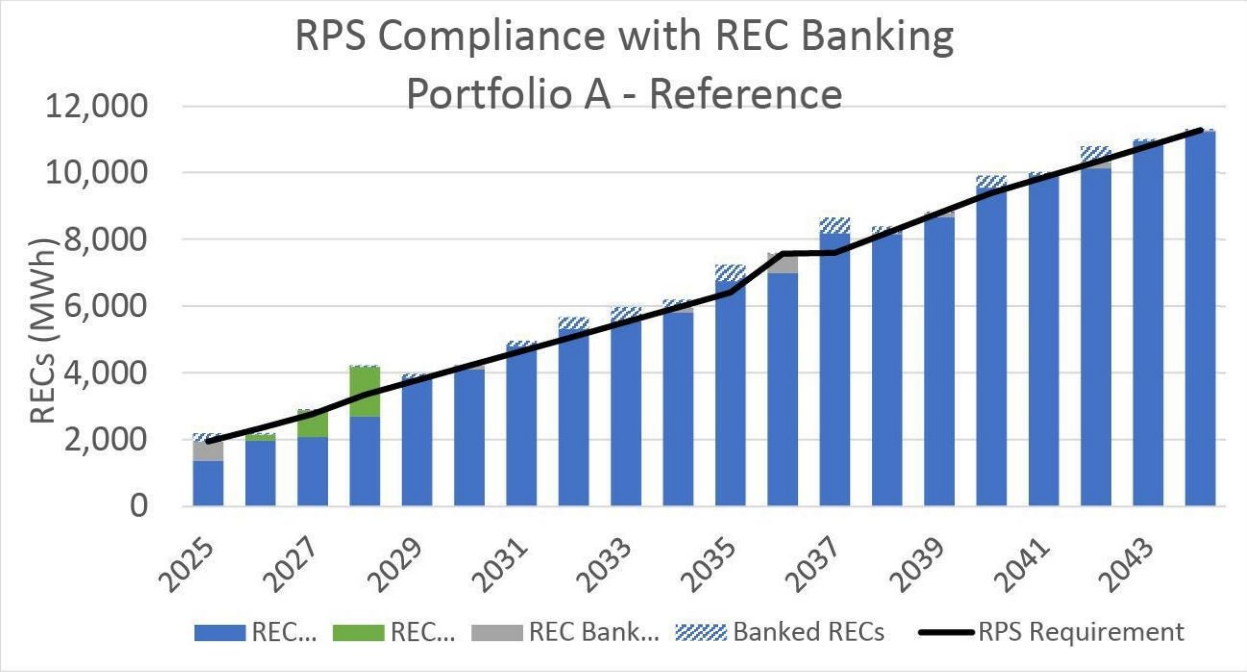
A. In Portfolio A, the Company began 2025 with a surplus number of RECs relative to the minimum RPS requirement. The modeling applied these surplus RECs through 2025 and then purchased RECs in years 2026 through 2028. The model optimally selected new renewable generation additions beginning in 2029, with solar and onshore wind resources being the predominant resource to support compliance with the RPS energy requirements. The actual future mix of RECs and supply-side resources will be dependent on the results of future RFPs for both RECs and supply-side resources, along with market prices and availability of RECs.[18] The Company's REC position for Portfolio A is displayed below.

[16] *Id.*

[17] The resource additions for Portfolio A, B, C, D, 1S, and 2S are displayed in Attachment ATB-2.

[18] 2025 RPS Plan at 51.

Figure 1: Portfolio A - Reference Plan REC Position[19]

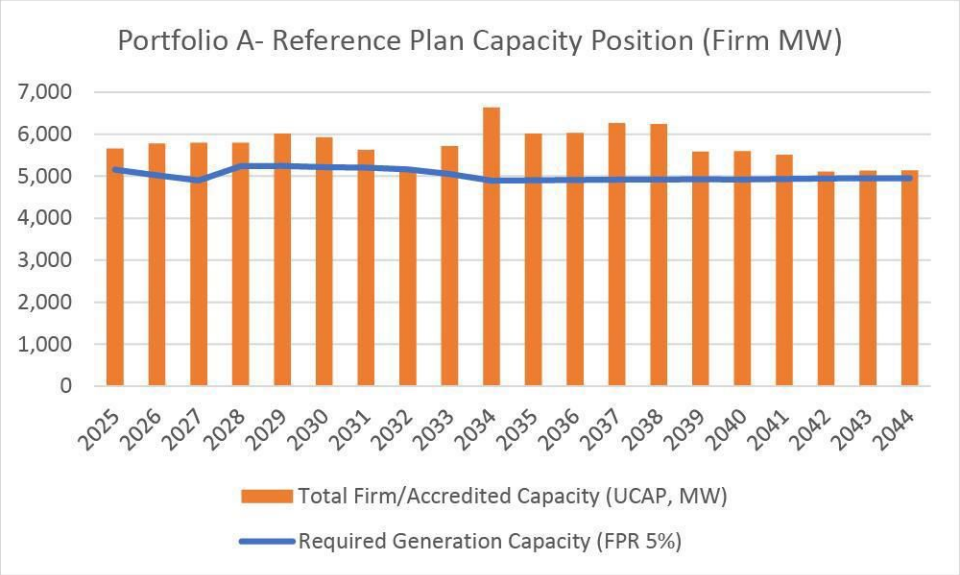


Q. HOW DOES PORTFOLIO A ADDRESS THE COMPANY'S CAPACITY NEEDS?

A. The chart below shows the Company's capacity position assuming construction, acquisition, and contracting for the resources contained in the Company's Portfolio A.

[19] Figure 1 was provided as part of the Company's Response to Staff Interrogatory No. 1-19. *See* Attachment ATB-1. Due to its voluminous nature and formatting, the entirety of Staff Interrogatory No. 1-19, Attachment 1 is not attached to this testimony. Staff has maintained electronic copies of this full attachment and will provide it upon request.

Figure 2: Portfolio A - Reference Plan Capacity Position (Firm MW)[20]



Including the resource additions and relevant retirements under Portfolio A, the Company expects to have capacity in excess of its PJM obligation through 2044. In 2025, the Company expects 504 MW of surplus capacity. In 2030, the Company anticipates 711 MW of surplus capacity. In 2034, the Company anticipates 1,744 MW of surplus capacity. In 2040, the Company anticipates 674 MW of excess capacity.[21]

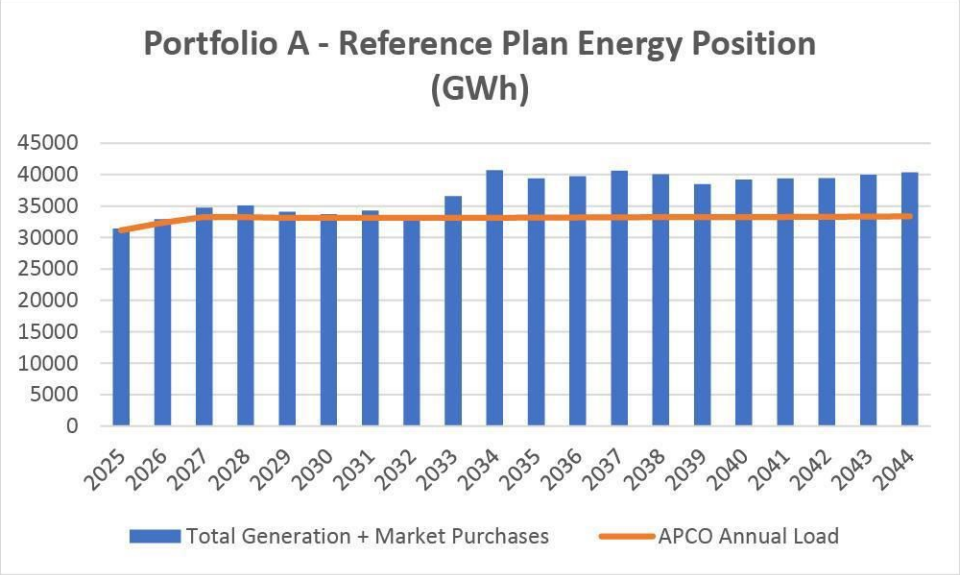
Q. HOW DOES PORTFOLIO A PROVIDE FOR THE COMPANY'S ENERGY NEEDS?

[20] Staff notes the "Total Firm/Accredited Capacity (UCAP, MW)" is the total firm capacity including existing generation and including new resources proposed in Portfolio A.

[21] Data underlying Figures 2, 5, 8, 11, 14, and 17 were provided in the Company's Response to Staff Interrogatory No. 1-23, Attachment 8. *See* Attachment ATB-1. Due to its voluminous nature and formatting, the entirety of Staff Interrogatory No. 1-23, Attachment 8 is not attached to this testimony. Staff has maintained electronic copies of this full attachment and will provide it upon request.

A. The Company's response to Staff Interrogatory No. 1-23, Attachment 7, provides information regarding the Company's energy position based on the resources added in Portfolio A. For convenience, Figure 3, below, shows the results graphically.

Figure 3: Portfolio A - Reference Plan Energy Position (GWh)[22]



As can be seen in Figure 3 above, including the resource additions and relevant retirements under Portfolio A, the Company expects to have energy in excess of APCo's Annual Load through 2044. In 2025, the Company expects 300 GWh of surplus energy. In 2034, the Company anticipates 7,545 GWh of surplus energy. In 2044, the Company anticipates 6,995 GWh of excess energy.

Q. WHAT IS THE NET PRESENT VALUE ("NPV") OF PORTFOLIO A?

[22] Data underlying Figures 3, 6, 9, 12, 15, and 18 were provided in the Company's Response to Staff Interrogatory No. 1-23, Attachment 7. *See* Attachment ATB-1. Due to its voluminous nature and formatting, the entirety of Staff Interrogatory No. 1-23, Attachment 7 is not attached to this testimony. Staff has maintained electronic copies of this full attachment and will provide it upon request. "GWh" refers to gigawatt-hours.

A. The Company represents that the NPV cost of Portfolio A is approximately $22.268 billion.[23]

Q. PLEASE BRIEFLY DESCRIBE THE PORTFOLIO THAT THE COMPANY REPRESENTS AS ITS "LEAST-COST" PLAN, PORTFOLIO B.

A. As previously mentioned, the Company states that Portfolio B represents its least-cost portfolio.[24] Portfolio B, or the Low REC Options Portfolio, included the same assumptions as Portfolio A, but the High REC assumption was replaced with a Low REC assumption.[25]

Q. PLEASE BRIEFLY DESCRIBE WHAT RESOURCE ADDITIONS ARE INCLUDED IN THE COMPANY'S LEAST-COST PLAN, PORTFOLIO B.

A. Resources selected in Portfolio B are illustrated in Figure 21 and listed in Table 19, both found in the 2025 RPS Plan.[26] The resource selections through 2044 in Portfolio B are identical to that of Portfolio A, with the exception that Portfolio B selected a fewer amount of Volt VAR Optimization ("VVO") resources.[27]

Q. HOW DOES THE LEAST-COST PLAN PROVIDE FOR THE COMPANY'S REC NEEDS?

A. The Company's response to Staff Interrogatory No. 1-49, Attachment 1 provided the relevant data that identifies how the Company would meet its REC requirement under

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[23] 2025 RPS Plan at 52.

[24] Company's Response to Staff Interrogatory No. 1-41. *See* Attachment ATB-1.

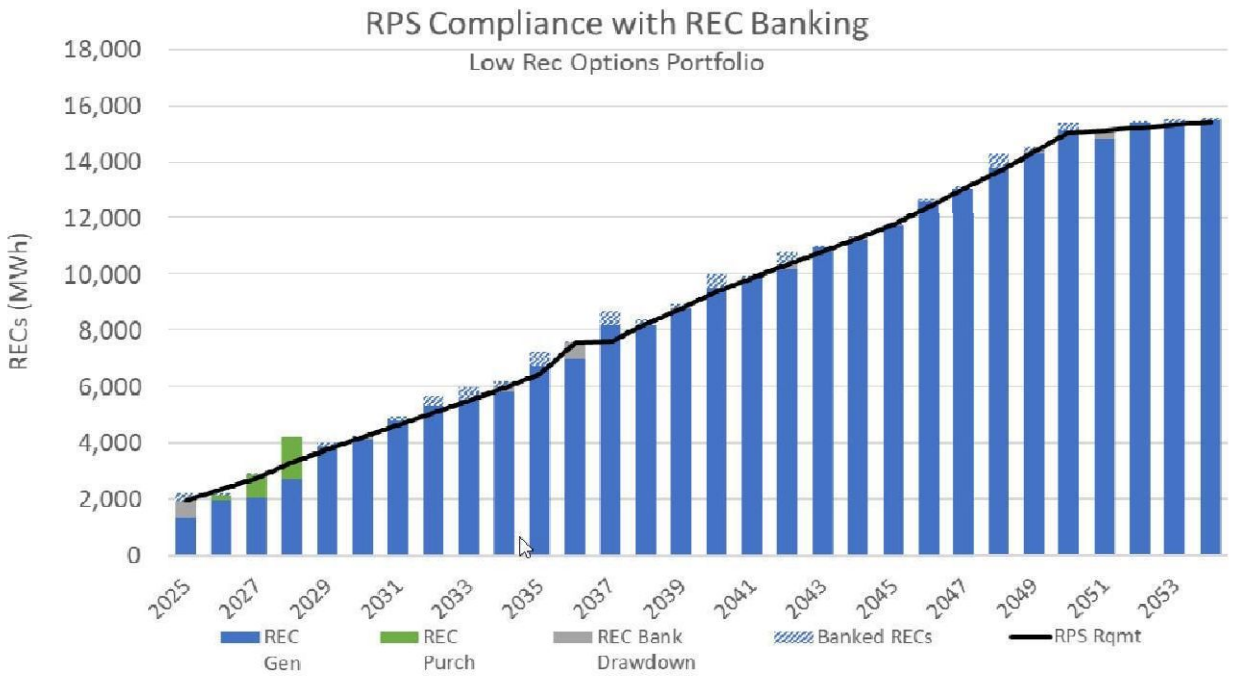
[25] 2025 RPS Plan at 43.

[26] *Id.* at 44.

[27] 2025 RPS Plan at 43.

Portfolio B.[28] In Portfolio B, the Company began 2025 with a surplus number of RECs relative to the minimum RPS requirement. The modeling applied these surplus RECs through 2025 and then purchased RECs in years 2026 through 2028.

Figure 4: Portfolio B - Low REC Option REC Position[29]



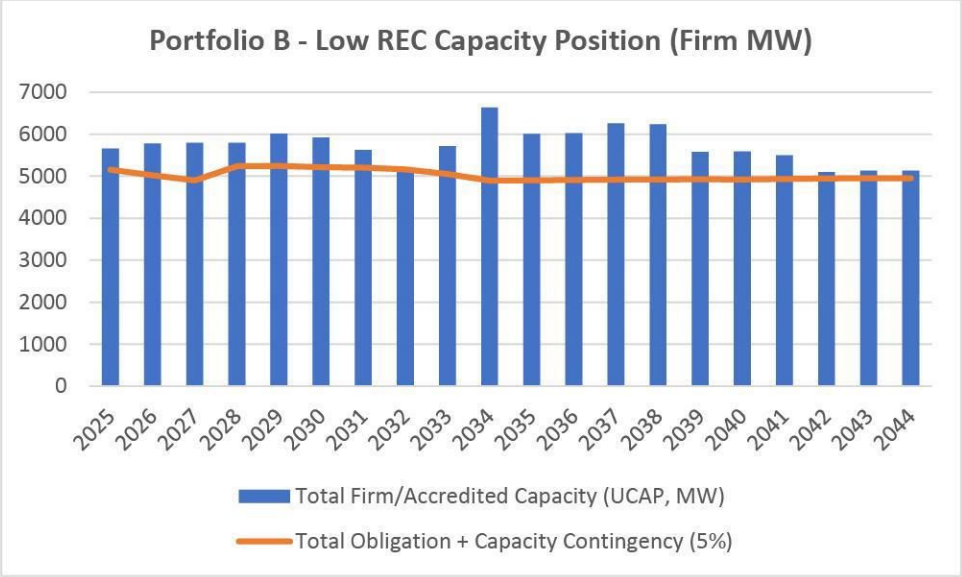
Q. HOW DOES PORTFOLIO B ADDRESS THE COMPANY'S CAPACITY NEEDS?

A. The chart below shows the Company's capacity position assuming construction, acquisition, and contracting for the resources contained in the Company's Portfolio B.

[28] Company's Response to Staff Interrogatory No. 1-49. *See* Attachment ATB-1

[29] Data underlying Figures 4, 7, 10, 13, and 16 were provided in the Company's Amended Response to Staff Interrogatory No. 1-23, Attachments 1-6. *See* Attachment ATB-1. Due to its voluminous nature and formatting, the entirety of Staff Interrogatory No. 1-23, Attachments 1-6 are not attached to this testimony. Staff has maintained electronic copies of these attachments and will provide it upon request. "GWh" refers to gigawatt-hours.

Figure 5: Portfolio B - Low REC Capacity Position (Firm MW)[30]



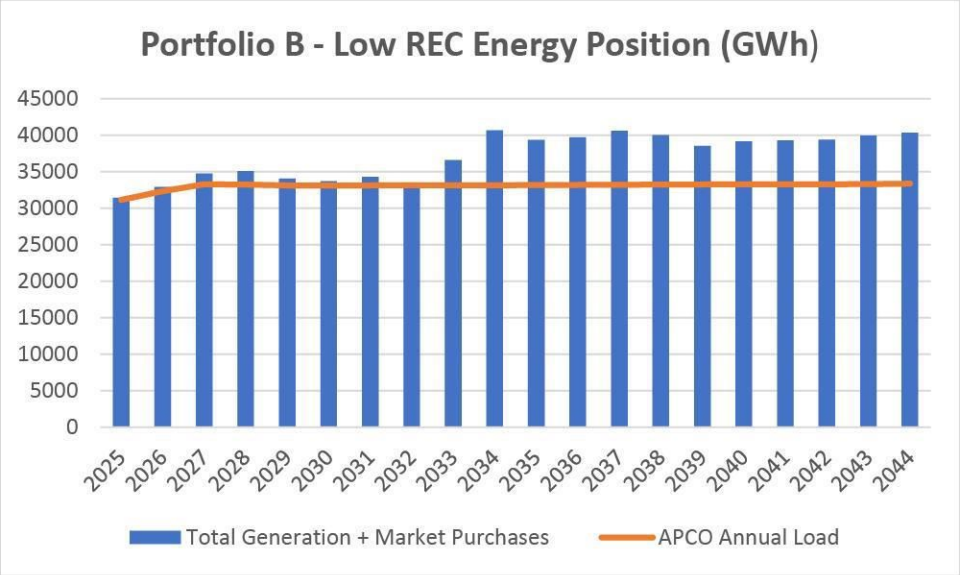
Including the resource additions and relevant retirements under Portfolio B, the Company expects to have capacity in excess of its PJM obligation in 2025 through 2044. In 2025, the Company expects 504 MW of surplus capacity. In 2030, the Company anticipates 708 MW of surplus capacity. In 2034, the Company anticipates 1,741 MW of surplus capacity. In 2040, the Company anticipates 666 MW of excess capacity.

Q. HOW DOES PORTFOLIO B ADDRESS THE COMPANY'S ENERGY NEEDS?

A. The Company's response to Staff Interrogatory No. 1-23, Attachment 7, provides information regarding the Company's energy position with the resources added in Portfolio B. For convenience, Figure 6 below, shows the results graphically.

[30] Staff notes the "Total Firm/Accredited Capacity (UCAP, MW)" is the total firm capacity including existing generation and including new resources proposed in Portfolio B.

Figure 6: Portfolio B - Low REC Energy Position (GWh)



As can be seen in Figure 6, above, when including the resource additions and relevant retirements under Portfolio B, the Company expects to have energy in excess of APCo's Annual Load through 2044. In 2025, the Company expects 300 GWh of surplus energy. In 2034, the Company anticipates 7,536 GWh of surplus energy. In 2044, the Company anticipates 6,978 GWh of excess energy.

Q. WHAT IS THE NPV OF PORTFOLIO B?

A. The Company states that the NPV cost of Portfolio B is approximately $22.240 billion.[31]

Q. PLEASE BRIEFLY DESCRIBE PORTFOLIO C.

A. Portfolio C was modeled with the same assumptions and resource options as Portfolio A, but the capacity revenue benefit was excluded for new resources.[32]

[31] 2025 RPS Plan at 52.

[32] *Id*. at 44.

Q. PLEASE BRIEFLY DESCRIBE WHAT RESOURCE ADDITIONS ARE INCLUDED IN THE COMPANY'S PORTFOLIO C.

A. Resources selected in Portfolio C are illustrated in Figure 22 and listed in Table 20, both found in the 2025 RPS Plan.[33]

REC resources were selected in years 2026 through 2028 to meet the RPS Requirement until supply-side resources became available in 2029. In 2029, onshore wind and solar resources were selected, with the solar resource selections increasing throughout the planning horizon. In the early 2030s, co-located solar with energy storage, CCs, and CTs, are selected. Capacity additions of new CCs increased over the planning horizon to support the energy needs. In 2037, 300 MW of SMR was selected. At the end of the planning horizon, solar resources were selected.[34]

When resource capacity benefits were not monetized for the benefit of customers, Portfolio C resulted in shifting the timing of onshore wind, solar, and CC resource selections to later in the planning horizon. Although similar amounts of onshore wind, solar, and CC resources were selected by 2044 compared to Portfolio A, additional EE, VVO, and short-term capacity resources[35] were selected between 2030 and 2034 compared to Portfolio A, in order to meet the PJM capacity obligation.[36]

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[33] *Id.*

[34] *Id.*

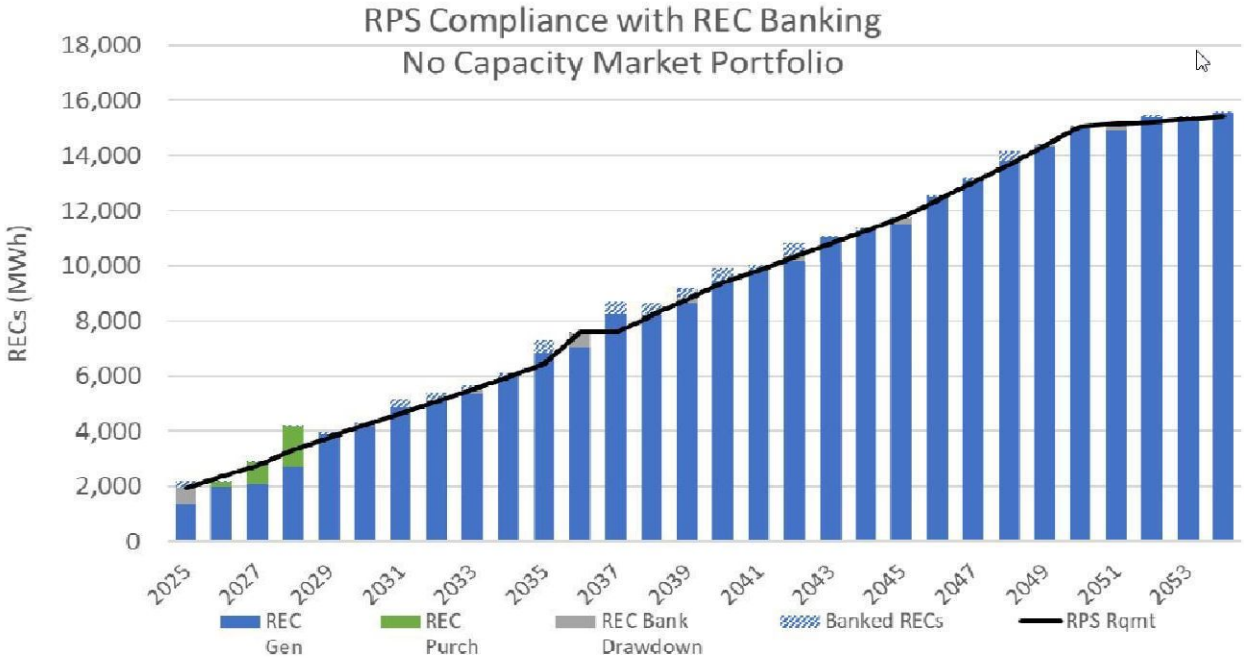
[35] According to the Company, "short-term capacity resources" means "[t]his resource is assumed to have no energy associated with it and a contract term of one year. The purpose of adding this resource was to allow the model an option to include a short-term capacity resource as a bridge to mitigate short-term capacity shortfalls." *See* 2025 RPS Plan at 35.

[36] *Id.*

Q. HOW DOES PORTFOLIO C PROVIDE FOR THE COMPANY'S REC NEEDS?

A. The Company's response to Staff Interrogatory No. 1-49, Attachment 1 provided the relevant data that identifies how the Company would meet its REC requirement under Portfolio C.[37] The Company's REC position with the resource additions included in Portfolio C is displayed below.

Figure 7: Portfolio C - No Capacity Benefit REC Position

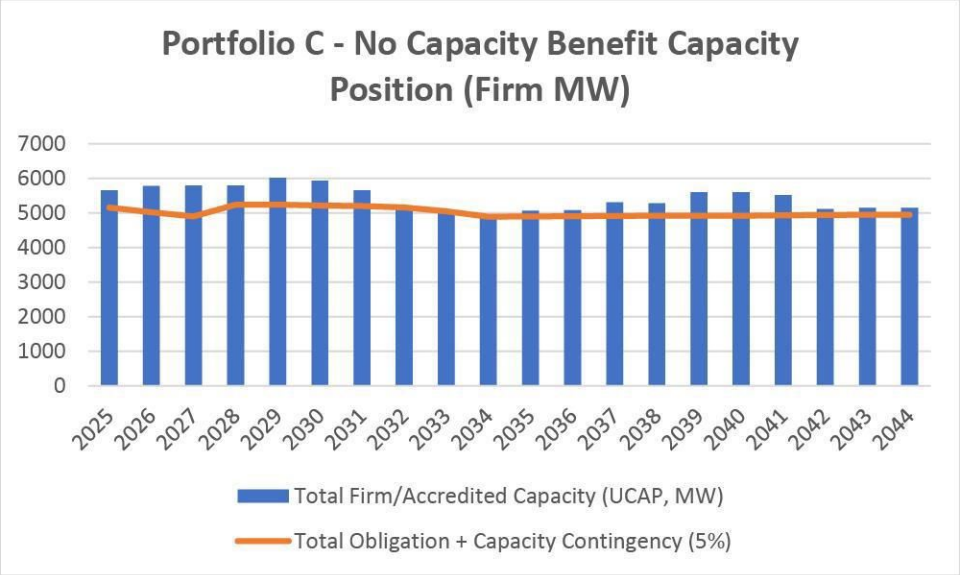


Q. HOW DOES PORTFOLIO C ADDRESS THE COMPANY'S CAPACITY NEEDS?

A. The chart below shows the Company's capacity position, assuming construction, acquisition, and contracting for the resources contained in the Company's Portfolio C.

[37] Company's Response to Staff Interrogatory No. 1-49. *See* Attachment ATB-1. Staff notes the electronic workpapers provided in Response 1-49 were provided as part of the Company's Amended Response No. 1-23.

Figure 8: Portfolio C - No Capacity Benefit Capacity Position (Firm MW)[38]



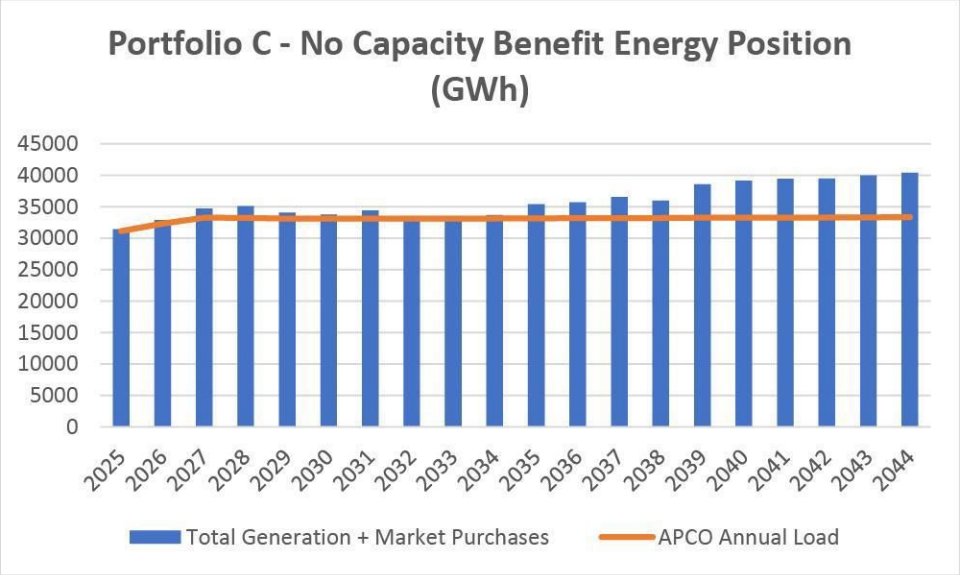
When including the resource additions and relevant retirements under Portfolio C, the Company expects to have capacity in excess of its PJM obligation in 2025 through 2044. In 2025, the Company expects 504 MW of surplus capacity. In 2030, the Company anticipates 722 MW of surplus capacity. In 2034, the Company anticipates 15 MW of surplus capacity. In 2040, the Company anticipates 685 MW of excess capacity

Q. HOW DOES PORTFOLIO C ADDRESS THE COMPANY'S ENERGY NEEDS?

A. The Company's response to Staff Interrogatory No. 1-23, Attachment 7, provides information regarding the Company's energy position with the resources added in Portfolio C. For convenience, Figure 9, below, shows the results graphically.

[38] Staff notes the "Total Firm/Accredited Capacity (UCAP, MW)" is the total firm capacity including existing generation and including new resources proposed in Portfolio C.

Figure 9: Portfolio C - No Capacity Benefit Energy Position (GWh)



As can be seen in Figure 9, above, when including the resource additions and relevant retirements under Portfolio C, the Company expects to have energy in excess of APCo's Annual Load through 2044. In 2025, the Company expects 300 GWh of surplus energy. In 2034, the Company anticipates 544 GWh of surplus energy. In 2044, the Company anticipates 7,065 GWh of excess energy.

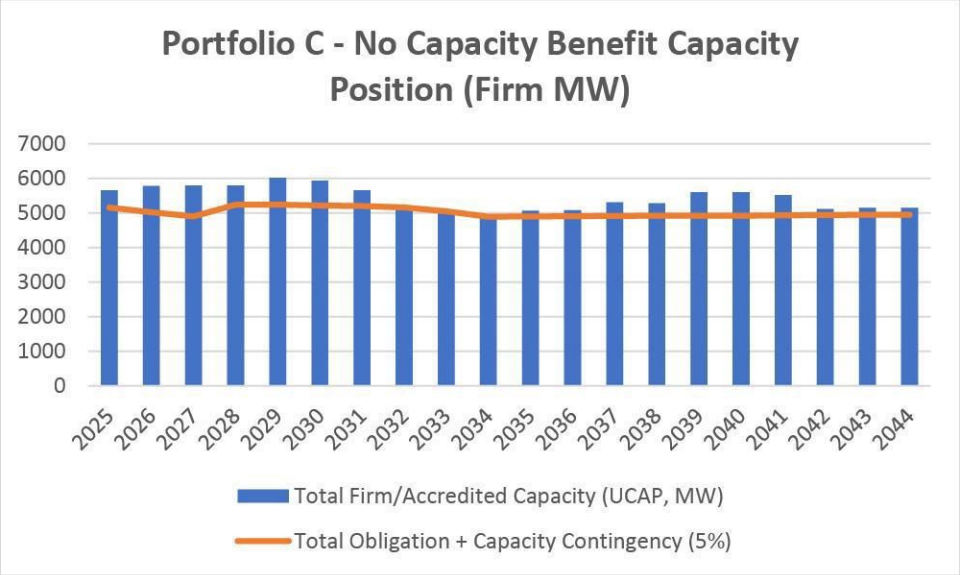
Q. WHAT IS THE NPV OF PORTFOLIO C?

A. The Company states that the NPV cost of Portfolio C is approximately $22.723 billion.[39]

Q. PLEASE BRIEFLY DESCRIBE PORTFOLIO D.

[39] 2025 RPS Plan at 52.

Figure 8: Portfolio C - No Capacity Benefit Capacity Position (Firm MW)[38]



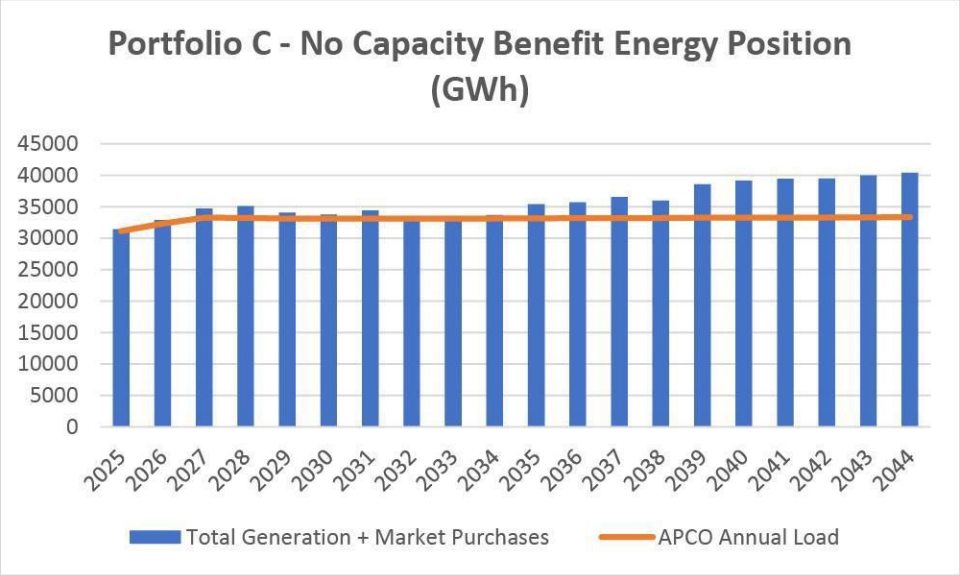
When including the resource additions and relevant retirements under Portfolio C, the Company expects to have capacity in excess of its PJM obligation in 2025 through 2044. In 2025, the Company expects 504 MW of surplus capacity. In 2030, the Company anticipates 722 MW of surplus capacity. In 2034, the Company anticipates 15 MW of surplus capacity. In 2040, the Company anticipates 685 MW of excess capacity

Q. HOW DOES PORTFOLIO C ADDRESS THE COMPANY'S ENERGY NEEDS?

A. The Company's response to Staff Interrogatory No. 1-23, Attachment 7, provides information regarding the Company's energy position with the resources added in Portfolio C. For convenience, Figure 9, below, shows the results graphically.

[38] Staff notes the "Total Firm/Accredited Capacity (UCAP, MW)" is the total firm capacity including existing generation and including new resources proposed in Portfolio C.

Figure 9: Portfolio C - No Capacity Benefit Energy Position (GWh)



As can be seen in Figure 9, above, when including the resource additions and relevant retirements under Portfolio C, the Company expects to have energy in excess of APCo's Annual Load through 2044. In 2025, the Company expects 300 GWh of surplus energy. In 2034, the Company anticipates 544 GWh of surplus energy. In 2044, the Company anticipates 7,065 GWh of excess energy.

Q. WHAT IS THE NPV OF PORTFOLIO C?

A. The Company states that the NPV cost of Portfolio C is approximately $22.723 billion.[39]

Q. PLEASE BRIEFLY DESCRIBE PORTFOLIO D.

[39] 2025 RPS Plan at 52.

A. Of the two sensitivity portfolios modeled, Portfolio 1S, or the High Load Forecast (200 MW+) Portfolio, included all the same resources and assumptions as Portfolio A, but considered a higher load forecast, as directed by the Commission.[45] Specifically, the load forecast included the addition of 200 MW of capacity each year from large load customers for the period 2027 through 2031.[46]

Q. PLEASE BRIEFLY DESCRIBE WHAT RESOURCE ADDITIONS ARE INCLUDED IN THE COMPANY'S PORTFOLIO 1S.

A. Resource additions through 2044 for this portfolio are shown in Figure 24 and listed in Table 22 of the 2025 RPS Plan.

REC resources were selected in years 2026 through 2028 to meet the RPS Requirement until supply-side resources became available in 2029. In 2029, onshore wind, solar, and co-located solar with energy storage resources were selected, with solar and co-located solar with energy storage resource selections increasing throughout the planning horizon. In the early 2030s, CCs and CTs were selected. Capacity additions of CCs increased over the planning horizon to support the energy needs. Between 2036 and 2037, 900 MW of SMR were selected, with an additional 300 MW selected in 2044.[47]

Compared to Portfolio A, this sensitivity portfolio selected more short-term capacity in 2032, and significantly more solar over the planning horizon. Additionally, owned onshore wind resources were selected to meet the increased capacity and energy

[45] *Id.* at 47.

[46] *Id.* at 21.

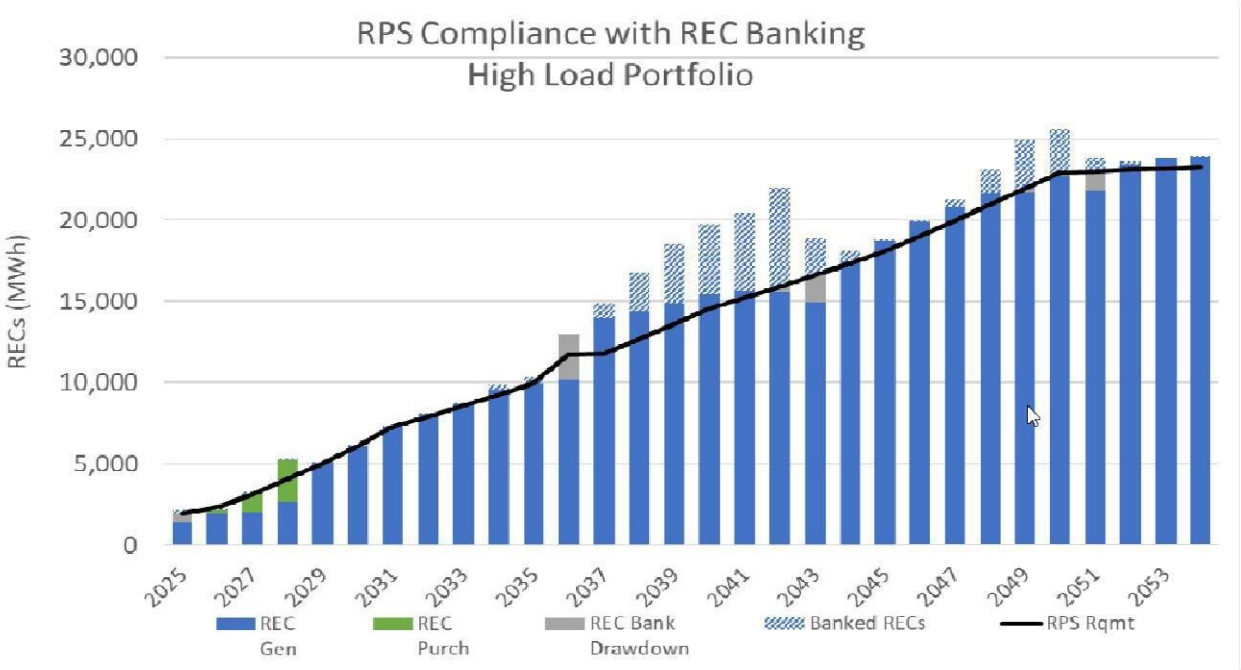
[47] *Id.*

requirements modeled in this sensitivity portfolio. More CTs and SMRs were selected to meet the increased capacity and energy requirements.[48]

Q. HOW DOES PORTFOLIO 1S ADDRESS THE COMPANY'S REC NEEDS?

A. The Company's response to Staff Interrogatory No. 1-49, Attachment 1 provided the relevant data that identifies how the Company would meet its REC requirement under Portfolio 1S. The Company's REC position with the resource additions included in Portfolio 1S, is displayed below.

Figure 13: Portfolio 1S REC Position



As can be seen in Figure 13, above, there appears to be some volatility associated with the REC position resulting from Portfolio 1S. Specifically, the Company is in an excess REC position beginning in 2037 through 2039 and uses RECs banked in prior periods to meet its needs in 2042 and 2043. In the out-years, it appears that the production

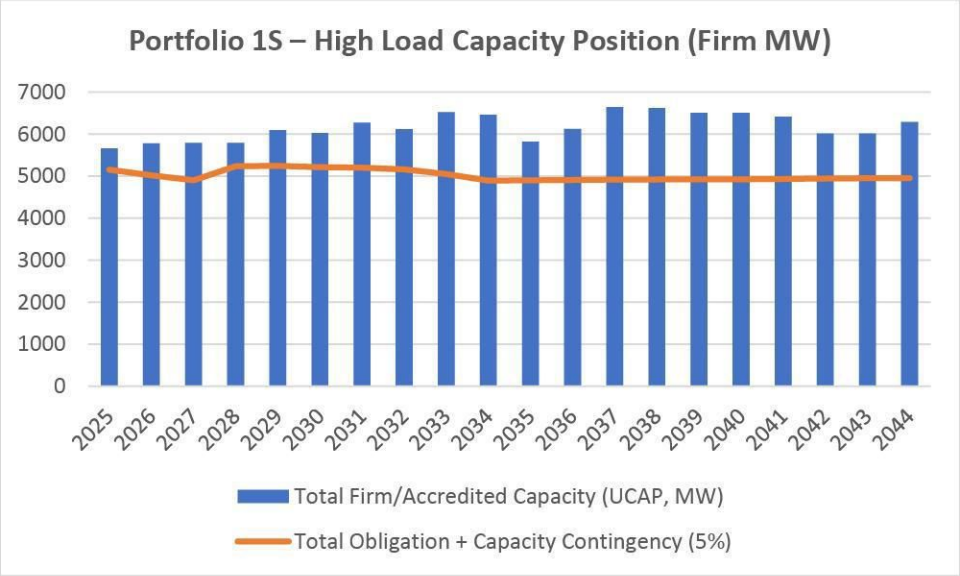
[48] *Id.*

and need converge, leaving the Company in a position where REC production and REC need are roughly equivalent.

Q. HOW DOES PORTFOLIO 1S ADDRESS THE COMPANY'S CAPACITY NEEDS?

A. The chart below shows the Company's capacity position assuming construction, acquisition, and contracting for the resources contained in the Company's Portfolio 1S.

Figure 14: Portfolio 1S – High Load Capacity Position (Firm MW)[49]



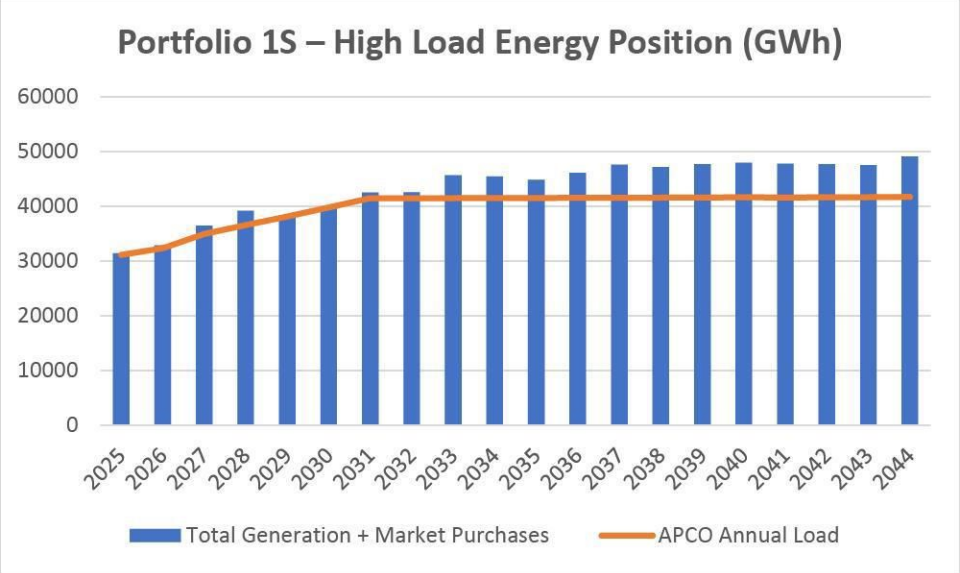
Including the resource additions and relevant retirements under Portfolio 1S, the Company expects to have capacity in excess of its PJM obligation in 2025 through 2044. In 2025, the Company expects 504 MW of surplus capacity. In 2030, the Company anticipates 44 MW of surplus capacity. In 2034, the Company anticipates 662 MW of surplus capacity. In 2040, the Company anticipates 679 MW of excess capacity

[49] Staff notes the "Total Firm/Accredited Capacity (UCAP, MW)" is the total firm capacity including existing generation and including new resources proposed in Portfolio 1S.

Q. HOW DOES PORTFOLIO 1S PROVIDE FOR THE COMPANY'S ENERGY NEEDS?

A. The Company's response to Staff Interrogatory No. 1-23, Attachment 7, provides information regarding the Company's energy position with the resources added in Portfolio 1S. For convenience, Figure 15, below, shows the results graphically.

Figure 15: Portfolio 1S – High Load Energy Position (GWh)



As can be seen in Figure 15, above, including the resource additions and relevant retirements under Portfolio 1S, the Company expects to have energy in excess of APCo's Annual Load through 2044. In 2025, the Company expects 300 GWh of surplus energy. In 2034, the Company anticipates 3,971 GWh of surplus energy. In 2044, the Company anticipates 7,411 GWh of excess energy.

Q. WHAT IS THE NPV OF PORTFOLIO 1S?

A. The NPV of Portfolio 1S is $29.550 billion.[50]

[50] 2025 RPS Plan at 52.

Q. PLEASE BRIEFLY DESCRIBE PORTFOLIO 2S.

A. Portfolio 2S, or the High Load + No New Gas Portfolio, included the same assumptions as Portfolio D but with the higher load forecast included in Portfolio 1S.[51]

Q. PLEASE BRIEFLY DESCRIBE WHAT RESOURCE ADDITIONS ARE INCLUDED IN THE COMPANY'S PORTFOLIO 2S.

A. Resources selected through 2044 for this portfolio are shown in Figure 25 and listed in Table 23 of the 2025 RPS Plan.

REC resources were selected in years 2026 through 2028 to meet the RPS Requirement until supply-side resources became available in 2029. Increased demand-side resources, including DR, EE, and VVO, were selected beginning in 2027 and increased until 2033. In 2029, onshore wind, solar, and co-located solar with energy storage resources were selected with solar and owned co-located solar with energy storage resource selections increasing throughout the planning horizon. Between 2031 and 2035, owned storage and short-term Capacity resources were selected. Between 2036 and 2042, 2,700 MW of SMR was selected.[52]

Portfolio 2S, similar to Portfolio 1S, selected onshore wind, as no new gas resources were available for selection. Portfolio 2S selected more short-term capacity purchases, SMR, storage, and solar and onshore wind resources compared to Portfolio D.[53]

Q. HOW DOES PORTFOLIO 2S PROVIDE FOR THE COMPANY'S REC NEEDS?

---

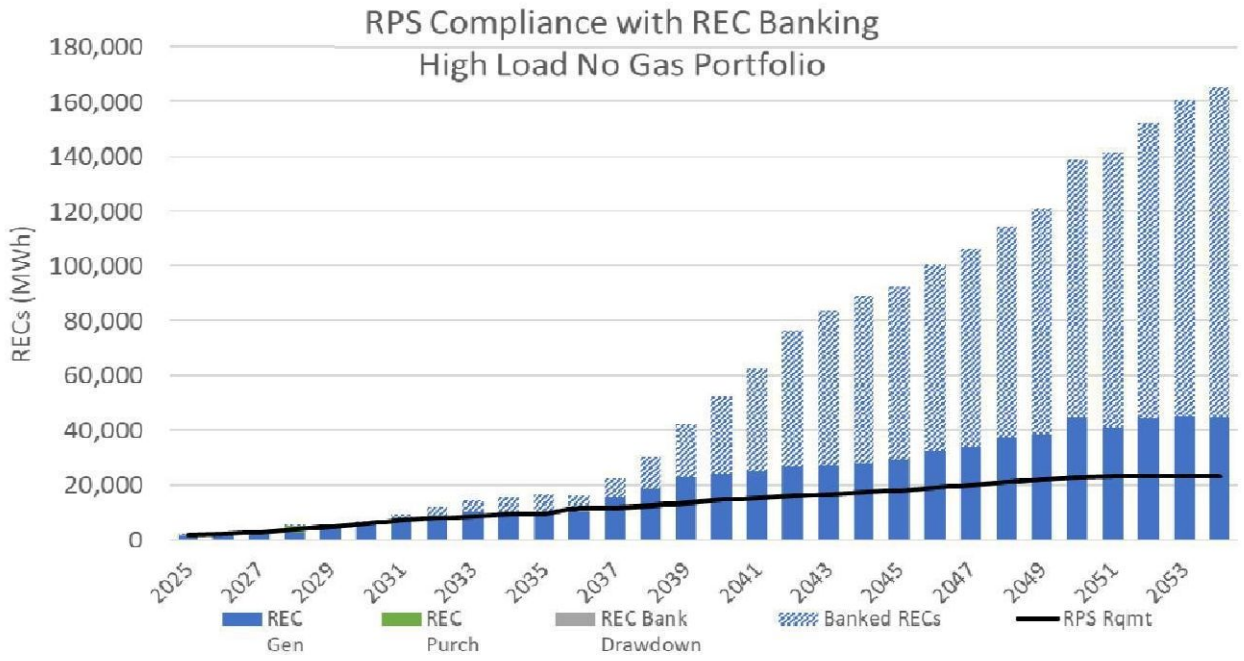
[51] *Id.* at 48.

[52] *Id.*

[53] *Id.* at 49.

A. The Company's response to Staff Interrogatory No. 1-49, Attachment 1 provided the relevant data that identifies how the Company would meet its REC requirement under Portfolio 2S. The Company's REC position with the resource additions included in Portfolio 2S is displayed below.

Figure 16: Portfolio 2S REC Position

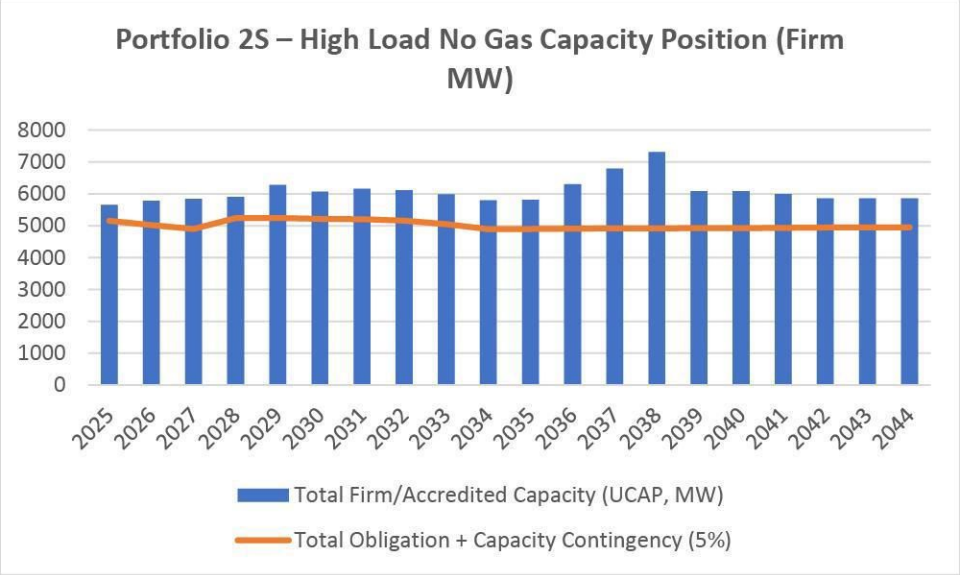


As can be seen in Figure 16, above, and similar to Portfolio D, the significant additions of renewable generation facilities result in large excesses of RECs created relative to the Company's REC need. If a scenario similar to Portfolio 2S were to materialize in the future, Staff recommends the Company explore options to monetize its significant quantity of excess RECs to the benefit of APCo's customers.

Q. HOW DOES PORTFOLIO 2S ADDRESS THE COMPANY'S CAPACITY NEEDS?

A. The chart below shows the Company's capacity position assuming construction, acquisition, and contracting for the resources contained in the Company's Portfolio 2S.

Figure 17: Portfolio 2S – High Load No Gas Capacity Position (Firm MW)[54]



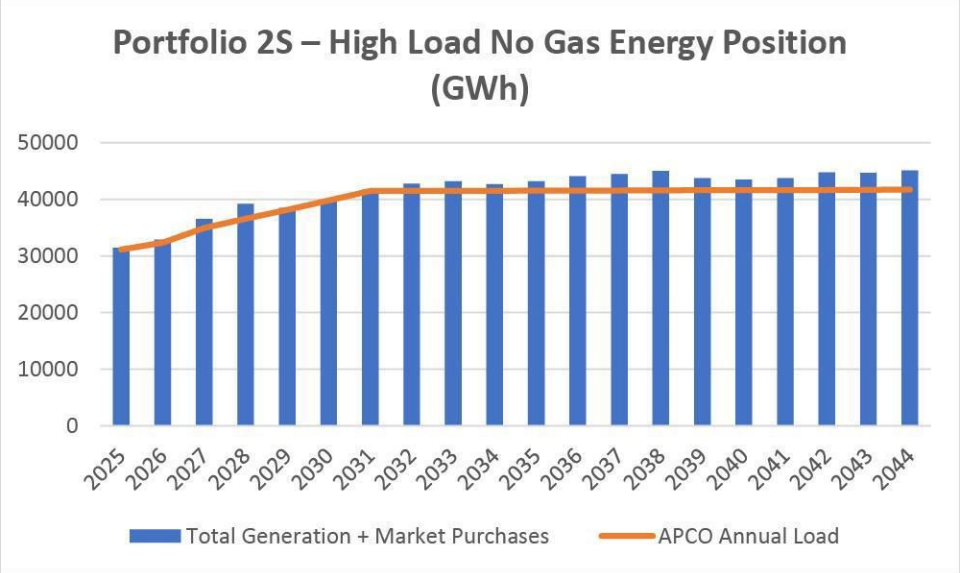
Including the resource additions and relevant retirements under Portfolio 1S, the Company expects to have capacity in excess of its PJM obligation in 2025 through 2044. In 2025, the Company expects 504 MW of surplus capacity. In 2030, the Company anticipates 83 MW of surplus capacity. In 2034, the Company anticipates 2 MW of surplus capacity. In 2040, the Company anticipates 254 MW of excess capacity

Q. HOW DOES PORTFOLIO 2S PROVIDE FOR THE COMPANY'S ENERGY NEEDS?

[54] Staff notes the "Total Firm/Accredited Capacity (UCAP, MW)" is the total firm capacity including existing generation and including new resources proposed in Portfolio 2S.

A. The Company's response to Staff Interrogatory No. 1-23, Attachment 7, provides information regarding the Company's energy position with the resources added in Portfolio 2S. For convenience, Figure 18, below, shows the results graphically.

Figure 18: Portfolio 2S – High Load No Gas Energy Position (GWh)



As can be seen in Figure 18, above, including the resource additions and relevant retirements under Portfolio 2S, the Company expects to have energy in excess of APCo's Annual Load through 2044. In 2025, the Company expects 343 GWh of surplus energy. In 2034, the Company anticipates 1,184 GWh of surplus energy. In 2044, the Company anticipates 3,402 GWh of excess energy.

Q. WHAT IS THE NPV OF PORTFOLIO 2S?

A. The NPV of Portfolio 2S is $36.858 billion.[55]

[55] 2025 RPS Plan at 52.

Q. PLEASE BRIEFLY SUMMARIZE THE NPVS OF ALL PORTFOLIOS.

A. In summary, the Reference Portfolio (Portfolio A) and the Low REC Options Portfolio (Portfolio B) are the least-cost portfolios. The No New Gas Options Portfolio (Portfolio D) differs from the Reference Portfolio in its resource selection over the planning horizon, selecting only renewable generating resources and SMRs, but it has a competitive near term NPV. However, the NPV increases over the planning horizon, resulting in higher costs to APCo's customers compared to the Reference Portfolio.[56] Portfolio D also results in a significant overproduction of RECs relative to the Company's REC needs. One option to reduce the NPV costs of this portfolio could be to monetize these excess RECs through various REC markets or bilateral transactions, to the benefit of APCo's customers.

The No Capacity Benefit Portfolio (Portfolio C) includes similar resources as the Reference Portfolio, but higher costs are realized when the value of excess capacity from new resources is not monetized as a revenue stream. Thus, the No Capacity Benefit Portfolio results in the second highest NPV and higher costs to customers compared to the Reference Portfolio. The High Load Forecast (200 MW+) (Portfolio 1S) and High Load + No New Gas (Portfolio 2S) Sensitivity Portfolios have higher NPVs compared to the Reference Portfolio due to the selection of additional resources to serve the higher load assumed.[57]

[56] *Id.*

[57] *Id.* at 53.

Table 1: NPVs of Portfolios A through D, 1S, and 2S ($M)

Portfolio	NPV [58]
A	$22,268
B	$22,240
C	$22,723
D	$27,021
1S	$29,550
2S	$36,858

Staff notes that the Company uses higher Levelized Cost of Energy ("LCOE") values compared to previous RPS proceedings, for assumed costs for the resources made available to PLEXOS, as discussed by Staff witness Davis Little. Staff expects that these higher LCOE values may affect the resource mix by making some resources less appealing to be selected in modeling, or, if the same resources are selected, to increase the NPV costs of the portfolios that these resources are selected in.[59]

Q. PLEASE BRIEFLY DESCRIBE THE COMPANY'S PROPOSED VCEA PLAN.

A. The Company identified the VCEA Portfolio Plan as Portfolio A, the Reference Portfolio. New resources in the VCEA Portfolio Plan are illustrated in Figure 20 and listed in Table 18 of the 2025 RPS Plan.

In the VCEA Portfolio Plan, the Company's reserve margin continues to grow consistent with the growth in the required RPS energy requirements through 2029, as illustrated in Figure 29.[60] Then in 2030, the Company's Amos Units 1 and 2 are selected

[58] Staff notes the values displayed in Table 7 are Portfolio NVPs for the years 2025 through 2054 exclusive of the Societal Cost of Carbon.

[59] Company's Response to Staff Interrogatory No. 2-91. *See* Attachment ATB-1.

[60] 2025 RPS Plan at 51.

to convert to co-fire operation, using natural gas as a secondary fuel. To mitigate some of the expected capacity needs starting in 2032 due to the Amos Unit 3 and Mountaineer Plant retirements, new gas, new SMR, and new renewable and storage resources, are selected.[61]

EE and VVO were also selected starting in 2027 and 2030, respectively. Market REC purchases were relied on consistently in all portfolios to meet compliance in years 2026-2028, including for the VCEA Portfolio Plan. Banked RECs in the years preceding 2026 mitigated the need for earlier REC purchases until adequate firm resources could be included in the portfolio to support the Company's RPS requirements.

Furthermore, APCo states that the VCEA Portfolio Plan includes selections of both owned and PPA resources, but these additions will be dependent on the responses to future competitive RFPs.[62] The Company represents that owned resources provide a balance to the portfolio such that customers will benefit from a long-term investment in the generation supply resource rather than being locked into a set price of energy for the length of the PPA contract at which time a likely replacement of the PPA resource would be needed. As such, the Company states that owned and PPA resource selections will be identified through a detailed and transparent RFP process and evaluation.[63] Staff witness Dalton offers additional context for the Company's position regarding Company-owned resources.

CONCLUSIONS AND RECOMMENDATIONS

[61] *Id.* at 54.

[62] *Id.*

[63] *Id.*

Q. PLEASE SUMMARIZE STAFF'S CONCLUSIONS AND RECOMMENDATIONS.

A. Staff provides the following conclusions and recommendations for the Commission's consideration:

1. The Company developed its Portfolios in a way that is materially the same as how Integrated Resource Plans are developed, using the same general methods, optimization software, inputs, and resource assumptions.

2. The Company's preferred plan, Portfolio A, has a Net Present Value ("NPV") of approximately $22.268 billion. Including the resource additions and relevant retirements under Portfolio A, the Company expects to have capacity and energy in excess of its obligations through 2044. In Portfolio A, the Company began 2025 with a surplus number of Renewable Energy Certificates ("RECs") relative to the minimum RPS requirement. The Company's modeling applied these surplus RECs through 2025 and then purchased RECs in years 2026 through 2028.

3. The Company's least-cost plan, Portfolio B, has a NPV of approximately $22.240 billion. Including the resource additions and relevant retirements under Portfolio B, the Company expects to have capacity and energy in excess of its obligations through 2044. In Portfolio B, the Company began 2025 with a surplus number of RECs relative to the minimum RPS requirement. The modeling applied these surplus RECs through 2025 and then purchased RECs in years 2026 through 2028

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

Attachment ATB-1

COMMONWEALTH OF VIRGINIA
STATE CORPORATION COMMISSION
APPLICATION OF
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SCC CASE NO. PUR-2025-00049
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Staff Set 1
To Appalachian Power Company

Interrogatory Staff 1-19:

Please refer to the RPS Plan at 51. Did the Company model the banking of renewable energy certificates ("RECs") in its RPS Plan, presented as Section 6.3.4, "REC Banking Analysis," using Plexos or other methods (e.g., Microsoft Excel)? Please provide a detailed narrative description of this modeling as well as any relevant supporting documentation, including Microsoft Excel files with underlying formulae intact, and the results of such modeling. If not, provide a narrative explanation why.

Response Staff 1-19:

The Company modeled REC banking using the Plexos model. It assumed that both new and existing RECs would count toward Renewable Portfolio Standard (RPS) compliance for the year they were generated (either in-service or purchased) plus an additional five years. The total RECs required for compliance were calculated net of existing resources, including previously banked RECs.

To reflect the rolling six-year compliance window, the Company implemented a series of annual custom constraints (Years 1 through 30) representing the cumulative REC requirements. Constraint logic ensured that newly selected REC resources—including market purchases—were added to meet the minimum requirement in their build year, with any surplus RECs eligible for carryover for up to five additional years.

Because REC banking was modeled, the Company assumed that any excess RECs would be used to meet future RPS obligations. As a result, no monetary value was assigned to surplus RECs.

See Staff 1-19 Attachment 1.

The foregoing response is made by Ismael Martinez, Resource Planning Lead, on behalf of Appalachian Power Company.

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Staff Set 1
To Appalachian Power Company

Interrogatory Staff 1-23:

Please refer to the RPS Plan at Appendix B, specifically Tables 29-35. Provide the following information: (a): Did APCo model the Company's Capacity Position, Energy Position, and REC Position to include all resource additions associated with all portfolios? If so, provide tables displaying these results. If not, provide a narrative explanation of why not. (b): For each portfolio (Portfolio A through Portfolio 2S) and the Virginia Clean Economy Act ("VCEA") Plan portfolios, please provide data underlying the figures associated with the Company's Capacity, Energy, and REC Positions in an executable Microsoft Excel format with all underlying formulae intact. Please provide this data inclusive of all resource additions and retirements associated with each respective portfolio.

Response Staff 1-23:

Original Response:

The Company objects to this request on the grounds of vagueness.

Amended Response:

Yes. The Company included all resources in all portfolios in its modeling of its Capacity Position, Energy Position, and REC Position. Tables displaying these results are attached, as follows:

- REC Position:
  - See Staff 1-23 Attachment 1- Reference
  - See Staff 1-23 Attachment 2- Low REC
  - See Staff 1-23 Attachment 3- No Capacity
  - See Staff 1-23 Attachment 4- No Gas
  - See Staff 1-23 Attachment 5- High Load
  - See Staff 1-23 Attachment 6- High Load No Gas
- Energy Position:
  - See Staff 1-23 Attachment 7- Energy
- Capacity Position:
  - See Staff 1-23 Attachment 8-Capacity

The foregoing response is made by Ismael Martinez, Resource Planning Lead, on behalf of Appalachian Power Company.

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Staff Set 1
To Appalachian Power Company

Interrogatory Staff 1-33:

Please refer to the RPS Plan at 42-54, Section 6.3, "Portfolio Analysis and Economic Analysis Summary." Identify which portfolio discussed therein is the Company's proposed, preferred, or otherwise intended path forward for compliance with the requirements of the VCEA and confirm whether it is a least-cost portfolio, as required by the Commission in Case No. PUR-2020-00135. Please also identify any other portfolios that meet the requirements of the VCEA as well.

Response Staff 1-33:

Please see Section 7 of the RPS Plan at 54. The Company identified Portfolio A to be its preferred plan and to serve as its intended path forward for compliance with the requirements of the VCEA, otherwise known as the Company's VCEA Portfolio Plan.
As discussed in Section 7 of the RPS Plan at 54, all the modeled portfolios were developed to comply with the VCEA.

The foregoing response is made by Ismael Martinez, Resource Planning Lead, on behalf of Appalachian Power Company.

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Staff Set 1
To Appalachian Power Company

Interrogatory Staff 1-41:

Please refer to the RPS Plan, specifically to the portfolios presented in Appendix B (i.e., Portfolios A through 2S), and identify which portfolio is the "least-cost" portfolio as required by the Commission in Case No. PUR-2020-00135.

Response Staff 1-41:

See the RPS Plan at page 54. Among all evaluated portfolios, Portfolio B represents the "least-cost" portfolio.

The foregoing response is made by Ismael Martinez, Resource Planning Lead, on behalf of Appalachian Power Company.

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Staff Set 1
To Appalachian Power Company

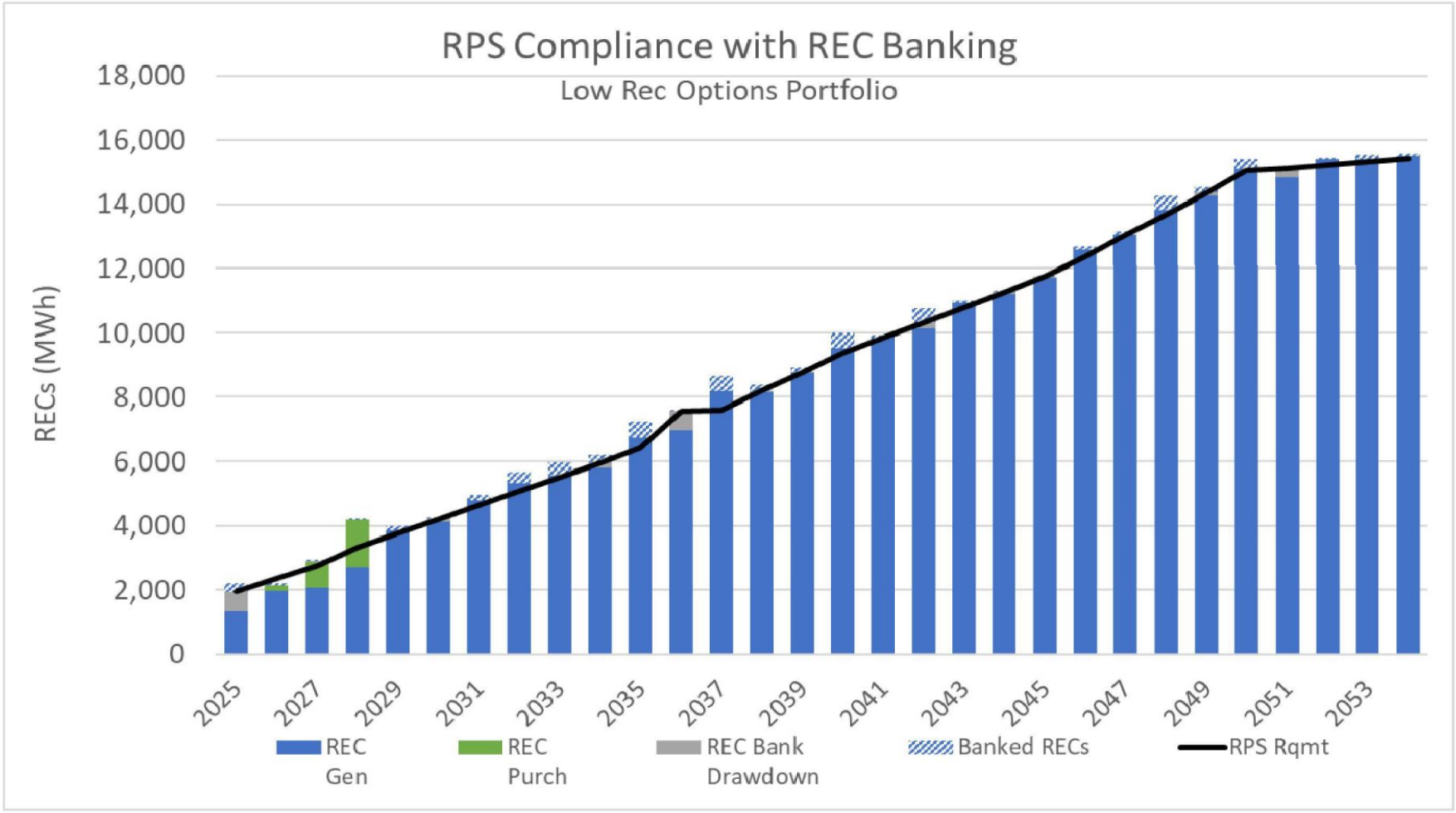
Interrogatory Staff 1-49:

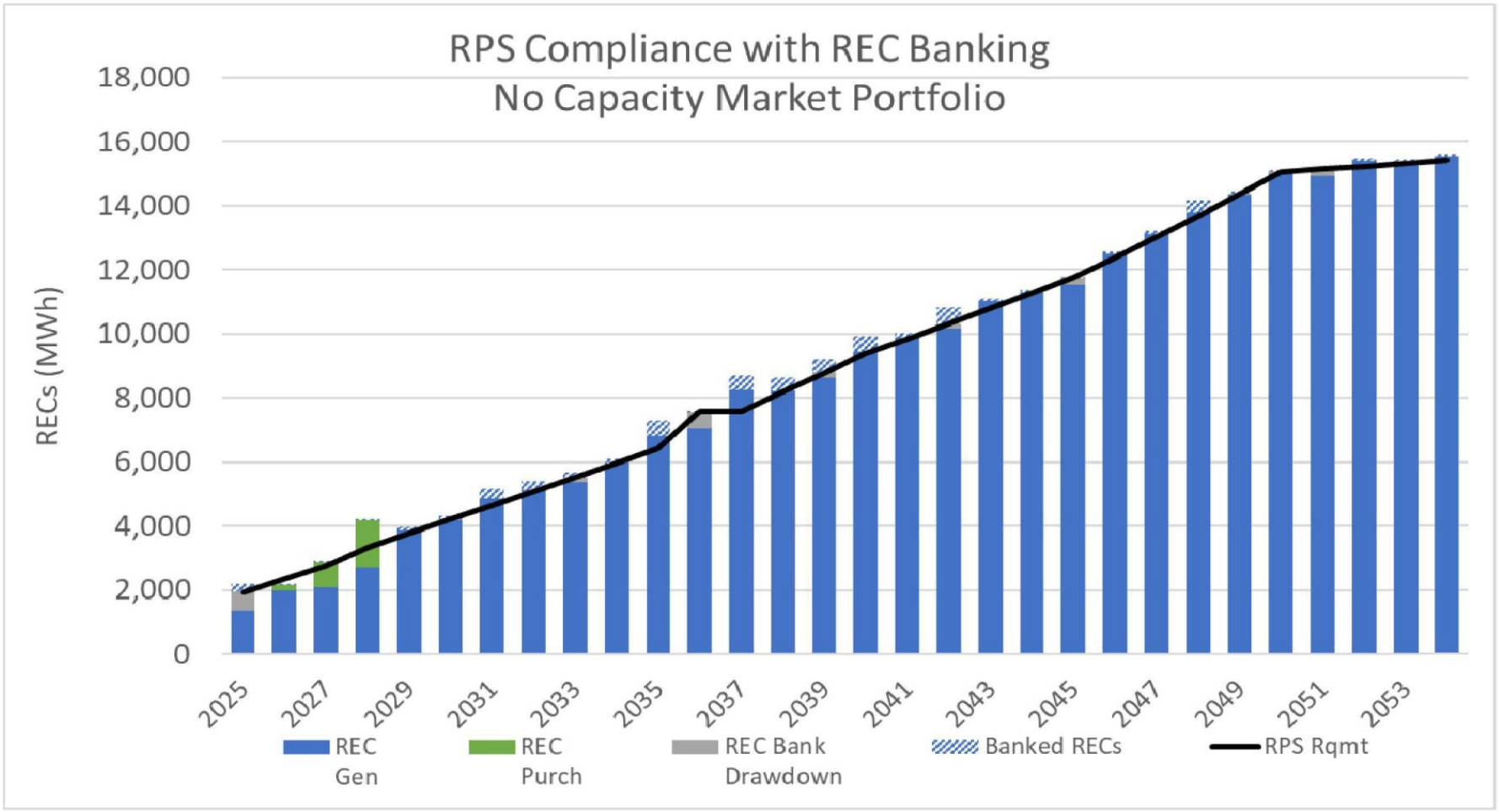
Please refer to the RPS Plan at 51, Figure 28. Please provide a figure similar to Figure 28 for Portfolios B, C, D, 1S, and 2S.

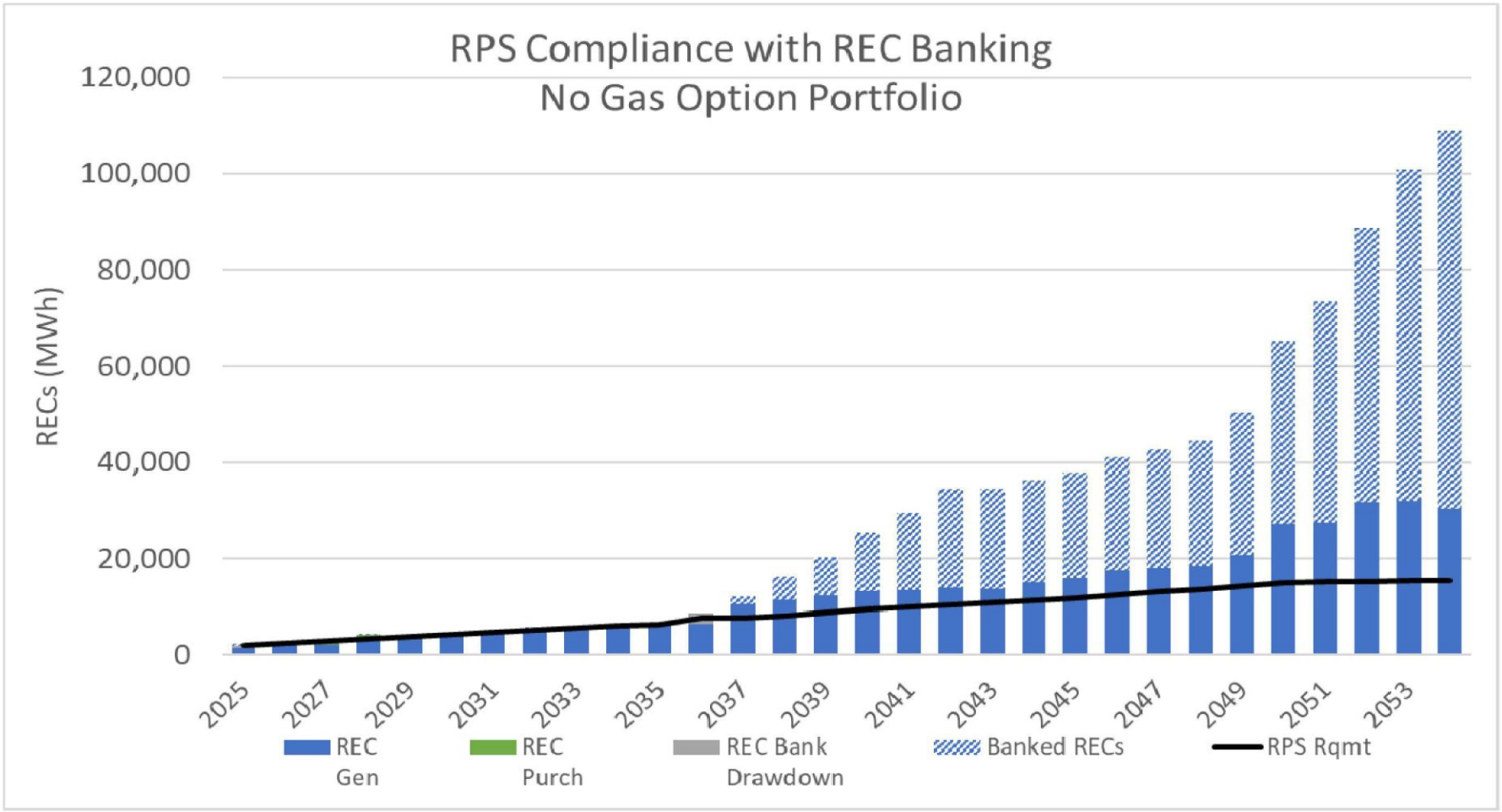
Response Staff 1-49:

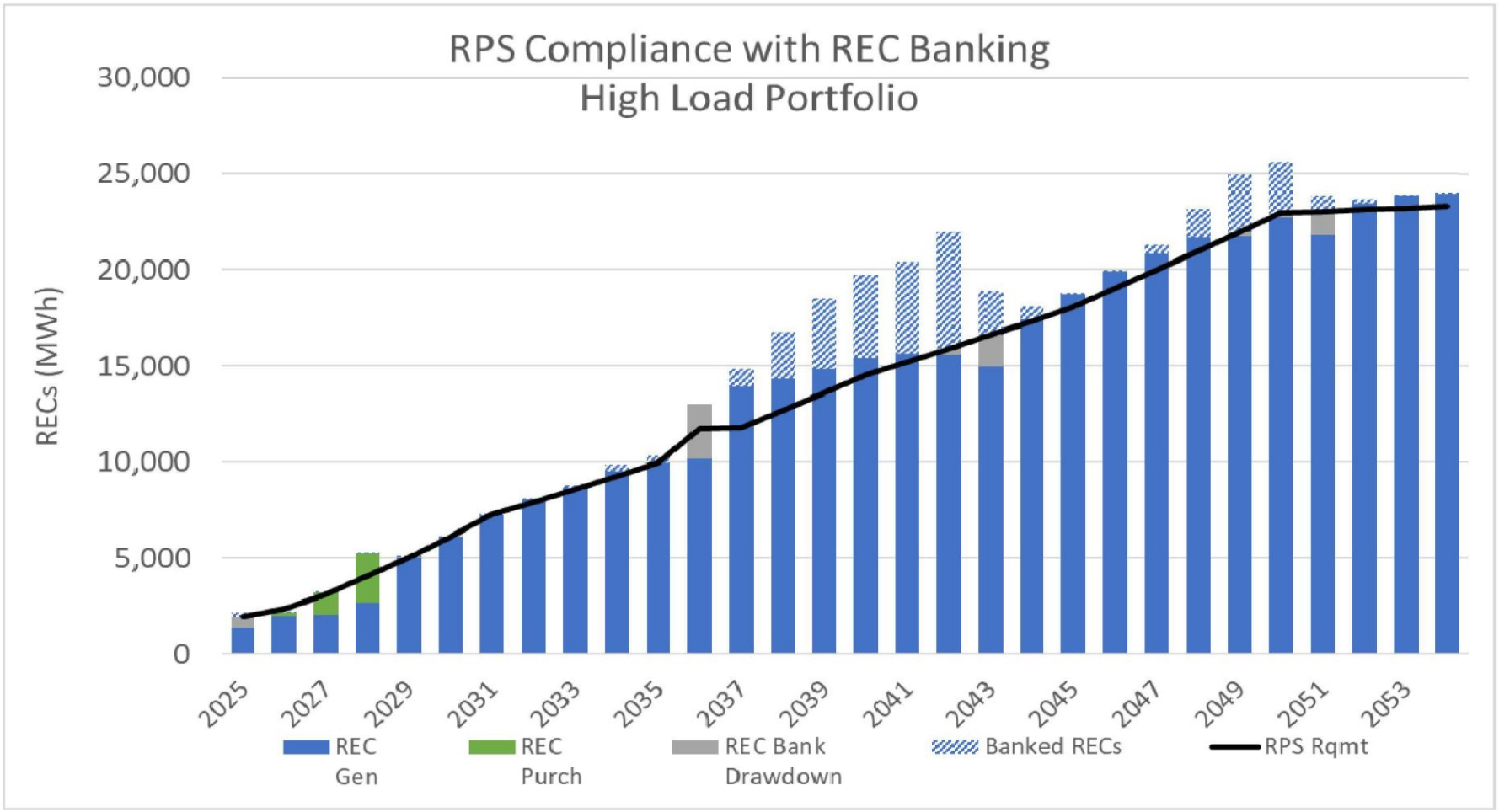
See Staff 1-49 Attachment 1.

The foregoing response is made by Ismael Martinez, Resource Planning Lead, on behalf of Appalachian Power Company.


RPS Compliance with REC Banking
Low Rec Options Portfolio
RECs (MWh)
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2025
2027
2029
2031
2033
2035
2037
2039
2041
2043
2045
2047
2049
2051
2053
REC Gen
REC Purch
REC Bank Drawdown
Banked RECs
RPS Rqmt


RPS Compliance with REC Banking
No Capacity Market Portfolio
RECs (MWh)
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2025
2027
2029
2031
2033
2035
2037
2039
2041
2043
2045
2047
2049
2051
2053
REC Gen
REC Purch
REC Bank Drawdown
Banked RECs
RPS Rqmt


RPS Compliance with REC Banking
No Gas Option Portfolio
RECs (MWh)
120,000
100,000
80,000
60,000
40,000
20,000
0
2025
2027
2029
2031
2033
2035
2037
2039
2041
2043
2045
2047
2049
2051
2053
REC Gen
REC Purch
REC Bank Drawdown
Banked RECs
RPS Rqmt


RPS Compliance with REC Banking
High Load Portfolio
RECs (MWh)
30,000
25,000
20,000
15,000
10,000
5,000
0
2025
2027
2029
2031
2033
2035
2037
2039
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2047
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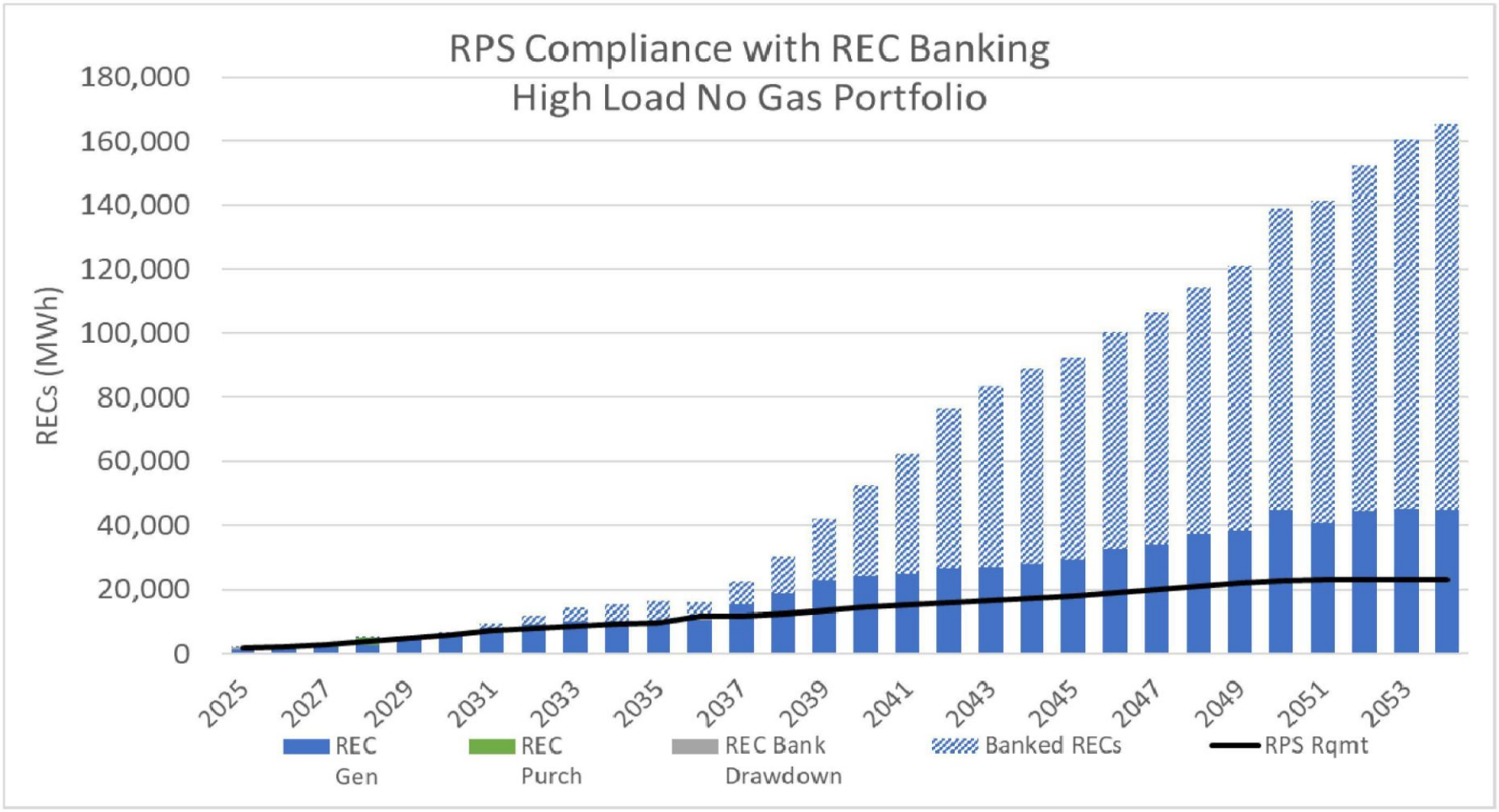
REC Gen
REC Purch
REC Bank Drawdown
Banked RECs
RPS Rqmt


RPS Compliance with REC Banking
High Load No Gas Portfolio
RECs (MWh)
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
2025
2027
2029
2031
2033
2035
2037
2039
2041
2043
2045
2047
2049
2051
2053
REC Gen
REC Purch
REC Bank Drawdown
Banked RECs
RPS Rqmt

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Staff Set 2
To Appalachian Power Company

Interrogatory Staff 2-91:

Please refer to the RPS Plan at Table 11. Please provide a narrative explanation regarding:
(a): How specifically has increased LCOE's affected the Company's selection of resources in its modeled portfolios?
(b): How specifically has increased LCOE's affected the NPV's of all modeled portfolios?

Response Staff 2-91:

The Company objects to this request on the grounds of vagueness.

The foregoing response is made by Ismael Martinez, Resource Planning Lead, on behalf of Appalachian Power Company.

Attachment ATB-2

Table 18: Portfolio A - Reference Portfolio Resource Additions (Cumulative Nameplate MW)

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Short-Term Capacity	-	-	-	-	-	-	-	450	-	-	-	-	-	-	-	-	-	-	-	-
Owned Solar Co-locate	-	-	-	-	-	-	150	299	447	595	742	888	884	879	875	870	866	861	857	852
Owned 4 Hr Storage Co-locate	-	-	-	-	-	-	50	100	150	200	250	300	300	300	300	300	300	300	300	300
Solar	-	-	-	-	400	448	695	842	838	833	1,229	1,223	1,216	1,210	1,404	1,796	1,987	2,027	2,716	2,751
Wind	-	-	-	-	225	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
CC	-	-	-	-	-	-	-	1,227	2,454	3,681	3,681	3,681	3,681	3,681	3,681	3,681	3,681	3,681	3,681	3,681
CT	-	-	-	-	-	-	-	430	430	430	430	430	430	430	430	430	430	430	430	430
SMR	-	-	-	-	-	-	-	-	-	-	-	-	300	300	300	300	300	300	300	300
EE - Accredited	-	-	14	27	41	59	78	76	72	65	62	59	16	10	8	6	2	1	1	-
VVO - Accredited	-	-	-	-	-	9	17	24	24	24	24	24	24	24	24	24	24	24	24	24
Amos 1 Co-Fire No ZLD	-	-	-	-	-	800	800	800	800	800	-	-	-	-	-	-	-	-	-	-
Amos 2 Co-Fire w ZLD	-	-	-	-	-	800	800	800	800	800	800	800	800	800	-	-	-	-	-	-
Amos 3 Coal	-	-	-	-	-	1,330	1,330	-	-	-	-	-	-	-	-	-	-	-	-	-
Mountaineer Coal	-	-	-	-	-	1,320	1,320	-	-	-	-	-	-	-	-	-	-	-	-	-
RECs	-	100	450	850	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 19: Portfolio B – Low REC Options Resource Additions (Cumulative Nameplate MW)

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Short-Term Capacity	-	-	-	-	-	-	-	450	-	-	-	-	-	-	-	-	-	-	-	-
Owned Solar Co-locate	-	-	-	-	-	-	150	299	448	595	742	888	884	879	875	870	866	861	857	852
Owned 4 Hr Storage Co-locate	-	-	-	-	-	-	50	100	150	200	250	300	300	300	300	300	300	300	300	300
Solar	-	-	-	-	400	448	695	842	838	833	1,229	1,223	1,216	1,210	1,454	1,796	1,937	2,027	2,716	2,751
Wind	-	-	-	-	225	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
CC	-	-	-	-	-	-	-	1,227	2,454	3,681	3,681	3,681	3,681	3,681	3,681	3,681	3,681	3,681	3,681	3,681
CT	-	-	-	-	-	-	-	430	430	430	430	430	430	430	430	430	430	430	430	430
SMR	-	-	-	-	-	-	-	-	-	-	-	-	300	300	300	300	300	300	300	300
EE - Accredited	-	-	14	27	44	66	88	84	77	69	65	60	15	10	7	4	2	1	1	-
VVO - Accredited	-	-	-	-	-	-	9	17	17	17	17	17	17	17	17	17	17	17	17	17
Amos 1 Co-Fire No ZLD	-	-	-	-	-	800	800	800	800	800	-	-	-	-	-	-	-	-	-	-
Amos 2 Co-Fire w ZLD	-	-	-	-	-	800	800	800	800	800	800	800	800	800	-	-	-	-	-	-
Amos 3 Coal	-	-	-	-	-	1,330	1,330	-	-	-	-	-	-	-	-	-	-	-	-	-
Mountaineer Coal	-	-	-	-	-	1,320	1,320	-	-	-	-	-	-	-	-	-	-	-	-	-
RECs	-	100	450	850	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 20: Portfolio C – No Capacity Benefit Resource Additions (Cumulative Nameplate MW)

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Short-Term Capacity	-	-	-	-	-	-	-	425	325	200	-	-	-	-	-	-	-	-	-	-
Owned Solar Co-locate	-	-	-	-	-	-	150	299	447	595	742	888	884	879	875	870	866	861	857	852
Owned 4 Hr Storage Co-locate	-	-	-	-	-	-	50	100	150	200	250	300	300	300	300	300	300	300	300	300
Solar	-	-	-	-	400	598	845	840	836	1,032	1,376	1,369	1,362	1,355	1,498	1,840	2,081	2,170	2,758	2,794
Wind	-	-	-	-	225	225	225	225	225	225	225	225	225	225	225	225	225	225	300	300
CC	-	-	-	-	-	-	-	1,227	1,227	1,227	2,454	2,454	2,454	2,454	3,681	3,681	3,681	3,681	3,681	3,681
CT	-	-	-	-	-	-	-	430	430	430	430	430	430	430	430	430	430	430	430	430
SMR	-	-	-	-	-	-	-	-	-	-	-	-	300	300	300	300	300	300	300	300
EE - Accredited	-	-	15	29	48	78	121	113	108	102	97	88	36	26	18	12	6	4	3	1
VVO - Accredited	-	-	-	-	-	9	17	24	31	31	37	37	37	37	37	37	37	37	37	37
Amos 1 Co-Fire No ZLD	-	-	-	-	-	800	800	800	800	800	-	-	-	-	-	-	-	-	-	-
Amos 2 Co-Fire w ZLD	-	-	-	-	-	800	800	800	800	800	800	800	800	800	-	-	-	-	-	-
Amos 3 Coal	-	-	-	-	-	1,330	1,330	-	-	-	-	-	-	-	-	-	-	-	-	-
Mountaineer Coal	-	-	-	-	-	1,320	1,320	-	-	-	-	-	-	-	-	-	-	-	-	-
RECs	-	100	450	850	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 21: Portfolio D – No New Gas Option Resource Additions (Cumulative Nameplate MW)

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Owned Solar Co-locate	-	-	-	-	-	-	150	299	448	595	742	888	884	879	875	870	866	861	857	852
Owned 4 Hr Storage Co-locate	-	-	-	-	-	-	50	100	150	200	250	300	300	300	300	300	300	300	300	300
Solar	-	-	-	-	350	648	695	991	986	981	976	971	966	961	956	951	946	941	936	931
Wind	-	-	-	-	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225
SMR	-	-	-	-	-	-	-	-	-	-	-	300	900	1,200	1,200	1,200	1,200	1,500	1,500	1,500
EE - Accredited	-	-	11	21	33	48	66	63	59	55	53	50	8	6	4	3	5	7	7	7
VVO - Accredited	-	-	-	-	-	-	-	-	-	-	-	-	-	4	10	19	27	34	41	47
Amos 1 100% Gas Conversion	-	-	-	-	-	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Amos 2 100% Gas Conversion	-	-	-	-	-	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Amos 3 CoFire w ZLD	-	-	-	-	-	1,330	1,330	1,330	1,330	1,330	1,330	1,330	1,330	1,330	-	-	-	-	-	-
Mountaineer 100% Gas Conversion	-	-	-	-	-	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320
RECs	-	100	450	850	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 22: Portfolio 1S – High Load Forecast (200 MW+) Resource Additions (Cumulative Nameplate MW)

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Short-Term Capacity	-	-	-	-	-	-	-	600	-	-	-	-	-	-	-	-	-	-	-	-
Owned Solar Co-locate	-	-	-	-	150	299	448	445	443	591	738	884	879	875	870	866	861	857	852	848
Owned 4 Hr Storage Co-locate	-	-	-	-	50	100	150	150	150	200	250	300	300	300	300	300	300	300	300	300
Solar	-	-	-	-	700	1,096	1,590	2,032	2,421	2,759	2,845	2,830	2,866	2,851	2,836	2,822	2,857	2,842	2,877	2,861
Wind	-	-	-	-	375	450	450	450	450	450	450	450	450	450	450	450	450	450	450	450
CC	-	-	-	-	-	-	-	1,227	2,454	2,454	2,454	2,454	2,454	2,454	3,681	3,681	3,681	3,681	3,681	3,681
CT	-	-	-	-	-	-	860	860	860	860	860	860	860	860	860	860	860	860	860	860
SMR	-	-	-	-	-	-	-	-	-	-	-	300	900	900	900	900	900	900	900	1,200
EE - Accredited	-	-	11	22	35	50	67	64	60	55	53	51	9	6	4	3	1	1	1	-
Amos 1 Coal	-	-	-	-	-	800	800	-	-	-	-	-	-	-	-	-	-	-	-	-
Amos 2 Co-Fire No ZLD	-	-	-	-	-	800	800	800	800	800	-	-	-	-	-	-	-	-	-	-
Amos 3 Coal	-	-	-	-	-	1,330	1,330	-	-	-	-	-	-	-	-	-	-	-	-	-
Mountaineer CoFire w ZLD	-	-	-	-	-	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	-	-	-	-	-	-
RECs	-	100	650	1,450	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 23: Portfolio 2S – High Load and No New Gas Resource Additions (Cumulative Nameplate MW)

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Short-Term Capacity	-	-	-	-	-	-	275	125	50	-	25	-	-	-	-	-	-	-	-	-
Owned Solar Co-locate	-	-	-	-	150	299	448	595	742	738	735	731	727	723	720	716	712	708	705	701
Owned 4 Hr Storage Co-locate	-	-	-	-	50	100	150	200	250	250	250	250	250	250	250	250	250	250	250	250
Solar	-	-	-	-	600	996	1,391	1,784	2,125	2,114	2,353	2,341	2,329	2,317	2,305	2,293	2,281	2,269	2,407	2,494
Owned 4 Hr Storage	-	-	-	-	-	-	75	175	225	225	225	225	225	225	225	225	225	225	225	225
Wind	-	-	-	-	450	675	975	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050
SMR	-	-	-	-	-	-	-	-	-	-	-	600	1,200	1,800	2,400	2,400	2,400	2,700	2,700	2,700
New DR	-	-	1	3	4	5	6	7	8	6	6	5	4	3	2	1	2	2	3	4
EE - Accredited	-	-	59	119	178	244	310	276	245	212	186	151	85	63	48	38	33	29	25	24
VVO - Accredited	-	-	7	13	21	28	37	37	37	37	37	37	37	37	37	43	49	47	46	42
Amos 1 100% Gas Conversion	-	-	-	-	-	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Amos 2 Co-Fire w ZLD	-	-	-	-	-	800	800	800	800	800	800	800	800	800	-	-	-	-	-	-
Amos 3 Co-Fire w ZLD	-	-	-	-	-	1,330	1,330	1,330	1,330	1,330	1,330	1,330	1,330	1,330	-	-	-	-	-	-
Mountaineer 100% Gas Conversion	-	-	-	-	-	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320
RECs	-	100	650	1,450	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-