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PETITION OF

APPALACHIAN POWER COMPANY **CASE NO. PUR-2020-00258**

For approval of a rate adjustment clause, the E-RAC, for costs to comply with state and federal environmental regulations pursuant to § 56-585.1 A 5 e of the Code of Virginia

REPORT OF A. ANN BERKEBILE, SENIOR HEARING EXAMINER

July 8, 2021

Appalachian Power Company ("APCo" or the "Company") seeks approval of a rate adjustment clause ("RAC"), designated as the Company's E-RAC, facilitating its recovery of expenses incurred to comply with state and federal environmental regulations at its Amos and Mountaineer generating facilities (collectively, "Plants"). No participant in this case opposes the Company's recovery of operating and maintenance ("O&M") expenses for coal combustion by-product management to comply with state and federal environmental requirements ("O&M Compliance Expenses") or APCo's recovery of costs to comply the Coal Combustion Residual ("CCR") Rule. However, the Office of the Attorney General, Division of Consumer Counsel ("Consumer Counsel") and the Sierra Club oppose the Company's request for approval to incur and recover the costs of achieving compliance with the Steam Electric Effluent Limitations Guidelines ("ELG") Rule at the Plants. I find this aspect of APCo's request lacks sufficient evidentiary support. Furthermore, based on my assessment of the record in this case, the evidence supports the approval of an E-RAC revenue requirement in the amount of $27.437 million, with the understanding that such amount will be subject to review and, if appropriate, true-up in a future E-RAC case.

HISTORY OF THE CASE

On December 23, 2020, APCo filed a Petition ("Petition") with the State Corporation Commission ("Commission") pursuant to § 56-585.1 A 5 e ("Subsection A 5 e") of the Code of Virginia ("Code") for approval of its proposed E-RAC to recover, on a timely basis, its costs to comply with state and federal environmental laws and regulations applicable to generation facilities used to serve the Company's load obligations. Specifically, the Petition sought the approval of an E-RAC with a forecast revenue component of $30.791 million, an Allowance for Funds Used During Construction ("AFUDC") revenue component of $0.823 million, and a true-up revenue requirement of $0.[1] Coincident with its Petition, APCo filed a Motion for a Protective Ruling ("PR Motion").

[1] Petition at 2. A copy of the Petition was introduced as an exhibit ("Ex.) during the hearing. *See* Ex. 2 and 2C. Although the Company submitted public and confidential parts of its Petition, only the public information in such Petition is summarized herein.

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On January 14, 2021, the Commission issued an Order for Notice and Hearing ("Procedural Order") that, among other things, docketed the Petition; directed APCo to publish notice of the Petition;[2] established a schedule for the submission of notices of participation and prefiled testimony; scheduled a telephonic session of the public hearing on June 22, 2021 ("Telephonic Session"), for the receipt of public witness testimony; scheduled the remainder of the public hearing for June 23, 2021 ("June 23rd Session"); and assigned the consideration of the PR Motion and any discovery issues to a Hearing Examiner. The Procedural Order also indicated that additional details relative to the June 23rd Session would be provided by further Commission Order or Hearing Examiner Ruling.[3] The Commission subsequently entered another Order on March 11, 2021, assigning "all further proceedings in this matter" to a Hearing Examiner.

On January 15, 2021, I granted the PR Motion and entered a Protective Ruling governing the handling of confidential information.

Steel Dynamics, Inc. ("Steel Dynamics"); the Old Dominion Committee for Fair Utility Rates ("Committee"); the Sierra Club;[4] and Consumer Counsel filed notices of participation.

On March 10, 2021, Consumer Counsel filed a Motion to Compel ("MTC") seeking to require APCo to respond to an interrogatory by conducting an additional run through its PLEXOS model. After reviewing pleadings relating to the MTC, I entered a Ruling on March 19, 2021 ("March 19th Ruling"), granting the MTC.

On April 19, 2021, I entered a Ruling directing that the June 23rd Session would be conducted virtually by Microsoft Teams and adopting associated special procedures. In addition, I entered a Ruling on June 15, 2021, directing that opening statements would be provided on June 22, 2021, following the Telephonic Session.

No written comments were filed in connection with the Petition and no public witnesses testified during the Telephonic Session.

The hearing associated with the Petition commenced, as scheduled, by Microsoft Teams on June 22, 2021, and continued on June 23 and June 24, 2021. Noelle J. Coates, Esquire, Daniel C. Summerlin, Esquire, and Charles J. Dickerson, Esquire, appeared on behalf of the Company. Dorothy E. Jaffe, Esquire, and Evan D. Johns, Esquire, appeared on behalf of Sierra Club. C. Mitch Burton, Jr., Esquire, and John E. Farmer, Jr., Esquire, appeared on behalf of Consumer Counsel. C. Austin Skeens, Esquire, and Frederick D. Ochsenhirt, Esquire, appeared on behalf of the Staff of the Commission ("Staff"). The Committee and Steel Dynamics did not appear at the hearing.

The completed transcript of the hearing ("Tr.") was filed on June 29, 2021.

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[2] APCo's proof of notice was introduced as Ex. 1.

[3] Procedural Order at 8.

[4] On February 4, 2021, the Commission entered an Order Granting Admission *Pro Hac Vice* authorizing Dorothy E. Jaffe, Esquire, and J. Michael Becher, Esquire, to practice before the Commission on behalf of the Sierra Club.

On July 7, 2021, I entered a Ruling ("July 7th Ruling") directing the Company to file an addendum to late-filed Exhibit ("Ex.") 22 on or before 12 p.m. on July 8, 2021.[5]

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SUMMARY OF THE RECORD

The Company's Direct Testimony

APCo submitted the direct testimony of **Christian T. Beam**, the Company's President and Chief Operating Officer; **Gary O. Spitznogle**, Vice President of Environmental Services at American Electric Power Service Corporation ("AEPSC"); **Brian D. Sherrick**, Managing Director of Projects for AEPSC; **Connie S. Trecazzi**, Staff Economic Forecast Analyst for AEPSC; **James F. Martin**, Director of Resource Planning Strategy for AEPSC;[6] **Tyler H. Ross**, Director of Regulatory Accounting Services for AEPSC; and **Jennifer B. Sebastian**, Regulatory Case Manager for AEPSC.

Mr. Beam introduced the Company's other witnesses and discussed APCo's proposed investments at the Plants to meet certain rules of the United States Environmental Protection Agency ("EPA") – specifically, the CCR and the ELG Rules.[7] According to Mr. Beam, the CCR and ELG Rules "require that, absent an extension, unlined CCR storage ponds (such as the bottom ash ponds at the Plants) must cease operations and initiate closure by April 11, 2021, which would cause the Plants to stop operating by that date."[8] He testified that the Company conducted an economic analysis of compliance options and now seeks to recover the costs of CCR and ELG retrofits at the Plants.[9] He explained that such retrofits (the option referred to by APCo as its "Case 1") will allow the Plants to operate past 2028.[10]

In Mr. Beam's assessment, Case 1's investment of $250 million to achieve both CCR and ELG compliance and the continued operation of the Plants beyond 2028 is more beneficial for customers than investing $125 million solely for CCR compliance (coupled with the retirement of the Plants in 2028).[11] Among other things, he asserted that APCo's expenditure of billions of dollars to obtain replacement capacity will be required if either of the Plants are retired.[12] He stated further: "[b]ecause the incremental cost of the next best capacity option exceeds the incremental cost of compliance and continued operation of both Plants, the Company decided

[5] At the hearing, the Hearing Examiner directed the Company to file a late-filed exhibit, designated as Ex. 22, on or before July 2, 2021, providing an approximation of the revenue requirement should the Commission decide not to approve the ELG investment. As initially filed, the revenue requirement set forth in late-filed Ex. 22 included the treatment of estimated ELG costs already incurred. The July 7th Ruling directed APCo to file an addendum to Ex. 22 excluding ELG costs from the revenue requirement calculation. APCo filed such addendum on July 8, 2021.
[6] At the hearing, Mr. Martin clarified that his title changed from Regulatory Case Manager to Director of Resource Planning Strategy after he submitted his prefiled direct testimony. Tr. at 94.
[7] Ex. 3, at 2.
[8] *Id.* at 2.
[9] *Id.* at 4.
[10] *Id.*
[11] *Id.*
[12] *Id.*

that making the ELG and CCR compliance investments is the most prudent option."[13] In addition, he questioned APCo's ability to timely replace the lost capacity (through bilateral contracts) should CCR investments not be made and the Plants cease operating in 2021.[14] He further indicated that, if obtained, such replacement capacity would be very expensive.[15] Moreover, he maintained that the Plants currently serve as a "physical energy hedge" for the Company.[16]

Mr. Beam also testified that APCo considered closing one of the Amos Plant's 800 megawatt ("MW") units instead of bringing it into compliance with ELG requirements but determined "the small savings that would result from such a closing would be significantly less than the value of the capacity lost to serve our customers."[17] Furthermore, he represented that the Company considered environmental justice factors as contemplated by § 2.2-235 of the Code when deciding to make the compliance investments at issue.[18]

When cross-examined by Sierra Club, Mr. Beam acknowledged that the Company considered AEP's commitment to greenhouse gas emissions when deciding to pursue CCR and ELG investments at the Plants.[19] He also identified and acknowledged his familiarity with AEP's March 2021 Power Forward to Net Zero Report, including such Report's consideration of a carbon tax/price.[20] He agreed that APCo does not yet have a published environmental justice policy for external use but maintained that the Company considered impacts to surrounding communities when deciding to pursue the ELG investments.[21] Furthermore, he acknowledged the potential for the required closure of the Plants (in the absence of compliance alternatives) if the EPA decides not to approve APCo's extension request and agreed such closure would protect groundwater in the surrounding communities.[22]

When questioned by the Hearing Examiner, Mr. Beam explained that the EPA continues to evaluate the Company's extension request and noted that the required review is more extensive than APCo initially anticipated.[23]

On redirect examination, Mr. Beam suggested the Company's intended CCR and ELG investments comport with Virginia's environmental justice statute because such investments will benefit all of APCo's customers.[24]

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[13] *Id.* at 4-5.
[14] *Id.* at 5.
[15] *Id.*
[16] *Id.*
[17] *Id.* at 6.
[18] *Id.*
[19] Tr. at 41.
[20] *Id.* at 42-44. *See also* Ex. 4.
[21] *Id.* at 46-47.
[22] *Id.* at 47-49.
[23] *Id.* at 49-50.
[24] *Id.* at 52-53. *See also id.* at 55-56 (wherein Mr. Spitznogle confirmed the extension request remains pending with the EPA and explained that the EPA tolled the associated closure requirements applicable to the bottom ash ponds at the Plants).

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Mr. Spitznogle described the environmental regulations driving the need and timing for the environmental upgrades at the Plants ("Projects") for which cost recovery is being sought.[25] He also outlined the permitting required to install the environmental controls at issue in the Petition.[26] Furthermore, he identified the activities necessary for the handling and disposal of coal combustion byproducts to comply with state and federal regulations and represented that he provided such information to Company witness Ross.[27]

Mr. Spitznogle described the CCR and ELG Rules driving the need for the Projects.[28] Among other things, he noted that the CCR Rule governs the handling and storage of CCR material in an environmentally responsible manner and the ELG Rule governs wastewater discharges for the protection of surface water.[29] Furthermore, he explained that APCo will be required to perform environmental work at the Plants under all compliance scenarios.[30]

Mr. Spitznogle explained that APCo filed CCR extension requests with the EPA on November 30, 2020, and the EPA's deadline for responding to such requests was March 31, 2021.[31] He also indicated that to continue operating the Plants after 2028, the Company is required to close bottom ash ponds at both locations, convert steam generating units at the Plants to dry bottom ash handling systems, and install bioreactors for the treatment of flue gas desulfurization ("FGD") wastewater streams.[32] According to Mr. Spitznogle, APCo has developed coordinated compliance activities making it possible to bring the Plants into ELG compliance by the end of 2022.[33] In addition, he confirmed the EPA's approval of the Company's CCR extension request is not guaranteed.[34] Furthermore, he represented that execution of the Projects will enable the Plants to continue operating "through their currently planned retirement dates."[35]

Mr. Spitznogle next discussed compliance alternatives to the Company's proposed Projects.[36] He testified that APCo analyzed CCR and ELG compliance alternatives other than the Projects and found such options to be impracticable.[37] He also indicated that the CCR Rule includes a retirement provision that would give the Company until October 17, 2023, to complete the closure of the bottom ash ponds if APCo decided to retire the Plants or cease their combustion of coal.[38] Similarly, he explained that the ELG Rule has a retirement provision allowing a generating unit to continue its discharge of bottom ash transport water and FGD wastewater subject to limiting criteria if the associated utility commits to stop combusting coal or

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[25] Ex. 5, at 2.
[26] *Id.* at 3.
[27] *Id.* at 3 and 11, Schedule 1.
[28] *Id.* at 3-5.
[29] *Id.* at 3-4.
[30] *Id.* at 5-6.
[31] *Id.* at 6-7.
[32] *Id.*
[33] *Id.* at 7.
[34] *Id.*
[35] *Id.* at 8.
[36] *Id.* at 8-10.
[37] *Id.* at 8.
[38] *Id.* at 9.

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retire the generating units by December 31, 2028.[39] Mr. Spitznogle acknowledged that APCo would not be required to make additional capital investments for dry ash handling or wastewater treatment equipment if the Plants were to retire or cease combusting coal by December 31, 2028, and referred to such scenario as the "CCR-Only" option.[40] He explained further that any utility electing to take advantage of the ELG retirement option must notify the associated state permitting agency by October 13, 2021.[41] Moreover, he clarified that it would not be possible for the Company to comply with the ELG Rule but not the CCR Rule with respect to the Plants.[42]

Mr. Spitznogle addressed the permitting activities that must be completed before the Company commences construction of the Projects.[43] Specifically, he testified that the existing National Pollution Discharge Elimination System ("NPDES") permit must be revised to incorporate ELG Rule requirements and the compliance schedule.[44] He also indicated the Company may be required to obtain a construction general storm water permit and/or revisions to the existing air permit.[45]

According to Mr. Spitznogle, he used "detailed accounting reports that included actual 2020 O&M activities for the handling and disposal of coal combustion byproducts for January through October 2020" when identifying the environmental compliance activities he supports (set forth in his Schedule 1).[46] Based upon such reports, he identified line items that, in his assessment, qualify for recovery under Virginia law.[47] Some of these line items include bottom ash pumps and transportation equipment, economizer ash handling equipment, fly ash handling equipment and disposal activities, gypsum handling and disposal equipment and systems, ponds, and landfills.[48] He also opined that the level of environmental activity in the first ten months of 2020 is representative of ongoing levels during the projected period at issue in this case.[49]

During questioning by the Sierra Club at the hearing, Mr. Spitznogle expressed his belief that the Company would have to retire the Plants if the EPA denies its extension requests and if APCo is unable to reach an agreement with the EPA for conditions to continue operations.[50]

Mr. Sherrick described the current status of the Plants and outlined the scope, cost, schedule, and management strategy planned by AEPSC, on behalf of APCo, to complete the Projects.[51] Among other things, he noted that the Amos Plant is located in West Virginia and consists of three super-critical pulverized coal-fired base-load generating units with total

[39] *Id.*
[40] *Id.*
[41] *Id.*
[42] *Id.* at 10.
[43] *Id.*
[44] *Id.*
[45] *Id.*
[46] *Id.* at 11.
[47] *Id.*
[48] *Id.* at 12.
[49] *Id.*
[50] Tr. at 58-59.
[51] Ex. 6, at 1-2.

nameplate capacity of 2,930 MW.[52] He stated further: "[a]ll three [Amos] units currently transport bottom ash and miscellaneous wastewater streams to a shared pond system where the bottom ash is later dredged and trucked to a permitted landfill."[53] He explained that the Mountaineer Plant is also located in West Virginia and has one super-critical pulverized coal-fired base-load generating unit with a 1,320 MW nameplate capacity.[54] He stated further: "[t]he [Mountaineer] [P]lant currently transports bottom ash and miscellaneous wastewater streams to a pond system where the bottom ash is later dredged and trucked to a permitted landfill."[55] He also described current environmental protection technology at the Plants.[56]

Mr. Sherrick testified that the scopes of the Projects were formulated through collaboration among various AESPC departments.[57] He also explained that the AESPC project department considered the timing requirements of compliance alternatives and then worked with a third-party vendor to develop associated cost estimates.[58] Furthermore, he testified that the following steps must be taken for the Plants to comply with the CCR and ELG Rules:[59]

<u>Amos Plant</u>

CCR Rule compliance: (1) removing of ash from bottom ash ponds 1A and 1B and the reclaim and clearwater ponds; (2) closing of 1A pond and grading and seeding it to establish natural drainage; (3) lining the existing reclaim and clearwater ponds; (4) constructing a new lined wastewater pond to replace the 1B ponds; and (5) installing a new chemical treatment system for non-CCR wastewater streams.

ELG Rule compliance: (1) modifying the bottom ash handling system to prevent the discharge of bottom ash transfer water ("BATW"); (2) installing two new ash bunkers; (3) retrofitting economizer ash handling systems on Amos units 1 and 2; and (4) installing a new FGD biological treatment system with ultrafiltration.

<u>Mountaineer Plant</u>

CCR Rule Compliance: (1) removing of ash from east and west bottom ash ponds; (2) lining the cleaned east and west ponds to create east and west wastewater settling ponds; (3) installing a new chemical treatment system for non-CCR wastewater streams; and (4) potentially installing ground water remediation equipment.

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[52] *Id.* at 2.
[53] *Id.*
[54] *Id.* at 3.
[55] *Id.*
[56] *Id.* at 2-3.
[57] *Id.* at 3.
[58] *Id.* at 3-4.
[59] *Id.* at 4-5.

ELG Rule Compliance: (1) modifying the bottom ash handling system to prevent the discharge of BATW; (2) installing a new ash bunker; and (3) retrofitting new ultrafiltration system to existing FGD treatment system.

Mr. Sherrick confirmed that AESPC evaluated other options or technologies to comply with the CCR and ELG Rules including the installation of large concrete troughs and remote dewatering conveyors, the ELG compliance option of evaluating vendors to covert wet bottom ash handling systems to dry systems, and the closure of loop recycle systems for the Amos Plant.[60] According to Mr. Sherrick, "[g]iven the rule and operations requirements for all the [P]lants, the project teams selected the technically feasible, least life cycle cost option for our customers."[61]

Mr. Sherrick confirmed that American Electric Power ("AEP") has a standard project execution process that will be utilized in connection with the Projects.[62] Such approach consists of the following Stages: Stage 0 and 1 (Initiation, Business Planning, and Screening); Stage 2 (Scope Selection); Stage 3 (Preliminary Engineering); Stage 4 (Detailed Engineering); Stage 5 (Construction); Stage 6 (Commissioning and Startup); and Stage 7 (Close Out).[63] He also provided a description of the activities that occur during the various Stages.[64] When he filed his prefiled direct testimony, Mr. Sherrick represented that the relevant teams were performing Stages 3 and 4.[65]

Mr. Sherrick next described AESPC's project schedule and safety management processes.[66] Among other things, he explained that AESPC assumes primary responsibility for schedule management by accounting for its own activities and by managing the activities of the associated architect/engineering contractor, equipment suppliers, and construction contractors.[67] Regarding safety, Mr. Sherrick highlighted AEP's Zero Harm Safety culture.[68]

Mr. Sherrick provided the following cost estimates relative to the Projects:[69]

<u>Amos</u>: An estimated total compliance cost of $177.1 million for continued operation under CCR and ELG Rules consisting of $169.9 million of capital costs, $2.7 million for other charges, and $4.5 million in Asset Retirement Obligation ("ARO") costs.

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[60] *Id.*
[61] *Id.*
[62] *Id.* at 5.
[63] *Id.* at 6.
[64] *Id.* at 6-8.
[65] *Id.* at 8.
[66] *Id.* at 8-9.
[67] *Id.* at 8.
[68] *Id.* at 9.
[69] *Id.*

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Mountaineer: An estimated total compliance cost of $72.9 million for continued operation under CCR and ELG Rules consisting of $70.1 million in capital costs, $2.4 million in other charges, and $433,000 in ARO costs.

He further explained that his cost estimates were developed by an independent engineering firm with AESPC's oversight.[70]

Mr. Sherrick confirmed the following cost estimates were prepared for compliance alternatives to the Projects: (1) the CCR Only option at the Amos and Mountaineer Plants with the retirement of both Plants in 2028 – with a total estimated cost of $72.7 million for the Amos Plant (including $52.1 million in capital costs, $3.7 million in other charges, and $16.9 million in ARO costs) and $52.1 million for the Mountaineer Plant (including $19.3 million in capital costs, $3.4 million in other charges, and $29.5 million in ARO costs); and (2) full CCR and ELG compliance at the Amos and Mountaineer Plants with the retirement of one 800 MW unit at Amos – with a cost reduction of approximately $37.0 million resulting in 800 MW less generating capacity.[71]

During cross-examination by the Sierra Club, Mr. Sherrick acknowledged that he was not sure when Stages 0 and 1 began for the Projects but thought it was around 2017.[72] He believed the reference to August 2020 in the Company's Filing Schedule 46 (Section 2, Statement 2) related to Stage 2 of the planning process.[73] He also confirmed that APCo witness Martin's economic study relative to the Projects would not have been conducted during Stage 1 of the planning process but, instead, would have been conducted at the beginning of Stage 3, after senior management authorized proceeding to such Stage.[74] In addition, he represented that the Company remains in Stage 4 and has now applied for NPDES permits at the Plants, almost completed detailed engineering and design for the Projects, and compiled construction work packages to send out for bid.[75] He confirmed APCo's expected completion of the ELG work at the Plants before the specific EPA deadlines.[76] Furthermore, he testified that by the end of April 2021, the Company incurred $9.8 million for ELG compliance at the Amos Plant and $9.5 million for ELG compliance at the Mountaineer Plant.[77]

When questioned by Consumer Counsel, Mr. Sherrick expressed his belief that APCo is required to obtain all necessary regulatory approvals before the Projects can be completed.[78]

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[70] *Id.* at 10.
[71] *Id.* at 11-12.
[72] Tr. at 62.
[73] *Id.* at 63.
[74] *Id.* at 63-66.
[75] *Id.* at 67-68.
[76] *Id.* at 68-69.
[77] *Id.* at 71. Mr. Sherrick subsequently confirmed, when questioned by Consumer Counsel, that such amounts were incurred as capital expenses, not O&M. *Id.* at 72.
[78] *Id.* at 72-73.

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On redirect, Mr. Sherrick explained that the Company must continue with Project engineering, permitting, and procurement activities to meet the expected timeline and deadlines.[79]

Ms. Trecazzi sponsored the AEP Fundamentals Forecast used by APCo's witness Martin in his cost-benefit/economic analysis.[80] Among other things, she explained that AEP's "[United States Energy Information Administration ("EIA")]-based Fundamentals Forecast is a long-term, weather-normalized commodity market forecast principally based upon the assumptions contained in the EIA's Annual Energy Outlook 2020 (EIA AEO 2020)."[81] She explained that the Fundamentals Forecast is provided to AEP's operating companies, including APCo, and AESPC for use in resource planning, analyzing capital improvements, fixed asset accounting, and other purposes.[82] She also identified the components of the EIA-based Fundamentals Forecast used by the Company (detailed in her Figure 1)[83] and explained her utilization of the Aurora energy market simulation model to provide information not directly available in the EIA AEO 2020.[84] She provided six charts demonstrating the relevant fundamental inputs and resulting energy forecasts.[85] Furthermore, she explained the scenarios included in her analysis which were "designed and generated to define a plausible range of outcomes surrounding the Base Case Fundamentals Forecast."[86] In addition, she discussed the adverse impact of a potential CO_2 burden on the EIA-based Fundamental Forecast associated with the cost of fossil generated/more carbon intensive sources of electricity.[87]

When questioned by the Sierra Club at the hearing, Ms. Trecazzi confirmed that she put data from the sources she identified in her Figure 1 (shown on page 4 of her prefiled direct testimony) into the Aurora model but agreed she did not personally develop such inputs.[88] Nevertheless, she maintained that her inputs had a reasonable basis.[89] She also indicated that she tested certain inputs against history.[90]

Ms. Trecazzi agreed that she did not include a possible $30 carbon price as an input to the Aurora model despite its inclusion in AEP's Power Forward to Net Zero Report and acknowledged such a price would place an additional burden on fossil generating units.[91]

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[79] *Id.* at 73.
[80] Ex. 7, at 2.
[81] *Id.*
[82] *Id.* at 2-3.
[83] *Id.* at 4.
[84] *Id.* at 3-5, 7. According to Ms. Trecazzi, "[t]he Aurora model iteratively generates zonal, but not company-specific, long-term capacity extension plans, annual energy dispatch, fuel burns and emission totals from inputs including fuel, load, emissions and capital costs, among others." *Id.* at 7.
[85] *Id.* at 5. Such charts reflected projections of PJM AEP On-Peak Energy Prices, PJM AEP Off-Peak Energy Prices, Dominion South Natural Gas Prices, NAPP High Sulfur Coal Prices, CO_2 Prices, and PJM AEP Capacity Prices.
[86] *Id.* at 6.
[87] *Id.* at 6-7.
[88] Tr. at 78.
[89] *Id.* at 79.
[90] *Id.*
[91] *Id.* at 80-81.

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Furthermore, she clarified that her Fundamentals Forecast included subsidies considered in the EIA AEO 2020 but did not include assumptions regarding future subsidies for renewables.[92] She acknowledged being familiar with the Guide to the Federal Investment Tax Credit for Commercial Solar Photovoltaics,[93] agreed it provided information regarding the extension of solar investment tax credits, and acknowledged the extension of the solar tax credit could make solar replacement capacity more cost effective.[94]

Ms. Trecazzi differentiated the long-term capacity price projection produced by the Company's model (depicted in the chart on the bottom right-hand corner of page five of her prefiled testimony) from the short-term clearing price obtained in the PJM Reliability Pricing Model ("RPM") auction and believed such prices were not comparable.[95] She indicated that Mr. Martin's prefiled direct testimony included a misstatement regarding his use of an EIA capacity price for a purchase power agreement ("PPA") as a potential resource and, instead, assumed Mr. Martin used the long-term capacity price projection from page five of her prefiled testimony, an EIA-based capacity price, for the PPA that was available as a potential resource in his analysis.[96]

On redirect, Ms. Trecazzi assumed that if tax credits result in more solar energy, solar capacity would receive less capacity credit in PJM under the Effective Load Carrying Capability ("ELCC") credit methodology.[97] However, she acknowledged she is not an expert in such methodology.[98]

Mr. Martin described the analysis he prepared for APCo's consideration when evaluating costs and benefits associated with making certain CCR and ELG compliance expenditures at the Plants.[99] Specifically, he indicated that his analysis considered the economics of the following compliance scenarios:[100]

> Case 1 – Assumes that CCR and ELG compliance expenditures are made at both Plants and the Plants continue to operate until December 31, 2040, when replacement capacity is obtained.
>
> Case 2 – Assumes that only CCR compliance expenditures are made at the Amos [P]lant and it continues to operate until it is required to retire on December 31, 2028. Replacement capacity is obtained in 2028 for Amos. Assumes that the CCR and ELG compliance expenditures are made at the

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[92] *Id.* at 82.
[93] Ex. 8.
[94] Tr. at 83-85.
[95] *Id.* at 86-87.
[96] *Id.* at 90-91.
[97] *Id.* at 93.
[98] *Id.*
[99] Ex. 9, at 3. Mr. Martin also sponsored Section 2, Statement 1 of the Company's Filing Schedule 46 and a separate Schedule attached to his prefiled testimony both of which relate to his economic analysis. *Id.* at 4.
[100] *Id.*

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Mountaineer [P]lant and the [P]lant continues to operate until December 31, 2040. Replacement capacity is obtained for Mountaineer in 2040.

Case 3 – Assumes that only CCR compliance expenditures are made at both Plants and they continue to operate until they are both required to retire on December 31, 2028. Replacement capacity is obtained in 2028 for both Plants.

According to Mr. Martin, his analysis was "designed to help APCo answer the question of whether making the CCR and ELG compliance investments makes economic sense for customers, compared to the next best option."[101] He also maintained that planning decisions relating to compliance should be evaluated based on the net present value ("NPV") of cost and revenue impacts because of their long-term implications.[102] Likewise, he asserted that an evaluation of capacity options (as compared to the continued operation of the Plants) was warranted when considering the retirement of the Plants.[103]

Mr. Martin provided the following chart (referred to as his Table 1) summarizing the NPV of the forecasted cost of service differences between Cases 1, 2 and 3 and including the cost of compliance options (in millions) provided to him by Company witness Sherrick:[104]

Incremental Cost of 2028 Retirement

				Increased NPV of Customer Revenue Requirement ($ Millions)		
	Case Descriptions	Retirement Year	Compliance Capital Investment	Base With Carbon	Base No Carbon	Low No Carbon
Case 1	Both Amos and Mountaineer CCR& ELG	Both 2040	$250			
Case 2	Amos CCR Only Mountaineer CCR&ELG	Amos 2028 Mountaineer 2040	$146	$176	$295	$245
Case 3	Both Amos and Mountaineer CCR Only	Both 2028	$125	$374	$622	$480

According to Mr. Martin, the forecasts embedded in the table set forth above "reflect sustained low power prices, coupled with a carbon tax in one scenario, which the modeling suggests will result in much lower forecasted capacity factors in the future than what these [P]lants have run in the past."[105] He also opined that high power production is not necessary for

[101] *Id.*
[102] *Id.*
[103] *Id.* at 5.
[104] *Id.* at 6. At the hearing, Mr. Martin clarified that in his Table 1, "Base with Carbon" refers to APCo's base case assuming a $15 a ton carbon tax beginning in 2028, "Base no Carbon" refers to the base case excluding a carbon tax, and "Low no Carbon" assumes a lower set of underlying commodity/power prices and does not include a carbon tax. Tr. at 96.
[105] Ex. 9, at 6.

the Plants to serve as capacity resources and as a hedge against market energy prices.[106] Moreover, he maintained that his analysis reflects "spending the $250 million to comply with both the CCR and ELG Rules at the Plants, and operating both Plants through 2040, will be less costly for customers than the next best option associated with CCR-Only compliance and retiring one or both Plants in 2028."[107]

Mr. Martin identified the three main drivers of his CCR/ELG cost of service analysis as: (1) future capital and operating cost, net of energy value associated with continuing to operate the Plants; (2) initial and future operating costs or purchase power cost, net of the energy value of resources necessary to replace the Plants if they retire; and (3) the power and fuel price forecast, including consideration of how future carbon regulations could impact prices.[108] Furthermore, his modeling process utilized the Company's typical planning analyses with assumption changes taking into account the impacts of 2028 Plant retirements if CCR and ELG compliance is not achieved.[109] He also identified the steps used in his cost of service analysis including his preparation of a load and generation availability forecast using a capacity, load, and reserve ("CLR") approach, preparation of an incremental future capital requirement cost forecast for the Plants, and his use of the PLEXOS model "to select optimal resources needed to serve APCo's load with and without the Plants at the minimum long term cost."[110]

Mr. Martin compared and illustrated the financial impacts of CCR and ELG compliance to the Plant retirements over time/his forecast period.[111] He acknowledged customers would initially see savings (through 2027) if the Plants were to retire in 2028.[112] However, his analysis indicated the non-compliance/retirement option would lead to increased customer costs during the 2028-2039 period. Specifically, his analysis showed "[t]he cumulative net cost of an Amos-only early retirement reaches a peak a $880 million, and the Amos and Mountaineer early retirement net cost impact reaches $1.55 billion by 2039."[113] He indicated costs associated with the retirement/non-CCR/ELG compliance option will begin going down in 2040.[114] Mr. Martin acknowledged that he did not perform a specific financial impact analysis of a Mountaineer-only early retirement scenario.[115] However, based upon his combined Amos/Mountaineer analysis, he estimated the cumulative incremental cost of only retiring the Mountaineer Plant would peak in 2029 at an approximate cost of $600-750 million.[116]

Mr. Martin explained his CLR forecast process beginning with his methodology for determining how many MW of replacement capacity would be needed if the Plants were to retire

[106] *Id.*
[107] *Id.*
[108] *Id.* at 7.
[109] *Id.* According to Mr. Martin, the results of his analysis show "[a] CC-only decision at Amos or Mountaineer would require adding billions of dollars of replacement capacity and energy cost in 2028 through either rate based investments or [PPAs]." *Id.*
[110] *Id.* at 8.
[111] *Id.* at 9, Figure 1.
[112] *Id.*
[113] *Id.* at 10.
[114] *Id.*
[115] *Id.*
[116] *Id.* at 10-11.

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and taking into account PJM reserve margin requirements.[117] Using this process, he determined as follows:[118]

> All three [C]ases start out with APCo between 300-800 MW long from 2021-2028, ending 2028 at 500 MW long, which is less length than the smallest Amos unit. This drops to a large short position when Amos alone...or Amos and Mountaineer...retire. All three cases would then converge at 3,700 MW short by 2041 without adding capacity. Retirement of Mountaineer by itself is not depicted [in my Figure 2],[119] but the loss of its -1,200 MW of [uniform capacity ("UCAP")] in 2028 would drop the [C]ompany from 500 MW to 700 MW short. This analysis shows none of the four units at the Plants could retire without being replaced at least in part.

Mr. Martin next provided a detailed description of his process for modeling the economics of the three Cases.[120] He explained that the PLEXOS model utilized in his analysis employs linear programming to generate optimal resource plans based upon a given set of inputs such as market energy prices and the operating and capital costs of available resources.[121] He also described the assumptions he used in his modeling process regarding the incremental and future O&M costs of the Plants.[122] Among other things, he maintained continued use of the 2029 forecasted level of O&M for the 2040 retirement cases after 2029 was conservative "in light of the reduced capacity factors that the economic dispatch model predicts could happen if power prices and fuel factors turn out as forecasted."[123]

Regarding the replacement resources used in the PLEXOS model for forming optimal resource plans, Mr. Martin adopted the EIA's major utility scale options.[124] Such options included natural gas base/intermediate and peaking generators; intermittent resources including large-scale solar, wind, and battery storage; and a range of demand-side load reduction options.[125] A one-year capacity only PPA capped at 400 MW was also included as an option for the model.[126] He summarized the optimal replacement resources selected through the model.[127] According to Mr. Martin, the model selected gas combustion turbines ("CTs") as the primary replacement capacity option based upon affordability.[128] Furthermore, although battery storage was not selected as part of any of the optimal plans, Mr. Martin believed that could change "if

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[117] *Id.* at 11.
[118] *Id.* at 12.
[119] Figure 2 is depicted on page 13 of Mr. Martin's prefiled direct testimony. Figure 2 constitutes a graph showing the Company's MW capacity position before replacing the Plants at retirement. *Id.* at 13.
[120] *Id.* at 13-16.
[121] *Id.* at 13.
[122] *Id.* at 15-16.
[123] *Id.* at 16.
[124] *Id.* at 16-17.
[125] *Id.* at 17.
[126] *Id.* at 18.
[127] *Id.* at 20, Table 4.
[128] *Id.* at 21.

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costs decline, as has been projected, coupled with public policy support ... [and] favorable treatment in PJM's capacity construct."[129]

Mr. Martin testified that the Company considered modeling cases when CCR or ELG compliance investment would be made for one or two of the Amos units rather than all three but decided such modeling was not warranted given the single-unit compliance costs of the Amos units.[130] Furthermore, he maintained that the results of his overall analysis show "both CCR and ELG compliance investments should be NPV positive for customers under a range of power prices, capacity factors, and with a carbon burden assumption."[131]

Mr. Martin also asserted that the retirement of the Plants would create voltage or thermal issues impacting the transmission system.[132] Nevertheless, he acknowledged that transmission constraints associated with the retirements could be eliminated with replacement gas-fired resources at the current Plant locations.[133] In addition, he explained that interconnection costs associated with new resources are uncertain and maintained such costs could increase "[g]iven the terrain in and around APCo's service territory."[134]

When questioned by Sierra Club at the hearing, Mr. Martin agreed with Ms. Trecazzi that the EIA does not forecast capacity prices for third-party PPAs and confirmed his use of Ms. Trecazzi's forecast of such a capacity price (based on her overall EIA-based fundamentals) when he considered a third-party capacity PPA as a potential replacement resource for the loss of capacity should either Plant retire.[135] He also agreed with Ms. Trecazzi that her forecast for such a PPA resource constituted a long-term measure as contrasted with the short-term clearing price resulting from PJM's capacity auction.[136] In addition, he explained that he prepared his economic analysis for this case over a period of several months beginning around October 2020.[137] Furthermore, he confirmed the Company's belief that a carbon cost is coming someday.[138]

Mr. Ross supported the Company's accounting of projected costs for updating the ash ponds at the Plants and O&M Compliance Expense associated with coal combustion by-product management for state and federal environmental compliance.[139] He also confirmed that APCo proposed an October 2021 through September 2022 forecasted rate year ("Rate Year").[140]

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[129] *Id.* at 22.
[130] *Id.* at 23.
[131] *Id.* at 23.
[132] *Id.* at 24-25.
[133] *Id.* at 26.
[134] *Id.*
[135] Tr. at 97-98.
[136] *Id.* at 98.
[137] *Id.*
[138] *Id.* at 98-99.
[139] Ex. 10, at 2-3.
[140] *Id.* at 3. More specifically, as explained by Company witness Sebastian, APCo's proposed Rate Year is from October 1, 2021, through September 30, 2022. Ex. 11, at 3.

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Mr. Ross explained that the Projects at issue include the installation of dry ash handling systems, new lined wastewater ponds, and water biological treatment systems with ultrafiltration.[141] In addition, he testified that the Company is seeking recovery of the following costs through the E-RAC:[142]

- AFUDC on CCR/ELG construction expenditures up to the beginning of the Company's proposed initial [R]ate [Y]ear[,]
- Return on construction work in progress (CWIP) on CCR/ELG construction expenditures from the beginning of the Company's proposed initial [R]ate [Y]ear through placement of assets in service,
- Depreciation and return on CCR/ELG assets placed in service,
- Certain ARO asset depreciation expense, and
- Certain ARO liability accretion expense.

Furthermore, Mr. Ross identified the following forecasted in-service dates for the Projects: dry ash handling systems at Amos – December 2022; new lined wastewater ponds at Amos – October 2023; water biological treatment system with ultrafiltration at Amos – December 2023; dry ash handling system at Mountaineer – May 2022; new lined wastewater ponds at Mountaineer – December 2023; and retrofit of ultrafiltration system onto existing FGD biological treatment system at Mountaineer – December 2022.[143]

Mr. Ross testified that APCo does not expect to incur new O&M expenses in connection with the construction of the Projects.[144] However, he indicated that the Company requests deferral authority associated with any such expenses and proposes their recovery in future E-RAC filings.[145]

Although the Company does not request recovery of O&M expenses associated with the Projects, Mr. Ross confirmed the Company seeks to recover Virginia jurisdictional O&M Compliance Expenses "related to the handling and disposal of fly ash, bottom ash and FGD by-product" in the E-RAC.[146] Specifically, he testified that APCo seeks to recover the following O&M Compliance Expenses through its E-RAC: $7.71 million incurred from January 2020 through October 2020; $8.49 million forecasted to be incurred from November 2020 through September 2021; and $9.26 million forecasted to be incurred from October 2021 through September 2022.[147] Moreover, he represented that any over/under-recovery of forecasted O&M Compliance Expenses would be addressed in future E-RAC proceedings.[148]

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[141] Ex. 10, at 4.
[142] *Id.* at 4-5.
[143] At the hearing, Mr. Ross corrected his prefiled direct testimony regarding the retrofit of ultrafiltration system onto the existing FGD biological treatment system at Mountaineer. Tr. at 102.
[144] Ex. 10, at 5.
[145] *Id.*
[146] *Id.*
[147] *Id.* at 6.
[148] *Id.*

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Mr. Ross next described the Company's proposed regulatory accounting and cost recovery for AFUDC related to the Projects.[149] Among other things, he explained that AFUDC associated with the construction of fixed assets such as the Projects "represents the estimated cost of borrowed and equity funds used by the Company to finance the construction of capitalized assets."[150] Furthermore, with regard to forecasted AFUDC, Mr. Ross clarified that any difference between the actual amortization of AFUDC and forecasted AFUDC collected in the initial E-RAC would be "deferred as part of the Company's ongoing E-RAC over/under-recovery calculation."[151]

Mr. Ross then described APCo's proposed regulatory accounting for, and return on, CWIP.[152] Like AFUDC, he noted that any difference between APCo's monthly calculation of an annual return on CWIP related to the Projects and the forecasted amount included in monthly E-RAC rates would be addressed in future E-RAC true-ups.[153]

Mr. Ross testified that the Company proposed a 9.25% annual depreciation rate for CCR and ELG investments at the Amos Plant and a 5.71% annual depreciation rate for the CCR and ELG investments at the Mountaineer Plant.[154] He explained that such depreciation rates were approved by the Commission in the *APCo 2020 Triennial Review Order*[155] using 2032 and 2033 retirement dates for units 1-3 at the Amos Plant and a 2040 retirement date for the Mountaineer Plant.[156] Furthermore, he testified that APCo's initially proposed depreciation rates did not contemplate a net salvage component.[157]

Mr. Ross next described the Company's accounting treatment of AROs.[158] Specifically, he addressed accounting standards for legal obligations related to asset retirements.[159] He explained that such legal obligations would arise with the ash ponds at the Plants.[160] He also described APCo's accounting methodology addressing changes to ARO liabilities over time and the depreciation of ARO assets.[161] For ratemaking purposes, he noted that the Company intends to recover existing ash pond ARO final closure costs through base rates.[162] However, for the Projects, APCo proposed to recover the costs of new AROs through the E-RAC.[163] He denied

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[149] *Id.* at 6-7.
[150] *Id.* at 6.
[151] *Id.* at 7.
[152] *Id.* at 7-8.
[153] *Id.*
[154] *Id.* at 9. Mr. Ross also provided a chart summarizing APCo's proposed depreciation rates. *Id.* at 10. At the hearing, he corrected the last line of such chart to remove the reference to a water treatment system at the Mountaineer Plant. Tr. at 103.
[155] Ex. 10, at 9. *See also Application of Appalachian Power Company, For a 2020 triennial review of its base rates, terms and conditions pursuant to § 56-585.1 of the Code of Virginia,* Case No. PUR-2020-00015, Final Order (Nov. 24, 2020) ("*APCo 2020 Triennial Order*").
[156] Ex. 10, at 9.
[157] *Id.* at 10.
[158] *Id.*
[159] *Id.*
[160] *Id.*
[161] *Id.* at 11.
[162] *Id.*
[163] *Id.*

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that the Company reflected an ARO accretion expense and ARO depreciation expense associated with the Projects in its calculation of the E-RAC revenue requirement but explained as follows:[164]

> Upon the establishment of initial ARO assets and ARO liabilities, the Company will reflect related ARO asset depreciation expense and ARO liability accretion expense, respectively, in the Company's future year E-RAC revenue requirement filings with the Commission and the Company's future per books E-RAC over/under-recovery calculations.

Furthermore, Mr. Ross denied that APCo will include ARO asset and ARO liability related to the Projects in the calculation of rate base when developing future E-RAC revenue requirements.[165]

Mr. Ross affirmed that the Company intends to utilize traditional over/under-recovery deferral accounting by comparing actual incurred costs associated with the Projects to eventual E-RAC revenues.[166] He also indicated that APCo will establish unique regulatory asset and liability subaccounts for monthly E-RAC over/under-recovery accounting.[167] In addition, he confirmed that CCR and ELG capital investments and CCR O&M expenses will not be recovered through any other rider and will be excluded from future APCo triennial reviews through the use of distinct project and work orders to track relevant costs.[168]

Ms. Sebastian supported the Company's Virginia jurisdictional revenue requirement for the E-RAC, proposed a Rate Year revenue requirement of $31.6 million (consisting of $5.5 million for CCR and ELG capital investment at the Plants and $26.1 million in actual and projected expenses associated with coal combustion by-product management), provided detail regarding the three components of the requested revenue requirement, discussed the associated jurisdictional allocation factors and the calculation of the E-RAC rates, and sponsored APCo's proposed E-RAC tariff sheets.[169]

Ms. Sebastian testified that she included both CCR and ELG capital costs associated with the Plants in APCo's proposed revenue requirement. She also included an annual level and projected balance of deferred O&M Compliance Expenses incurred prior to the Rate Year.[170] She explained that the Company's total proposed E-RAC revenue requirement of approximately $31.614 million consists of the following components: (1) a forecast revenue component of $30.791 million; (2) an AFUDC revenue component of $0.823 million; and (3) a true-up revenue component of $0.[171] 31.614

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[164] *Id.* at 12.
[165] *Id.*
[166] *Id.* at 13.
[167] *Id.*
[168] *Id.*
[169] Ex. 11, at 2.
[170] *Id.* at 3.
[171] *Id.* at 3-4.

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According to Ms. Sebastian, the forecast revenue component proposed to be collected from Virginia jurisdictional customers includes projected financing costs on invested capital through September 30, 2022 (together with taxes on the equity portion of the return).[172] She also noted that the rate base developed in the forecast revenue component "is comprised of the Virginia jurisdictional 13 month average projected balances for CWIP, projected net plant in service and unrecovered AFUDC through September 30, 2022."[173] In addition, she confirmed that the Company seeks to recover, through the forecast revenue component, an annual level of O&M Compliance Expenses and a projected balance of deferred O&M Expenses (as of September 30, 2021) over the proposed Rate Year.[174] Furthermore, she used an after tax rate of return on rate base of 7.072% (based on the Company's year ended December 31, 2019, capital structure) when calculating the revenue requirement.[175] Such rate of return was included in the 9.2% ROE approved by the Commission in the *APCo 2020 Triennial Review Order*.[176]

Ms. Sebastian next outlined how the Company developed the AFUDC revenue component.[177] Among other things, she explained that "[t]he proposed AFUDC Cost Recovery Factor revenue requirement for the 12-month period beginning October 1, 2021, of $0.823 million, recovers the accrued-balance of AFUDC, at a revenue requirement level, which has been appropriately grossed up for taxes."[178]

Regarding the final component of the proposed revenue requirement, Ms. Sebastian explained that APCo does not have a currently approved RAC pursuant to Subsection A 5 e and, therefore, no true-up is included in this E-RAC proceeding.[179] She anticipated that any true-up will be included in a 2021 E-RAC update filing.[180]

Ms. Sebastian testified that the Company's proposed jurisdictional allocation is consistent with the methodology used for its Dresden G-RAC.[181] She also explained that some O&M Compliance Expenses were allocated to the Virginia jurisdiction using the payroll allocator provided in APCo's 2020 Triennial Review case.[182] Furthermore, she explained that all rate base components were allocated based on demand as in other Virginia rate proceedings.[183] In contrast, and also consistent with other Virginia rate proceedings, O&M Compliance Expenses were allocated based on energy.[184]

According to Ms. Sebastian, the Company used the class cost allocation methodology approved by the Commission for the Dresden G-RAC to allocate Virginia jurisdictional costs to

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[172] *Id.* at 4.
[173] *Id.* at 5.
[174] *Id.*
[175] *Id.*
[176] *Id.* at 6.
[177] *Id.*
[178] *Id.*
[179] *Id.*
[180] *Id.*
[181] *Id.* at 7.
[182] *Id.*
[183] *Id.*
[184] *Id.*

the customer classes for the E-RAC (with demand and energy class allocation factor being updated using 2019 data).[185] She explained further that, consistent with the Dresden G-RAC, the class demand allocation factors were developed using a six coincident peak methodology.[186]

Ms. Sebastian represented that APCo proposes to use the billing determinants provided in its 2020 Triennial Review case.[187] She also indicated that implementation of the E-RAC proposed by the Company would increase a residential customer's monthly bill, based upon monthly usage of 1,000 kilowatt hour ("kWh"), by $2.50.[188]

During cross-examination by Consumer Counsel, Ms. Sebastian expressed her belief that $26.1 million of the revenue requirement requested in this case relates to coal combustion byproduct management and not to the ELG investment proposed by the Company.[189] Furthermore, she did not believe such costs were sought in the 2020 Triennial Review case.[190]

Sierra Club Testimony

Sierra Club provided the testimony of **Rachel Wilson**, a Principal Associate with Synapse Energy Economics, Incorporated ("Synapse").

Ms. Wilson provided an alternative modeling analysis to the Company's PLEXOS evaluation of APCo's proposal for capital investments and O&M expenses for CCR and ELG compliance at the Plants.[191] Specifically, she presented the results of her alternative modeling analysis comparing the following cases: (1) Synapse Business as Usual ("BAU"), including CCR and ELG investments at the Plants through 2040; (2) Synapse Retirement 1, including CCR investments at the Amos Plant but retirement of the Amos Plant on December 31, 2028, coupled with CCR and ELG investments at the Mountaineer Plant with its retirement in 2040; and (3) Synapse Retirement 2, including CCR investments at the Plants and retirements of both Plants on December 31, 2028.[192]

In Ms. Wilson's assessment, it is uneconomic and not in the best interest of ratepayers for the Company to invest in CCR and ELG costs at the Plants to facilitate the continued operation of such Plants through 2040.[193] In contrast, she recommended that the Commission approve CCR compliance costs for the Plants but deny ELG costs.[194] As further explained by Ms. Wilson,[195]

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[185] *Id.* at 7-8.
[186] *Id.* at 8.
[187] *Id.*
[188] *Id.*
[189] Tr. at 110.
[190] *Id.* at 114-16.
[191] Ex. 12 and 12C, at 3. Although the Ms. Wilson submitted public and confidential versions of her prefiled testimony, only the public information in such testimony is summarized herein.
[192] *Id.*
[193] *Id.* a 4-5, 51.
[194] *Id.* at 6, 51.
[195] *Id.*

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While the Synapse modeling in this docket shows that the retirement of both Amos and Mountaineer is more expensive than the retirement of Amos alone, we only model a single type of constraint on CO_2. It is expected that the Biden administration will soon be implementing some type of carbon policy, but it remains to be seen what form that policy might take, or how stringent it might be. It is thus premature, at the current time, to approve the ELG cost at Mountaineer. Rather, the Commission should deny the ELG cost until APCo can present an analysis of the effect of upcoming carbon regulations on the operation of the [P]lant.

Ms. Wilson provided an overview of the Company's Petition and supporting analysis.[196] She then described and supported the Synapse alternative modeling analysis.[197] Among other things, she explained that the Synapse analysis employs an industry-accepted EnCompass capacity and dispatch model.[198] She maintained the inputs used in the Synapse analysis largely conformed to APCo's assumptions but also acknowledged and defended certain modifications that she made to the Company's assumptions regarding prices for solar, wind, and battery storage.[199] Among other things, she concluded, based upon her review of EIA and PJM cost information, that APCo's new resource costs assumption was unreasonably high.[200] She also explained Synapse's decision to use standard cost assumptions from the National Renewable Laboratory ("NREL") 2020 Advanced Technology Baseline ("ATB") for new resource costs rather than the EIA – in part, because of EIA's reliance upon a single source for its input costs as compared to the NREL ATB's incorporation of several sources.[201]

According to Ms. Wilson, Synapse modeling found that the retirement of the Amos Plant in 2028 is the least cost option under the Base No Carbon commodity price forecast, saving customers slightly more than $200 million.[202] She reported further that the Synapse Retirement 1 and 2 cases under the Base No Carbon price forecast result in ratepayer savings relative to the BAU case ($1.1 billion in savings associated with the retirement of Amos in 2028 and almost $670 million in savings associated with the retirement of both Plants).[203] She also provided the following chart (her Table 8) setting forth the revenue requirements under the four Synapse cases, under APCo's Base No Carbon and Base with Carbon pricing forecasts:[204]

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[196] *Id.* at 7-18.
[197] *Id.* at 19-39.
[198] *Id.* at 19.
[199] *Id.* at 21-29.
[200] *Id.* at 22-24.
[201] *Id.* at 27-29. Earlier in her testimony, Ms. Wilson represented that the NREL produces industry standard assumptions for utility-scale solar, onshore wind, and battery storage resources and indicated such data is similar to EIA's estimates of overall capital costs. *Id.* at 24.
[202] *Id.* at 29. As shown in Ms. Wilson's Table 8 reproduced below, the savings figures she calculated are NPVs of revenue requirements.
[203] *Id.*
[204] *Id.* Ms. Wilson also explained why the NPV revenue requirements produced by the analyses of Synapse and APCo cannot be directly compared. Notably, she emphasized the differing optimization and dispatch algorithms and differing analysis periods used in the EnCompass and PLEXOS models and recognized Synapse's lack of access to the same level of detail provided to AEP modelers. *Id.* at 30-31.

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Net present value of revenue requirements, Synapse modeling scenarios

Scenario	Base No Carbon NPVRR ($Millions)	Base No Carbon Delta from BAU ($Millions)	Base With Carbon NPVRR ($Millions)	Base With Carbon Delta from BAU ($Millions)
Synapse BAU	$11,803		$13,654	
Synapse Retirement 1	$11,597	($206)	$12,514	($1,140)
Synapse Retirement 2	$12,281	$478	$12,985	($669)

Ms. Wilson identified the types and quantities of replacement resources included in the Synapse scenarios.[205] She also explained how the cumulative capacity builds included in Synapse's Retirement 2 case compare to those included in the Retirement 1 case (associated with the addition of battery storage in Retirement 2).[206] Furthermore, she described the differing generation portfolios and CO_2 emissions forecasts modeled into the three Synapse cases and explained the revenue requirement effects associated with including a CO_2 price in Synapse's modeling analysis.[207] In her assessment, results of the Synapse modeling analysis support the following conclusions: (1) the retirement of the Amos Plant in 2028 is the least-cost scenario and is in the best interest of ratepayers (saving ratepayers more than $200 million from 2021-2040); (2) it is in the economic interest of the Company's ratepayers to integrate additional renewable and storage resources ahead of the retirement of the Plants; and (3) "the importance of APCo's forecasts for replacement resources and market energy prices cannot be understated."[208]

Ms. Wilson also provided a detailed comparison of the modeling conducted by the Company and Synapse focusing on the varying amounts and types of resources added under the case scenarios of APCo and Synapse.[209] Furthermore, she identified economic and regulatory forces that, in her assessment, will cause coal-fired power plants to become increasingly uneconomic in the future.[210]

When providing surrebuttal at the hearing, Ms. Wilson explained that she did not model through 2050 like the Company due to time constraints and maintained her modeling period was sufficient because it captured the 2028 retirements.[211] Moreover, she believed the modeling of a longer period would have shown retirement in 2028 to be even more economic because it would have added additional replacement costs to the scenario.[212] She also defended her decision not to run a low band commodity case due to time constraints and opined that such modeling would

[205] *Id.* at 31-34.
[206] *Id.* at 34.
[207] *Id.* at 35-38.
[208] *Id.* at 39.
[209] *Id.* at 40-45.
[210] *Id.* at 45-50.
[211] Tr. at 121.
[212] *Id.* at 121-22. Ms. Wilson also indicated the modeling she performed for a companion case in West Virginia supported this conclusion. *Id.* at 122-23.

have supported the economic retirement of the Plants because the Plants would run less in the event of lower prices.[213] Furthermore, she criticized APCo witness Martin's analysis for placing too much importance on capacity and largely ignoring the energy requirements in the Company's service territory (in contrast to her analysis which built resources for energy purposes to meet APCo's demand, allowing the Company to export energy in some hours).[214]

In addition, Ms. Wilson disagreed with Mr. Martin's suggestion that a number of her assumptions were implausible (relating to the likely cost from 2028-2040 of solar per MWh and paired solar and storage, likely energy market prices per MWh, and likely decreases in capital and O&M costs for storage).[215] She also indicated that some of Mr. Martin's criticisms of her analysis related to her calendar-year modeling period and believed adjustments to her dates would not substantially change her present value of revenue requirement results.[216] Furthermore, she continued to defend her use of NREL data for the following reasons: (i) such information is derived from the most recent survey of actual historical costs and, in her assessment, is appropriately projected; (ii) her analysis was forward looking and not a retail cost of service study; and (iii) the NREL data did not include likely tax credits which would further support her ultimate conclusions.[217]

Regarding Mr. Martin's criticism of the solar capacity factors incorporated into her analysis, Ms. Wilson explained she did not add solar resources into her alternative case until 2026 and later, at which time she believed it was reasonable to assume technological advancements will have occurred improving the capacity factors of solar facilities.[218] She also clarified that her alternative analysis only changed one key input assumption from the analysis conducted by the Company – the input relating to the cost of replacement capacity – and maintained that her cost adjustment was supported by a reputable data source.[219] In addition, she emphasized that even APCo's analysis shows a slim margin between continuing to operate the Plants until 2040 and retiring them in 2028.[220]

During cross-examination by APCo, Ms. Wilson confirmed her reliance on information from Colorado and Indiana in support of her conclusion that prices for solar are going down.[221] She was unaware of any all-resource solicitations being issued in the PJM region in Virginia.[222] She acknowledged that supply chain pressures could affect renewable prices but expected current constraints to resolve in the near term.[223] Furthermore, she confirmed that her analysis supports the CCR investments at the Plants.[224]

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[213] *Id.* at 123-24.
[214] *Id.* at 124-25.
[215] *Id.* at 125-28.
[216] *Id.* at 129.
[217] *Id.* at 130-31.
[218] *Id.* at 131-32.
[219] *Id.* at 132.
[220] *Id.* at 132-33.
[221] *Id.* at 134.35.
[222] *Id.* at 135.
[223] *Id.* at 136.
[224] *Id.* at 136-37.

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Ms. Wilson acknowledged that APCo's customers may be required to pay for transmission upgrades associated with the closure of the Plants but was unsure if the Company would be allowed to collect stranded costs.[225] She also confirmed her assessment that coal is becoming generally less competitive in both the energy and capacity markets.[226] In addition, she acknowledged that APCo does not currently purchase capacity from PJM but, instead, has elected the Fixed Resource Requirement ("FRR") option.[227]

Ms. Wilson confirmed her analysis would not have considered the VCEA if APCo's analysis did not incorporate it.[228] Furthermore, she confirmed that her analysis contemplated 6,300 MWs of solar and storage as replacement resources when both Plants are retired.[229] She did not dispute that such amount of solar would require about 66 square miles of space.[230] In addition, she indicated that her modeling did not configure resource planning on a UCAP basis.[231] Nevertheless, she maintained that the installed capacity ("ICAP") reserve margin she used in her analysis should have been comparable to APCo's actual minimum reserve margin, unless the Company assumed something about its forced outage rates that was not accounted for in her modeling.[232]

On redirect examination, Ms. Wilson confirmed that she did not recommend any particular replacement resource if the Plants retire.[233] She also affirmed that her analysis focused on a comparison of scenarios and did not believe her modeling of ICAP in all of her scenarios, rather than UCAP, would impact such a comparison.[234] In addition, she suggested that the stranded costs associated with the Plants would be higher if the ELG investments were made and the Plants shut down before 2040.[235]

Consumer Counsel Testimony

Consumer Counsel presented the testimony of **Scott Norwood**, President of Norwood Energy Consulting, L.L.C.

Mr. Norwood reached the following conclusions regarding APCo's request for the approval of its proposed E-RAC:[236]

1. APCo's PLEXOS analysis supporting the Company's proposed $250 million investment for CCR and ELG compliance at the Amos and Mountaineer

[225] *Id.* at 138-39.
[226] *Id.* at 140-41. Among other things, Ms. Wilson noted that fewer gigawatts of coal capacity cleared in PJM's 2022-2023 base residual auction. *Id.* at 140.
[227] *Id.* at 141.
[228] *Id.* at 142.
[229] *Id.* at 143.
[230] *Id.*
[231] *Id.* at 146-47.
[232] *Id.* at 147.
[233] *Id.* at 148.
[234] *Id.* at 148-49.
[235] *Id.* at 149.
[236] Ex. 13, at 4-5.

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[P]lants fails to explicitly consider impacts of the [VCEA] and the risk of potential compliance cost increases due to future environmental regulations. The selected Case 1 analysis also assumes a 2040 retirement date for the Amos units which is unjustified and inconsistent with the 2032/2033 retirement dates for the Amos units supported by the Company in its 2020 Triennial Review [c]ase. These flaws serve to unreasonably inflate the forecasted benefits of the Company's selected Case 1 over other compliance options that were evaluated.

2. Even with the flaws in APCo's PLEXOS analysis, the forecasted benefits of the Case 1 plan are less than 0.85% of total forecasted costs over the 30-plus year study period, when compared to the forecasted costs of the next lowest cost option. This 0.85% forecasted benefit is insignificant given the uncertainty inherent in utility production cost analyses over such a long period of time, and therefore does not conclusively demonstrate that the Company's proposed $250 million investment for CCR and ELG compliance [P]rojects at the Amos and Mountaineer [P]lants is justified.

3. APCo's selected compliance Case 1 is much riskier than the other two compliance cases evaluated by APCo, considering that it would involve the highest level of fixed investment and assumes that the Amos units would operate until 2040, without incurring significant additional investment for environmental compliance or for the repair of major components.

4. APCo's requested depreciation expense for the proposed compliance investments for the Amos coal units is based on a 9.52% depreciation rate that assumes the Amos units are retired in 2033; however, the Company's economic analysis supporting the Amos compliance projects assume[s] that the units do not retire until 2040. This inconsistency in assumed retirement dates results(sic) unreasonably overstates depreciation expense included in APCo's E-RAC revenue requirement by approximately $227,000.

Given such conclusions, Mr. Norwood opposed the E-RAC as proposed.[237] However, if the Commission finds it appropriate to approve the E-RAC, he recommended that the Company's proposed revenue requirement be decreased by approximately $227,000 because of APCo's overstatement of depreciation expense.[238]

Mr. Norwood provided an overview of the Plants, APCo's proposed investments in CCR and ELG and associated capital costs and ARO obligations, the Company's proposed in-service dates for the CCR and ELG investments, and APCo's proposed revenue requirement of $31.6 million for the Rate Year.[239] He also provided the following assessment of the key questions to

[237] *Id.* at 5.
[238] *Id.*
[239] *Id.* at 5-8.

be answered by the Commission when determining whether to approve cost recovery for CCR and ELG investments at the Plants:[240]

1. Are the proposed compliance investments reasonable and necessary?
2. Did APCo properly consider available alternatives to the proposed CCR and ELG investments?
3. Is APCo's proposed E-RAC revenue requirement reasonably calculated?

In Mr. Norwood's assessment, the Company's PLEXOS analysis fails to demonstrate Case 1 is the lowest reasonable cost alternative for compliance with other existing or future environmental regulations.[241] Among other things, he maintained APCo's PLEXOS modeling was majorly deficient because it failed to directly evaluate the cost of complying with the Virginia Clean Economy Act ("VCEA") and other future environmental requirements such as the Renewable Portfolio Standard ("RPS") requirement of zero carbon by 2050.[242] He opined that the failure to explicitly evaluate such cost impacts unreasonably biased the Company's PLEXOS results in favor of Case 1.[243]

Regarding APCo's forecasted benefits of Case 1, Mr. Norwood believed the Company's 0.85% calculation to be insignificant because of uncertainties associated with: (1) forecasts of utility system loads, operations and production costs for a large system over a 30-year plus study period; and (2) compliance costs associated with future energy and environmental requirements.[244] He also believed the Company may be shifting an excessive amount of risk to customers under Case 1 given energy trends moving toward the retirement of coal-fired generation.[245]

Mr. Norwood believed APCo's assumption that the Amos Plant will retire in 2040 is inconsistent with the Company's position in its 2020 Triennial Review case wherein the Company provided testimony supporting the accelerated retirement of the Amos Plant from 2040 to 2032.[246] He also highlighted language from a discovery response provided by the Company in the 2020 Triennial Review case wherein APCo represented the 2032 and 2033 retirement dates for the Amos units were based on factors such as engineering judgment, operating experience, energy prices, and the physical condition of the units.[247] Furthermore, he emphasized that the Company has not identified any changes subsequent to its 2020 Triennial Review case justifying the delayed retirement of the Amos Plant.[248]

Mr. Norwood also expressed concern regarding the failure of APCo's PLEXOS model to evaluate the possible retirement and replacement of one or more Amos or Mountaineer units as

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[240] *Id.* at 8.
[241] *Id.* at 9.
[242] *Id.* at 9-10.
[243] *Id.* at 10-11.
[244] *Id.* at 11-12.
[245] *Id.* at 12.
[246] *Id.* at 13.
[247] *Id.*
[248] *Id.*

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an alternative to the $250 million investment proposed in connection with Case 1.[249] He explained that, in the absence of such analysis, he was unable to conclude Case 1 is the lowest reasonable cost alternative for customers.[250]

In the final section of his prefiled testimony, Mr. Norwood addressed the depreciation rates used by the Company for compliance investments at the Amos Plant.[251] He maintained that it was unreasonable for APCo to use a 9.52% depreciation rate for such investments because the 9.52% rate is based upon 2032 and 2033 retirement dates instead of the 2040 retirement date included in the Company's PLEXOS analysis.[252] Using the 5.71% depreciation rate proposed by the Company for Mountaineer compliance (based on a 2040 retirement date), Mr. Norwood estimated compliance investments for both Plants would reduce APCo's proposed revenue requirement by approximately $227,000.[253]

When providing surrebuttal testimony, Mr. Norwood disagreed with Company witness Martin's suggestion that the potential impacts of the VCEA are irrelevant when evaluating the environmental investments proposed in this case given the going-forward economic analysis presented by APCo in support of its proposals and given the apparent conflict between running coal units through 2040 with the VCEA's goal of reducing carbon emissions.[254] Furthermore, he defended his comparison of the Company's forecasted savings associated with the CCR and ELG investments to the overall production cost modeled in this case and believed it inappropriate to rely upon savings of less than 1 percent (which he believed are unlikely to have been determined with accuracy given the applicable 30-year timeframe) for the level of environmental investment proposed by APCo.[255] He also emphasized that once the $250 million environmental investment proposed in this case is made, it will not be deferrable and cannot be avoided.[256]

Regarding replacement capacity, Mr. Norwood explained that the Company has the ability to leave PJM's FRR construct and engage in bilateral contracting for capacity available through solicitations.[257] He noted that projections in APCo's 2019 Integrated Resource Plan ("IRP") support a capacity cost of approximately $30 per kW year, an amount that is about half the cost of a new resource such as a new combined cycle facility.[258] He maintained that more detailed modeling needs to be done (including VCEA considerations) to determine if it would be more prudent to make PJM capacity purchases rather than continuing to rely on the Plants.[259]

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[249] *Id.* at 14.
[250] *Id.*
[251] *Id.* at 16-17.
[252] *Id.*
[253] *Id.* at 17.
[254] Tr. at 155-56.
[255] *Id.* at 156-57.
[256] *Id.*
[257] *Id.* at 158.
[258] *Id.*
[259] *Id.* at 159.

Mr. Norwood continued to maintain that it is inappropriate for the Company to rely upon earlier retirement date assumptions for the Amos Plants when setting rates and later retirement date assumptions for resource planning.[260] In addition, despite his concerns regarding APCo's modeling, he confirmed that he did not oppose the CCR investments proposed.[261]

During cross-examination by the Company, Mr. Norwood clarified that it was hard to say the CCR investment is definitely justified given the level of the Company's modeling.[262] He also acknowledged that the VCEA's implications regarding in-state coal plants are inapplicable in this case.[263] In addition, because he has not conducted independent modeling, Mr. Norwood agreed that he could not be certain the modeling of the VCEA would result in significant changes to APCo's analysis (but he believed "intuitively" it would).[264] Mr. Norwood subsequently recognized that APCo witness Martin provided an analysis considering the VCEA on rebuttal.[265] However, Mr. Norwood noted the results of such analysis showed even smaller savings associated with making the environmental investments than what was reflected in Mr. Martin's initial analysis.[266] Mr. Norwood also acknowledged that he did not conduct any independent analysis to refute Mr. Martin's analysis.[267]

Mr. Norwood acknowledged uncertainty regarding future regulations impacting coal units.[268] However, he believed most people in the power industry expect greater regulation of carbon emissions going forward.[269] In addition, he clarified that his comment regarding risk in his prefiled testimony was based on the premise that the Plants will have to run until 2040 to achieve the small savings demonstrated by the Company's analysis.[270] He acknowledged that the Company will have to replace the capacity from the Plants if they close in 2028 and again highlighted information from APCo's recent IRP forecasting capacity prices of $30 per kW year.[271]

Mr. Norwood agreed the Company's customers would be required to pay retirement costs associated with the Plants if they close, presuming such costs are found to be prudent.[272] He also acknowledged customers could be required to pay for the accelerated depreciation of the Plants, if they retire in 2028, depending upon policy judgements of the impacted states.[273] He refused to agree that a plan to close the Plants in 2028 would be unreasonable and imprudent because of

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[260] *Id.* at 159-62.
[261] *Id.* at 162.
[262] *Id.* at 167.
[263] *Id.* at 167-68.
[264] *Id.* at 168-70.
[265] *Id.* at 170.
[266] *Id.* at 171.
[267] *Id.*
[268] *Id.* at 177.
[269] *Id.*
[270] *Id.* at 178-79.
[271] *Id.* at 179-80.
[272] *Id.*
[273] *Id.* at 182.

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likely costs associated with such closures and continued to support further analysis before APCo makes the ELG investments at the Plants.[274]

On redirect, Mr. Norwood indicated that his lack of opposition to the proposed CCR investments relates to timing and the required closure of the Plants by 2023, if such investments are not made.[275] He agreed that, in comparison to a possible 2023 shutdown necessitated by a lack of CCR investment, the Company would have more time to plan (until 2028), and conduct more detailed modeling of the ELG investments including consideration of the VCEA, if the CCR investments are made.[276]

Staff Testimony

Staff presented the testimony of **Ernest J. White,** a Principal Utilities Policy Specialist in the Commission's Division of Public Utility Regulation ("PUR"); **Anna L. Clayton,** a Principal Utility Accountant with the Commission's Division of Utility Accounting and Finance ("UAF"); **Turner L. Labrie,** a Utility Specialist with UAF; and **Tyler W. Lohmeyer,** an Assistant Utilities Analyst with PUR.

Mr. White evaluated the Company's economic analysis supporting its request for the approval of its proposed E-RAC.[277] He also described APCo's market Fundamentals Forecast, including the scenarios contained therein.[278] Among other things, he acknowledged the Company's Fundamentals Forecast was developed pursuant to accepted industry sources and modeling software.[279] In addition, he offered the following comments regarding the Fundamentals Forecast used by APCo:[280]

> [t]he forecasts present lower projections than were used in the Company's most recent [IRP]; however, since the Company's IRP, many factors, including the on-going public health emergency related to COVID-19, provide a reasonable explanation for the forecasted decline in commodities prices. The Fundamental Forecast was used as an input to the Company's economic analysis conducted by Company witness James Martin.

Mr. White next described APCo's economic analysis and the options considered within it (Cases 1, 2, and 3).[281] He noted that the Company performed an economic analysis of an additional scenario (Case 4) in response to the Hearing Examiner's granting of Consumer Counsel's MTC.[282] He explained that Case 4 evaluated the costs and benefits of environmental

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[274] *Id.* at 183.
[275] *Id.* at 184.
[276] *Id.* at 184-85.
[277] Ex. 14, at 1.
[278] *Id.* at 2-3.
[279] *Id.* at 3.
[280] *Id.* at 3-4.
[281] *Id.* at 4-5.
[282] *Id.* at 5-6.

compliance assuming 2032 and 2033 retirement dates for the Amos units.[283] In addition, he summarized the methodology used by APCo in its economic analysis, including the development of forecasts (a peak demand and reserve requirement forecast and a future capital, fixed and variable operating cost forecast) and the use of the PLEXOS model to select optimal resource options.[284] He identified the results of the Company's economic analysis, in terms of Net Present Value of the Revenue Requirements ("NPVRR"), for Cases 1 through 4 in the following table:[285]

Scenario	NPVRR ($millions)
Case 1 Amos & Mountaineer CCR & ELG	
Base w/ Carbon	$20,578
Base No Carbon	$18,435
Low	$17,088
Case 2 Amos CCR & Mountaineer CCR & ELG	
Base w/ Carbon	$20,754
Base No Carbon	$18,730
Low	$17,333
Case 3 Amos & Mountaineer CCR Only	
Base w/ Carbon	$20,951
Base No Carbon	$19,057
Low	$17,569
Case 4 Amos 1/2 Retire in 2032 & Amos 3 Retires in 2033	
Base w/ Carbon	$20,696
Base No Carbon	$18,626
Low	$17,269

Mr. White also offered the following comments regarding the Company's analysis:[286]

> [APCo's economic analysis] [p]resents a narrow band of outcomes, which makes it difficult for Staff to agree with the Company that it has identified a best and least cost option, given that the ultimate costs will be determined by the realized prices of several inputs forecasted by the Company, as well as general uncertainty in the markets.

[283] *Id.* at 6.
[284] *Id.* at 6-9.
[285] *Id.* at 8.
[286] *Id.* at 9.

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Although Staff did not conduct its own economic analysis, Mr. White discussed the alternative economic analysis conducted by Sierra Club witness Wilson.[287] He believed Ms. Wilson's analysis revealed two potential areas of concern with the Company's analysis – potentially inflated energy prices and potentially inflated replacement resource costs.[288] He also stated the following regarding the varying outcomes of the economic analyses conducted by APCo and Ms. Wilson:[289]

> [g]iven that coal-fired plants are marginal in PJM, the differences between these two thorough and detailed economic analyses may suggest that the benefit to ratepayers of upgrading and continuing to operate the Plants may also be marginal and it may be difficult to identify a clear best option for extending the operation of the Plants through 2040 as proposed by the Company.

Mr. White represented that Staff does not take a position on the preferred compliance option identified by the Company or the course of action supported by the Sierra Club.[290] However, he emphasized that APCo's analysis contains information that cannot be verified by the other parties and suggested that the Company's own analysis shows only a minimal benefit to ratepayers associated with APCo's preferred compliance option as compared to the other options considered by the Company.[291] He stated further:[292]

> [g]iven the capital costs of replacement resources identified by the Company could not be verified, the general uncertainty in commodity price forecasts, and the changing economics of the potential replacement generation capacity in the Company's economic analysis, this range may not provide confidence in the [Company's] projected benefits to ratepayers.

Moreover, based upon market and industry trends relative to coal, Mr. White questioned whether the Plants will be able to operate economically in the market through 2040.[293]

When providing surrebuttal, Mr. White acknowledged an error in his prefiled testimony (identified by Mr. Martin in on rebuttal) regarding the use of Ms. Trecazzi's high band forecast in either of the two economic analyses conducted in this case.[294] He confirmed this error did not change the conclusions he reached in his prefiled testimony.[295]

When questioned by Consumer Counsel, Mr. White confirmed his understanding that the Company's model did not include a carbon price until 2028.[296] He also affirmed his

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[287] *Id.* at 9-11.
[288] *Id.* at 10.
[289] *Id.* at 10-11.
[290] *Id.*
[291] *Id.*
[292] *Id.*
[293] *Id.* at 12.
[294] Tr. at 189-90.
[295] *Id.* at 190.
[296] *Id.* at 191-92.

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understanding that § 56-585.5 of the Code will require APCo to procure renewable energy credits ("RECs") for all generation that is not produced by renewable resources.[297] In addition, he identified and discussed a recent Commission Order ("*2021 APCo Modeling Order*")[298] relating to APCo's future IRP modeling requirements.[299] He speculated that the Company's economic analysis would change if APCo were to model the items listed in the *2021 APCo Modeling Order*.[300]

Ms. Clayton addressed Staff's review of the Company's requested Rate Year revenue requirement and considered the lifetime revenue requirement associated with the E-RAC.[301] She testified that Staff does not take issue with APCo's cost projections at this time.[302] In addition, she testified that Staff audited the Company's actual E-RAC construction and O&M compliance costs through October 31, 2020, and confirmed the sample transactions reviewed in such audit were appropriately recoverable pursuant to Subsection A 5 e.[303] Furthermore, Ms. Clayton confirmed that Staff does not contest APCo's proposed depreciation rates for its intended CCR and ELG investments at the Plants but recommended that APCo incorporate a depreciation rate analysis of E-RAC investments, including net salvage considerations, in its next depreciation study.[304]

Ms. Clayton testified that Staff recommends a different capital structure and overall weighted cost of capital than what was proposed by the Company.[305] Nevertheless, she acknowledged that the incorporation of Staff's 7.074% overall weighted cost of capital recommendation in the Projected and AFUDC Cost Recovery Factors does materially change the revenue requirement proposed by APCo.[306] Specifically, Staff calculated the following Rate Year revenue requirements: (1) $3,123,704 for the Amos Plant; (2) $2,341,394 for the Mountaineer Plant; and (3) $26,149,620 for O&M Compliance expense.[307]

Regarding the E-RAC's lifetime revenue requirements, Ms. Clayton noted the Company's nominal estimate of $348,547,166 on a Virginia jurisdictional basis.[308] Although Staff did not dispute the methodology used by APCo in estimating a lifetime revenue requirement for its proposed environmental compliance measures, Staff performed a recalculation incorporating the correct tax gross-up factor and using a proposed cost of capital

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[297] *Id.* at 192-93.
[298] *Commonwealth of Virginia, ex rel., State Corporation Commission, In re: Appalachian Power Company's Integrated Resource Plan filing pursuant to § 56-597 et seq.* Case No. PUR-2019-00058, Order (June 16, 2021).
[299] Tr. at 194-96.
[300] *Id.* at 197.
[301] Ex. 15, at 2.
[302] *Id.* at 3-4.
[303] *Id.* at 4.
[304] *Id.* at 5.
[305] *Id.* at 5-6.
[306] *Id.* at 6.
[307] *Id.*
[308] *Id.*

percentage of 7.074%.[309] Incorporation of Staff's adjustments resulted in a lifetime revenue requirement of $349,074,452.[310]

According to Ms. Clayton, the Petition does not address environmental justice concerns in accordance with § 2.2-234 of the Code.[311] It was also her understanding, based upon the Company's discovery responses, that APCo does not have an environmental justice policy.[312]

Ms. Clayton summarized her recommendations regarding the revenue requirement as follows (assuming the Commission approves the proposed investments):[313]

1. A total Projected Cost Recovery Factor of $30,791,313 and AFUDC Cost Recovery Factor of $823,000 for the [R]ate [Y]ear beginning October 1, 2021, and ending September 30, 2022, should be approved.

2. Staff recommends that the Commission direct the Company to incorporate a depreciation rate analysis of its E-RAC investment in its next depreciation study, including net salvage considerations.

Mr. LaBrie noted that APCo initially proposed the use of its December 31, 2019 end-of-period capital structure and overall weighted cost of capital (7.072%) for the E-RAC.[314] Instead of supporting the Company's initially proposed capital structure and overall cost of capital, Staff recommended incorporation of APCo's updated unamortized balance of the loss on reacquired debt.[315] As explained by Mr. LaBrie, inclusion of the updated expenses decreases the amount of long-term debt outstanding to $4,031,177,250 and increases the cost of long-term debt from 4.978% to 4.981%.[316] In addition, he testified that Staff supports the capital structure set forth in his Schedule 1 and an overall weighted cost of capital of 7.074%.[317]

Mr. Lohmeyer provided an overview of the Company's Petition and environmental regulations associated with the E-RAC.[318] Among other things, he noted that the EPA can extend the CCR compliance date for the Plants until October 15, 2023.[319] Furthermore, he explained that compliance with the ELG Rule must occur as soon as possible between October 31, 2021, and December 31, 2025.[320]

Mr. Lohmeyer also described the proposed Projects, APCo's proposed allocation of

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[309] *Id.* at 7.
[310] *Id.*
[311] *Id.* at 8.
[312] *Id.*
[313] *Id.* at 9.
[314] Ex. 16, at 1-2.
[315] *Id.* at 2.
[316] *Id.*
[317] *Id.*
[318] Ex. 17, at 1-3.
[319] *Id.* at 3.
[320] *Id.*

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E-RAC costs to the Virginia jurisdiction, and the Company's proposed allocation methodology and rate design.[321] He testified that Staff does not oppose APCo's proposed class cost allocation.[322] In addition, he recognized that the Commission previously approved an environmental cost recovery RAC for Virginia Electric and Power Company ("Dominion Energy").[323]

According to Mr. Lohmeyer, approval of the proposed RAC would increase the monthly bill of a residential customer using 1,000 kWh a month by $2.50.[324] He also discussed the cumulative residential bill impacts of the Company's pending RACs.[325] Lastly, he recommended that APCo's proposed allocation and rate design methodologies be utilized if the Commission approves a revenue requirement differing from the initial amount proposed.[326]

The Company's Rebuttal Testimony

On rebuttal, APCo presented the testimonies of **Mr. Beam, Mr. Martin, Mr. Ross,** and **Ms. Sebastian.**

Mr. Beam responded to the testimony of Staff, Consumer Counsel, and the Sierra Club by emphasizing that the Company will need to close down the Plants immediately if it does not make the CCR investments proposed.[327] Furthermore, he noted that no participant opposed APCo's recovery of the O&M Expenses.[328] He also asserted "if the Commission decides that APCo should not make the investments, then the Company must replace, in short order, the capacity that these facilities provide and address the stranded costs that would result from the early retirements."[329]

When providing surrebuttal, Mr. Beam disputed Sierra Club witness Wilson's conclusions that solar prices are likely to remain low.[330] He also represented that prices obtained from recent Company RFPs for solar have revealed prices that are significantly different than the amounts referenced by Ms. Wilson.[331] In addition, Mr. Beam affirmed that he has not made any announcements regarding retirements of the Plants since becoming president of APCo in 2017.[332] Furthermore, he represented that the Virginia jurisdictional share of ELG investments at the Plants would be roughly $60 million.[333]

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[321] *Id.* at 4-6.
[322] *Id.* at 7.
[323] *Id.*
[324] *Id.*
[325] *Id.* at 8.
[326] *Id.*
[327] Ex. 18, at 1.
[328] *Id.*
[329] *Id.* at 2.
[330] Tr. at 201.
[331] *Id.*
[332] *Id.*
[333] *Id.* at 205.

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During cross-examination by Sierra Club, Mr. Beam acknowledged that if the EPA denies the Company's current extension request in its entirety, the Plants will need to cease operating but also believed the Company would be given a rational schedule to achieve the shutdown.[334] He did not believe the Plants would necessarily need to close in 2028, if the Commission denies APCo's recovery of the proposed ELG investment and explained that the Company would need to evaluate its next course of action if West Virginia approves the ELG investment but Virginia does not.[335] If such circumstance were to occur, Mr. Beam anticipated the Company would come back to the Commission with a new proposal.[336]

When questioned by the Hearing Examiner regarding the status of APCo's companion case in West Virginia, Mr. Beam represented that the Company expects a decision from West Virginia by mid-August.[337]

Mr. Martin responded to the criticisms raised by witnesses for Consumer Counsel and Sierra Club regarding the Company's economic analysis supporting the E-RAC.[338]

In response to Consumer Counsel witness Norwood's criticism of APCo's failure to consider the renewable resource mandates of the VCEA when proposing the E-RAC, Mr. Martin emphasized that the VCEA does not require the Company to have at least 600 MW of renewable capacity in service by 2030.[339] He also asserted that the Commission previously approved the Company's VCEA compliance plan.[340] He maintained that "[t]he period that matters for this proceeding are the years between now and 2028, when the [P]lants would need to be retired if the ELG investments are not made."[341] He explained further that the compliance decision before the Commission depends upon the difference between the cost of operating the Plants from 2029 to 2040 as compared to the cost of obtaining resources by 2028 to replace the Plants.[342] In addition, he contended that the failure to precisely match the timing of planned VCEA renewable additions is immaterial to such analysis and provided the following table which, in his assessment, illustrates such conclusion:[343]

[334] *Id.* at 206-07.
[335] *Id.* at 208.
[336] *Id.* at 208-09.
[337] *Id.* at 209.
[338] Ex. 19, at 2-22.
[339] *Id.* at 3.
[340] *Id.*
[341] *Id.*
[342] *Id.*
[343] *Id.* at 4-5.

Comparison of 2028 VCEA Compliant Resource Additions

2028 Cumulative Capacity Additions	VCEA Plan Table 15 - Both Plants 2040 Retirement	Case 1 - Both Plants 2040 Retirement (1)	Case 2 Amos 2028 Retirement (2)	Case 3 Amos and Mountaineer 2028 Retirement (3)
Wind UCAP	48	24	24	24
Owned and PPA Solar UCAP	100	60	60	240
Storage UCAP	20	-	-	-
Energy Efficiency / DSM UCAP	46	24	43	38
Distributed Generation UCAP	28	28	28	28
TOTAL	242	136	155	330
Difference Versus VCEA	-	(106)	(87)	88

(1) Martin Direct Testimony Exhibit 1 page 1 of 9 2028 values
(2) Martin Direct Testimony Exhibit 1 page 2 of 9 2028 values
(3) Martin Direct Testimony Exhibit 1 page 3 of 9 2028 values

Mr. Martin disagreed with the suggestion of Consumer Counsel and Staff that the savings associated with the proposed CCR and ELG investments are insignificant.[344] Among other things, he explained such suggestion was based on Consumer Counsel and Staff's assessment of savings as a percentage of total cost rather than the actual dollar value of savings.[345] He maintained it would be difficult for the Company to make investments large enough to achieve a large percentage change in its cost of service given APCo's size.[346] He also testified that the proposed investments would pay for themselves by 2028, thereby benefiting customers.[347]

Mr. Martin next responded to Consumer Counsel witness Norwood's suggestion that APCo's analysis is flawed because it failed to consider risks associated with possible future environmental regulations.[348] Among other things, Mr. Martin maintained that his analysis of an additional scenario conducted pursuant to the March 19th Ruling – wherein CCR and ELG investments are made but the Amos units 1 and 2 retire in 2032, and Amos unit 3 retires in 2033 – addressed such a concern.[349] Although his additional analysis did reflect a reduction of NPV customer savings because of a delayed need to obtain replacement capacity, his analysis of the sooner retirement date scenarios continued to reflect a net NPV benefit of between $118 to $191 million.[350]

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[344] *Id.* at 5-6.
[345] *Id.* at 5.
[346] *Id.*
[347] *Id.* at 6.
[348] *Id.* at 6-8.
[349] *Id.* at 7, Rebuttal Schedule 2.
[350] *Id.* at 8.

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Mr. Martin also provided an overview of the Sierra Club's economic analysis and compared it to his own.[351] He identified Sierra Club witness Wilson's failure to extend her analysis beyond 2040 (as compared to the Company's extension of its analysis through 2050) as a "significant shortcoming" because it ignores the reality that the Plants would have to be replaced by something in 2040 and, thus, fails to consider "the value of delay."[352] In addition, he maintained that Ms. Wilson's failure to model a low band fundamental forecast (as he did) "denies parties important insights on the sensitivity of her plans to lower energy prices."[353]

According to Mr. Martin, "Ms. Wilson's direct testimony contains numerous flaws, is based on assumptions which do not fit together, and should not be relied upon."[354] In his assessment, Ms. Wilson's economic analysis overstates the cost advantage of retiring the Plants in 2028 and is based upon the false premise that $1 billion of NPV solar resource profits are attributable to retiring the Plants early.[355] Furthermore, he identified the following specific factors he believed to be unrealistic, that must be accepted for Ms. Wilson's economic analysis to be credible:[356]

1. That APCo can have ~15,000-16,000 MW of total nameplate capacity (3 times projected peak load) by 2040 including new resources, which will cost $12-14 billion, without massive rate increases that would make the plan untenable.

2. That stand-alone solar will be available between 2028 and 2040 at an average cost of ~$21.00/MWh, and paired solar and storage will be available at ~$20.00/MWh, without either of them receiving any tax credits.

3. That if solar and paired solar resources are available at the costs just mentioned, the average PJM energy market prices including a CO_2 cost realized those resources will remain at an average of ~$45.00 between 2028 and 2040.

4. That no new transmission beyond routine interconnection costs will be required to enable delivery of all of this new generation, and that none of the new resources will incur any PJM congestion costs or be curtailed due to excess capacity in certain hours.

5. That APCo can actually get approval to add an annual average of 675 MW of new resources over the 2026-2040 period.

[351] *Id.* at 9-10.
[352] *Id.*
[353] *Id.* at 10.
[354] *Id.*
[355] *Id.* at 12-13.
[356] *Id.* at 14.

6. That sites occupying up to 71,000 acres of land for solar (7 acres per MW) and 14,000 acres for storage (6 acres per MW) can be located by 2040.

7. That new dispatchable gas-fired generation should not be considered a resource option to meet APCo capacity obligations.

8. That battery technology and reliability will evolve, and costs will come down enough to allow as much as 2,272 MW of utility-scale batteries costing $2.4 billion to be added economically by 2028 to replace Amos and Mountaineer.

9. That both the capital cost and fixed O&M cost on storage will cost 45% less in 2028 than they did in 2018 in real dollar terms.

Moreover, Mr. Martin opined that Ms. Wilson's contemplation of APCo adding thousands of MWs over and above the Company's PJM capacity requirement was inconsistent with proper resource planning.[357]

According to Mr. Martin, Ms. Wilson's modelling added storage (either 888 MW or 2,272 MW) in 2028 (her contemplated retirement dates for the Plants) as the primary replacement resource and expected such storage would provide capacity for fifteen years.[358] He expressed concern regarding delays associated with the availability of such storage.[359] In addition, he believed "a resource plan that relies on this much storage so soon is particularly risky, given substantial uncertainty about battery life spans and if capital and operating costs will decline as fast as NREL predicts they will."[360]

Mr. Martin next discussed Ms. Wilson's use of NREL information in her analysis.[361] Specifically, he explained that Ms. Wilson used resource cost and capacity factor information obtained from NREL's financial modeling of a research and development ("R&D") case.[362] He further explained that NREL's R&D case is intended to provide users with information regarding the expected, future costs of various technologies under a common set of assumptions and using real dollars but without providing the "absolute nominal cost" of relevant technologies.[363] Mr. Martin also detailed how, in his assessment, Ms. Wilson use of NREL data resulted in her understatement of the fixed costs of all of the resources included in her analysis.[364]

Mr. Martin testified that Ms. Wilson did not incorporate the impact of PJM generation composition changes, fleet dispatch and energy prices (and associated projected cost savings estimates) when she modeled her estimated savings attributable to larger, low or no-variable cost

[357] *Id.* at 15.
[358] *Id.*
[359] *Id.* at 15-16.
[360] *Id.* at 16.
[361] *Id.* at 16-17.
[362] *Id.* at 16.
[363] *Id.* at 16-17.
[364] *Id.* at 18-20.

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energy from renewable and storage sources used to displace more expensive fossil generation.[365] He maintained that the prices used by Ms. Wilson failed to reflect the impact of significantly displacing fossil generation (including fuel and other variable costs) with renewables and storage (having zero or near zero variable costs).[366] It was also his understanding Ms. Wilson assumed no availability of new gas resources in her analysis.[367]

In response to Staff witness White's skepticism regarding the market prices used in the Company's analysis, Mr. Martin clarified that prices from Company witness Trecazzi's high band fundamental forecast ($43/MWh 30-year average and $62/MWh 2050 prices) are not embedded in the economic analyses of either APCo or Sierra Club in this proceeding.[368] He also defended his use of prices from Company witness Trecazzi's Base No Carbon Fundamentals Forecast in his analysis and maintained that the future energy prices he utilized are quite low given the level of inflation included in the associated forecast.[369] Moreover, he opined that his use of such prices in his analysis shows "making the ELG investments still makes economic sense vs other options."[370]

In response to Mr. White's suggestion that continued operations at the Plants may be marginal because coal facilities in PJM are marginal, Mr. Martin confirmed that APCo's analysis shows coal generation capacity factors could be lower in the future.[371] Nevertheless, he maintained that "[t]he potential to keep [coal generating facilities] operating, even at low capacity factors, and delay billions of dollars in replacement capacity investments creates significant potential value."[372]

When providing surrebuttal, Mr. Martin disagreed with Sierra Club witness Wilson's conclusion that the ELG investments become even less economic in the low band (low commodity/energy price) scenario because the Plants would run less.[373] He emphasized that the Company's coal units are already running with low capacity factors in the forecast and he believed renewable resources would be more negatively impacted by the low band scenario.[374] He also maintained that Ms. Wilson's analysis was more focused on the addition of energy resources while his analysis focused on capacity.[375] In addition, Mr. Martin disagreed with Ms. Wilson's conclusions regarding the likely trajectory of storage prices and highlighted supply chain issues that have already negatively impacted the cost of batteries.[376] Furthermore, he clarified that the fixed cost information relating to the Plants used by Ms. Wilson in her analysis included things like depreciation expense, and taxes, but the NREL data that she relied upon did

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[365] *Id.* at 21.
[366] *Id.*
[367] *Id.*
[368] *Id.* at 22.
[369] *Id.*
[370] *Id.*
[371] *Id.* at 23.
[372] *Id.*
[373] Tr. at 211-12.
[374] *Id.*
[375] *Id.* at 212-13.
[376] *Id.* at 214.

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not include such information.[377] Moreover, he maintained that his conclusion that the ELG investments are beneficial for customers would not change even if the replacement cost information included in his analysis was too high. In his assessment, it would be very difficult to bring in new resources generating enough energy value to make up for the cost of replacing the Plants (and taking into account the $60 million Virginia jurisdictional cost of making the ELG investments).[378] He also maintained that Ms. Wilson misinterpreted a discovery response when concluding APCo forced the Amos and Mountaineer units to run at economic minimums, thereby artificially increasing her BAU case and overstating the cost of continuing to run the Plants.[379]

In response to Mr. Norwood's concerns, Mr. Martin again highlighted his rebuttal analysis contemplating sooner retirement dates for the Amos units and taking into account the VCEA and maintained such analysis continued to show the ELG investments are economic.[380] Among other things, he noted that his rebuttal analysis showed all new resources becoming more expensive by "roughly the same amount between now and 2028 when these units would have to be replaced."[381] Furthermore, although he agreed with Mr. Norwood that the assumptions during his forecast period could change and impact his modeled level of savings, he indicated that the level of such savings could actually go up rather than down.[382] He also maintained that such potential long-term savings fluctuations do not impact the level of nominal savings to customers from now to 2029 associated with making the ELG investments (calculated by him to be over one billion dollars).[383]

During cross-examination by the Sierra Club, Mr. Martin clarified his concerns regarding supply chain interruptions and batteries by expressing his belief that such interruptions could continue for some time.[384] In addition, he maintained that there is value to customers associated with not having to spend billions for replacement capacity sooner rather than later even though the Plants will eventually have to retire.[385] Furthermore, although he acknowledged investment requirements associated with the VCEA between 2023/2025 and 2050, he asserted that APCo's level of VCEA requirements before 2028 – when replacement investments would need to be made if the Plants close – are small.[386] However, he acknowledged that the Company could over-comply with the VCEA before 2028 and, by doing so, lessen its future statutory investment requirements.[387]

Mr. Martin confirmed that his economic analysis did not consider stranded costs, a change of depreciation schedule, or transmission costs associated with the retirement of the

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[377] *Id.* at 214-15.
[378] *Id.* at 215-16.
[379] *Id.* at 217-18.
[380] *Id.* at 219-21.
[381] *Id.* at 221.
[382] *Id.* at 222-23.
[383] *Id.* at 223.
[384] *Id.* at 224-25.
[385] *Id.* at 225-27.
[386] *Id.* at 227-28.
[387] *Id.* at 228-29.

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Plants.[388] He also confirmed the Company has not done a detailed analysis of how to reduce or avoid transmission costs associated with the retirement of the Plants.[389]

When questioned by Consumer Counsel, Mr. Martin acknowledged that he did not model the purchase of RECs from 2021 to 2028 in his rebuttal analysis.[390] However, he believed his analysis included energy savings comparable to those required by the VCEA from 2022-2035.[391] He also acknowledged that his rebuttal analysis did not include updates regarding the VCEA's impacts on future commodity prices.[392]

When asked about testimony previously provided by different Company witnesses in another Commission case, Mr. Martin agreed such witnesses acknowledged the VCEA was going to force APCo to rely less over time upon its coal fleet.[393] However, he believed such witnesses were focusing on energy requirements given the VCEA's status as an energy requirement law.[394] Furthermore, although Mr. Martin acknowledged that the results of his rebuttal modeling performed with earlier retirement dates showed a lower customer benefit associated with the ELG investments, he continued to believe such modeled savings (between $118 to $191 million) was a good return for the cost of achieving ELG compliance.[395] Regardless, he ultimately confirmed that the Company's Petition relied upon his economic analysis considering a 2040 retirement.[396]

Mr. Ross responded to the depreciation and accounting issues raised by Staff, Consumer Counsel and the Sierra Club.[397]

Mr. Ross acknowledged that Staff witness Clayton was correct when concluding the Company had accidentally included $566,000 of depreciation expense in the Amos Project rather than the Mountaineer Project.[398] Nevertheless, he maintained such amount was appropriately included in the overall E-RAC revenue requirement.[399] He also agreed with Staff's recommendation to include CCR and ELG salvage values in APCo's next Virginia depreciation study.[400]

Mr. Ross next addressed Sierra witness Wilson's recommendation to install CCR assets but not ELG assets at the Plants.[401] He maintained approval of such a course by the Commission and the Public Service Commission of West Virginia and the associated retirement of one or

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388 *Id.* at 229-31.
389 *Id.* at 231-32.
390 *Id.* at 234.
391 *Id.*
392 *Id.*
393 *Id.* at 239-42.
394 *Id.* at 241.
395 *Id.* at 247.
396 *Id.* at 248.
397 Ex. 20, at 1.
398 *Id.* at 2.
399 *Id.*
400 *Id.* at 3.
401 *Id.*

more of the Plants by 2028 would require the Company to change the per books estimated depreciation retirement date of the Plants to 2028 (as compared to the recording of depreciation expense currently based on 2032 and 2033 retirement dates for the Amos Plant and 2040 for the Mountaineer Plant).[402] He explained further:[403]

> the Company would also defer the incremental depreciation expense incurred using the 2028 per books estimated retirement date when compared to the level of depreciation expense recovered in rates using the 2032/2033 retirement dates for Amos and the 2040 estimated per books retirement date for Mountaineer as previously approved by the [Commission] until a depreciation study could be prepared and submitted to Staff for review.

Mr. Ross also confirmed APCo's request for deferral authority associated with previously incurred ELG expenditures if the Commission declines to approve the Company's construction and recovery of ELG investments at the Plants.[404] He represented that APCo would seek recovery of the Virginia jurisdictional share of such costs in a future Virginia rate case filing.[405]

When cross-examined by Consumer Counsel, Mr. Ross agreed that the Commission would have the discretion to spread out the recovery of stranded costs associated with the retirement of the Plants despite Generally Accepted Accounting Principle ("GAAP") requirements.[406] He also confirmed the Company's belief that it should be allowed to recover ELG investment costs already incurred either on a one-year or multi-year basis through the E-RAC. He represented that, if such collection is approved, APCo would record the amortization of such costs on its books to offset the amount recovered from customers.[407] In addition, he expressed his belief that the E-RAC would be the most appropriate tool for recovering previously incurred ELG costs.[408] He did not have an opinion regarding whether an earnings test should be performed before such costs were determined to be recoverable.[409] In addition, based on forecasting showing the Company earning below its approved ROE from 2020 to 2022, Mr. Ross suggested APCo would not be able to collect such costs through base rates if they are not approved for collection through the E-RAC.[410]

During questioning by Staff, Mr. Ross affirmed APCo's request for the Commission to conclude previously incurred expenses associated with its proposed ELG investment were

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[402] *Id.*
[403] *Id.* at 4.
[404] *Id.*
[405] *Id.* at 5. *See also* Tr. at 250-53 (correcting prefiled rebuttal testimony to clarify that the Company did not consider previously approved investment costs associated with the Plants to be a regulatory investment but, instead, would defer such amount in its Federal Energy Regulatory Commission ("FERC") 108 account and include it in future depreciation studies filed with the Commission).
[406] *Id.* at 255.
[407] *Id.* at 255-56.
[408] *Id.* at 256.
[409] *Id.*
[410] *Id.* at 257.

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prudent.[411] He also clarified that the Company first requested a prudency determination associated with previously incurred costs in his rebuttal testimony.[412]

Ms. Sebastian responded to issues raised by Consumer Counsel witness Norwood, evaluated Staff's proposed modification to APCo's proposed revenue requirement, provided an alternative rate design methodology for the General Service ("GS") and Medium General Service ("MGS") rate classes, explained why the alternative methodology may be preferred to the initial methodology proposed by the Company, and confirmed that the new alternative rate design does not impact the proposed rates for other classes.[413]

According to Ms. Sebastian, Consumer Counsel witness Norwood appeared to conflate the issue of whether APCo's economic analysis is reasonable with the Company's assertion that the CCR and ELG investments are necessary for federal regulatory compliance.[414] It was her understanding Mr. Norwood did not directly challenge the legitimacy of such investments.[415] Moreover, she asserted that the Commission's Rate Case Rules[416] do not specify the scenarios or forecast requirements for the approval of E-RAC costs.[417] However, she also explained that Company witness Martin performed an additional run of his economic analysis in response to Consumer Counsel's request and the March 19th Ruling using 2032 and 2033 retirement dates for the Amos Plant.[418]

Ms. Sebastian emphasized that Staff does not take issue with the Company's proposed depreciation rates.[419] She also indicated that APCo agrees with Staff's recommendation to incorporate a depreciation rate analysis of E-RAC investments in its next depreciation study.[420]

Ms. Sebastian disputed Consumer Counsel witness Norwood's suggestion that an estimated retirement date used when developing depreciation expense for ratemaking purposes should necessarily be tied to an asset's lifespan in the context of an economic analysis.[421] According to Ms. Sebastian:[422]

> [a] depreciation study estimates the annual depreciation accruals related to electric plant in service for ratemaking purposes and determines the appropriate average remaining lives and net salvage percentages for each plant account as of a specific point in time. Although the depreciation study is comprehensive and generally consistent in its methodology; it is essentially a snapshot in time of the Company's entire electric plant in service. It is not uncommon for the estimated

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[411] *Id.* at 258-59.
[412] *Id.* at 260.
[413] Ex. 21, at 1.
[414] *Id.* at 2.
[415] *Id.*
[416] 20 VAC 5-201-10 *et seq.*
[417] Ex. 21, at 2.
[418] *Id.* at 2, 4.
[419] *Id.* at 2.
[420] *Id.*
[421] *Id.* at 3-4.
[422] *Id.* at 3.

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retirement date of a generating station, or any other depreciable asset for that matter, to change over time as new information becomes available on the respective generating station or asset. Witness Norwood proposes that the estimated remaining life used to set ratemaking depreciation rates should align with the Amos and Mountaineer asset lifespan assumptions in witness Martin's economic analysis. This would introduce a very dynamic, random and potentially volatile process. Finally, the estimated asset retirement date for depreciation purposes (the time over which an asset depreciates to its salvage value) may consider different factors when compared to the asset lifespan for economic purposes (the number of years in which the asset returns more value to the owner than it costs to own, operate, and maintain).

Ms. Sebastian testified that she agreed with Staff's suggested revenue requirement changes relative to the use of a 7.074% overall cost of capital, the correction of depreciation expense described above, and an adjustment to include the Virginia minimum tax in the gross-up factor for the lifetime revenue requirement.[423] She also highlighted Staff witness Lohmeyer's recognition of the Commission's approval of a RAC allowing Dominion Energy's recovery of environmental compliance expenses.[424]

Ms. Sebastian next described the concerns that she developed subsequent to the submission of her prefiled direct testimony relating to the design of GS and MGS rates.[425] She noted that APCo's original rate design proposal for the E-RAC resulted in a substantial increase in the Block 2 energy rate relative to how Block 2 rates have traditionally been developed in RACs.[426] To address such concerns, she supported an alternative rate design on rebuttal developing GS and MGS rates based upon the combined revenue requirement of both the GS and MGS classes.[427] She emphasized that her recommended rate design alternative does not change the rates she proposed with her direct testimony for customers outside of the GS and MGS classes.[428]

Ms. Sebastian further opined that the E-RAC rates should be incorporated into the Balancing Charge of the Company's Rider WWS associated with the Company's non-renewable generation RACs.[429] In her assessment, the E-RAC should be classified as a non-renewable generation rider.[430]

When questioned by Consumer Counsel, Ms. Sebastian expressed a lack of familiarity with the Commission's findings when approving an E-RAC for Dominion Energy.[431] In addition, in response to questioning from Staff, Ms. Sebastian expressed her belief that APCo

[423] *Id.* at 4.
[424] *Id.* at 4-5.
[425] *Id.* at 5.
[426] *Id.*
[427] *Id.* at 5, Revision MGS-GS of APCo's Schedule 46, Rebuttal Section (3 and 13) Revenue.
[428] *Id.* at 6.
[429] *Id.*
[430] *Id.*
[431] Tr. at 263.

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would probably use the E-RAC as its first mechanism for seeking previously incurred expenses associated with ELG compliance.[432]

DISCUSSION

Relevant Statutory Provisions

As reflected above, APCo filed its Petition pursuant to Subsection A 5 e. Subsection A 5 e authorizes the Company to petition the Commission "not more than once in any 12-month period" for the approval of a RAC facilitating the "timely and current recovery" of the following costs from customers:

> [p]rojected and actual costs of projects that the Commission finds to be necessary ... to comply with state or federal environmental laws or regulations applicable to generation facilities used to serve the utility's native load obligations, including the costs of allowances purchased through a market-based trading program for carbon dioxide emissions. The Commission shall approve such a petition if it finds that such costs are necessary to comply with such environmental laws or regulations; ....

Furthermore, § 56-585.1 D of the Code provides in pertinent part:

> The Commission may determine, during any proceeding authorized or required by this section, the reasonableness or prudence of any cost incurred or projected to be incurred, by a utility in connection with the subject of the proceeding. A determination of the Commission regarding the reasonableness or prudence of any such cost shall be consistent with the Commission's authority to determine the reasonableness or prudence of costs in proceedings pursuant to the provisions of Chapter 10 (§ 56-232 et seq.) ....

Analysis

Undisputed E-RAC Expenses

No participant in this case challenges the necessity, reasonableness, or prudence of approximately $26.1 million in O&M Compliance Expenses related to the handling and disposal of fly ash, bottom ash and FGD by-product at the Plants.[433] Furthermore, the evidence supports the Company's recovery of such expenses pursuant to Subsection A 5 e because they are necessary to achieve environmental regulatory compliance.[434] Under the circumstances, the Commission should approve an E-RAC for APCo including the O&M Compliance Expenses.

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[432] *Id.* at 264-65.

[433] The Sierra Club and Consumer Counsel did not oppose such amount with the understanding that it does not include any expenses associated with the disputed proposed ELG investments at the Plant. Tr. at 269.

[434] Ex. 5, at 3-4; Ex. 10, at 5-6; Ex. 11, at 3. In addition, no case participant contests the reasonableness and prudence of such costs as long as they are not associated with the ELG investments.

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Modified Design Proposal for GS and MGS Rates

As reflected above, on rebuttal the Company proposed an alternative rate design for its E-RAC developing GS and MGS rates based upon the combined revenue requirement of both classes.[435] APCo supported such a modification because its originally proposed rate design resulted in a substantial increase in the Block 2 energy rate relative to how Block 2 rates have traditionally been developed in RACs.[436] Because the Company's recommended rate design change does not change the proposed rates for customers outside of the GS and MGS classes and is not opposed by the other participants in this case, I conclude it should be approved by the Commission.[437]

CCR Investments

No participant in this case opposes APCo's proposed CCR investment at the Plants (the total cost of which totals approximately $125 million) to comply with the CCR Rule and allow the Plants to operate until December 31, 2028.[438] In addition, the recovery of costs associated with such investment through an E-RAC is supported by the evidence, and consistent with the Code, because the CCR investments are necessary for regulatory compliance and because, in my assessment, the expenditure of associated costs is reasonable and prudent.[439] More specifically, I recognize that the Plants will be required to cease operating by no later than October 2023, if the CCR investments are not made and conclude making CCR investments at the Plants is reasonable and prudent to provide the Company more time to plan regarding alternative resources/capacity should it become necessary to retire the Plants by 2028.[440]

ELG Investments

The Sierra Club asserts, consistent with the Commission's 2019 denial of certain environmental compliance expenses in the *2019 Dominion E-RAC Orders*,[441] that the Company's request for the approval of proposed ELG investment costs should be denied because such costs

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[435] Ex. 21, at 5.
[436] *Id.*
[437] *Id.* at 6; Tr. at 24-25, 270.
[438] Tr. at 269-70.
[439] As explained in more detail below, the Commission has recognized that the Code requires environmental costs to be both necessary for regulatory compliance and reasonable and prudent to justify their recovery through the E-RAC.
[440] *See, e.g.,* Ex. 5, at 9 (Spitznogle explaining that the bottom ash ponds at the Plants must be closed by October 17, 2023, if the CCR investments are not made and noting further that the ELG Rule has a retirement provision allowing a generating unit to continue its discharge of bottom ash transport water and FGD wastewater subject to limiting criteria when the associated utility commits to stop combusting coal or retire the generating units by December 31, 2028).
[441] *Petition of Virginia Electric and Power Company, For approval of a rate adjustment clause, designated Rider E, for the recovery of costs incurred to comply with state and federal environmental regulations pursuant to § 56-585.1 A 5 e of the Code of Virginia,* Case No. PUR-2018-00195, Final Order (Aug. 5, 2019) and Order on Reconsideration (Nov. 14, 2019) ("*Dominion E-RAC Reconsideration Order*") (collectively, "*2019 Dominion E-RAC Orders*").

do not make economic sense and, therefore, are not reasonable or prudent.[442] According to the Sierra Club, APCo's economic analysis is flawed because it relies upon overstated replacement resource costs, was conducted based upon insufficiently supported inputs and assumptions, does not appropriately consider a likely carbon price, fails to adequately consider the impacts of the VCEA, and contemplates the Plants running more in the near term than they have in the recent past.[443] In addition, although the Sierra Club continues to support the results of Ms. Wilson's alternative economic analysis reflecting that customers would benefit from the retirement of the Plants in 2028, the Sierra Club emphasizes that it is not supporting a specific alternative portfolio of resources in this case.[444] Instead, the Sierra Club urges APCo and the Commission to re-run the economic modeling associated with the ELG investments "using realistic replacement resource costs" to "determine the best path forward over the next seven years."[445] Moreover, the Sierra Club asserts that the Company's attempt to compare the Virginia cost of making the ELG investments ($60 million) to billions of dollars in replacement capacity costs is inaccurate and unfair because there is no guarantee the Plants will run through 2040, there is a possibility the EPA will deny the Company's pending extension request, and such comparison fails to take into account the continuing costs of running the Plants (which, like replacement capacity costs, would be spread out over time).[446] Finally, given that the EPA's deadline for ELG Rule compliance is not until 2025, the Sierra Club challenges the reasonableness of the Company's decision to push forward with the Projects (and incur associated expenses) before Mr. Martin completed his economic analysis and before the Commission approved the ELG investment.[447]

Consumer Counsel urges the Commission to withhold approval of ELG investment costs at the Plants until the Company has established such costs are reasonable and prudent.[448] Like the Sierra Club, and based upon Commission precedent, Consumer Counsel emphasizes that the reasonableness and prudence of ELG investment is an issue before the Commission in this proceeding.[449] Consumer Counsel contends the economic analysis provided by APCo fails to establish such reasonableness and prudence because it demonstrated only a marginal benefit based upon the continued operation of the Plants until 2040, did not model requirements of known laws, did not consider carbon constraints until 2028, and did not incorporate updated commodity prices in its modeling.[450] Furthermore, Consumer Counsel suggests that modeling

[442] Tr. at 277. Sierra Club also claims the ELG investment is not necessary to achieve environmental compliance because the better alternative is to retire the Plants in 2028. *Id.* at 288.
[443] *Id.* at 281-86. Regarding a carbon price, the Sierra Club relies upon a recent case from the United States Circuit Court for the District of Columbia as support for its assertion that the EPA is under a statutory mandate to regulate greenhouse gas emissions from new and existing power plants. *Id.* at 283 (citing *Am. Lung Ass'n v. EPA*, 985 F.3d 914, 935-936 (D.C. Cir. 2021)).
[444] Tr. at 285.
[445] *Id.*
[446] *Id.* at 287-88.
[447] *Id.* at 278-80, 289. As an alternative to denying the Company's request for the recovery of previously incurred ELG investment costs (totaling approximately $18 million), a request that was first made by APCo on rebuttal, the Sierra Club suggests the Commission could require APCo to establish the reasonableness and prudence of $18 million in previously incurred ELG costs in its next E-RAC filing. *Id.* at 289.
[448] Tr. at 291-92.
[449] *Id.* at 292-96.
[450] *Id.* at 296-99. Consumer Counsel also highlighted testimony provided by the Company in its 2020 Triennial Review case calling into question the ability of the Plants to operate through 2040. *Id.* at 299. Furthermore,

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comparable to what the Commission directed in the *2021 APCo IRP Modeling Order* is required to establish the reasonableness and prudence of the ELG investment costs.[451]

Although Staff does not take a position on the Company's preferred environmental compliance option (including the ELG investment), Staff witness White expressed doubt regarding APCo's identification of the best and least cost option.[452] Among other things, Mr. White identified the following factors for the Commission's consideration when evaluating APCo's supporting economic analysis: (1) "the Company's analysis contains information that cannot be verified by other parties in this proceeding;" (2) "the Company's own analysis suggests that the benefit to ratepayers of its preferred plan, as compared to the other options considered by the Company, is minimal with the difference in NPVRRs for the alternative compliance scenarios ranging from just 0.5% to 1.8% above the Company-identified least cost compliance option;" and (3) "[g]iven that the capital costs of replacement resources identified by the Company could not be verified, the general uncertainty in commodity price forecasts, and the changing economics of the potential replacement generating capacity in the Company's economic analysis, this range may not provide confidence in the projected benefits to ratepayers."[453]

Unlike the Sierra Club and Consumer Counsel, APCo argues that Subsection A 5 e overrides the requirement of establishing reasonableness and prudence pursuant to § 56-585.1 D of the Code when expenses are necessary for achieving environmental compliance.[454] Nevertheless, the Company contends the evidence shows failing to make the ELG investments and shutting down one or both of the Plants in 2028 is not reasonable and prudent given the costs of obtaining replacement capacity.[455] According to APCo, expending $60 million for Virginia's share of the ELG investment costs will delay billions in replacement capacity costs, preserve the Company's options, and, ultimately, be less risky for customers than shutting down the Plants in 2028.[456] APCo also emphasizes its view that this case is about the value of the Plants as capacity resources and criticizes the Sierra Club and Consumer Counsel for focusing on future generation at the Plants.[457] In addition, the Company disputes the results of the alternative economic analysis conducted by Sierra Club witness Wilson, claiming such analysis is based on unrealistic assumptions and speculation regarding prices and technology, and notes that Consumer Counsel

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although Consumer Counsel acknowledges that the rebuttal analysis submitted by Mr. Martin re-configured the in-service dates of renewable generation, Consumer Counsel maintains such analysis did not fully consider what is required by the VCEA and did not include what the Commission has directed the Company to model for future resource planning. *Id.* at 297-99.

[451] *Id.* at 297.

[452] *Id.* at 24; Ex. 14, at 9-11.

[453] Ex. 14, at 11.

[454] *Id.* at 312.

[455] *Id.* Although the Company relies, primarily, on Mr. Martin's initial economic analysis (including 2040 retirement dates for the Amos units) as support for this assertion, it also contends Mr. Martin's rebuttal analysis shows making the ELG investments would continue to be economic if the Amos units retire in 2032 and 2033. *Id.* at 314. Additionally, APCo contends that continuing to operate the Plants after 2028 will delay retirement costs and avoid accelerated depreciation. *Id.* at 311.

[456] *Id.* at 307, 313.

[457] *Id.* at 310. While acknowledging that coal plants may be somewhat marginal on an energy basis going forward, APCo maintained that the principal value of the Plants until they retire will be as capacity resources. *Id.* at 311.

witness Norwood did not conduct an independent economic analysis of the ELG investment (either with or without consideration of the VCEA).[458] Furthermore, APCo maintains that Company witness Martin considered the requirements of the VCEA at the rebuttal stage of this case, found such requirements were similar to what he initially modeled, and ultimately concluded the VCEA's requirements would not change his recommendations in this case.[459] Regarding the timing of APCo's decision to pursue the ELG investments, the Company maintains it was required to file for an extension relative to CCR requirements by November 2020 and claims it made practical sense to pursue the CCR and ELG investments together.[460] Finally, the Company suggests Consumer Counsel's recommendation to put approval of the ELG investment on hold is impractical because APCo is required by law to implement the ELG investment as soon as possible; the Company previously committed itself in EPA filings to meeting certain deadlines; and, if the ELG investments are not ultimately approved by Virginia and West Virginia, the Company will need as much time as possible to obtain necessary replacement capacity.[461]

As a preliminary matter, although it is undisputed that the ELG investments are required to achieve compliance with the ELG Rule, I recognize, pursuant to§ 56-585.1 D of the Code and in accordance with the Commission's decision in the *2019 Dominion E-RAC Orders*, that the Company also has the burden to demonstrate the reasonableness and prudence of the ELG investment costs it seeks to recover from customers through the E-RAC.[462] Under the circumstances, I reject APCo's suggestion that the Commission must approve the ELG pursuant to Subsection A 5 e merely because they are "necessary" for EPA regulatory compliance.[463]

The Company asserts that it has established the reasonableness and prudence of making the ELG investments and relies, primarily, upon the economic analysis performed by Mr. Martin as support for such assertion.[464] In my view, however, such analysis suffers from several deficiencies and substantial uncertainties calling into question the overall sufficiency of APCo's evidentiary support for the ELG investments.

First, although the Company's economic analysis (as submitted in support of the Petition) assumes both Plants will operate through 2040, such assumption is inconsistent with APCo's prior representations to the Commission concerning the Amos Plant's expected retirement in

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[458] *Id.* at 312, 317. APCo contends Ms. Wilson's analysis contemplates the Company's ability to procure an unrealistic amount of solar and storage (6,300 MW) within seven years, fails to adequately consider price increases for solar panels and batteries, includes speculative assumptions relative to the capacity market when theorizing APCo's ability to sell excess capacity, assumes unrealistic solar capacity factors between now and 2031, and fails to adequately account for O&M costs, accelerated depreciation, taxes, and general expenses. *Id.* at 314-17.

[459] *Id.* at 312-13.

[460] *Id.* at 309-10.

[461] *Id.* at 322.

[462] *Dominion E-RAC Reconsideration Order* at 7. *See also id.* at 12-13 (explicitly recognizing that the Commission's discretionary authority under § 56-585.1 D of the Code continues to apply to Subsection A 5 e RACs).

[463] Specifically, the Company argues the provisions of Subsection A 5 e "override" the reasonableness and prudence requirements of § 56-585.1 D of the Code. *Id.* at 312.

[464] *Id. See also id.* at 248 (wherein Mr. Martin agreed the Petition was supported by his initial analysis contemplating 2040 retirement dates for the Plants).

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2032/2033, at least with respect to depreciation.[465] I find unpersuasive APCo's contention that its prior representations regarding likely retirement dates for the Amos units are irrelevant in this case because they were made for depreciation purposes rather than in conjunction with resource planning.[466] I note further that when such prior representations regarding earlier retirement dates for the Amos units were made, the Company identified the Amos Plant's physical condition, expected useful life of the Plant's major components, cost to repair or replace such components when they fail, and the possible impact of public policy/environmental regulation decisions as factors supporting the 2032 and 2033 Amos retirement dates proposed in the 2020 Triennial Review case.[467] APCo identified no changed circumstances in this case which would appear to negate or alter the factors relied upon when supporting earlier Amos retirement dates in the 2020 Triennial Review case.[468]

Second, the evidence presented calls into question the level of energy prices and replacement resource costs used by Mr. Martin in his analysis and suggests that such prices/costs may have been inflated. Sierra Club witness Wilson's analysis (and her inability to verify or reproduce certain APCo cost assumptions through its source, EIA) appears to support such a conclusion.[469] Staff witness White also recognized such a concern in his testimony.[470]

Third, the record reflects that Mr. Martin did not fully consider the requirements of current Virginia law when conducting his economic analysis. Specifically, although he reconfigured the in-service dates of renewable generation in his rebuttal analysis, Mr. Martin did not fully model the requirements of the VCEA including, among other things, the impacts of the RPS program (as shown by his failure to affirmatively consider carbon constraints until 2028).[471] Given the changing regulatory environment in Virginia relative to environmental issues and the lack of a fuller exploration of the impacts of recently enacted legislation in the Company's analysis, and in the absence of further modeling, I am concerned about the validity of APCo's conclusion that the ELG investments will ultimately be beneficial to ratepayers.

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[465] *Id. See also* Ex. 9, at 3 (wherein Mr. Martin explained that Case 1, the option preferred by the Company, assumed the Plants would continue to operate until December 31, 2040) and Ex. 13, at 13.
[466] *See, e.g.*, Ex. 21, at 3.
[467] Ex. 13, at 13, and SN-5.
[468] As discussed in more detail below, although the Company's rebuttal analysis contemplating the retirement of the Amos units in 2032 and 2033 continued to reflect an economic benefit associated with the ELG investments, such analysis reflected a lower level of savings than Mr. Martin's initial analysis.
[469] *See* Ex. 12 and 12C, at 22-24. I also note that a significant amount of APCo's closing argument was focused on a critique of Ms. Wilson's conclusions regarding replacement resources for the Plants. *See* Tr. at 314-17. However, as explained below, when concluding that the Commission should not approve the ELG investment at this time, I do not rely upon Ms. Wilson's specific conclusions regarding likely ratepayer savings associated with the retirement of the Plants. Instead, I conclude the Company failed to sustain *its burden* to prove the reasonableness and prudence of the ELG investment.
[470] Ex. 14, at 10-11. Furthermore, Consumer Counsel witness Norwood explained that the Company has the ability to leave the FRR construct and make wholesale purchases and highlighted what he believed to be fairly low forecasted capacity prices shown information provided by APCo in its 2019 IRP. Tr. at 158, 181.
[471] *See* Ex. 19, at 3-5. *See also* Tr. at 234 (wherein Mr. Martin acknowledged that he did not model purchases of RECs from 2021 to 2028 or analyze the VCEA's impact on future commodity prices); *id.* at 191-192 (Staff witness White confirming his understanding the Company did not model a carbon price until 2028).

Fourth, the overall results of Mr. Martin's economic analysis demonstrate only minimal forecasted savings for customers associated with making both environmental investments at the Plants – that is, forecasted cost savings of less than 1% over APCo's 30-year study period when compared to the next lowest cost option.[472] When earlier retirement dates for the Amos units are considered (2032/2033), the Company's forecasted savings resulting from making the ELG investments are even smaller.[473] Thus, even when all of APCo's assumptions (a number of which have been called into question by other case participants) are accepted for purposes of its economic analysis, the benefits of making the ELG investments so that the Plants can continue operating after 2028 remain unclear.

Moreover, I view the Company's comparison of approximately $60 million for the Virginia portion of the ELG investment to the expenditure of billions of dollars in replacement capacity costs should the Plants close in 2028 to be misleading.[474] Such comparison ignores the fact that there is no guarantee the Plants will actually run through 2040 and fails to take into account, among other things, the continuing costs of running the Plants.[475]

Taking into account the overall deficiencies and uncertainties associated with the Company's supporting analysis and the relatively small level of potential savings ultimately forecasted by APCo, I am unable to conclude, at this time, that the Company established the reasonableness and prudence of the ELG investment at the Plants.[476] Having reached this conclusion, however, I do not recommend that the Commission deny the Company's request for the approval of the ELG investments outright. Instead, it would appear appropriate, as has been suggested by Consumer Counsel, for the Commission to withhold its approval of the ELG investment until after APCo has conducted a more comprehensive and updated analysis supporting the ELG investment at the Plants, including its full consideration of the VCEA's impacts (consistent with the *2021 APCo IRP Modeling Order*).[477]

Although I conclude the Commission should withhold its approval of the ELG investment, I also recognize the time-sensitive nature of the Company's ELG compliance.

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[472] Ex. 13, at 4. *See also* Ex. 14, at 9. Although Mr. Martin suggests that forecasted savings should be considered based upon actual dollars rather than as a percentage of total costs, given the nature of his analysis and its reliance upon forecasts, I view a percentage comparison to be appropriate. *See* Ex. 19, at 5.

[473] Ex. 19, at 5-8 (Mr. Martin discussing initial NPV calculation from between $176 to $622 million associated with making the environmental investments and continuing to run the Plants through 2040 and comparing such forecasted savings to those associated with earlier retirement dates for the Amos units in the range of $118 to $191 million).

[474] *See* Tr. at 307.

[475] I also note that the Company's economic analysis already considered the NPV costs and benefits of making the requested environmental investments, thereby already accounting for the delay in incurring replacement capacity costs.

[476] I recognize that APCo identified a number of additional factors which, in its assessment, are likely to negatively impact ratepayers if the Plants retire earlier than expected. However, the Company's economic analysis did not consider stranded costs and a change of depreciation schedule associated with the earlier retirement of the Plants. Additionally, APCo has not done a detailed analysis of how to reduce or avoid transmission costs associated with such retirements. Tr. at 229-32.

[477] The Company's more comprehensive analysis could include detailed consideration (and quantification) of the potential stranded costs, depreciation, and transmission cost impacts associated with retiring the Plants in 2028. Such analysis could also evaluate a scenario in which Mountaineer runs until 2028 but the Amos runs longer – a scenario that was not specifically modeled in Mr. Martin's analysis.

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However, APCo appears, in my assessment, to have time to formulate and present a more comprehensive analysis supporting its request with its next E-RAC petition given the EPA's 2025 deadline for achieving ELG compliance.[478]

Finally, I recognize that the Commission could, in the exercise of its statutorily authorized discretion, determine the analysis presented by the Company in this case, while not adequately persuasive to me, sufficiently establishes the reasonableness and prudence of the ELG investment when coupled with other factors unique to this case.[479] Under the circumstances, I consider below alternative revenue requirements both including and excluding Rate Year costs associated with the ELG investments.

Recovery of Depreciation Expense and Previously Incurred ELG Costs

Company witness Ross asserted on rebuttal that if Virginia or West Virginia rejects APCo's request for the approval of the ELG investments, the Company intends to defer resulting incremental depreciation expense using 2028 retirement dates and seek recovery of such deferral in a future filing.[480] In addition, the Company maintains that even if the Commission refuses to approve the proposed ELG investment, the Commission should conclude in this proceeding that previously incurred costs associated with the ELG investment (totaling approximately $18 million)[481] were reasonable and prudent and are deferrable for future recovery.[482]

In my view, concerns relative to the Company's proposed deferral of depreciation expense and the reasonableness and prudence of previously incurred ELG investment costs need not be addressed in the present case and, instead, should be addressed in connection with a future filing.

Revenue Requirement

Should the Commission withhold approval of the ELG investment in this case, my assessment of the evidence supports approval of an E-RAC with a Rate Year revenue requirement of $ 27.437million, consisting of a forecast revenue component of $27,173 million, an AFUDC revenue component of $0.264 million, and a true-up revenue requirement of $0 million (with such amount being subject to true-up).[483]

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[478] I also note that the Company acknowledged pending litigation associated with the ELG Rule (dealing with whether the Rule is strict enough) and pending action from the Biden Administration associated with the Rule. Tr. at 249. Although unclear, it appears as though the results of such pending matters could potentially impact the ELG investments at the Plants.

[479] In addition to the results of APCo's economic analysis, the Commission could consider the options/flexibility afforded to the Company by the ELG investments, the timing parameters applicable to ELG compliance (including prior representations made by the Company to the EPA), and the potential overlap between CCR and ELG compliance as factors supporting the reasonableness and prudence of the ELG investments. *See* Tr. at 309-10. While I also considered such factors, the Commission could assign greater weight to them.

[480] Ex. 20, at 4-5.

[481] Tr. at 71.

[482] Ex. 20, at 4-5.

[483] *See* Ex. 22 (with addendum). Because the Company's recalculation of the Rate Year revenue requirement without the inclusion of ELG investment costs was not subjected to thorough review through discovery in this case,

In the alternative, should the Commission find it appropriate to approve the proposed ELG investment, the record supports the approval of an E-RAC with a Rate Year revenue requirement of $31.614 million, consisting of a forecast revenue component of $30.791 million, an AFUDC revenue component of $0.823 million, and a true-up revenue requirement of $0.[484]

I also recognize Consumer Counsel's recommendation that the Commission adjust depreciation if the ELG investment is approved based upon the proposed retirement of the Amos units in 2040, rather than in 2032 and 2033 as was proposed in the Company's 2020 Triennial Review case.[485] In contrast, APCo asserts that depreciation rates do not always match up to changing retirement dates over time but agrees with Staff's recommendation for the incorporation of depreciation analysis of E-RAC investment in its next depreciation study, including net salvage considerations.[486] Given APCo's use of depreciation rates previously approved by the Commission, the relatively small revenue requirement impact associated with Mr. Norwood's recommended depreciation adjustment, and Staff's lack of opposition to the Company's revenue requirement calculation, I am not inclined to recommend the Commission's adoption of Mr. Norwood's proposed revenue requirement adjustment (should the Commission adopt the initial review requirement proposed by APCo in this case and approve the Company's recovery of ELG investment costs).[487]

FINDINGS AND RECOMMENDATIONS

In conclusion, based on the record developed in this proceeding and in accordance with the discussion above, I find:

1. The Commission should approve an E-RAC for APCo's recovery of environmental compliance costs including O&M Compliance Expenses related to the handling and disposal of fly ash, bottom ash and FGD by-product and the costs of CCR investments at the Plants;

2. The Commission should deny, at this time, APCo's request for the approval of ELG investments at the Plants based upon the Company's failure to establish such investments are reasonable and prudent;

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it is possible that participants in future E-RAC cases, including Staff, could raise concerns regarding the amount of the alternative revenue requirement provided in Ex. 22. Should the evidence support such concerns, they could, in my view, be addressed in a future E-RAC true-up.

[484] *See* Ex. 11, at 3-4; Ex. 15, at 6 (although Staff recommends a different capital structure an overall weighted cost of capital than what was proposed by the Company, incorporation of Staff's 7.074% overall weighted cost of capital recommendation in the Projected and AFUDC Cost Recovery Factors does materially change the revenue requirement supported by APCo).

[485] Tr. at 301-02.

[486] *Id.* at 318-19.

[487] *See* Ex. 13, at 5 (according to Mr. Norwood, the inconsistency in assumed retirement dates results in the overstatement of depreciation expense to the Company's proposed revenue requirement by approximately $227,000).

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3. The Commission should delay its consideration of APCo's proposed deferral of depreciation expense and the reasonableness and prudence of previously incurred ELG investment costs until a future case;

4. If the Commission decides not to approve the ELG investment at this time, the Commission should approve an E-RAC with a Rate Year revenue requirement of $27.437 million, consisting of a forecast revenue component of $27.173 million, an AFUDC revenue component of $0.264 million, and a true-up revenue requirement of $0;

5. In the alternative, should the Commission find it appropriate to approve the Company's proposed ELG investment, the Commission should approve an E-RAC with a Rate Year revenue requirement of $31.614 million, consisting of a forecast revenue component of $30.791 million, an AFUDC revenue component of $0.823 million, and a true-up revenue requirement of $0; and[488]

6. The Commission should approve the Company's alternative rate design for GS and MGS rates.

Accordingly, **I RECOMMEND** the Commission enter an order that:

1. ***ADOPTS*** the findings of this Report; and

2. ***DISMISSES*** this case from the Commission's docket of active cases.

[488] As reflected above, I conclude the Commission should delay its consideration of the reasonableness and prudence of previously incurred ELG investment costs until a future Commission proceeding. However, if the Commission concludes, in this case, that previously incurred ELG costs were reasonably and prudently incurred, the record would appear to support the approval of a revenue requirement exceeding the initial amount noticed. *See* Ex. 22 (supporting a total revenue requirement of $32.668 million when considered separately from the Company's addendum excluding previously incurred ELG costs). In such an eventuality, and consistent with Commission precedent and applicable law, the revenue requirement approved herein would presumably be limited to $31.614 million, the initial amount noticed. Moreover, the Company's revenue requirement calculation including previously incurred ELG costs would, in my view, be subject to review and further evaluation in a future E-RAC case, also potentially supporting a subsequent modification by true-up.

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COMMENTS

Staff and the parties are advised that, pursuant to Rule 5 VAC 5-20-120 C of the Commission's Rules of Practice and Procedure and § 12.1-31 of the Code, any comments to this Report must be filed on or before July 26, 2021. In accordance with the directives of the Commission's *COVID-19 Electronic Service Order*[489] the parties are encouraged to file electronically. If not filed electronically, an original and fifteen (15) copies must be submitted in writing to the Clerk of the Commission, c/o Document Control Center, P.O. Box 2118, Richmond, Virginia 23218. Any party filing such comments shall attach a certificate to the foot of such document certifying copies have been sent to all counsel of record and any such party not represented by counsel.

Respectfully submitted,

A. Ann Berkebile
Senior Hearing Examiner

Document Control Center is requested to send a copy of the above Report to all persons on the official Service List in this matter. The Service List is available from the Clerk of the State Corporation Commission, c/o Document Control Center, 1300 East Main Street, First Floor, Tyler Building, Richmond, VA 23219.

[489] *Commonwealth of Virginia, ex rel., State Corporation Commission, Ex Parte: Electronic service among parties during COVID-19 emergency*, Case No. CLK-2020-00007, Doc. Con. Cen. No. 200410009, Order Requiring Electronic Service, (April 1, 2020) ("*COVID-19 Electronic Service Order*").