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March 21, 2022

BY HAND

Mr. Bernard Logan, Clerk
c/o Document Control Center
State Corporation Commission
P.O. Box 2118
Richmond, Virginia 23218

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

Dear Counsel:

Please find attached for filing in the above-referenced matter, a redacted version of the testimony and exhibits of Mr. D. Scott Norwood filed on behalf of the Office of Attorney General, Division of Consumer Counsel.

Yours truly,

/s/ C. Mitch Burton Jr.

C. Mitch Burton Jr.
Assistant Attorney General

Enclosure

cc: Service List

CERTIFICATE OF SERVICE

I hereby certify that a true copy of the foregoing was served on March 21, 2022, by electronic service, to:

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COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

PETITION OF	)	
	)	
APPALACHIAN POWER COMPANY	)	**CASE NO. PUR-2021-00206**
	)	
For approval of its 2021 RPS Plan under § 56-585.5 of the Code of Virginia and related requests	)))	

DIRECT TESTIMONY

OF

D. SCOTT NORWOOD

ON BEHALF OF

THE OFFICE OF THE ATTORNEY GENERAL

DIVISION OF CONSUMER COUNSEL

[REDACTED VERSION]

March 21, 2021

Summary of Direct Testimony of D. Scott Norwood

Mr. Scott Norwood presents testimony addressing his findings and recommendations regarding Appalachian Power Company's ("APCo" or "Company") petitions for various approvals associated with its renewable portfolio standard ("RPS") Plan Filing.

Mr. Norwood addresses APCo's plan to procure new renewable resources through year 2035. APCo does not have a need for additional generation capacity through year 2040. APCo plans to request approval of new generation in amounts that are in excess of its § 56-585.5 Subsection D requirements. The purchase of market RECs would appear to be a more economical option, and less risky for customers, than APCo's plan to continue purchasing renewable resources when it has no need for additional capacity. He recommends that the Commission direct APCo to address the extent to which its VCEA compliance costs can be mitigated through market purchases of RECs in its next RPS Plan case.

APCo is requesting approval of four new Company-owned renewable energy facilities with a combined capacity of 409 MW, plus six renewable energy power purchase agreements ("PPAs") with a combined capacity of approximately 144 MW, for a total combined capacity of approximately 553 MWs of nameplate capacity. The Company did present an economic analysis of the proposed facilities that includes a net present value study. But the Company claims that this information is not intended to demonstrate the prudence of its proposal. Mr. Norwood addresses the fact that the Company's economic analysis includes an avoided cost based capacity value that is speculative and likely overstated in that it assumes the Company will be able to realize an avoided cost benefit or sell excess capacity resulting from the proposed resources at a value that will reasonably offset costs incurred for the projects, which is not guaranteed.

Mr. Norwood addresses the Company's inclusion of a social cost of carbon ("SCoC") in its petition. Mr. Norwood expresses concerns with the Company's calculation of the SCoC benefit and recommends that it be given qualitative weight.

Mr. Norwood does not object to the general rate framework proposed by the Company for recovering VCEA-related costs. APCo is a multijurisdictional utility, and West Virginia could deny cost recovery of any facility approved by Virginia. In that situation, the VCEA permits APCo to charge Virginia customers the West Virginia jurisdictional share of costs, but must pass 100 percent of the benefits associated with such a facility to Virginia customers. Cost responsibility effectively doubles for Virginia customers if they are asked to pay the typical West Virginia share of a new generation facility. Before the Commission approves cost recovery of a VCEA resource, the Commission should ensure that the Company has a concrete plan that will permit it to pass 100 percent of benefits to the Virginia jurisdiction, if necessary.

In recognition that the Company needs to move forward with meeting VCEA requirements, and the relatively high LCOE of certain proposed new renewable resources when compared to other proposed resources, Mr. Norwood recommends withholding approval of two of the ten projects. He recommends that the Company be allowed to request remaining approvals of the other projects in a future case at which time it should be allowed to present additional supporting analysis for these projects.

CASE NO. PUR-2021-00206

DIRECT TESTIMONY OF SCOTT NORWOOD

<u>TABLE OF CONTENTS</u>

<u>EXHIBITS</u>

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, TITLE, AND BUSINESS ADDRESS.

A. My name is Scott Norwood. I am President of Norwood Energy Consulting, L.L.C. My business address is P.O. Box 30197, Austin, Texas 78755-3197.

Q. WHAT IS YOUR OCCUPATION?

A. I am an energy consultant specializing in the areas of electric utility regulation, resource planning, and energy procurement.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I am an electrical engineer with over 37 years of experience in the electric utility industry. I began my career as a power plant engineer for the City of Austin's Electric Utility Department where I was responsible for electrical maintenance and design projects for the City's three gas-fired power plants. In January 1984, I joined the staff of the Public Utility Commission of Texas, where I was responsible for addressing resource planning, fuel, and purchased power cost issues in electric rate and plant certification proceedings before the Texas Commission. Since 1986 I have provided utility regulatory consulting, resource planning, and power procurement services to public utilities, electric consumers, industrial interests, municipalities, and state government clients. I have testified in over 200 utility regulatory proceedings over the last 20 years, before state regulatory commissions in Alaska, Arkansas, Florida, Georgia, Illinois, Iowa, Kentucky, Louisiana, Michigan, Missouri, New Jersey, Ohio, Oklahoma, Texas, Virginia, Washington, and Wisconsin.[1]

[1] See Exhibit SN-1 for additional details on my background and experience.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS CASE?

A. I am testifying on behalf of the Virginia Office of the Attorney General, Division of Consumer Counsel ("Consumer Counsel").

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE VIRGINIA STATE CORPORATION COMMISSION?

A. Yes. I have testified on behalf of Consumer Counsel in many past regulatory proceedings before the Virginia State Corporation Commission ("Commission") over the last twenty years, including cases that involved electric restructuring, base rates, fuel recovery, power plant certification, distribution reliability, demand-side management and renewable energy matters. Most recently, I testified in Case No. PUR-2020-00035, Dominion's 2020 Integrated Resource Plan proceeding, Case No. PUR-2021-00258, APCo's most recent proposal for an E-RAC, and Case No. PUR-2021-00229, Dominion's request for Rider SNA.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to present my findings and recommendations regarding Appalachian Power Company's ("APCo" or "Company") filing in this case ("RPS Filing").

Q. HAVE YOU PREPARED ANY EXHIBITS TO SUPPORT YOUR TESTIMONY?

A. Yes. I have prepared 5 exhibits, which are attached to my testimony.

II. APCO's RPS FILING

Q. PLEASE PROVIDE AN OVERVIEW OF VA. CODE § 56-585.5, WHICH WAS RECENTLY ENACTED AS PART OF VCEA.

A. On advice of counsel, the recently enacted VCEA resulted in a new Code provision, § 56-585.5, which is titled "Generation of electricity from renewable and zero carbon sources." Subsection C establishes a new mandatory RPS Program in which APCo shall participate. The RPS Program establishes annual goals related to the sale of renewable energy to *all* retail customers located in APCo's service territory, with certain defined exceptions. For, APCo to comply with the RPS Program it must procure and retire Renewable Energy Certificates ("RECs") produced from RPS eligible sources. Generally, most of APCo's RPS eligible resources will be electric-generating resources that generate electric energy derived from solar, wind, or falling water and which are located "in the Commonwealth or off the Commonwealth's Atlantic shoreline or in federal waters and interconnected directly into the Commonwealth or physically located within the PJM region." For purposes of complying with the RPS Program from 2021 to 2024, APCo may use RECs from any renewable energy facility, as defined in § 56-576, provided that such facilities are in the Commonwealth or are physically located within the PJM Interconnection, LLC (PJM) region.

Q. WHAT ARE APCO'S RPS REQUIREMENTS UNDER THE VCEA?

A. The number of RECs that must be retired in a year are calculated based on a percentage of the total electric energy sold in the previous calendar year. That is, the cost of compliance is dependent upon the amount of *energy* (megawatt hour) that APCo produced to serve its customers in the previous year. More energy sales would require more RECs to comply with the annual RPS requirements. As presented below, Subsection C includes a schedule through year 2050 by which APCo must have an increasing percentage of RECs compared to total electric energy sales.

TABLE 6: APCO VCEA RPS REQUIREMENTS BY YEAR

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

Subsection D provides that the Company must petition the Commission for approval of certain types of renewable generation on a defined schedule. In coordination with this schedule, APCo must conduct annual requests for proposals for renewable generation. Subsection D further requires that the Company submit an annual plan related to its compliance with the requirements of Subsection D and also submit any petitions to the Commission seeking approval of specific solar and onshore wind generation facilities. Most immediate, by year-end 2023, APCo must petition to construct, acquire, or enter into agreements to purchase the energy, capacity, and environmental attributes of at least 200 megawatts of generating capacity located in the Commonwealth using energy derived from sunlight or onshore wind. Subsection E provides that the Company must petition the Commission for approval of certain energy storage facilities before December 31m 2035.

Subsection F relates to the allocation of non-bypassable charges associated with compliance with §§ 56-585.5 and 56-585.1:11. All costs of compliance associated with these two Sections, "shall be recovered from all retail customers in [APCo's] service territory . . . as a non-bypassable charge, irrespective of the generation supplier of such customer" with certain defined exceptions. This non-bypassable charge – which shall be recovered from all retail customers – is to be "determine[d]" by the Commission by ascertaining "the amount of such [compliance] costs, net of benefits[.]"

Subsections G and H carve out and define rules for special exemptions for certain types of customers that are not subject to the non-bypassable charge.

Subsection J makes clear that the Commission is responsible for implementation of the provisions of § 56-585.5.

Q. PLEASE PROVIDE AN OVERVIEW OF APCO'S FILING.

A. The VCEA directs APCo to participate in a RPS Program with the goal of attaining zero carbon emissions by 2050, and further ordered the Commission to initiate a proceeding to determine the costs, net of benefits, related to compliance with this program, to be recovered from all retail customers, no later than January 1, 2021.[2] In response to this requirement, the Commission issued an Order Establishing Proceeding on August 31, 2020, which directed APCo to file a tariff and supporting information to collect costs, net of benefits, of implementing the Company's RPS Program. In case no. PUR-2020-00165, The Commission approved "a placeholder tariff for the Company that permits recovery of costs associated with Code § 56-585.5 F, net of benefits[.]" The placeholder non-bypassable charge was set to zero, pending future proceedings in which the Company seeks recovery of costs under the tariff. The Commission ordered that "[a]ny RPS compliance costs for the current rate year can be accounted for in a future true-up."

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[2] Va. Code § 56-585.5 F.

There were no costs proposed for recovery in APCo's first RPS proceeding (PUR-2020-00135). Thus, the Commission deferred making decisions on cost allocation of the VCEA and RPS Program costs that must be included in the non-bypassable charge and stated that it would "address the rate adjustment clause framework and cost allocation either in the Company's next RPS proceeding or, at the Commission's discretion, in a separate jurisdictional and class allocation proceeding initiated for this purpose." I am not aware of a separate proceeding being established for this purpose.

On December 31, 2021, APCo made its second annual RPS Filing. Among other items, the RPS Filing requests approval of:[3]

- Approval of its annual plan for the development of new solar, wind, and energy storage resources pursuant to Va. Code § 56-585.5 D 4 in order to comply with the mandatory Renewable Portfolio Standard ("RPS") Program established by the Virginia Clean Economy Act ("VCEA") (the "2021 RPS Plan");

- Approval of a revenue requirement of $32,069,614 for the rate year of August 2022 through July 2023, approximately 21 percent ($6,628,807), of which are new costs that have not been previously approved for recovery;

- Approval of cost recovery mechanisms to recover this and future revenue requirements related to compliance with the RPS Program;

- Approval of the future cost recovery related to the acquisition of two other renewable facilities, which are not located in Virginia and will not be online during the rate year; and

- Determination that the purchase of one solar facility and the power purchase agreements ("PPAs") with three other solar facilities, all located in Virginia, are prudent.

Q. IS APCO A MULTI-JURISIDICTIONAL UTILITY?

[3] Petition at 1.

A. Yes. The RPS Filing states that APCo is a "Phase I Utility that serves customers in more than one jurisdiction, as it also serves customers in West Virginia."[4] With respect to jurisdictional allocation of the non-bypassable costs, § 56-585.5 F states:

> If a Phase I or Phase II Utility serves customers in more than one jurisdiction, such utility shall recover all of the costs of compliance with the RPS Program requirements from its Virginia customers through the applicable cost recovery mechanism, and all associated energy, capacity, and environmental attributes shall be assigned to Virginia to the extent that such costs are requested but not recovered from any system customers outside the Commonwealth.

The Petition anticipates the scenario where Virginia grants approval and West Virginia denies approval of resources included in the RPS Filing.[5] Typically, as a multi-jurisdictional utility, APCo needs approval from both jurisdictions to add a new generation cost to its rate base and recovers a proportional share of the cost from each state's jurisdiction. APCo filed for approval of the RPS Filing's new generation facilities in West Virginia after it made the RPS Filing.[6] Thus, the status of approval in West Virginia is unknown at this time. Denial of a resource in West Virginia would effectively double the cost burden on Virginia customers. If West Virginia denies cost recovery approval for a generation resource approved in Virginia, the Commission must be able to ensure that "all associated energy, capacity, and environmental attributes shall be assigned to Virginia."

III. APCO's RPS PLAN

Q. IS APCO SEEKING APPROVAL OF AN RPS PLAN IN THIS CASE?

A. Yes. APCo included a proposed RPS Plan as attachment 1 to its Petition.

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[4] Petition at 4.

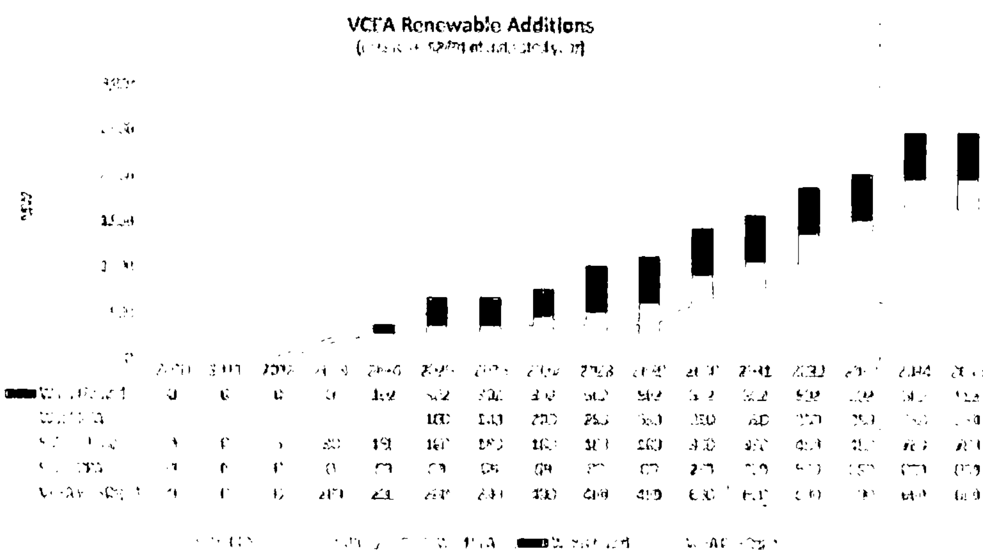
[5] Petition at 6.

[6] See Exhibit SN-2, APCo's response to OAG 2-8.

Q. GENERALLY, WHAT ARE APCO'S PLANS TO ADD VCEA COMPLIANT WIND AND SOLAR ADDITIONS OVER THE STUDY PERIOD THROUGH 2035.

A. The Company produced six different resource portfolios for the consideration of stakeholders. The Company states that it prefers Portfolio 2, which is described as a base plan. APCo included a Figure 10 in its RPS Filing showing its plans to add renewable generation capacity through year 2035. Figure 10 shows that APCo plans to request approvals for generation capacity significantly over its Subsection D requirements. For example, APCo plans to request approval of almost 1,000 MWs of renewable generation by 2028 and almost 2500 MWs by 2035. As shown in Figure 10, if APCO adds these proposed future renewable resources, the Company will have over 4 times the level of additions (600 MW) under the VCEA by 2035.

FIGURE 10: VCEA COMPLIANT WIND AND SOLAR ADDITIONS



Q. WHAT ARE THE FORECASTED RATE IMPACTS OF THE RPS PLAN?

A. The Company provided a forecast of a long-term revenue requirement of the RPS Plan, including financing costs, through year 2050. The values are in nominal dollars and have not been discounted back to present value. This does not represent the lifetime revenue requirements of the RPS Plan as the Company would continue to have revenue requirements for VCEA-related investments well after year 2050. On a nominal basis, the Company projects a total revenue requirement of $14 billion through 2050, which will be recovered from customers through rate adjustment clauses. Based on these revenue requirements, the Company estimates that residential monthly bills based on a 1,000 kwh customer would rise to $185.51 by year 2028, and then begin to decline. Smaller commercial customers would see monthly bills rise to $785.82, and then begin to decline.[7]

Q. WHAT IS THE COMPANY'S SHORT-TERM ACTION PLAN COMING OUT OF THIS CASE?

A. The Company has a five-point action plan:

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

Q. DO YOU HAVE ANY RECOMMENDATIONS ON THE SHORT-TERM ACTION PLAN?

[7] See APCo's RPS Plan, page 47 of 68, Table 23.

A. Yes. I recommend that the Commission direct APCo to address the status of the above action items and the potential impact of each action on resource investment decisions presented in the Company's direct testimony in the next RPS Plan Case.

In addition, I recommend that the Commission direct APCo to address the extent to which its VCEA compliance costs can be mitigated through market purchases of RECs in its next RPS Plan case. The preferred Portfolio 2 significantly over procures new generation in excess of the Company's capacity needs. In addition, Portfolio 2 significantly over procures renewable generation compared to its Subsection D requirements. As discussed below, there may be little or no benefit to customers derived from renewable resources acquired by APCo which are not needed to meet the Company's minimum PJM capacity requirement, unless the Company is able to sell such excess capacity at prices that are sufficiently high to offset the cost of the resources. The purchase of market RECs would appear to be a more economical option, and less risky for customers, than APCo's plan to continue purchasing renewable resources when it has no need for additional capacity. As it currently stands APCo does not plan to make any market REC purchases through year 2035.[8]

IV. NEED FOR AND PRUDENCE OF PROPOSED RESOURCES

Q. DOES APCO HAVE EXISTING GENERATION RESOURCES THAT IT PLANS TO USE TO COMPLY WITH THE VCEA'S RPS REQUIREMENTS?

[8] See APCo's RPS Plan, page 60 of 68, Table 31.

A. Yes. The Company indicates that to comply with the mandatory RPS Program it will use its Virginia retail share of its base rate hydro assets, existing wind PPAs that it used to comply with the voluntary RPS (Camp Grove, Fowler Ridge, and Bluff Point), two solar facilities contracted through its Cogen SPP tariff schedule (Leatherwood and Wytheville), and the contracted Depot Solar facility.[9]

Q. WHAT ARE THE NEW RENEWABLE RESOURCES FOR WHICH APCO IS REQUESTING APPROVAL IN THIS RPS FILING?

A. APCo is requesting approval of four new Company-owned renewable energy facilities with a combined capacity of 409 MW, plus six renewable energy power purchase agreements ("PPAs") with a combined capacity of approximately 144 MW, for a total combined capacity of approximately 553 MWs of nameplate capacity, as summarized in Table 1 below. As shown in Table 1, only four of these new resources would have a commercial operation date ("COD") in the upcoming rate year and therefore be included in the Company's proposed RAC charges which are expected to become effective in September of 2022.

[9] See the Direct Testimony of William Castle at 5.

Table 1
APCO's Proposed New Renewable Resources[10]

Project	Location	Type	Size	Online Date	Ownership	Proposal in the Petition
Amherst	Virginia	Solar	4.875 MW	2022	Appalachian	Cost recovery in Rate Year
Bedington	West Virginia	Solar	50 MW	2023	Appalachian	Future cost recovery
Depot	Virginia	Solar	15 MW	2022	Depot Solar	Cost recovery in Rate Year
Dogwood	Virginia	Solar	18.9 MW	2024	Dogwood Solar	Prudency determination
Firefly	Virginia	Solar	150 MW	2023	Appalachian	Prudency determination
Horsepen	Virginia	Solar	20 MW	2024	Clenera	Prudency determination
Leatherwood	Virginia	Solar	20 MW	2021	Caden Energix	Cost recovery in Rate Year
Sun Ridge	Virginia	Solar	50 MW	2024	NextEra	Prudency determination
Top Hat	Illinois	Wind	204 MW	2024	Appalachian	Future cost recovery
Wytheville	Virginia	Solar	20 MW	2022	Caden Energix	Cost recovery in Rate Year

Q. WHAT ARE THE TOTAL CAPITAL COSTS ASSOCIATED WITH THE NEW RENEWABLE GENERATION PROJECTS THAT APCO PROPOSES TO OWN?

A. As summarized in Table 2 below, the combined installed capital costs associated with the Amherst, Bedington, Top Hat, and Firefly Projects total approximately [redacted] The Company has designated the information in Table 2 as extraordinarily sensitive.

[10] Source is Attachment 2 to the Petition and the Direct Testimony of Company witness Castle.

Table 2 - ES

Estimated Capital Costs for APCO's Proposed New Renewable Resources[11]

TOTAL INSTALLED CAPITAL COST

PSA Purchase Price	[redacted]
Owner's Costs	[redacted]
Owner's Costs & Overheads	[redacted]
Contingency	[redacted]
AFUDC	[redacted]
Subtotal	[redacted]
Total Facility Cost	[redacted]

Q WHAT IS THE LEVELIZED COST OF ENERGY OF THE NEW RENEWABLE ENERGY RESOURCES INCLUDED IN THE RPS FILING?

A. LCOE stands for Levelized Cost of Energy, which is the generation-weighted average cost per megawatt-hour ("MWh") of total projected energy output over the operating life of a project expressed on a levelized basis. An LCOE allows for a comparison (on a $/MWh basis) between Company-owned projects and third-party projects secured through PPAs, which normally have levelized pricing terms. As summarized in Table 3 below, all the Company-owned projects except the [redacted] project have higher LCOEs than the levelized charges from PPAs. This raises questions regarding the reasonableness of costs of the Company-owned projects.

[11] Data source is Company witness Jefferies' Direct Testimony. Schedule 15.

Table 3 - ES
LCOEs for APCO's Proposed Renewable Resources[12]

Project	Owner	Type	MW	Contract Term/ Expected Life	LCOE ($MWh)	[redacted]
Depot	Third-Party	Solar	15	[redacted]		
Leatherwood	Third-Party	Solar	20			
Wytheville	Third-Party	Solar	20			
Horsepen Branch	Third-Party	Solar	20			
Top Hat	APCo	Wind	204			
Sun Ridge	Third-Party	Solar	50			
Dogwood	Third-Party	Solar	18.98			
Firefly	APCo	Solar	150			
Bedington	APCo	Solar	50			
Amherst	APCo	Solar	4.875			

Q. **HAS THE COMPANY PRESENTED EVIDENCE TO ADDRESS THE PRUDENCE OF THE PROPOSED RENEWABLE RESOURCES IN TABLE 3?**

A. Yes. The Commission's Rate Case Rules require that APCo provide certain information in Schedule 46 when proposing new rate adjustment clauses and seeking prudency determinations. In general, the Rules require that utilities demonstrate prudence by showing that the proposed renewable resources: 1) are needed; 2) have reasonable costs as supported by cost/benefit analyses and other information; and 3) are the best alternative when compared to available options.

- For any § 56-585.1 A 5 of A 6 RAC, the Company must provide key documents supporting the projected and actual costs that the applicant seeks to recover through the rate adjustment clause, such as economic analyses, contracts, studies, investigations, results from requests for proposals, cost benefit analyses, or other items supporting the costs (Schedule 46b.1.iv.).

[12] See Castle at Schedule 1.

- For any § 56-585.1 A 6 proposal, the Company must provide information relative to the need or justification for the proposed generating unit. Economic studies that compare the selected alternative with other options considered, including sensitivity analyses and production costing simulations of the applicant's overall generating resources that demonstrate that the selected option is the best alternative (Schedule 46b.2.v)

- Finally, in any case involving a prudency determination under § 56-585.1 the Company must provide detailed explanation of the justification for the proposed costs and key documents supporting the projected and actual costs of the project for which the applicant seeks a prudency determination, such as economic analyses, support used by senior management for major cost decisions as determined by the applicant, contracts, studies, investigations, results from requests for proposals, cost-benefit analyses, and other items supporting the costs (Schedule 46d.1 and 2).

To comply with these requirements to provide information demonstrating the proposals to be prudent and the best alternative option (where applicable), the Company cites to, among other items, an economic analysis presented in the pre-filed direct testimony of Company witness Spaeth, Extraordinary Sensitive Schedule 1.[13]

Q. DOES THE CITED ECONOMIC ANALYSIS DISCUSSED IN MR. SPAETH'S DIRECT TESTIMONY DEMONSTRATE THE PRUDENCE OF THE RENEWABLE RESOURCES FOR WHICH APCO SEEKS APPROVAL IN THIS CASE?

A. The Company states in response to Consumer Counsel's discovery that the analysis presented in Mr. Spaeth's Schedule 1 "is not meant to demonstrate the prudency of the renewable resources, but rather shows each resource's energy, capacity, and REC value percentage that is used to allocate costs to be accumulated in the corresponding RACs that are being proposed."[14]

[13] See APCo's Petition at 7 and the Direct Testimony of Michael Spaeth at 2.
[14] See Exhibit SN-3, APCO's response to OAG 2-003.

Q. HAS ANOTHER APCO WITNESS PRESENTED ANY OTHER ECONOMIC ANALYSIS IN THIS CASE THAT DEMONSTRATES THAT THE PROPOSED RENEWABLE RESOURCES ARE PRUDENT OR THE BEST AVAILABLE ALTERNATIVES?

A. No. As noted earlier in my testimony, the Commission's Rate Case Rules require that for any § 56-585.1 A 6 proposal (such as this case), the Company must provide economic studies that compare the selected alternative with other options considered, including sensitivity analyses and production costing simulations of the applicant's overall generating resources that demonstrate that the selected option is the best alternative. The Company indicates that Extraordinarily Sensitive Schedule 46A, Section 3 provides such an analysis,[15] however, this information simply summarizes the results of the Company's Request for Proposals ("RFP") for renewable energy resources. It does not demonstrate the prudence of proposed renewable resources in terms of the Company's need for capacity nor does it provide economic studies including sensitivity analyses and production cost simulations of the applicant's overall generating resources that demonstrate that the selected resources are the best available alternatives from a cost-effectiveness perspective.

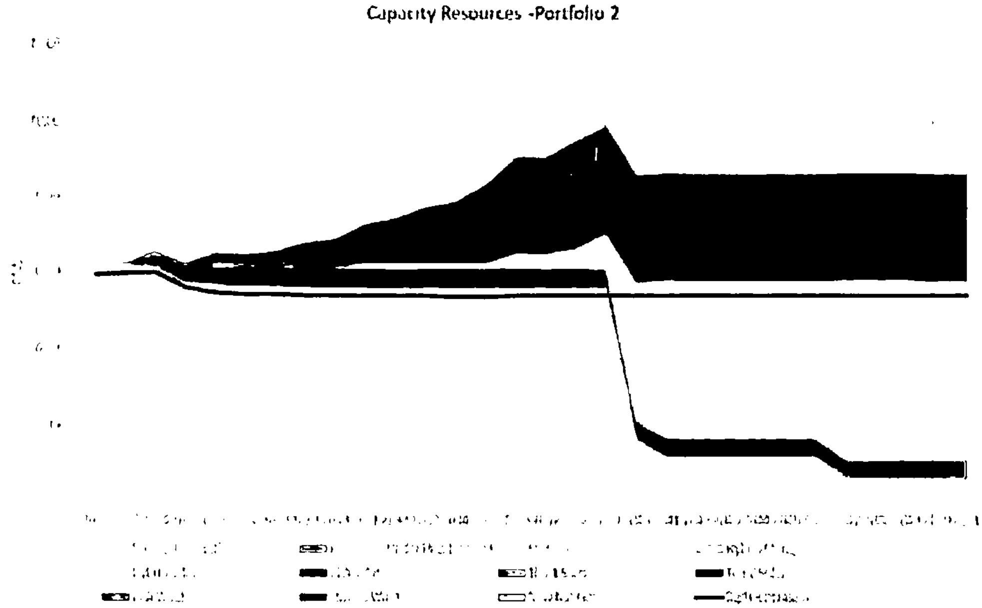
Q. DOES THE COMPANY'S RPS FILING DEMONSTRATE A CAPACITY NEED FOR APCO'S PROPOSED NEW RENEWABLE RESOURCES?

A. No. As represented in Figure 12 to the RPS Plan as presented below, the Company currently has enough existing generation to meet its required generation (i.e., PJM capacity requirements) through year 2040. This means that the Company does not have a need to purchase the additional capacity that would be supplied from the new renewable resources

[15] See Exhibit SN-4, APCo's response to OAG 2-004.

proposed in this case. In fact, the Company's RPS Plan envisions a scenario where APCo exceeds its capacity reserve requirements by almost 5,000 MWs by year 2039.

FIGURE 12: APCO VCEA PLAN 2021-2050 CAPACITY



Q. DOES APCO'S CURRENT AND PLANNED CAPACITY POSITION HAVE IMPLICATIONS FOR THE ASSUMED CAPACITY VALUE BENEFIT INCLUDED IN THE NPVANALYSIS?

A. Yes. As the level of excess capacity forecasted by APCo continues to rise, the risk related to the forecasted value of excess capacity will also rise. It is incorrect and improper for APCo to assume that new generation capacity, exceeding the Company's capacity requirement, will result in a realized avoided capacity value to customers. It is unduly speculative to assume that the amount of excess capacity projected by APCo can be monetized in capacity markets and the Company's status as an FRR utility in PJM constrains sales of capacity into PJM's wholesale markets.

V. SOCIETAL COST OF CARBON

Q. WHAT IS THE SOCIETAL COST OF CARBON ("SCOC")?

A. The SCoC represents the estimated indirect cost to society of carbon emissions, typically measured on a dollars per metric tons basis.

Q. WHY IS THE SOCIETAL COST OF CARBON AN ISSUE IN THIS PROCEEDING?

A. APCo has estimated the cumulative NPV SCoC benefit of the Company's owned renewable energy resources to be $886.3 million and indicates this benefit increases the estimated NPV of the proposed resources. [16] APCo's estimated SCoC benefit has no impact on APCo's electric charges billed to its Virginia customers. It is my understanding that the Company's inclusion of the estimated SCoC benefit is based on Code Section 56-585.1 A 6, which provides that:

> In any application to construct a new generating facility, the utility shall include, and the Commission shall consider, the social cost of carbon, as determined by the Commission, as a benefit or cost, whichever is appropriate. . . The Commission may adopt any rules it deems necessary to determine the social cost of carbon and shall use the best available science and technology, including the Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866, published by the Interagency Working Group on Social Cost of Greenhouse Gases from the United States Government in August 2016, as guidance. The Commission shall include a system to adjust the costs established in this section with inflation.

[16] See the Direct Testimony of APCo witness Spaeth at pages 6-7.

Q. HOW SHOULD THE COMMISSION CONSIDER APCO'S ESTIMATED SCOC BENEFIT IN EVALUATING THE PRUDENCE OF THE COMPANY'S PROPOSED RENEWABLE RESOURCES?

A. It is my understanding that the Commission is required to consider the SCoC benefit only when evaluating utility applications to construct a new generating facility, and the Company has not presented a SCoC estimate for the proposed renewable PPA resources.

Q. PLEASE EXPLAIN THE ERROR IN APCO'S SCOC BENEFIT.

A. APCO'S SCoC estimate was derived by calculating the cumulative present value of the estimated carbon reduction produced by the proposed Company-owned renewable resources times the federal government's Interagency Working Group's SCoC estimate of $51/metric ton, over the assumed 34-year life of the resources. In effect, this calculation assumes that: 1) APCo would have no alternatives to reduce carbon emissions if it does not acquire the proposed resources, and 2) that there will be no change in SCoC charges during that period. In reality, because of the VCEA's requirements, any new resource acquired by APCo would likely reduce carbon emissions, therefore the "SCoC benefit" of the proposed resources is the *difference* between the carbon reduction benefit produced by the proposed resources when compared to the carbon benefit of the best available alternatives. APCo's method of calculating the benefits based solely on the forecasted carbon reduction of APCo's proposed resources is contrary to the requirement that economic studies supporting the prudence of generating resource investments should be based on analyses that compare the selected alternative with other options considered, including sensitivity analyses and production costing simulations of the applicant's overall generating resources that demonstrate that the selected option is the best alternative. APCo's SCoC benefit calculations only consider the proposed resources and the Company has not conducted system production cost studies to determine whether those resources are the best available alternatives.

Q. WHAT IS THE IMPACT OF THIS ERROR ON APCO'S SCOC BENEFIT ESTIMATE?

A. APCo has not presented an analysis that demonstrates that the selected resources are the best alternatives, and there is no evidence analyzing what SCoC benefit will result from the new generation facilities as compared to other renewable options that could otherwise be added to meet the VCEA's requirements. However, I estimate that correcting this flaw in APCo's calculation of the estimated SCoC benefits would reduce the claimed benefit by 90% or more.

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATION REGARDING APCO'S SCOC BENEFIT ESTIMATE.

A. The SCoC benefit is uncertain and does not impact electric charges to customers, and therefore should be considered as a qualitative factor in evaluating utility applications for generation investments.

VI. <u>APCO's PROPOSED RATE FRAMEWORK</u>

Q. HAS THE COMPANY PROPOSED A NEW RATE FRAMEWORK FOR PURPOSES OF RECOVERING COSTS RELATED TO THE VCEA?

A. Yes. Company witness Sebastian describes a rate adjustment clause ("RAC") framework proposed by the Company to comply with § 56-585.5. The Company proposes to create four new RACs to recover the costs of renewable projects proposed in this case, in addition to the existing Fuel Factor.

Q. HOW HAS THE COMPANY PROPSOED TO ALLOCATE THE COSTS OF THE NEW RENEWABLE RESOURCES THAT IT REQUESTS TO RECOVER THROUGH THE COMPANY'S PROPOSED RACS?

A. The Company proposes to allocate costs of the new resources based on the relative percentages of estimated capacity, energy, and REC avoided cost benefits (values) for each resource, as calculated in witness Spaeth's Economic Analysis.

Q. DO YOU HAVE ANY CONCERNS WITH MR. SPAETH'S PROPOSED CALCULAION OF THE BENEFITS FOR PURPOSES OF ASSIGNING REVENUE REQUIREMENTS?

A. Yes. My primary concern that Mr. Spaeth's capacity value estimates are speculative and likely overstated in that they assume the Company will be able to realize an avoided cost benefit or sell excess capacity resulting from the proposed resources at a value that will reasonably offset costs incurred for the projects, which is not guaranteed.

VII. ALLOCATION OF RPS PROGRAM COSTS

Q. HAS THE COMPANY PROPOSED ALLOCATION FACTORS FOR THE VARIOUS RACS THAT WOULD RECOVER COSTS TO COMPLY WITH THE VCEA?

A. Yes. The Company has proposed different jurisdictional and class allocators for the various RACs that it proposes to use to recover VCEA related costs according to the specific terms of § 56-585.5. The below table summarizes the Company's proposal.

Table 4. Allocator Treatment

	PROPOSED ALLOCATORS					
	RECs-A.5 RPS RAC 2 Components			Owned Generation-A.6 RPS RAC 2 Components		
	A.5 RPS - $RAC_{D\&E}$	A.5 RPS - RAC_{F}	A.5 RPS - PPA Capacity	A.6 G-RAC_{e}	A.6 G-RAC_{c}	Fuel Factor
Jurisdictional	Annual Energy	Annual Energy	Annual Energy	Annual Energy	Annual Energy	Annual Energy
Class	Annual Energy	Annual Energy	6 CP	Annual Energy	6 CP	Annual Energy

Q. DO YOU AGREE THAT ENERGY ALLOCATORS ARE APPROPRIATE FOR THE ALLOCATING THE FUEL FACTOR, A.5 RPS $RAC_{D\&E}$, A.5 RPS-RAC_{F}, A.6 G-RAC_{e}?

A. Yes. I understand that these RACs are intended to recover the energy and REC related costs and benefits of prudently incurred VCEA investments. Given the statutory requirements governing this case, it is reasonable to allocate REC-related costs on an annual energy basis because such costs are incurred to reduce carbon emissions which vary with the level of energy produced from APCo's carbon emitting resources to serve the Company's system energy requirements. Using an energy allocator for this purpose in this case reflects principles of cost causation as the level of carbon emissions and REC-related costs vary with the level of energy consumed by APCo's customers.

VIII. CONCLUSIONS AND RECOMMENDATIONS

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS.

A. APCo has not presented economic analysis that it intends to demonstrate that the proposed new resources are needed and prudent. The Company's SCoC benefits estimate is flawed and does not impact APCo's electric cost of service and therefore should be given little weight in determining the prudence of proposed resources. In recognition that the Company needs to move forward with meeting VCEA requirements, and the relatively high cost (LCOE) of certain proposed new renewable resources when compared to other proposed resources, the evidence supports withholding approval of the proposed Bedington and Amherst resources,[17] but that the Commission approve the remaining proposed resources. I recommend that the Company be allowed to request approvals of the other remaining projects in a future case at which time it should be allowed to present additional supporting analysis for these projects.

I do not object to the general structure and cost allocation methods reflected in the Company's proposed RACs, and I recommend that any cost allocation reflect cost causation and/or benefits of the VCEA-related costs. APCo is a multijurisdictional utility, and West Virginia could deny cost recovery of any facility approved by Virginia. In that situation, the VCEA permits APCo to charge Virginia customers the West Virginia share of the costs and the utility must pass 100 percent of the benefits associated with such a facility to Virginia customers. Cost responsibility effectively doubles for Virginia customers if they are asked to pay the typical West Virginia share of a new generation facility. Before the Commission approves cost recovery of a VCEA resource, the Commission should ensure that the Company has a concrete plan that will permit it to pass 100 percent of benefits to the Virginia jurisdiction, if necessary. Finally, I recommend that

[17] I recommend withholding requested approvals of the Amherst Facility, but I am generally aware that a separate prudence determination was the subject of a distinct docket.

the Commission direct APCo to address the impacts of its proposed RPS short-term action plan and the extent to which the Company's future VCEA compliance costs can be mitigated through market purchases of RECs in its next RPS Plan case.

Q. DOES THAT CONCLUDE YOUR TESTIMONY?

A. Yes. I reserve the right, however, to present oral surrebuttal testimony at the hearing to respond to any new issues that may be raised in rebuttal testimony or in the responsive testimony filed by other parties.

EX. SN-1

DON SCOTT NORWOOD

Norwood Energy Consulting, L.L.C.

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Austin, Texas 78755-3197
scott@scottnorwood.com
(512) 297-1889

SUMMARY

Scott Norwood is an energy consultant with over 39 years of utility industry experience in the areas of regulatory consulting, resource planning, power plant operations and energy procurement. His clients include government agencies, publicly-owned utilities, public service commissions, municipalities and various electric consumer interests. Over the last 15 years Mr. Norwood has presented expert testimony on electric utility ratemaking, resource planning, and electric utility restructuring issues in over 200 regulatory proceedings in Arkansas, Georgia, Iowa, Illinois, Michigan, Missouri, New Jersey, Oklahoma, South Dakota, Texas, Virginia, Washington and Wisconsin.

Prior to founding Norwood Energy Consulting in January of 2004, Mr. Norwood was employed for 18 years by GDS Associates, Inc., a Marietta, Georgia based energy consulting firm. Mr. Norwood was a Principal of GDS and directed the firm's Deregulated Services Department which provided a range of consulting services including merchant plant due diligence studies, deregulated market price forecasts, power supply planning and procurement projects, electric restructuring policy analyses, and studies of power plant dispatch and production costs.

Before joining GDS, Mr. Norwood was employed by the Public Utility Commission of Texas as Manager of Power Plant Engineering from 1984 through 1986. He began his career in 1980 as Staff Electrical Engineer with the City of Austin's Electric Utility Department where he was in charge of electrical maintenance and design projects at three gas-fired power plants.

Mr. Norwood is a graduate of the college of electrical engineering of the University of Texas.

EXPERIENCE

The following summaries are representative of the range of projects conducted by Mr. Norwood over his 30-year consulting career.

Regulatory Consulting

Oklahoma Industrial Energy Consumers - Assisted client with technical and economic analysis of proposed EPA regulations and compliance plans involving control of air emissions and potential conversion of coal-to-gas conversion options.

Cities Served by Southwestern Electric Power Company – Analyzed and presented testimony regarding the prudence of a $1.7 billion coal-fired power plant and related settlement agreements with Sierra Club.

New York Public Service Commission - Conducted inter-company statistical benchmarking analysis of Consolidated Edison Company to provide the New York Public Service Commission with guidance in determining areas that should be reviewed in detailed management audit of the company.

Oklahoma Industrial Energy Consumers - Analyzed and presented testimony on affiliate energy trading transactions by AEP in ERCOT.

Virginia Attorney General – Analyzed and presented testimony regarding distribution tap line undergrounding program proposed by Dominion Virginia Power Company.

Cities Served by Southwestern Electric Power Company – Analyzed and presented testimony regarding the prudence of the utility's decision to retire the Welsh Unit 2 coal-fired generating unit in conjunction with a litigation settlement agreement with Sierra Club.

Georgia Public Service Commission - Presented testimony before the Georgia Public Service Commission in Docket 3840-U, providing recommendations on nuclear O&M levels for Hatch and Vogtle and recommending that a nuclear performance standard be implemented in the State of Georgia.

Oklahoma Industrial Energy Consumers - Analyzed and presented testimony addressing power production and coal plant dispatch issues in fuel prudence cases involving Oklahoma Gas and Electric Company.

Georgia Public Service Commission - Analyzed and provided recommendations regarding the reasonableness of nuclear O&M costs, fossil O&M costs and coal inventory levels reported in GPC's 1990 Surveillance Filing.

City of Houston - Analyzed and presented comments on various legislative proposals impacting retail electric and gas utility operations and rates in Texas.

New York Public Service Commission - Conducted inter-company statistical benchmarking analysis of Rochester Gas & Electric Company to provide the New York Public Service Commission with guidance in determining areas which should be reviewed in detailed management audit of the company.

Virginia Attorney General – Analyzed and presented testimony regarding an accelerated vegetation management program and rider proposed by Appalachian Power Company.

Oklahoma Attorney General – Analyzed and presented testimony regarding fuel and purchased power, depreciation and other expense items in Oklahoma Gas & Electric Company's 2001 rate case before the Oklahoma Corporation Commission.

City of Houston - Analyzed and presented testimony regarding fossil plant O&M expense levels in Houston Lighting & Power Company's rate case before the Public Utility Commission of Texas.

City of El Paso - Analyzed and presented testimony regarding regulatory and technical issues related to the Central & Southwest/El Paso Electric Company merger and rate proceedings before the PUCT, including analysis of merger synergy studies, fossil O&M and purchased power margins.

Residential Ratepayer Consortium - Analyzed Fermi 2 replacement power and operating performance issues in fuel reconciliation proceedings for Detroit Edison Company before the Michigan Public Service Commission.

Residential Ratepayer Consortium - Analyzed and prepared testimony addressing coal plant outage rate projections in the Consumer's Power Company fuel proceeding before the Michigan Public Service Commission.

City of El Paso - Analyzed and developed testimony regarding Palo Verde operations and maintenance expenses in El Paso Electric Company's 1991 rate case before the Public Utility Commission of Texas.

City of Houston - Analyzed and developed testimony regarding the operations and maintenance expenses and performance standards for the South Texas Nuclear Project, and operations and maintenance expenses for the Limestone and Parish coal-fired power plants in HL&P's 1991 rate case before the PUCT.

City of El Paso - Analyzed and developed testimony regarding Palo Verde operations and maintenance expenses in El Paso Electric Company's 1990 rate case before the Public Utility Commission of Texas. Recommendations were adopted.

Energy Planning and Procurement Services

Virginia Attorney General – Review and provide comments or testimony regarding annual integrated resource plan filings made by Dominion Virginia Power and Appalachian Power Company.

Dell Computer Corporation – Negotiated retail power supply agreement for Dell's Round Rock, Texas facilities producing annual savings in excess of $2 million.

Texas Association of School Boards Electric Aggregation Program – Serve as TASB's consultant in the development, marketing and administration of a retail electric aggregation program consisting of 2,500 Texas schools with a total load of over 300 MW. Program produced annual savings of more than $30 million in its first year.

Oklahoma Industrial Energy Consumers - Analyzed and drafted comments addressing integrated resource plan filings by Public Service Company of Oklahoma and Oklahoma Gas and Electric Company.

S.C. Johnson - Analyzed and presented testimony addressing Wisconsin Electric Power Company's $4.1 billion CPCN application to construct three coal-fired generating units in southeast Wisconsin.

Oklahoma Industrial Energy Consumers - Analyzed wind energy project ownership proposals by Oklahoma Gas and Electric Company and presented testimony addressing project economics and operational impacts.

City of Chicago, Illinois Attorney General, Illinois Citizens' Utility Board - Analyzed Commonwealth Edison's proposed divestiture of the Kincaid and State Line power plants to SEI and Dominion Resources.

Georgia Public Service Commission - Analyzed and presented testimony on Georgia Power Company's integrated resource plan in a certification proceeding for an eight unit, 640 MW combustion turbine facility.

South Dakota Public Service Commission - Evaluated integrated resource plan and power plant certification filing of Black Hills Power & Light Company.

Shell Leasing Co. - Evaluated market value of 540 MW western coal-fired power plant.

Community Energy Electric Aggregation Program – Served as Community Energy's consultant in the development, marketing and start-up of a retail electric aggregation program consisting of major charitable organizations and their donors in Texas.

Austin Energy – Conducted competitive solicitation for peaking capacity. Developed request for proposal, administered solicitation and evaluated bids.

Austin Energy - Provided technical assistance in the evaluation of the economic viability of the

City of Austin's ownership interest in the South Texas Project.

Austin Energy - Assisted with regional production cost modeling analysis to assess production cost savings associated with various public power merger and power pool alternatives.

Sam Rayburn G&T Electric Cooperative - Conducted competitive solicitation for peaking capacity. Developed request for proposal, administered solicitation and evaluated bids.

Rio Grande Electric Cooperative, Inc. - Directed preparation of power supply solicitation and conducted economic and technical analysis of offers.

Virginia Attorney General – Review and provide comments or testimony regarding annual demand-side management program programs and rider proposals made by Dominion Virginia Power and Appalachian Power Company.

Austin Energy – Conducted modeling to assess potential costs and benefits of a municipal power pool in Texas.

Electric Restructuring Analyses

Electric Power Research Institute - Evaluated regional resource planning and power market dispatch impacts on rail transportation and coal supply procurement strategies and costs.

Arkansas House of Representatives – Critiqued proposed electric restructuring legislation and identified suggested amendments to provide increased protections for small consumers.

Virginia Legislative Committee on Electric Utility Restructuring – Presented report on status of stranded cost recovery for Virginia's electric utilities.

Georgia Public Service Commission – Developed models and a modeling process for preparing initial estimates of stranded costs for major electric utilities serving the state of Georgia.

City of Houston – Evaluated and recommended adjustments to Reliant Energy's stranded cost proposal before the Public Utility Commission of Texas.

Oklahoma Attorney General – Evaluated and advised the Attorney General on technical, economic and regulatory policy issues arising from various electric restructuring proposals considered by the Oklahoma Electric Restructuring Advisory Committee.

State of Hawaii Department of Business, Economics and Tourism – Evaluated electric restructuring proposals and developed models to assess the potential savings from deregulation of the Oahu power market.

Virginia Attorney General - Served as the Attorney General's consultant and expert witness in the evaluation of electric restructuring legislation, restructuring rulemakings and utility proposals addressing retail pilot programs, stranded costs, rate unbundling, functional separation plans, and competitive metering.

Western Public Power Producers, Inc. - Evaluated operational, cost and regional competitive impacts of the proposed merger of Southwestern Public Service Company and Public Service Company of Colorado.

Iowa Department of Justice, Consumer Advocate Division - Analyzed stranded investment and fuel recover issues resulting from a market-based pricing proposal submitted by MidAmerican Energy Company.

Cullen Weston Pines & Bach/Citizens' Utility Board - Evaluated estimated costs and benefits of the proposed merger of Wisconsin Energy Corporation and Northern States Power Company (Primergy).

City of El Paso - Evaluated merger synergies and plant valuation issues related to the proposed acquisition and merger of El Paso Electric Company and Central & Southwest Company.

Rio Grande Electric Cooperative, Inc. - Analyzed stranded generation investment issues for Central Power & Light Company.

Power Plant Management

City of Austin Electric Utility Department - Analyzed the 1994 Operating Budget for the South Texas Nuclear Project (STNP) and assisted in the development of long-term performance and expense projections and divestiture strategies for Austin's ownership interest in the STNP.

City of Austin Electric Utility Department - Analyzed and provided recommendations regarding the 1991 capital and O&M budgets for the South Texas Nuclear Project.

Sam Rayburn G&T Electric Cooperative - Developed and conducted operational monitoring program relative to minority owner's interest in Nelson 6 Coal Station operated by Gulf States Utilities.

KAMO Electric Cooperative, City of Brownsville and Oklahoma Municipal Power Agency - Directed an operational audit of the Oklaunion coal-fired power plant.

Sam Rayburn G&T Electric Cooperative - Conducted a management/technical assessment of the Big Cajun II coal-fired power plant in conjunction with ownership feasibility studies for the project.

Kamo Electric Power Cooperative - Developed and conducted operational monitoring program for client's minority interest in GRDA Unit 2 Coal Fired Station.

Northeast Texas Electric Cooperative - Developed and conducted operational monitoring program concerning NTEC's interest in Pirkey Coal Station operated by Southwestern Electric Power Company and Dolet Hills Station operated by Central Louisiana Electric Company.

Corn Belt Electric Cooperative/Central Iowa Power Cooperative - Perform operational monitoring and budget analysis on behalf of co-owners of the Duane Arnold Energy Center.

PRESENTATIONS

Quantifying Impacts of Electric Restructuring: Dynamic Analysis of Power Markets, 1997 NARUC Winter Meetings, Committee on Finance and Technology.

Quantifying Costs and Benefits of Electric Utility Deregulation: Dynamic Analysis of Regional Power Markets, International Association for Energy Economics, 1996 Annual North American Conference.

EX. SN-2

Exhibit SN-2

COMMONWEALTH OF VIRGINIA
STATE CORPORATION COMMISSION
APPLICATION OF
APPALACHIAN POWER COMPANY
SCC CASE NO. PUR-2021-00206
Interrogatories and Requests for the Production of Documents by the OFFICE OF THE ATTORNEY GENERAL'S DIVISION OF CONSUMER COUNSEL
OAG Set 2
To Appalachian Power Company

Interrogatory OAG 2-008:

Please explain whether APCo has sought guidance from the West Virginia Public Service Commission on whether prudently incurred costs of compliance with the VCEA will be recoverable from customers in West Virginia.

Response OAG 2-008:

Please see the Company's West Virginia filings, Docket Nos. 22-0044-E-PC and 22-0045-E-US.

The foregoing response is made by William K. Castle, Dir Regulatory Svcs, on behalf of Appalachian Power Company.

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EX. SN-3

Exhibit SN-3

COMMONWEALTH OF VIRGINIA
STATE CORPORATION COMMISSION
APPLICATION OF
APPALACHIAN POWER COMPANY
SCC CASE NO. PUR-2021-00206
Interrogatories and Requests for the Production of Documents by the OFFICE OF THE ATTORNEY GENERAL'S DIVISION OF CONSUMER COUNSEL
OAG Set 2
To Appalachian Power Company

Interrogatory OAG 2-003:

Please explain whether the cost/benefit analyses presented in Schedule 1 are meant to demonstrate the prudence of renewable energy resources for which APCo seeks approval in this case.

Response OAG 2-003:

APCo Exhibit No. (MMS) Extraordinarily Sensitive Schedule 1 is not meant to demonstrate the prudency of the renewable resources, but rather it shows each resource's energy, capacity, and REC value percentage that is used to allocate costs to be accumulated in the corresponding RACs that are being proposed.

The foregoing response is made by Michael M. Spaeth, Regulatory Consultant Prin, on behalf of Appalachian Power Company.

EX. SN-4

Exhibit SN-4

COMMONWEALTH OF VIRGINIA
STATE CORPORATION COMMISSION
APPLICATION OF
APPALACHIAN POWER COMPANY
SCC CASE NO. PUR-2021-00206
Interrogatories and Requests for the Production of Documents by the OFFICE OF THE ATTORNEY GENERAL'S DIVISION OF CONSUMER COUNSEL
OAG Set 2
To Appalachian Power Company

Interrogatory OAG 2-004:

Please provide any analysis by APCo comparing the costs of the proposed renewable energy resources to other renewable energy resources including renewable energy certificate ("REC") purchases that were available for ownership or purchase by APCo.

Response OAG 2-004:

Please see Extraordinarily Sensitive Schedule 46A Section 3. The Company relied on its RFP process to select the lowest reasonable cost resources for selection.

The foregoing response is made by Amy E. Jeffries, Dir Regulated Infrstr Dev, and Michael M. Spaeth, Regulatory Consultant Prin, on behalf of Appalachian Power Company.