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Re: Application of Appalachian Power Company for a 2014 Biennial Review of the Rates, Terms and Conditions for the Provision of Generation, Distribution and Transmission Services Pursuant to § 56-585.1 A of the Code of Virginia
Case No. PUE-2014-00026

Dear Mr. Peck:

Please find attached the PREPARED DIRECT TESTIMONY OF STEVEN GABEL on behalf of THE ALLIANCE FOR SOLAR CHOICE, e-filed today in the above referenced matter.

Please feel free to contact me should you have any questions.

Sincerely,

Briane R. Greene

CC: Service List

COMMONWEALTH OF VIRGINIA
STATE CORPORATION COMMISSION

APPALACHIAN POWER COMPANY

For a 2014 Biennial Review of Rates, Terms and Conditions for the Provision Of Generation, Distribution and Transmission Services Pursuant to 56-585.1 A of the Code of Virginia	)))))	CASE NO. PUE-2014-00026

PREPARED DIRECT TESTIMONY
OF
STEVEN GABEL
ON BEHALF OF
THE ALLIANCE FOR SOLAR CHOICE

Date: August 6, 2014

Q. Please state your name and business address.

A. My name is Steven Gabel, and my business address is 417 Denison Street, Highland Park, New Jersey 08904. I am presently employed as President of Gabel Associates, Inc., an energy, environmental, and public utility consulting firm.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of The Alliance for Solar Choice, a Respondent in this matter.

Q. Please summarize your educational background and professional experience.

A. I am an economist who specializes in public utility economics and regulation. I have over 30 years of experience in the energy industry, working at the New Jersey Board of Public Utilities ("NJBPU") and as an energy consultant at Gabel Associates. Over the years my responsibilities have included working as an economist for the NJBPU; Bureau Chief of Electric Rates and Tariffs for the NJBPU; Director of the Electric Division at the NJBPU; and Director of the Division of Solid Waste at the New Jersey Department of Environmental Protection.

During my employment at the NJBPU, I worked extensively on various utility rate cases and developed, implemented and testified with respect to rate setting, alternative energy, demand side management, incentive regulation, cost of service and tariff design initiatives.

From 1993 to the present, I have served as the President of Gabel Associates to utilize my expertise in the field of energy. Gabel Associates is a consulting firm that assists clients in strategic energy issues, regulatory matters, project development of renewable and fossil fueled generation markets, and energy procurement in wholesale and retail energy markets. The firm currently provides energy planning, procurement and financial advice, strategic analysis and expert testimony to a wide range of public and private sector clients.

I have also testified extensively before state regulatory and legislative bodies with respect to ratemaking, cost of service, industry restructuring, energy policy, renewable energy policy and tariff design issues, including direct involvement in the development of renewable energy policy, standby rates, and net metering policy. In addition, I am involved in tariff and policy development in PJM with respect to energy, capacity, transmission and related issues. Finally, with respect to my understanding of commercial issues, I have been involved in the development of over 200 renewable energy projects and hundreds of energy transactions and power purchase agreements for energy commodities, combined heat and power, bulk power, and renewable projects.

My educational background includes a BA in Economics from the University of Pennsylvania and a MA in Economics from Rutgers University, where I studied price theory, industrial organization, and the history of economic thought.

My professional experience is also detailed on my resume, which is attached as Exhibit SG-1.

Q. Please describe the purpose of your testimony in this proceeding.

A. I have been requested to review and analyze various tariff changes proposed by Appalachian Power Company ("APCo"). Specifically, APCo has proposed, among other things, to (a) increase the Basic Service Charge (formerly the Customer Charge) for residential customers, (b) add a standby charge for residential customer generators with installed renewable energy generation capacity that exceeds 10 kilowatts (kW) but is not greater than 20 kW, and (c) revise the availability of the present General Service Time of Day ("TOD") tariff to smaller customers, while proposing a new Large General Service TOD tariff, which incorporates a demand charge, for larger customers. My review has been performed within the context of reasonable cost of service principles and ratemaking, the benefits associated with solar energy resources, and Virginia's energy policy.

Q. How is your testimony organized?

A. This testimony addresses the following issues:

1) Summary of Recommendations
2) Renewable Energy Policy Overview
3) Approach to Ratemaking and Rate Design
4) Cost of Service and Rate Design Review of the APCo Rate Proposal
   a. Standby Rate Proposal
   b. Residential Basic Service Charge (Customer Charge)
   c. Time of Day Demand Charge for Smaller Commercial Customers
   d. Net Metering Policy Considerations
5) Review of Benefits of Solar Energy

1) <u>Summary of Recommendations</u>

Q. Can you please summarize your conclusions and recommendations?

A. Yes. Several elements of APCo's rate design proposals are contrary to ratemaking principles and to Virginia policy (as recently set forth by the Governor) and will deter development of on-site renewable energy in its service territory. In particular:

1. APCo's proposed residential standby charges are not cost based as they do not reflect the nature and diversity of renewable generation. Rather than designing standby charges in accordance with the principle that the standby charge should act as an insurance policy to cover the cost of adequate capacity, APCo designed its standby charges to provide full insulation from its potential loss of transmission and distribution revenue from renewable generation.

2. The APCo proposed standby charge is discriminatory toward on-site renewable energy resources as it treats these resources differently than other resources (such as energy efficiency resources) that reduce utility sales. These other resources are not subject to "make whole revenue" treatment by APCo.

3. The standby charge should not be implemented until a full accounting of the benefits from on-site renewable energy can be completed by the Virginia State Corporation Commission (the "Commission"). However, if the Commission determines to set a rate at this time, it should be set at no more than $0.377 per kW, which is composed of $0.194 per kW for distribution and $0.183 per kW for transmission standby service.

4. The proposed Residential Basic Service Charge increase from $8.35 per month to $16.00 per month is excessive in its customer impact and will deter energy conservation.

5. The proposed Residential Basic Service Charge is inconsistent with the ratemaking principle of "continuity in rates", creates significant residential inter-class rate increase and decrease differences and is out of line with the customer charge of other major regulated utilities in neighboring states. The Residential Basic Service Charge should be no more than $9.55 per month.

6. APCo's proposal to charge a demand charge to smaller commercial customers under its TOD rate should be clarified to provide that both standby rates and demand charges will not be charged to these customers.

7. The benefits of on-site renewable energy are wide ranging and substantial. The rate design proposals of APCo should be adjusted so that Virginia and its ratepayers can realize these benefits.

2) <u>Renewable Energy Policy Overview</u>

Q. Is APCo's application consistent with recent state and federal policy trends that emphasize the development of renewable energy markets?

A. No. Since APCo filed the subject proceeding and since the Commission issued its final order in the 2011 Virginia Electric and Power Company standby charge and methodology proceeding that addressed related

issues (see PUE-2011-00088), there have been significant actions both in Virginia and nationally that will have an impact upon the future of renewable energy markets in Virginia. As a result, several of APCo's proposals (specifically the unreasonably high residential standby charge and the proposed increase to the Residential Basic Service Charge) are not only contrary to ratemaking principles, they will frustrate the development of renewable energy, energy efficiency and conservation resources in the APCo Virginia service territory.

Q. What is the recent policy development in Virginia?

A. On June 4, 2014, Governor McAuliffe signed Executive Order #16 which established the Virginia Energy Council. The Virginia Energy Council will assist in the development and implementation of a cohesive, comprehensive and aggressive energy strategy for Virginia. Governor McAuliffe stated that "Virginia must develop an aggressive strategy to protect existing jobs in our energy industries while positioning the Commonwealth to be a leader in new energy technologies. An innovative energy strategy will enable us to attract the best businesses and entrepreneurs to Virginia, create more jobs in growing industries and lead a 21st Century Virginia economy" (See Governor McAuliffe's written announcement on the Virginia Energy Council). Because APCo filed its case before this policy announcement was made, the APCo rate proposal does not take this new policy into account.

Q. Please identify specific responsibilities and duties of the Virginia Energy Council that relate to the renewable energy market.

A. Duties of the Virginia Energy Council include:

1. Developing strategies to increase the diversity of energy used to power Virginia, while ensuring a commitment to the most efficient use of existing energy sources; and

2. Developing strategies to increase Virginia's renewable energy economy and grow the entire energy industry in Virginia by retaining, expanding and attracting businesses in the energy sector.

Q. Please identify the objectives of the Commonwealth Energy Policy as set forth in the Code of Virginia.

A. The objectives of the Commonwealth Energy Policy that relate to the renewable energy market include:

1. Accelerating the development and use of renewable energy sources - Virginia can become a hub of innovative and alternative energy research and development by focusing on expanding the use of the Commonwealth's underutilized renewable assets, such as solar and offshore wind; and

2. Promoting a diverse energy mix - Virginia should continue to increase the diversity of sources used to generate energy in the Commonwealth to ensure that it is not overly-reliant on particular sources.

Q. What has occurred at the national level?

A. In June 2014, the Environmental Protection Agency ("EPA") issued a proposed rule under Section 111(d) of the Clean Air Act. The EPA is to

issue a final rule by June 2015 and states will be required to submit their final proposed implementation plans for EPA approval by June 2016.

Q. What does Section 111(d) of the Clean Air Act require of each state?

A. Section 111(d) requires each state, with the assistance of the EPA, to develop "standards of performance" for existing stationary energy sources and an implementation plan to achieve those air quality standards related to greenhouse gas reductions. The term "standards of performance" is defined as "a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction...(taking into account the cost of achieving such reduction...)."[1]

Q. Did the EPA make specific reference to renewable energy sources as potentially contributing to the achievement of emission reductions as part of a state plan?

A. Yes, the EPA has indicated that renewable energy sources could be considered as part of a flexible compliance mechanism. Specifically, the EPA indicated that:

1. States may be credited with emission rate reductions afforded by the construction of new renewable fuel sources, thus encouraging the substitution of new renewable energy sources for fossil fuel-fired generation; and

[1] See 42 U.S.C. 7411(a)(1)

2. Renewable energy sources and energy efficiency programs are a cost-effective way to reduce emissions.

Q. Please summarize how the newly enacted Virginia Executive Order #16 and EPA's proposed rule on CO_2 emission reductions relate to the development of renewable energy sources in Virginia.

A. Both of these initiatives support the development of renewable solar generation in Virginia. Such policies would assist Virginia in meeting the goals of Governor McAuliffe's Executive Order #16, and assist Virginia in complying with the requirements of the Clean Air Act Section 111(d). Increased development of solar energy will reduce the Commonwealth's greenhouse gas footprint and reduce the risk to Virginia and its utilities to abrupt and more costly compliance costs after the EPA rule is adopted.

Q. Will APCo's proposed tariff changes support Virginia in meeting the goals of Governor McAuliffe's Executive Order #16, and assist Virginia in complying with the requirements of the Clean Air Act Section 111(d)?

A. No. In addition to being contrary to sound cost-of-service principles (as discussed in detail in this testimony), APCo's proposed tariff changes will impede the realization of Virginia's energy policy and the development of customer generated solar energy sources by making it more difficult for the installer to economically justify the installation of on-site solar generation sources.

The proposed tariff changes at issue that I will address further in this testimony are:

1. The imposition of a higher Residential Basic Service Charge and lower usage charge for residential and small commercial customers;

2. The imposition of a standby charge for residential customer generators with installed renewable energy generation capacity that exceeds 10 kW but is less than 20 kW; and

3. A demand charge proposed for commercial customers with demands between 100 and 1,000 kW on the TOD tariff.

3) Approach to Ratemaking and Rate Design

Q. Please discuss the basic ratemaking principles that apply to the development of a cost of service study and the resulting customer class tariffs.

A. Cost of service studies are a basic tool of ratemaking that quantify the costs of serving individual customer classes. Basing rates on the cost of service fulfills many goals, including:

- Assuring that customers receive the right price signal so they use energy more efficiently;

- Assuring that there is not "undue discrimination" between customers; *i.e.*, it is unfair for one customer or group of customers to be treated differently than customers who cause the same cost profile;

- Assuring that there is no subsidy between customers; and

- Providing financial stability to a utility as the rates and revenues collected under cost based rates track costs incurred.

These principles not only apply to the overall level of rates, but also to the rates set for classes of customers. A cost of service study is a guideline to address these goals.

Of course there is not always agreement about how the cost of service study should be conducted, specifically (for electric utilities) with respect to (a) how costs should be functionalized (are the costs customer, demand or energy related?) and (b) how costs should be allocated among rate classes. As a result, while rates may appear to be cost based when based upon a specific cost of service study, the proposed rates may not actually be cost based if the cost study is not performed in a reasonable manner. Moreover, it should be recognized that a cost of service study is a static analysis - the allocation of costs based on a test year - and does not capture long term costs and benefits, nor recognize that a cost that is fixed in the static analysis may be variable (or avoidable) in the long run. Finally, while many utilities contend that net metering (and other renewable energy policies) impose substantial costs on ratepayers, the level of subsidy (and appropriate policy or ratemaking changes), if any, cannot be determined without a full accounting of costs and benefits.

Q. Are there any factors that are considered in setting rates in addition to basing them on cost?

A. Yes. There are other factors that can reasonably come into play in designing tariffs, including (a) continuity in ratemaking, *i.e.*, abrupt changes can be viewed as unfair to customers, (b) consistency with policy

goals which could include social, energy, environmental or other policy goals, (c) simplicity, or (d) cost to implement or administer.

Q. Please explain how on-site renewable energy resources, like solar, should be viewed within the ratemaking process.

A. Cost based rates have the effect of assuring cost recovery by the utility, non-discriminatory treatment between customers, and effective action based on the price signal received. My review of APCo's rate proposals is undertaken in this context, with cost based rates as a touchstone, and with consideration of Virginia's policy direction and statute, including Virginia Code § 56-594 F relating to standby rates.

On-site (or behind the meter) renewable resources should be viewed as any other activity by a customer who reduces (or increases) his or her power purchases from a utility. Customers should be charged rates that are reflective of the costs they impose on the system. In reaction to that price signal (as well as a host of other factors), customers will make decisions regarding their use of utility services. In some cases, the signal will cause the customer to take steps to reduce consumption; for example, the purchase of an energy efficient air conditioner, heat pump, geothermal system, or the installation of a solar system on the roof of a home. From the perspective of the utility system and its cost impact, these steps all have similar impacts and should be treated in the same manner (while recognizing the individual profile and performance of each). Otherwise, the utility would be discriminating against the technology being designated for different treatment.

On the other hand, sometimes a customer will react to price signals (and other factors) and increase their purchase of utility services, for example,

buying a window air conditioner for a room where there was no unit. In that case, the customer would pay for the cost of the additional energy consumed, based, again, on the cost based tariff of the utility.

4) Cost of Service and Rate Design Review of the APCo Rate Proposal

a. Standby Rate Proposal

Q. Can you summarize APCo's standby rate proposal?

A. APCo has proposed that a standby charge (both distribution and transmission components) be implemented to residential net metered customers that have on-site generation of between 10 kW and 20 kW. This would be applied to customers taking service under both tariff Schedule RS (Residential Service) and tariff RS-TOD (Residential Service – Time of Day).

The distribution standby charge starts with all residential distribution fixed costs (from the cost of service study) and subtracts related customer charges (which customers would continue to pay). This net figure is then divided by the residential billing demand, which results in a proposed distribution standby charge of $1.94 per kW. The transmission standby charge starts with the transmission rate from Rider T-RAC (Transmission Rate Adjustment Clause Rider), modifies it for the difference in the time of zonal transmission load peak between the PJM and AEP systems, and multiplies this modified transmission rate by residential sales to obtain the total transmission costs. This figure is then divided by residential billing demand, which results in a transmission standby charge of $1.83 per kW.

APCo is not proposing a generation component to the standby charge, following the Commission's Order in the Virginia Electric and Power standby proceeding, which determined that this component should not be addressed until further review by the Commission.

Q. Is APCo's standby rate proposal consistent with sound rate making principles?

A. No. In fact, APCo's own analysis shows that it would recover more fixed transmission and distribution costs from a solar customer after imposition of its proposed standby charge than it would from the same customer prior to installation of solar generation. APCo's standby service rate proposal is not aligned with the cost of providing the service and is inconsistent with Virginia Code § 56-594 F. To the contrary, APCo's standby rate proposal is designed to hold APCo financially harmless from the presence of on-site renewable projects, rather than address the cost of providing standby service.

The analysis provided by APCo witness Jennifer B. Sebastian indicates that APCo's standby charge proposal provides it with <u>even</u> <u>more</u> distribution and transmission revenues than if the customer did not install an on-site renewable system. Specifically, as shown in Exhibit SG-2 and taken directly from APCo testimony JBS Schedule 2, the utility would collect $715.05 in transmission and distribution revenues from the sample customer before installation of the solar project, and would collect $742.86 in transmission and distribution revenues if its proposal were adopted. As a result, APCo's standby rate proposal means that the utility will realize more revenue from the standby service than if the customer did not install the solar system. It is clearly unreasonable for the cost of

standby service to be more than the cost of serving a full requirements customer.

Q. Has APCo proposed to impose a similar structure on customers who reduce their load for other reasons?

A. No they have not. Through its proposal, APCo is singling out customers that install solar generation with the imposition of charges that APCo has designed to hold itself harmless from the loss of load. Customers that install energy efficiency measures (or simply have low off-peak energy use) have no such "utility hold harmless rate treatment" applied to them, nor should they. To underscore this problem, it should be recognized that APCo has not proposed to give customers who add load a payment for contributing more revenue, nor should it. Customers who increase or decrease their load on the utility should all operate under the same set of price signals. APCo's proposal is discriminatory toward solar customers (including the three current customers who would be impacted by this proposal, as well as all customers who are considering or implementing on-site renewable generation in this size category).

Q. Is APCo's standby rate proposal consistent with Virginia Code § 56-594 F?

A. No. Virginia Code § 56-594 states that "[t]he Commission shall approve a supplier's proposed standby charge methodology if it finds that the standby charges collected from all such eligible customer-generators and eligible agricultural customer-generators allow the supplier to recover only the portion of the supplier's infrastructure costs that are properly associated with serving such eligible customer-generators or eligible agricultural customer-generators." Rather than analyze only the portion

of the supplier's infrastructure costs that are properly associated with serving the customer-generator, as stated in the law, APCo has designed a rate that is focused on protecting its revenue recovery. This full revenue protection will also have the effect of deterring on-site renewable generation in the APCo service territory.

Q. How should the standby charge be calculated?

A. In order to be consistent with Virginia Code § 56-594 F, the standby charge should only include standby costs related to serving the customer-generator. In the case of standby rate design, several factors should be recognized in this regard:

1. The customer is continuing to take utility service for the portion of its load that is not being served by the on-site renewable energy project and the payments for this service help to pay for costs incurred to serve the customer-generator;

2. The standby service rate should include the appropriate transmission and distribution cost elements of utility service; and

3. Standby service is, in effect, an insurance policy offered by the utility to assure that it has the facilities in place to serve the customer-generator if the renewable project does not provide power to serve the customer-generator. As with any insurance policy, the premium – in this case, the standby charge – should recognize the diversity of outages among applicable customer-generators. Just as homeowner insurance premiums are not set with the assumption that every home will have a fire every year (if they were, the annual

premium would equal the cost of a new home), it is not appropriate to assume in the derivation of a standby charge that every customer-generator will have an outage at the same time or at the time of system peak.

Q. Taking these factors into account what is a reasonable standby charge?

A. While standby charges would be more appropriately calculated after a full accounting of the costs and benefits of on-site renewable energy (which will ultimately determine if a standby charge is needed and if so, what level fully reflects all costs and benefits), if the Commission determines to set residential standby charges prior to such full accounting, I have evaluated the distributed nature of many small solar installations to determine a reasonable standby charge for transmission and distribution. Based on these considerations, an appropriate standby charge should not be more than $0.377 per kW, which is composed of $0.194 per kW for distribution and $0.183 per kW for transmission standby service.

This rate is developed with recognition that standby service is, in effect, an insurance policy offered by the utility. As a result, the derivation of the standby charge for renewable generation captures the diversity of outages among applicable customers and the generation profile, forced outage rate and capacity value of renewable generation. In addition, as recognized by the APCo proposal, only the net charges for this service (above those otherwise charged to the customer-generator) should be charged to the customer-generator.

Q. Are there any other issues related to the APCo standby service proposal you would like to address?

A. Yes. This rate, as well as the standby charge proposal detailed in the testimony of APCo witness Sebastian, bases the calculation of the standby charge on a per kW basis. In order to calculate kW charges, the customer must have a demand meter on the premises. However, to my knowledge, the APCo application does not contain a requirement or plan for residential customers to have demand meters, nor does it provide any request for treatment of the cost of installing demand meters. As a result, from an operational and administrative standpoint, it does not appear that the utility can actually charge for this service, and, therefore, subject to further clarification, APCo may not be able to implement the standby charge proposal.

b. Residential Basic Service Charge (Customer Charge)

Q. What is APCo proposing with respect to its Residential Basic Service Charge?

A. APCo is proposing to increase its Residential Basic Service Charge from $8.35 per month to $16.00 per month. APCO provides a cost analysis (see Vaughan Testimony pages 13-16) supporting an eventual $26 charge, which is a charge it plans to move toward over time.

Q. Do you recommend that this proposal be adopted?

A. No. For several reasons, I recommend that an increase of this magnitude not be considered in this proceeding.

Q. What is the impact of APCo's Residential Basic Service Charge proposal?

A. This proposal results in a significant increase in the Residential Basic Service Charge (92%) and a commensurate decrease in distribution energy charges (9.6%). This shift will: (a) result in a rate increase for smaller usage customers (even though the company has not requested a general rate increase), and (b) send a price signal that will discourage cost-effective energy conservation activities.

Q. What level of residential rate increases and decreases would the proposed APCo Residential Basic Service Charge cause to the customer?

A. APCo has proposed to increase the residential customer charge from $8.35 per month to $16.00 per month (or a 92% increase); while decreasing the energy charge from $0.0691 per kWh to $0.06246 per kWh (or a 9.6% decrease). Although APCo has indicated that the overall level of revenues received from all customers served on the Residential Service Tariff would be revenue neutral, APCo has not considered the revenue impacts within the residential class.

In Exhibit SG-3, I have shown the interclass rate impacts upon residential customers at various monthly usage levels (the source for this information is APCo's response to data request OAG-113). As can be seen in Exhibit SG-3, the story is very different for the interclass rate impact than for the overall residential class impact. Depending upon monthly usage level, individual customers within the residential class will see increases as much as 36.9% (100 kWh per month) and rate decreases as much as 4.4%.

Based on these impact amounts, and consideration of the "continuity in ratemaking," this change is too abrupt. Therefore, the increase in the

Residential Basic Service Charge should be substantially scaled back or delayed until the next case in which the overall level of base rates is reviewed.

Q. If approved, how would APCo's proposed Residential Basic Service Charge compare with those of neighboring utilities?

A. It would be substantially higher. On Exhibit SG-4, I have shown the customer charge for major regulated utilities in Virginia and neighboring states (North Carolina, West Virginia and Maryland). The customer charge for these ten utilities shown range from a high of $11.80 per month to a low of $5.00 per month (charged by four of the ten utilities). Thus, the average customer charge of the ten major regulated utilities is $7.17 per month.

The Residential Basic Service Charge proposed by APCo is not only a 92% increase over the customer charge currently in effect for its residential customers, it would be 36% above the highest customer charge within a four state area, 220% above the lowest rate within the four state area and 123% above the average of the other ten utilities in the four state area. This large increase is clearly too abrupt and violates the "continuity of ratemaking" principle. Thus, a more moderate approach to increasing the Residential Basic Service Charge should be considered at this time.

Q. Why should an increase of this magnitude not be considered in this proceeding?

A. Such a significant increase is not consistent with continuity in ratemaking, is out of line with the customer charge of regulated utilities in neighboring states and causes dramatic increases/decreases in rates within the

residential rate class. In addition, an increase of this amount will secure APCo's revenue recovery to the more certain mechanism of customer charge payments, and reduce the overall risk attendant to its distribution business without a reduction in its rate of return (which should reflect the utility's risk). Without a proceeding in which the overall level of base rates is reviewed, it is unfair to customers to reduce the utility's risk profile with a 92% increase in the fixed customer charge without reducing its rate of return.

Q. Is the APCo Residential Basic Service Charge proposal consistent with Virginia or national energy policy?

A. No. Both state and federal policies promote energy conservation. The loading of revenue requirements into the Residential Basic Service Charge will have the opposite effect by reducing energy charges and promoting energy use.

Q. Based on the above consideration, what do you recommend with respect to the APCo Residential Basic Service Charge proposal?

A. Based on the consideration of continuity in ratemaking principle, resulting dramatic increases and decreases in rates within the residential rate class, the resulting significant differential between the proposed APCo customer charge and those of neighboring regulated utilities and the need to consider the reduction of risk that will be caused by an increase of this magnitude, I recommend that consideration of this issue either be deferred until the next full rate proceeding, or that a smaller increase of the customer charge, from $8.35 per month to up to $9.55 per month, be considered at this time. The recommended increase in the customer charge would more than double the differential between APCo's current

residential customer charge and the average customer charge of the ten major regulated regional utilities shown in Exhibit SG-4, while giving recognition to the basic ratemaking principle of continuity of ratemaking.

c. Time of Day Demand Charge for Smaller Commercial Customers

Q. What has APCo proposed regarding the General Service – Time of Day (GS-TOD) tariff?

A. Currently, customers are eligible to take service under Schedule GS-TOD if their demand is less than 1,000 kW. These customers pay a customer charge and an energy charge that is divided into on-peak and off-peak hours. If such customer has on-site (behind the meter) solar generation, they are also required to take service under tariff Schedule SBS (Standby Service). Under Schedule SBS, they pay a demand charge (depending on the level of service requested) and an energy charge for usage.

APCo is proposing to redefine Schedule GS-TOD to limit its eligibility to customers with a demand of 100 kW or less. If such customer has on-site (behind the meter) solar generation, they are also required to take service under tariff Schedule SBS (Standby Service). For customers with a demand greater than 100 kW, but less than 1,000 kW (customers currently served under Schedule GS-TOD), APCo is proposing a new tariff called Large General Service – Time of Day (LGS-TOD). Under Schedule LGS-TOD, a customer would pay a customer charge, an energy charge that is divided into on-peak and off-peak hours, and a demand charge. If such customer has on-site (behind the meter) solar generation, they are also required to take service under tariff Schedule SBS (Standby Service).

Q. Please comment upon the APCo proposal as it relates to the proposed GS-TOD and LGS-TOD Schedules.

A. Under APCo's proposal, customers with solar generation and demand of 100 kW or less would be treated no differently than they are under the current Schedule GS-TOD.

However, the APCo filing does not provide clarity with respect to whether customers with solar generation and demand greater than 100 kW but less than 1,000 kW would now be subject to a demand charge under tariff Schedule LGS-TOD (which they did not pay under the current tariff Schedule GS-TOD) , in addition to a demand charge under tariff Schedule SBS. Accordingly, the APCo proposal does not provide clarity on how this tariff change would impact on-site renewable energy. The imposition of two demand charges appears to be contrary to traditional ratemaking as it amounts to double recovery of the same costs. As a result, the Commission should make clear that double charging is not permitted, and customers should be charged the lesser of the two charges. Further consideration should be given to how this proposed change impacts the development of on-site renewable energy.

d. Net Metering Policy Considerations

Q. Much of APCo's rate design proposals appear to discourage the installation of on-site solar projects. Can you discuss this effect?

A. The effect of APCo's proposal to substantially increase the monthly Residential Basic Service Charge and to impose an unreasonably high residential standby charge would be to deter the development of residential based solar energy in its service territory. To my knowledge,

there are only three (3) residential projects above 10 kW on line in APCo's territory at this time. As discussed earlier in my testimony, this is contrary to cost based ratemaking and state policy direction. In addition, the approach APCo uses to set the standby charge is overly broad in its target to recover the entire potential loss of revenue to its distribution and transmission business that might occur from residential solar growth. The addition of on-site solar is one element of the ebbs and flows of load growth in a utility service territory (along with energy efficiency, conservation, changes in the number of customers, economic growth and activity and a host of other factors). The standby charge should not be intended to target one particular area of potential change in utility load.

As discussed in detail earlier in my testimony, in the absence of reasonable cost justification, it is discriminatory to attack the reduction in load from the installation of solar while other load reductions (through energy conservation or installation of energy efficiency measures) are appropriately unchallenged. Customers should have the freedom to reasonably determine energy conservation measures that make sense for them, and new and old technologies should compete for customers. APCo's proposals would block this dynamic competitive effect in its territory.

Q. Are there any elements of solar development that differentiate it from these other energy efficiency and load reduction measures?

A. Yes. Net metering is a policy mandated by law in Virginia that is a differentiator. However, the differentiator is not the reduction in sales by the utility as the result of the installation of a solar project, it is only the treatment of the net metered energy, specifically only the excess solar energy that is greater than customer load and "runs the meter backwards"

under the state's net metering laws. This element, the treatment of "excess solar energy", is different than other load reductions or other forms of power generation and is mandated by Virginia law.

Moreover, net metering is separable and distinct from the standby rate determination required by Virginia Code § 56-594 F, because standby charges are intended to address instances when the renewable system is not producing. In contrast, standby charges are not intended to address instances when the renewable system is producing excess energy. There are a host of benefits and policy considerations that led Virginia to allow net metering that are not accounted for in APCo's proposals. Accordingly, the "revenue protection" proposals of APCo should be rejected as simply a mechanism to undercut Virginia's net metering program without a cost basis.

5) Review of Benefits of Solar Energy

Q. Thus far in your testimony you have focused on the cost of utility service and utility rate policy issues. Are there other factors that should be considered?

A. Yes. In addition to cost of service, the Commission should also consider the benefits of solar energy. The charges being sought by APCo should be reviewed in the context of the larger policy goals of the Commonwealth of Virginia and should be considered with a full recognition or accounting of all costs and benefits. As the Commission weighs the merit of APCo's proposals that will discourage conservation and adoption of on-site solar, it is important to keep in mind the broader benefits that on-site renewable energy provides to APCo ratepayers and Virginia.

Q. Please discuss the benefits of distributed solar energy as a resource.

A. The categories of benefits are as follows:

- Energy benefits, where the primary components of this benefit are: (1) the cost and amount of energy that would have otherwise been generated to meet customer needs - often referred to as the merit order effect, which occurs when renewable energy is injected into the grid, displacing the need to dispatch energy at a higher dispatch cost; (2) energy benefits provided when excess solar is generated during higher on-peak periods; and (3) the reduction in line losses that can occur with distributed energy as compared to energy from remote central station generation.

- Capacity benefits, where the two primary components of this benefit are: (1) generation capacity - the cost of generation capacity that can be deferred or avoided due to the addition of solar energy resources; and (2) transmission and distribution (T&D) capacity - the avoided costs in T&D infrastructure investment required to meet local demand, to which the solar resource contributes.

- Grid Support Services, which are services required to enable the reliable operation of the electric grid. There are five components of this benefit: (1) reactive supply and voltage control; (2) frequency regulation; (3) energy imbalance; (4) operating reserves; and (5) scheduling/forecasting.

- Financial Risk Reduction or the "hedge value" of renewable energy in that it has no fuel cost and provides greater cost stability relative to fossil fueled generation.

- Security Risk Reduction, where solar energy increases grid reliability and resiliency by (1) reducing outages by reducing congestion along the T&D network; (2) reducing large-scale outages by increasing the diversity of the electricity system's generation portfolio with geographically dispersed smaller generators; and (3) providing back up power sources available during outages through the combination of PV, control technologies, inverters and storage.

- Environmental benefits, where there is an avoided environmental and/or health impact due to the avoidance of a marginal generation resource being displaced by solar.

- Local and regional economic benefits, when the building out of solar resources results in a net increase in jobs and local economic development. In addition, in the case of solar energy serving commercial or industrial settings, the lower cost or price stability of solar energy may enable the business to enhance its competitiveness and maintain or expand its operations and employment at a site.

Q. To whom do these benefits accrue?

A. In some cases, the benefits accrue to ratepayers, and in some cases, to the region or society at large. For example, energy, capacity, grid support services, and financial and security risk are benefits that accrue to all

ratepayers, whereas environmental benefits and social benefits accrue locally, regionally or more widely.

Q. Have you estimated the benefits of solar energy in terms of economics and jobs?

A. Yes. I used the United States National Renewable Energy Laboratory's (NREL) Jobs and Economic Development Impact Model (JEDI), release PV10.17.11. This is an economic input/output model developed by NREL specifically to analyze the jobs and economic impact of state-specific solar development. The JEDI model uses economic multipliers derived from the industry-leading Minnesota IMPLAN group's IMPLAN Version 3 software. These multipliers support the model's calculations of net economic benefits specific to Virginia's economy and the industries impacted by the construction and operation of solar installations in the state.

The JEDI model is used by federal agencies, state agencies, industry groups, universities, utilities, transmission owners, energy consultants and others to evaluate the jobs and economic impact of both fossil fuel powered and renewable energy generation policies and project development. A partial list of entities that have used the JEDI model or referenced analysis based on the JEDI model include:

- Center for Wind Energy - James Madison University (referenced by Virginia Offshore Wind Development Authority)
- US Department of Energy
- US Department of Agriculture
- Central Appalachian Sustainable Economies
- ITC Midwest (transmission owners/operators)

- University of Michigan – The Energy Policy Institute of the School of Natural Resources & Environment

To reflect current market conditions, I updated the model input assumptions, lowering the overall installation cost from $6.56 per Watt (the JEDI default data) to $4.53 per Watt. Thus, the conservative projected economic benefit may be underestimated.

With no mandatory solar renewable portfolio standard (RPS) requirements in Virginia, I analyzed several scenarios where solar generation provides a percentage of Virginia's electric energy load ranging from 0.25% to 2.0%. Based on solar production estimates provided by NREL's PVWatts calculator, this results in an estimated 225 megawatts (MW) to 1,800 MW of total solar capacity required. In all cases, I assumed that this solar construction would take place during 2015-2019.

Other basic assumptions include a 2.5% annual inflation rate and a 6.0% discount rate used in net present value ("NPV") calculations.

Q. Please summarize your findings of the economic and jobs benefits analysis.

A. In the 2% solar case, the construction of 1,800 MW of solar over 5 years would require more than $1.6 billion per year in total solar development costs. There is an economic multiplier effect for in-state spending that increases the net economic impact (*i.e.*, new workers on location with wages that would buy construction supplies, gas, lunch, etc.). Some spending occurs out of state (i.e., solar panels and inverters that are not made in Virginia) which does not add to Virginia's economy. All of these variables are considered in the JEDI model.

This level of solar development would add 14,514 jobs per year to the Virginia economy during the first 5 years of construction, including direct (solar engineering/construction/installation workers), indirect (construction supply chain, electrical supply, solar materials distribution), and induced (lunch, gas, etc.). After the assumed five-year construction period, the operation and maintenance for the 1,800 MW of installed solar would support 648 jobs per year, which also includes direct, indirect and induced workers.

Over a 20 year period, this economic activity would add $4.1 billion of worker earnings in NPV and $8.8 billion NPV in economic output to Virginia's economy. As with the jobs analysis, this includes direct, indirect and induced economic activity.

Q. Did you estimate the merit order benefits of solar energy in Virginia?

A. Yes. As with the economic benefits analysis, I analyzed several scenarios where solar generation provides a percentage of Virginia's electric energy load ranging from 0.25% to 2.0%. To analyze the Merit Order Effect, I utilized the AURORAxmp Power Market Model (AURORA). AURORA is an industry-leading software and data package that simulates the fundamentals-based dispatch of generation to serve hourly utility load. AURORA recognizes fundamental system inputs such as transmission limits, individual generator operational characteristics and generation costs, monthly fuel costs, and other critical data elements required to simulate the operation of the North American electric grid.

The Merit Order Effect is a recognized and demonstrated price impact of renewable energy generation additions. In essence, solar generation reduces the need for expensive, fossil fuel-based generation. This reduces wholesale power prices and total system cost for all ratepayers. To measure this effect, I conducted AURORA simulations using the 0.25% to 2.0% range of solar generation and compared these scenarios to a base-case which included 0% solar.

Q. Please summarize your findings of the Merit Order Effect analysis.

A. In the 2% case, the Merit Order Effect provides ratepayers with approximately $15 million in annual benefits in 2019, when the solar installations are completed. Taking into consideration the reduced benefits provided in the earlier years, this results in a $158 million NPV over 20 years.

Q. Did you estimate the environmental benefits from solar energy in Virginia?

A. Yes. As with the economic benefits analysis, I analyzed several scenarios where solar generation provides a percentage of Virginia's electric energy load ranging from 0.25% to 2.0%. In each scenario, the solar generation displaces an equal amount (MWh per year) of fossil fuel-based generation and its associated CO_2, SO_2, NO_x, and other pollutants.

Using EPA analysis of monetized benefits resulting from emissions reduction programs, I calculated the net benefit per ton of reduced SO_2 and NO_x emissions. Additional analysis by the EPA provided an estimate of the net benefit per ton of reduced CO_2 emissions. Combining these results

with EPA marginal emissions rates for CO_2, SO_2, and NO_x in the Virginia area, I calculated the annual value for the emissions reductions provided by solar generation.

To verify my calculations, I compared my results to an independent study by Jonathan Levy, et.al. of the Harvard School of Public Health. My calculations were within the range of values provided in this independent Harvard study.

Q. Please summarize your findings of the environmental benefits analysis.

A. In the 2% case, the environmental benefits provide approximately **$302** million in annual benefits by 2019, when the solar installations are completed. This results in a **$3.3** billion NPV over 20 years.

My calculations indicate an environmental value for solar of approximately $127 per MWh. This compares to $31 per MWh (Harvard study low estimate), $60 per MWh (Perez, Zweibel, and Hoff study of the NY area), and $201 per MWh (Harvard study high estimate).

Q. Please summarize your findings of these combined benefits.

A. In the 2% case, the combined economic, Merit Order Effect and environmental benefits provide a total NPV of $16.4 billion over 20 years. This is dominated by the economic benefits, which deliver their primary benefit in the first five years.

While I have only quantified three of the various benefits of solar energy in Virginia, I did not quantify the benefits related to grid support, hedge

value, on-peak energy value, transmission and distribution value, line loss value, and security risk reduction that are described earlier in the my testimony and recognize that analysis of benefits is still under review. When this review is completed and these benefits and costs are valued and accounted for, the Commission will be in a more informed and better position to make determinations related to the standby charge levels and other policy matters.

In any event, it is clear that the benefits of developing solar energy in Virginia are strong and should be considered in the Commission's determination in this matter.

Q. Does this conclude your direct testimony?

A. Yes. Thank you.

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EDUCATION

M.A., Economics, Rutgers University, New Brunswick, New Jersey, price theory, industrial organization, history of economic thought, 1981.

B.A., Economics, minor in Math, University of Pennsylvania, Philadelphia, Pennsylvania, Dean's List, cum laude, 1978.

EMPLOYMENT HISTORY

PRESIDENT, Gabel Associates, Highland Park, New Jersey.
July, 1993 - Present .

- provide a wide range of economic, technical, regulatory and marketplace advice and analysis in the energy, solid waste and environmental industries;
- provide expert testimony before regulatory and legislative bodies;
- assist private sector clients in the analysis and implementation of business ventures;
- assist public sector clients in reducing cost, and expanding and improving the delivery of services.

DIRECTOR, Division of Solid Waste Management,
Department of Environmental Protection and Energy, Trenton, New Jersey.
September, 1991 - July, 1993

- directed the development and implementation of a comprehensive state solid waste management plan, including the development of source reduction and recycling programs and regionalization of disposal facilities;
- managed a staff of 210 in planning, recycling, source reduction, budget, administration, permitting, rate setting, licensing and enforcement activities in the only comprehensive, economic and environmental regulatory agency in the country;
- directed the economic evaluation of solid waste service agreements and waste collection and disposal rates and the development of economic incentives and financial assistance to recycling activities;
- led the state's efforts in pursuing a target of recycling 60% of New Jersey's solid waste by 1996, through financing, licensing, planning and market development efforts;
- directed the enforcement of New Jersey's solid waste environmental and economic regulations;
- managed the state's landfill closure activities and disbursement of closure and post-closure funds;
- testified extensively before legislature and regulatory bodies.

DIRECTOR, Solid Waste Division
New Jersey Board of Public Utilities, Newark, New Jersey.
April 1990 - August, 1991

- supervised staff of 60 in the evaluation of solid waste economic issues and in the enforcement of the state's solid waste laws;

- evaluated, designed programs and made recommendations in the areas of resource recovery, recycling, regionalization of solid waste facilities, landfill and transfer station economics, landfill closure and post-closure financing and enforcement strategy;

- testified extensively before legislative and regulatory bodies.

DIRECTOR, Electric Division,
New Jersey Board of Public Utilities, Newark, New Jersey.
February, 1983 - March, 1990

- designed programs, evaluated and made recommendations to the Board in the areas of finance, capacity planning, cogeneration, small power production, cost of service, tariff design, demand side management, economic analysis, utility fuel clauses, nuclear performance, load forecasting, service adequacy, revenue requirements, incentive regulation and accounting;

- developed and implemented significant analytical methods and policies in cost of service and tariff design, cogeneration and small power production procurement, demand side management incentives and nuclear performance standards;

- supervised staff of 35 in the preparation of briefs, position papers, and economic and technical analysis;

- testified extensively before legislative and regulatory bodies; particular expertise in cost of service, tariff design, cogeneration and small power production, demand side management, capacity analysis and incentive ratemaking.

BUREAU CHIEF, Bureau of Electric Rates and Tariffs,
New Jersey Board of Public Utilities, Newark, New Jersey.
May, 1982 - February, 1983

- evaluated, designed programs and made recommendations to the Board in the areas of tariff design, capacity planning, load forecasting, conservation, alternative energy, load management, and fuel clauses;

- supervised staff of 7 in the preparation of briefs, position papers, economic analysis and consumer responses;

- testified before legislative and regulatory bodies as necessary;

- managed agency activities related to the Public Utilities Regulatory Policies Act.

ECONOMIST, New Jersey Board of Public Utilities,
Newark, New Jersey.
January, 1980 - May, 1982

- analyzed and administered all areas of the Board's consideration of the Public Utilities Regulatory Policies Act and Natural Gas Policies Act;

- performed economic analysis in the areas of tariff design and cost of service;

- wrote briefs and position papers;

- testified as necessary

APPOINTMENTS, TESTIMONY AND PAPERS

12/13	Testimony before the New Jersey Board of Public Utilities on behalf of Fishermen's Energy regarding its proposed offshore wind project
2008 - 2013	Frequent testimony before the New Jersey Assembly Telecommunication and Utilities Committee and Senate Environment Committee on various energy issues
2010	Serves on New Jersey's Solar Alternative Compliance Payment (SACP) Subcommittee (through the present)
4/07	Testimony before the New Jersey Senate Environment Committee on climate change
2/07	Testimony before the New Jersey Assembly Environment and Solid Waste Committee on the New Jersey Global Warming Response Act
10/06	Testimony on behalf of the Optional Industrial Water coalition in a New Jersey American Water Company case
1/06	Testimony before the New Jersey Assembly Telecommunication and Utilities Committee regarding key energy issues for New Jersey
2004 -2008	Served as Co-Chair of New Jersey's Renewable Energy Committee
1/03	Appointed to and Served on Governor's Renewable Energy Task Force
8/02	Appointed to and Served on Governor's Deferred Balances Task Force
4/02	Testimony before the New Jersey Assembly Telecommunications and Utilities Committee regarding Four-Year Restructuring Transformation Period
11/01	Testimony before the New Jersey Office of Administrative Law on the Atlantic City Electric Company-PEPCO Merger Filing
4/01	Testimony before the New Jersey Office of Administrative Law on the FirstEnergy Corporation and Jersey Central Power and Light Company Merger Filing
7/99	Testimony before the New Jersey Office of Administrative Law on The Matter of the Petition of the Mount Holly Water Company for Approval of an Increase in Rates For Service
11/98	Testimony before the New Jersey Senate Natural Resource and Environment Committee on electric industry restructuring
11/98	Testimony before the New Jersey Assembly Policy and Regulatory Oversight Committee on electric industry restructuring
3/98	Testimony before the New Jersey Board of Public Utilities on electric industry restructuring issues
2/98	Affidavit before the Federal Energy Regulatory Commission on New York Power Pool Governance issues
1/98	Testimony before the New Jersey Office of Administrative Law on Rockland Electric unbundled rate and stranded cost filing
12/97	Testimony before the New Jersey Office of Administrative Law on Atlantic Electric unbundled rate and stranded cost filing

11/97 Testimony before the New Jersey Office of Administrative Law on GPU Energy unbundled rate and stranded cost filing

11/97 Testimony before the New Jersey Office of Administrative Law on PSE&G unbundled rate and stranded cost filing

10/97 Testimony before the New Jersey Department of Environmental Protection on proposed NOx Allocation regulations

6/97 Testimony before the New Jersey Board of Public Utilities on exit fees

5/97 Testimony before the New Jersey Assembly Policy Committee with respect to energy taxes

8/96 Testimony on electric industry restructuring before the New Jersey Board of Public utilities

4/96 "Solid Waste Rate Regulation and the Structure of the Solid Waste Collection Industry", testimony before the Assembly Agriculture and Waste Management Committee on behalf of the National Solid Wastes Management Association, New Jersey Chapter

12/95 "Solid Waste Rate Regulation", testimony before the New Jersey Assembly Solid Waste Committee on behalf of the National Solid Wastes Management Association, New Jersey Chapter

9/95 "In the Matter of the Petition of New Jersey-American Water Company, Inc. For an Increase in Rates for Water and Sewer Service And Other Tariff Modifications", testimony before the Office of Administrative Law on behalf of the Bulk Purchasing Coalition

8/95 "Standards for Setting Flex-rates", testimony before the New Jersey Board of Public Utilities on behalf of the Independent Energy Producers of New Jersey

6/95 "Rate Flexibility and Alternative Ratemaking", testimony before the Senate Natural Resources and Economic Development Committee on behalf of the Independent Energy Producers of New Jersey

6/95 "Rate Flexibility and Alternative Ratemaking", testimony before the Assembly Policy and Rules Committee on behalf of the Independent Energy Producers of New Jersey

5/95 "Analysis of Rate Flexibility and Alternative Ratemaking", testimony before a joint hearing of the New Jersey Senate National Resources and Economic Development Committee and the Assembly Policy and Rules Committee, on behalf of the Independent Energy Producers of New Jersey

4/95 "New Jersey Energy Tax Policy", testimony before the New Jersey Board of Public Utilities and the New Jersey Department of Treasury on behalf of the Independent Energy Producers of New Jersey

11/94 "In the Matter of the Motion of Public Service Electric and Gas Company for increases in its levelized energy adjustment clause and levelized gas adjustment clause", testimony before the New Jersey Office of Administrative Law on behalf of the Independent Energy Producers of New Jersey

9/94 "In the matter of the DEP's Proposed Amendments and Proposed New Rules for NOx Emissions", testimony before the New Jersey Department of Environmental Protection on behalf of the Independent Energy Producers of New Jersey

5/94 "Approaches to Rate Flexibility for Utilities", testimony before the Board of Regulatory Commissioners on behalf of the Independent Energy Producers of New Jersey

12/93 "Analysis of Rate Flexibility Legislation", testimony before the New Jersey Assembly Energy and Environmental Committee on behalf of the Independent Energy Producers of New Jersey

11/93 "Analysis of Rate Flexibility Legislation", testimony before the New Jersey Joint Committee on Economic Development on behalf of the Independent Energy Producers of New Jersey

9/93 "Assessment of the Proposed Agreement between Public Service Electric and Gas Company and the Bayway Refinery", testimony before the Board of Regulatory Commissioners on behalf of the Independent Energy Producers of New Jersey

4/93 "Allocation of Resource Recovery Bond Funds", testimony before the New Jersey State Senate Local Public Affairs Committee

11/92 "Options for Financing Solid Waste Projects", testimony before the New Jersey State Assembly Solid Waste Committee

2/92 "New Jersey's Solid Waste Direction: The Drive to Self-Sufficiency", testimony before the New Jersey State Assembly Solid Waste Committee

9/91 "Public vs. Private Sector incentives in Solid Waste Planning", testimony before the New Jersey State Assembly Solid Waste Committee

4/91 "Refinements in Rate Reform in the Solid Waste Collection Industry", testimony before the New Jersey State Assembly Solid Waste Committee

2/91 "Initiatives in Recycling", testimony before the New Jersey State Assembly Solid Waste Committee

10/90 "Advances in Solid Waste Policy", Environmental Expo, Edison, New Jersey

6/90 "Rate Reform in the Solid Waste Collection Industry", testimony before the New Jersey State Assembly Solid Waste Committee

2/90 "New Jersey Energy Policy", testimony before the New Jersey State Assembly Natural Resources and Energy Committee

7//89 "Cogeneration and Small Power Production Policy in New Jersey", Cogeneration and Small Power Production Conference, Newark, New Jersey

6/89 "The Future of the New, Unregulated Electric Utility Industry", panel discussion, 1989, Cogeneration and Independent Power Congress, Atlantic City, New Jersey

5/89 "Competitive Bidding: A View From The State Regulators", National Association of Energy Service Companies Conference, Coral Gables, Florida

4/89 "Electric Supply Planning", The Looming Crisis in Electric Power Generation Conference, Arlington, Virginia

3/89 "Real vs. Phantom Competition in the Power Industry: Who Wins?", New Jersey Energy & Facilities Management Expo, Secaucus, New Jersey

2/89 "Utility Advertising Costs and Competition in Fuel Markets", testimony before the New Jersey State Senate Committee on Energy and Environment

1/89 "New Jersey's Cogeneration Policy", Alternate Energy/Independent Power Producers Seminar, New York, New York

1/89 "A Regulatory Approach to Alternative Power Development", Rutgers University Workshop on Regulation, Newark, New Jersey

12/88 "Competitive Bidding", Middle States Independent Power Producers Association Conference, Philadelphia, Pennsylvania

12/88 "Regulatory Incentives for Reliable, Low-Cost Energy Generation", New Jersey Board of Public Utilities

Electric Conference, New Brunswick, New Jersey

10/88 "In the Matter of the Joint Application of Public Service Electric & Gas Company and Eagle Point Cogeneration Partnership for Approval of Power Purchase and Interconnection Agreement", testimony before the New Jersey Board of Public Utilities

9/88 "Nuclear Performance Standards", testimony before the New Jersey State Assembly Committee on Energy and Environment

6/88 "United States and New Jersey Cogeneration Policy", Confederation of Engineering Industry of India, Mission on Cogeneration Conference, Newark, New Jersey

2/88 "New Jersey's Regulatory Approach to Packaged Cogeneration", National Conference on Packaged Cogeneration Systems, Orlando, Florida

9/87 "In the Matter of Cogeneration and Small Power Production", testimony before the New Jersey Board of Public Utilities

4/87 "Blueprint for Fair Competition", Energy Bureau Cogeneration and Small Power Production Conference, Arlington, Virginia

3/87 "Cogeneration - A New Jersey Success Story", Administrative Law Conference, Somerset, New Jersey

3/87 "Cogeneration in New Jersey", IEEE Meeting, Nutley, New Jersey

11/86 "In the Matter of Public Service Electric & Gas, A Review of the Reasonableness of Hope Creek Costs", testimony before the New Jersey Board of Public Utilities

10/86 "In the Matter of the Petition of Atlantic City Electric Company to Form a Holding Company", testimony before the New Jersey Board of Public Utilities

6/86 "In the Matter of Atlantic City Electric Company Nuclear Performance Standards", testimony before the New Jersey Board of Public Utilities

6/86 "In the Matter of Public Service Electric & Gas Company, Nuclear Performance Standards", testimony before the New Jersey Board of Public Utilities

6/86 "In the Matter of Public Service Electric & Gas Company, A Review of the Various Ratemaking Options for Hope Creek", testimony before the New Jersey Board of Public Utilities

4/86 "In the Matter of Public Service Electric & Gas Company, Electric Tariff Design", testimony before the New Jersey Board of Public Utilities

2/86 "In the Matter of Jersey Central Power & Light Company's Nuclear Performance Standards", testimony before the New Jersey Board of Public Utilities

12/85 "In the Matter of the Petition of Jersey Central Power & Light Company for an Increase in Rates", testimony before the New Jersey Board of Public Utilities

7/85 "Analysis of the Draft Energy Master Plan", testimony before the New Jersey Department of Energy

4/85 "Nuclear Performance - A Regulatory Outlook", Administrative Law Conference, Somerset, New Jersey

4/84 "In the Matter of Jersey Central Power & Light Company Fault Phase II, Three Mile Island Accident Pursuant to Fault Determination Act", testimony before the New Jersey Board of Public Utilities

10/83 "Electric Tariff Design for the Public Service Electric & Gas Company", testimony before the New Jersey

Board of Public Utilities

9/83 "The Regulatory Outlook on Cogeneration", The Association for Chemical Engineers, Nutley, New Jersey

1/83 "New Jersey Board of Public Utilities Cogeneration Policy", testimony before the New Jersey State Senate Subcommittee on Energy and Environment

12/82 "Utility Service Termination Policy", testimony before the New Jersey State Senate Subcommittee on Energy and Environment

11/82 "Allocation of New York Hydro-Power to Neighboring States", testimony before the Power Authority of the State of New York

4/82 "New Jersey Board of Public Utilities Cogeneration Policy", New York Cogeneration Society

1/82 "A Prospective on Load Management", IEEE Convention, New York City

1/82 "Electric Cost Allocation for the Boston Edison Company", testimony before the Massachusetts Department of Public Utilities

10/81 "Pricing of Power from Qualifying Cogeneration and Small Power Production Facilities", testimony before the Pennsylvania Public Utilities Commission

6/81 "Regulatory Policy Toward Cogeneration and Small Power Production", New Jersey Cogeneration Conference, Princeton, New Jersey

5/81 "In the Matter of Cogeneration and Small Power Production", testimony before the New Jersey Board of Public Utilities

Residential Service - Example
Bill - Pre and Post Solar
Source - APCo JBS, Schedule 2, page 1 of 1

Exhibit SG - 2
Witness: S. Gabel
Page 1 of 1

Solar Status

Residential Service Billing Components

Solar Status	Other Riders	T-RAC	Distribution Base Energy	Generation Base Energy	Distribution Customer	TOTAL BILL
Pre-Solar	$1,149.73	$354.39	$360.66	$1,363.93	$192.00	$3,420.72
Post-Solar						
Current Components	$554.15	$170.81	$173.83	$657.39	$192.00	$1,748.19
Standby Charge		$189.88 A	$208.34 B			$398.22
TOTAL	**$554.15**	**$360.69**	**$382.17**	**$657.39**	**$192.00**	**$2,146.41**

A Propsed transmission standby charge.
B Proposed distribution standby charge.

Residential Bill Impact
Proposed APCo changes to Residential Service Tariff (Schedule RS)
Data Source - APCo response to data request OAG-113

Exhibit SG - 3
Witness: S. Gabel
Page 1 of 1

Summary APCo Proposed changes to Schedule RS:

Customer Charge - Increase from $8.35 per month to $16.00 per month; or 92% increase
Energy Charge - Decrease from $0.0691 per kWh to $0.06246 per kWh; or 10% decrease

Energy Usage per month (kWh)	Bill Impact (Percentage Change)
100	36.9%
250	17.2%
500	7.1%
1,000	0.3%
2,000	-2.5%
2,500	-3.3%
3,000	-3.8%
4,000	-4.4%

Customer Charge Comparison
Major Electric Utilities
Virginia and Neighboring States

Exhibit SG - 4
Witness: S. Gabel
Page 1 of 1

APCo. Virginia current - $8.35 per month
APCo. Virginia proposed - $16.00 per month
Proposed Increase - 92%

State	Major Utility	Customer Charge per Month
Virginia	Dominion Virginia Power	$7.00
North Carolina	Duke Energy	$11.80
	Dominion North Carolina Power	$10.99
	Progress Energy Carolinas	$7.00
West Virginia	Monogahela Power	$5.00
	Potomac Power	$5.00
	Wheeling Electric (APCo.)	$5.00
Maryland	Baltimore Gas & Electric	$7.50
	Pepco Holdings	$7.39
	Allegheny Electric	$5.00
Average		$7.17

CERTIFICATE OF SERVICE

I hereby certify that on August 6, 2014 I sent a true and correct copy of this Prepared Direct Testimony of Steven Gabel on Behalf of The Alliance for Solar Choice to the following persons:

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