

**PECO ENERGY COMPANY
STATEMENT NO. 5-R**

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PENNSYLVANIA PUBLIC UTILITY COMMISSION
v.
PECO ENERGY COMPANY

DOCKET NO. R-2018-3000164

REBUTTAL TESTIMONY

WITNESS: PAUL R. MOUL

SUBJECTS: PECO'S OVERALL RATE OF RETURN AND
THE COST OF EQUITY

DATED: July 24, 2018

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**REBUTTAL TESTIMONY
OF
PAUL R. MOUL**

4

I. INTRODUCTION AND PURPOSE OF TESTIMONY

5 **1. Q. Please state your name, occupation and business address.**

6 A. My name is Paul Ronald Moul. My business address is 251 Hopkins Road,
7 Haddonfield, New Jersey 08033-3062. I am Managing Consultant at the firm
8 P. Moul & Associates, an independent financial and regulatory consulting
9 firm.

10 **2. Q. Did you previously submit testimony in this proceeding on behalf of**
11 **PECO Energy Company (“PECO Energy” or the “Company”)?**

12 A. Yes. I submitted my direct testimony, PECO Energy Statement No. 5, on
13 March 29, 2018.

14 **3. Q. What is the purpose of your rebuttal testimony?**

15 A. PECO has requested I review and respond to the direct testimony relating to
16 the rate of return submitted by David S. Habr, a witness appearing on behalf
17 of the Office of Consumer Advocate (“OCA”), Anthony Spadaccio, a witness
18 appearing on behalf of the Commission’s Bureau of Investigation and
19 Enforcement (“I&E”), and Gregory W. Tillman, a witness appearing on behalf
20 of Wal-Mart/Sam’s Club (“Walmart”).

1 **4. Q. Please identify the principal areas of controversy concerning the rate of**
2 **return issue in this proceeding.**

3 A. The Company's cost of equity is the principal rate of return issue in this case.
4 Mr. Spadaccio and Dr. Habr have accepted the Company's proposed capital
5 structure ratios. Mr. Spadaccio also accepted the Company's proposed
6 embedded cost of long-term debt for the fully projected future test year. Dr.
7 Habr has proposed an alternative methodology to compute the cost of debt for
8 PECO Energy which departs from the Commission's long practice of using
9 the yield-to-maturity ("YTM") approach, but it does not provide a meaningful
10 difference in the positions of the parties.¹ Mr. Tillman did not address these
11 issues.

12 The equity returns proposed by Dr. Habr and Mr. Spadaccio, however, are
13 entirely too low to reflect the risks of PECO and its prospective cost of equity.
14 Dr. Habr has proposed a return of 8.74% (prior to an unjustified downward
15 adjustment for the Company's common equity ratio) and Mr. Spadaccio has
16 proposed 9.21%. Mr. Tillman did not prepare a cost of equity analysis but
17 simply presented authorized returns of other utilities, and his testimony does
18 not provide an independent analysis of the Company's cost of equity.

19 I believe the disparities between the opposing-parties' cost of equity proposals
20 and mine are attributable to their failures to account properly for the effect of
21 the Tax Cuts and Jobs Act of 2017 ("TCJA") and to consider a rate of return

¹ The lack of a meaningful difference is shown by the Company's proposed embedded cost of debt of 4.16% as compared to Dr. Habr's cost of debt of 4.17%. I note that the Federal Energy Regulatory Commission ("FERC") also relies upon the YTM approach to calculate the cost of debt.

1 that reflects and supports both the Company's financial and risk profile and its
2 effective management. In addition, there are also a number of technical errors
3 made by the parties, which I address in detail hereafter. The combined effect
4 of all of these factors results in opposing-party witnesses significantly
5 understating the Company's required cost of equity in this proceeding. I
6 believe that adopting either the OCA's or I&E's proposal would raise serious
7 concerns for investors.

8 **5. Q. Have you prepared any exhibits to accompany your rebuttal testimony?**

9 A. Yes. I have prepared PECO Exhibit PRM-2, which I discuss later in my
10 rebuttal testimony. The contents of PECO Exhibit PRM-2 were previously
11 provided to all parties in the Company's response to I&E's interrogatory IE-
12 III-RR-4-D.

13 **6. Q. How is your rebuttal testimony organized?**

14 A. I will first discuss the TCJA and the equity returns proposed by the opposing
15 parties. I will then discuss the errors in the analyses of Dr. Habr and Mr.
16 Spadaccio, which I summarize briefly here:

- 17 ○ Comparable Companies – Dr. Habr and I agree on the composition of the
18 proxy group, with the exception that he erroneously excludes Avangrid
19 from his group. Mr. Spadaccio excludes several companies erroneously
20 and proposes a barometer group with companies that are inappropriate in
21 this case.
- 22 ○ Discounted Cash Flow (DCF) – A variety of DCF results are too close to
23 the cost of debt to provide a reliable measure of the cost of equity. As
24 such, alternative measures should be considered as the Commission has

1 done in other proceedings. A multistage DCF model, as proposed by Dr.
2 Habr, is inappropriate for use in this case.

3 ○ DCF Leverage Adjustment – Neither Dr. Habr nor Mr. Spadaccio refute
4 the accuracy of the Company’s leverage adjustments to the DCF and beta
5 component of the CAPM, and those should be applied as discussed in my
6 direct testimony.

7
8 ○ Capital Asset Pricing Model – A reasonable application of the CAPM
9 mandates using 30-year Treasury bond yields, leverage adjusted betas, and
10 historical returns based on arithmetic means.

11 ○ Risk Premium Analysis – The Risk Premium approach has previously
12 been considered by the Commission and should be considered here,
13 contrary to Dr. Habr’s views; the results presented by the Company
14 substantiate the Company’s proposed return in this case. The Risk
15 Premium analysis is particularly relevant because it directly reflects the
16 effect of higher expected interest costs on the prospective cost of common
17 equity capital.

18 ○ Comparable Earnings Approach – Contrary to the testimony of Mr.
19 Spadaccio, consideration of the comparable earnings approach is
20 appropriate and substantiates the Company’s proposed return in this case.

21 ○ Neither Dr. Habr nor Mr. Spadaccio provide a basis for the Commission to
22 reject an equity return above the midpoint of the indicated returns I
23 calculated in light of the effectiveness of PECO’s management.

24

25 **II. EFFECTS OF THE TCJA AND COMPARABLE RETURNS**

26 **7. Q. Please explain what credit rating agencies have said about the effect of**
27 **the TCJA.**

28 A. Moody’s has indicated that the TCJA has a negative impact on the credit
29 ratings of utility holding companies and their regulated operating companies
30 due to the reduction in cash flow and coverage ratios as the ratemaking
31 process passes the benefits of reduced taxes through to ratepayers. On June
32 18, 2018, Moody’s Investors Service downgraded its outlook on the regulated
33 utilities sector to “negative” from “stable,” citing a declining financial trend

1 prompted by lower cash flows and higher debt levels. This change in outlook
2 is attributable to uncertainty about regulatory recovery provisions, authorized
3 equity returns and common equity ratios. For PECO Energy, Moody's has
4 expressed concern that a deterioration of financial metrics could jeopardize its
5 credit quality.

6 **8. Q. How has the TCJA increased business and operating risk for PECO**
7 **Energy?**

8 A. There are several major financial consequences that flow from the changes in
9 the federal corporate income tax law that will negatively affect the Company.
10 First, a lower federal corporate income tax rate (21% versus 35%) will lower
11 the Company's pre-tax interest coverage and, therefore, will reduce its credit
12 quality and increase risk. As I noted in my direct testimony (pp. 10-11), the
13 new 21% marginal federal corporate income tax rate will result in pre-tax
14 interest coverage of 5.24 times at proposed rates. Under the prior income tax
15 rate of 35%, the Company's pre-tax interest coverage would have been 6.15
16 times. Furthermore, lower federal corporate income taxes will make investor
17 returns more volatile than before the change in federal corporate income taxes,
18 and higher volatility translates into increased business risk for PECO.
19 Utilities such as PECO will also require more investor-supplied capital to fund
20 construction programs because the new federal corporate income tax law
21 eliminates bonus depreciation and deferred taxes will be booked at a lower
22 rate prospectively. In response to these financial challenges caused by the
23 new lower federal corporate income tax rate, the Company's business risk will

1 increase, thereby causing an increase in the cost of capital in response to this
2 risk as well as weaker credit quality measures.

3 **9. Q. Have I&E and OCA witnesses adequately considered the effect of the**
4 **TCJA on the risk profile of PECO Energy?**

5 A. No, they have not. Dr. Habr's and Mr. Spadaccio's proposals are not an
6 appropriate regulatory response to the TCJA for electric utilities generally, or
7 to PECO specifically. Setting a return on equity at a much higher rate would
8 be the appropriate response to the increased risk fostered by the TCJA. As to
9 the claim that the market evidence, and in particular the stock prices in the
10 DCF, reflect the impact of the TCJA, the claim simply disregards the credit
11 quality implications of the TCJA. Dr. Habr and Mr. Spadaccio have not
12 demonstrated how their equity proposals (substantially based on the DCF
13 model) have addressed the cash flow and credit quality issues on a prospective
14 basis.

15 **10. Q. What actions can be taken to address the higher risk implications of the**
16 **TCJA?**

17 A. Credit rating agencies anticipate that it will be necessary for utilities to work
18 closely with state regulators to try to address the negative impact of tax
19 reform. The rating agencies have suggested that potential regulatory
20 ratemaking offsets to tax-related cash flow reductions could include:

- 1 (i) a higher authorized return on equity from regulators to recognize
2 that business risk has increased, credit quality will decline, and
3 cash flow will be diminished prospectively;
- 4 (ii) a deleveraging of the capital structure through less debt and more
5 equity; and/or
- 6 (iii) a reduction in future capex to accommodate lower future cash
7 flows.²

8 Although item (ii) is arguably under the control of public utilities, new, higher
9 equity ratios can produce credit rating agencies' expected outcome only if
10 those equity ratios are actually used in the rate-setting process. Additionally,
11 item (iii) is not a valid alternative for electric utilities, like PECO, that face the
12 need to make large, and growing, capital expenditures. Importantly, item (i) is
13 directly under the control of regulators. In this case, the Commission can, and
14 should, employ the financial risk adjustment in the DCF model I proposed and
15 described in my direct testimony, which properly increases the equity return
16 rate to recognize the need for deleveraging the capital structure until equity
17 ratios grow to the level that reflects the adverse impact on utility cash-flows
18 created by the TCJA. It is essential that the Commission recognize the need
19 for higher authorized returns to account for the effects of the TCJA and the
20 trend toward higher interest rates that has developed in 2018.

21

² Moody's Investors Service, "Moody's Changes Outlooks on 25 U.S. Regulated Utilities Primarily Impacted by Tax Reform," Jan. 19, 2018.

1 **11. Q. How do Dr. Habr’s recommendations compare with recently authorized**
2 **equity returns?**

3 A. Dr. Habr’s recommended equity return (8.50%) is more than 100 basis points
4 below the average equity return authorized for electric utilities of 9.65% for
5 the first half of 2018 and 9.74% for the full year 2017.³ Since these returns
6 were established, capital costs have increased and business risk has increased
7 due to TCJA. Hence, higher returns are required today.

8 **12. Q. Are the equity return recommendations by Mr. Spadaccio and Dr. Habr**
9 **commensurate with the returns that investors expect other electric**
10 **utilities to earn?**

11 A. No. The table provided below summarizes the forecasted returns on equity
12 for the Electric Group, as published in the May 18, 2018 edition of Value
13 Line:

14

Company	2019	2021-23
Avangrid, Inc.	5.00%	6.00%
Consolidated Edison	8.50%	8.50%
Dominion Energy	14.50%	16.00%
Duke Energy	8.00%	8.50%
Eversource Energy	9.00%	9.50%
Exelon Corp.	9.00%	9.50%
FirstEnergy Corp.	14.00%	15.50%
NextEra Energy	12.00%	13.00%
PPL Corp.	13.00%	13.00%
Public Service Enterprise Group	11.00%	11.00%
Average	10.40%	11.05%

15

16

³ Regulatory Research Associates Regulatory Focus, “Major Rate Case Decisions – January-June 2018,” July 17, 2018.

1 Knowledgeable investors are aware of these returns and price the stocks of the
2 electric utilities accordingly.⁴ These data support an equity return that
3 substantially exceeds the proposals of Dr. Habr and Mr. Spadaccio.

4
5 **13. Q. Is there evidence that suggests that the cost of equity has been increasing?**

6 A. Yes. Generally, utility stock prices reached a peak in November 2017 and
7 have trailed off since then, indicating that the cost of equity has increased. A
8 number of factors have weighed on utility stock prices. They include: (i)
9 higher interest rates; (ii) greater stock market volatility; and (iii) the TCJA.
10 There have been seven (7) one-quarter percentage point increases in the Fed
11 Funds rate since the Federal Open Market Committee (“FOMC”) began to
12 normalize interest rates following the financial crisis and the Great Recession.
13 The most recent of these increases occurred on June 13, 2018. Going forward,
14 there is an expectation of possibly two additional interest rate increases in
15 2018 and three increases are expected in 2019. Along with these increases,
16 the yield on 10-year Treasury notes recently hit the 3% level for the first time
17 since 2014. Indeed, the yield on A-rated public utility bonds has increased to
18 4.27% in June 2018 from 3.79% in December 2017 -- a 48 basis point (13%)
19 increase. Higher interest rates have been weighing heavily on stocks, and
20 utilities in particular.

⁴ The FERC has recognized the relevance of comparing earnings and stock prices across electric utility companies because this approach has a “close relationship to the comparable earnings standard that originated in *Hope*,” “is used by investors to estimate the ROE that a utility will earn in the future,” and, therefore, “can be useful in validating our ROE recommendations.” *Coakley v. Bangor Hydro Electric Co.*, Opinion No. 531, 147 FERC ¶61,231 at P 147 (2014).

1 **14. Q. Are there additional issues that the Commission should consider when**
2 **setting the Company's return?**

3 A. Yes. If the Commission were to adopt either of the proposals of OCA and
4 I&E, investors would see Pennsylvania regulation as less supportive of the
5 Company at a time of high levels of capital investment, rising interest rates,
6 and the cash-flow consequences of the TCJA. At present, Pennsylvania
7 regulation is currently ranked Above Average/3 by Regulatory Research
8 Associates ("RRA"), which reflects an upgrade that occurred on May 10,
9 2017. The rating system used by RRA includes three principal categories
10 (i.e., Above Average, Average and Below Average with more refined
11 positions within the categories designated by the numbers 1, 2 and 3). If the
12 Commission were to follow the proposals of I&E or the OCA, the regulatory
13 ranking of Pennsylvania would certainly be jeopardized. The return on equity
14 used by the Commission to set rates embodies in a single numerical value a
15 clear signal of regulatory support for the financial strength of the utilities that
16 it regulates. Although other components of a regulatory commission's
17 revenue requirement determination, such as policies and practices for
18 determining rate base, revenues, expenses and taxes, as well as rate structure
19 and rate design issues are important considerations, the opportunity to achieve
20 a reasonable return on equity represents a direct signal to the investment
21 community of regulatory support (or lack thereof) for the utility's financial
22 strength. A single figure – the return on equity used to set rates – provides a
23 common and widely understood benchmark that can be compared from one

1 company, and jurisdiction, to another and is the basis by which returns on all
2 financial assets (stocks – both utility and non-regulated, bonds, money market
3 instruments, and so forth) can be measured. So, while varying degrees of
4 sophistication are required to interpret the meaning of specific Commission
5 policies on technical matters, the return on equity figure is universally
6 understood and communicates to investors the types of returns that they can
7 reasonably expect from an investment in utilities operating in Pennsylvania.

8 III. PROXY GROUP

9 **15. Q. Are there differences in the proxy groups utilized by the rate of return**
10 **witnesses in this case?**

11 A. Yes. Dr. Habr accepts my Electric Group for his analysis, except that he
12 erroneously removes Avangrid. Mr. Spadaccio describes his criteria on page
13 8 of his prefiled direct testimony (I&E St. No. 2). He then provides a chart on
14 page 9 that includes five of the same companies that I included, excludes five
15 of my original companies, and includes 7 other companies based on his
16 analysis. I will describe why Mr. Spadaccio's proxy group is inappropriate.

17 **16. Q. Mr. Spadaccio used the percentage of revenues devoted to utility**
18 **operations as a criterion for screening companies to assemble his**
19 **barometer group. Please explain why this is not the correct criterion.**

20 A. This screening criterion used by Mr. Spadaccio's is incorrect and, therefore,
21 Exelon Corporation and Public Service Enterprise Group should not be
22 excluded from the barometer group. The percentage of regulated revenues

1 should not be used to select members of the barometer group because the
2 margins on other business segments within barometer group companies are
3 generally dissimilar to the utility business. Energy trading is a case in point,
4 which would make revenue comparisons incompatible because of the large
5 revenues and small margins associated with that business, when contained in
6 potential barometer group companies. That is to say, energy trading generates
7 large amount of revenues, but little profit because the margins on such trades
8 are very small. The correct screening criterion is the percentage of electric
9 assets to total assets. This measure best describes how the potential returns on
10 capital used in utility operations will be achieved on the total business. I have
11 provided the Percentage of Regulated Assets for my Electric Group in Exhibit
12 PRM-2. There, I have shown that regulated assets for my Electric Group were
13 in the range of 50.56% to 94.72%. The average for the Electric Group is
14 69.90%. Moreover, the Commission uses a criterion of 50% of assets related
15 to jurisdictional utility operations when it assembles the barometer group in
16 the Quarterly Earnings Report. Hence, my Electric Group provides a
17 reasonable barometer group for this case.

18 **17. Q. Does the use of Mr. Spadaccio's barometer group provide a reasonable**
19 **basis to measure the cost of equity for PECO Energy?**

20 A. No. Although I have modified both the DCF return and the CAPM for Mr.
21 Spadaccio's barometer group, these revisions show higher results than those
22 produced by Mr. Spadaccio, yet those results continue to be unreasonable and
23 inadequate to provide PECO Energy with a reasonable equity return.

1 18. Q. Dr. Habr excludes Avangrid from your Electric Group. Is this exclusion
2 proper?

3 A. No. Dr. Habr excludes Avangrid based entirely on subjective assessments.
4 He has not shown that the operational risk of Avangrid departs significantly
5 from the risk of other members of the Electric Group.

6 19. Q. Dr. Habr cites the “controlled company” exemption that allows the stock
7 of Avangrid to be listed on the NYSE. Does this have any particular
8 relevance to the inclusion of Avangrid in the Electric Group?

9 A. No. Although the exemption cited by Dr. Habr is an acknowledgment of
10 Avangrid’s relationship to Iberdrola, Value Line places no particular
11 relevance on this fact when discussing the attributes of Avangrid in its
12 publication. If the “controlled company” factor were important to the risk and
13 return profile of Avangrid as Dr. Habr assumes, then Value Line would have
14 noted that factor. But, it does not. Furthermore, Avangrid has credit quality
15 ratings identical to the average of the Electric Group, which further
16 substantiates the validity of including it as a member of the Electric Group.

1 **IV. COST OF COMMON EQUITY - DISCOUNTED CASH FLOW (DCF)**

2 **20. Q. The DCF model has been used by Mr. Spadaccio, Dr. Habr and you as**
3 **one method for measuring the cost of equity. What is your position**
4 **concerning the usefulness of the DCF model?**

5 A. While the results of a DCF model should certainly be given weight, the use of
6 more than one method provides a superior foundation for the cost of equity
7 determination. All cost of equity models must, of necessity, rest upon certain
8 assumptions that, given what it means to create and apply a “model,” cannot
9 capture the variability and complexity of all the factors affecting investors’
10 expectations. For that reason, it is important to consider the results of more
11 than one model in order to capture, to the extent possible, the multiplicity of
12 factors that influence investors’ decisions to commit capital to an enterprise
13 (i.e., current income, capital appreciation, preservation of capital, level of risk
14 bearing). In any event, there is no evidence that investors rely exclusively
15 upon any one method, such as the DCF, when making their investment
16 decisions. The simplified DCF model assumes a constant growth rate, a
17 constant dividend payout ratio, no change in price-earnings multiples, and the
18 same growth rate for the price of stock, earnings per share, dividends per
19 share and book value per share. We know from experience that those
20 simplifying assumptions will not correspond to market-based expectations,
21 because the stock market exhibits actual performance that differs – often

1 materially – from the assumptions that underlie the DCF model.⁵ The use of
2 multiple methods, therefore, provides a more comprehensive and reliable
3 basis to establish a reasonable equity return for PECO. The Commission has
4 acknowledged the usefulness of other methods, such as CAPM and Risk
5 Premium, as a check on the reasonableness of the DCF return.

6 I am aware that the Commission usually expresses its cost of equity
7 determination in the context of the DCF model. But the Commission also
8 considers other methods as well. In its Order entered on December 28, 2012,
9 in Docket No. R-2012-2290597, the Commission stated:

10 Sole reliance on one methodology without checking the
11 validity of the results of that methodology with other cost
12 of equity analyses does not always lend itself to responsible
13 ratemaking. We conclude that methodologies other than the
14 DCF can be used as a check upon the reasonableness of the
15 DCF derived equity return calculation.⁶

16 Indeed, the influence of other methods must have an impact on the
17 Commission's attitude toward the DCF model because the Commission's
18 selection of the rate of return on equity for use in the DSIC is usually set
19 above the cost of equity indicated by the DCF model alone. For example, in
20 the May 17, 2018 Quarterly Earnings Report, the Commission set the DSIC
21 return at 9.55% for the Electric Distribution Companies, while the DCF
22 returns were 9.12% using current prices and 8.97% using 52-week average
23 prices.

⁵ The growth rate variables shown on Schedules 8 and 9 of PECO Exhibit PRM-1 show that the assumptions associated with the simplified DCF model are not reasonable.

⁶ *Pennsylvania Public Utility Commission v. PPL Electric Utilities*, R-2012-2290597 (Final Order entered Dec. 28, 2012) at 80.

1

2 **21. Q. What form of the DCF model has been employed in this case?**

3 A. The constant growth form of the DCF model has been used by Mr. Spadaccio,
4 Dr. Habr, and me. Dr. Habr also offers two variations of a two-stage DCF
5 model, which is not appropriate in this case, and has never been used by the
6 Commission in a rate case decision.

7 **22. Q. Do the DCF results proposed by Mr. Spadaccio provide a reasonable**
8 **representation of the cost of equity?**

9 A. No, not in my opinion. A barometer group assembles a group of utilities for
10 study to avoid relying on data for only a single company, which may not be
11 representative. Therefore, a barometer group should consist of companies
12 having relevant characteristics that are comparable to the utility for which a
13 cost of equity is being determined and should capture sufficient data to
14 smooth out abnormalities. However, the selection of barometer group
15 members requires analysts to carefully assess the reasonableness of the equity
16 cost rates that a model produces for individual members of the proxy group.
17 Individual company results may indicate that sole reliance on a particular
18 model would be problematic. Specifically, when some of the barometer group
19 results are unreasonable on their face, the reliability of the method being used,
20 or the witness' application of that method, should be questioned. Mr.
21 Spadaccio himself realizes that some of his results are unreasonable on their
22 face. For example, he removes from his barometer group the growth rates for
23 Entergy Corp. and FirstEnergy Corp. Yet, he retains the results for a variety

1 of companies that clearly fail the reasonableness test. As indicated below,
 2 DCF results used by Mr. Spadaccio fall into that category:

	Average:					
	52 wk &					
Company	Spot Yield	+	Growth	=	Total	
Consolidated Edison, Inc.	3.66%	+	3.78%	=	7.44%	
El Paso Electric Co.	2.88%	+	4.90%	=	7.78%	
IDACORP, Inc.	2.80%	+	3.88%	=	6.68%	
Northwestern Corp.	4.10%	+	2.57%	=	6.67%	
Portland General Electric	3.44%	+	2.99%	=	6.43%	

3 It is a fundamental tenet of finance that the cost of equity must be higher than
 4 the cost of debt by a meaningful margin to compensate for the higher risk
 5 associated with a common equity investment. Each of the companies listed
 6 above have DCF returns calculated by Mr. Spadaccio that fail to provide a
 7 sufficient spread over the six-month average yield of 4.52% on Baa-rated
 8 public utility bonds, or the June 2017 yield that was 4.71%. As I have
 9 demonstrated in my direct testimony (PECO Energy St. No. 5 at page 45), the
 10 spread between the cost of debt and cost of equity should be 6.50% in this
 11 market environment. Moreover, all of the DCF returns shown above are
 12 substantially below the 9.21% cost of equity that is proposed by Mr.
 13 Spadaccio. As such, none of the returns listed above can come close to
 14 meeting the standard of a fair return.

1 23. Q. Please summarize Dr. Habr's DCF methodology.

2 A. Dr. Habr develops both a Constant Growth DCF that uses analysts' growth
3 forecasts only and two versions of a "Multi-stage DCF" analysis. The first
4 version of his multi-stage model uses the FERC's 2/3 and 1/3 weighting
5 methodology, thus resulting in a blended constant growth model. The other
6 version is a true two-stage model that employs analysts' forecasts and the
7 change in the United States Gross Domestic Product ("GDP"). I address the
8 problems with Dr. Habr's weighting approach later in my testimony.

9 24. Q. Do you have any general observation regarding how Dr. Habr has
10 presented the findings of his analysis?

11 A. Dr. Habr calculates 79 DCF returns for the members of his proxy group using
12 his various models. He then employs the median of all results to reach his
13 proposed 8.74% DCF return. This presentation of his results is very unusual
14 because it does not allow the ALJs and the Commission to see his components
15 of dividend yield and growth that support his proposal, thus making
16 replication of his results difficult. I do not see how the ALJs and Commission
17 could express Dr. Habr's DCF return rate in terms of the individual
18 components of the DCF, as the Commission always does in final orders in
19 base rate cases.

1 25. Q. What additional observations do you have regarding the development of
2 Dr. Habr's DCF results?

3 A. The only component of Dr. Habr's analysis results that merits consideration is
4 his use of averages of analysts' growth forecasts. If those results were
5 modified just to include the DCF returns for Avangrid, the combined DCF
6 return for the proxy group would be 9.76%, as the average, and 9.05%, as the
7 median, and the range would be 6.59% to 16.67% rather than combined
8 returns shown on Dr. Habr's Table 1 at page 14 of his direct testimony.

9 V. DCF GROWTH RATE

10 26. Q. As to the DCF growth component, what financial variables should be
11 given greatest weight when assessing investor expectations?

12 A. The theory underlying the DCF model holds that: (1) the value of a firm's
13 equity (i.e., share price) will grow at the same rate as earnings per share (i.e., a
14 constant price-earnings ("P-E") ratio is assumed); and (2) dividend growth
15 will equal earnings growth (i.e., a constant payout ratio is assumed).
16 Therefore, to properly reflect investor expectations within the limitations of
17 the DCF model, earnings per share growth, which is the basis for the capital
18 gains yield and the source of dividend payments, must be given the greatest
19 weight. The reason that earnings per share growth is the primary determinant
20 of investor expectations rests with the fact that the capital gains yield (i.e.,
21 price appreciation) will track earnings growth with a constant price earnings
22 multiple (a key assumption of the DCF model). It is also important to

1 recognize that analysts' forecasts of earnings growth rates significantly
2 influence investors' expectations of growth. For this reason, the
3 internal/external book value growth rate calculations submitted by Dr. Habr
4 are an inappropriate representation of investor's expected growth rates.
5 Moreover, Professor Myron Gordon, the foremost proponent of the DCF
6 model in public utility rate cases, has concluded that the best measure of
7 growth for use in the DCF model is forecasts of earnings-per-share growth.⁷

8 **27. Q. Dr. Habr claims that you have not correctly interpreted the results of the**
9 **Gordon, Gordon and Gould study. Please respond.**

10 A. As a preliminary matter, although Dr. Habr seems to be making a point that
11 analysts' growth rates are not the best measure of growth for use in the DCF
12 model, it is noteworthy that Dr. Habr used analysts' growth forecasts
13 extensively in all three versions of the DCF model he employed.
14 Consequently, if any alternative conclusion can be drawn from the Gordon,
15 Gordon and Gould study, it is not revealed by Dr. Habr's DCF analysis.
16 The Gordon, Gordon and Gould study looked at historical growth in EPS,
17 historical growth in DPS, analysts' forecasted growth rates, and historical
18 retention growth. Of these measures, Dr. Habr, Mr. Spadaccio and I have

⁷ "Choice Among Methods of Estimating Share Yield," The Journal of Portfolio Management, Spring 1989 by Gordon, Gordon & Gould. "We have compared the accuracy of four methods for estimating the growth component of the discounted cash flow yield on a share: past growth rate in earnings (KEGR), past growth rate in dividends (KDGR), past retention growth rate (KBRG), and forecasts of growth by security analysts (KFRG)...we have three observations to make. First, the superior performance by KFRG should come as no surprise. All four estimates of growth rely upon past data, but in the case of KFRG a larger body of past data is used, filtered through a group of security analysts who adjust for abnormalities that are not considered relevant for future growth."

1 used analysts' forecasts of growth principally in our DCF analysts. No
2 witness used historical growth in either EPS or DPS or historical retention
3 growth in this case. If there is a better measure of growth than analysts'
4 forecasted growth rates, it is not evident from the testimony of any rate of
5 return witness in this case.

6
7 **28. Q. Please address the DCF growth rate analysis performed by Mr.**
8 **Spadaccio.**

9 A. As shown on page 23 of I&E St. No. 1, Mr. Spadaccio proposes a growth rate
10 of 5.37%, after removing negative projected growth rates for Entergy and
11 FirstEnergy Corporation. But, he should have gone further, as he incorrectly
12 did not adjust for the abnormally low growth rates of other companies he used
13 in his proxy group. If he had removed the abnormally low growth rates for
14 Consolidated Edison, IDACORP, Northwestern Corp., and Portland General
15 Electric, his group average growth rate would have been 6.74%, thereby
16 producing a 10.58% (3.84% + 6.74%) DCF return.

17 **VI. LEVERAGE ADJUSTMENT**

18 **29. Q. Please respond to Mr. Spadaccio's criticisms of your leverage adjustment.**

19 A. Mr. Spadaccio offers several reasons for not making a leverage adjustment.
20 First, Mr. Spadaccio notes that the credit rating agencies assess financial risk
21 in terms of a company's income statement in their analysis of the
22 creditworthiness of a company. I agree, but this has nothing to do with my
23 leverage adjustment, which is not designed to produce any particular market-

1 to-book (“M/B”) ratio. The credit rating agencies do not measure the market-
2 required cost of equity for the companies they analyze. Rather, their concerns
3 focus on the interests of lenders, and they assess the risk associated with a
4 company’s ability to make timely payments of principal and interest. Because
5 credit rating agencies do not analyze the cost of equity and do not assess how
6 equity return rates are developed or applied in the rate-setting context, Mr.
7 Spadaccio’s observation has no relevance to my leverage adjustment.

8 **30. Q. Mr. Spadaccio also questions your leverage adjustment by reference to**
9 **prior Commission orders. Please comment.**

10 A. Mr. Spadaccio points to several decisions where the Commission declined to
11 make a leverage adjustment – i.e., rate cases involving Aqua Pennsylvania and
12 the City of Lancaster Water Department. The mere fact that the Commission
13 declined to use the leverage adjustment in the Aqua Pennsylvania case cited
14 by Mr. Spadaccio does not invalidate its use for other companies. Notably,
15 the Commission did not repudiate the leverage adjustment in the Aqua case,
16 but instead arrived at an 11.00% return on equity for Aqua by including a
17 separate return increment for management performance. Thus, just as the
18 Commission does not add an increment for management performance in all
19 rate cases, it does not use the leverage adjustment in all cases either. As to the
20 City of Lancaster decision, the situation there was quite different than the
21 leverage adjustment that I propose in this case. Lancaster proposed a leverage
22 adjustment to the cost of equity measured with the Hamada formula and
23 applied it to the DCF result, the Risk Premium result, and the CAPM. While

1 the Hamada formula plays a role in the CAPM, it is not applicable to the DCF
2 or the Risk Premium measures of the cost of equity. Hence, this distinguishes
3 the City of Lancaster approach to the leverage adjustment from mine in this
4 case.

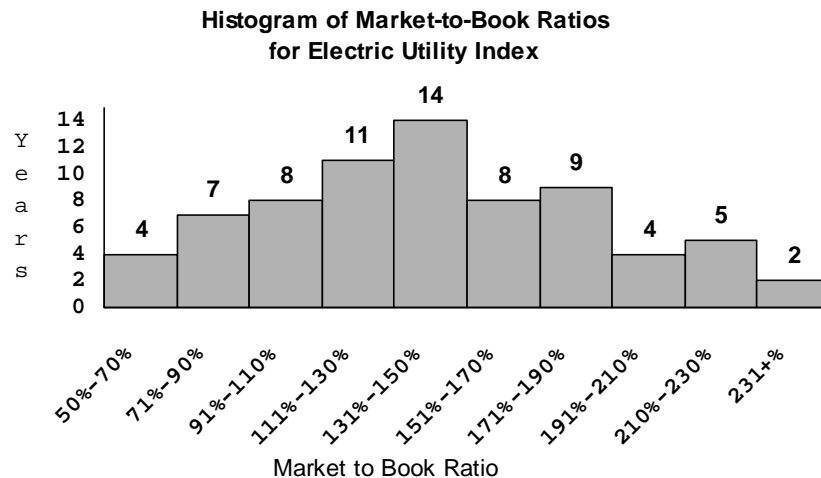
5 **31. Q. Dr. Habr also criticized the leverage adjustment. Please comment.**

6 A. It must be recognized that, in order to make the DCF results relevant in the
7 rate-setting context, the market-derived cost rate cannot be used without
8 modification. As I explained in my direct testimony, the leverage adjustment
9 properly accounts for the divergence of market capitalization from book
10 capitalization. Dr. Habr seems to be arguing that my leverage adjustment may
11 be relevant to non-regulated industries, but he believes that this adjustment is
12 not relevant to regulated public utilities. He asserts that my adjustment would
13 double-count existing risk for public utilities. However, he has not
14 demonstrated, by specific reference to the data I presented on Schedule 10 of
15 PECO Exhibit PRM-1, that any double-counting exists. Rather, he engages in
16 a theoretical discussion of the retention growth (“br”) form of the DCF model.
17 Yet, no witness in this case has used the retention growth form of the DCF
18 model, including Dr. Habr. His discussion of my leverage adjustment is
19 entirely off point. Mr. Spadaccio also contends that, because investors
20 allegedly base their decisions on book-value debt and equity ratios, my
21 proposed adjustment to the DCF is not needed (I&E St. No. 2, p. 45).
22 However, investors cannot purchase the book value of a utility’s debt and
23 equity. Rather, they purchase these securities at their market value and realize

1 returns on the market value. Therefore, Mr. Spadaccio's contention, and the
2 assumption on which it is based, have no foundation.

3 **32. Q. Dr. Habr's opines that any divergence between market value capital**
4 **structure and book value capital structure is related to regulatory risk. Is**
5 **this correct?**

6 A. No. I am not asking the Commission to assume that investors consistently and
7 repeatedly misjudge regulatory risk by pricing stocks and bonds different from
8 book value. My only point is that when we use a market determined cost of
9 equity developed from the DCF model, it reflects a level of financial risk that
10 is different from the capital structure stated at book value. This is not a
11 regulatory risk. In the long history of M/B ratios for electric utilities since
12 1945, M/B ratios equal to 1.0 are unusual and ratios of greater than 1.0 are
13 quite common. That data is shown below.



1 These data show that it is unusual for market prices to gravitate to book value.
2 Indeed, in only about 11% of the years studied did electric utility stock prices
3 approximate book value. In 74% of the years, electric utilities stock prices
4 exceeded book value and sometimes by a substantial amount. The average
5 market-to-book ratio over the past 72 years is 143%. This does not mean that
6 investors have misjudged regulatory risk.

7
8

VII. MULTI-STAGE DCF ANALYSES

9 **33. Q. Is there anything inherently wrong with the non-constant DCF model in**
10 **public utility rate-setting?**

11 A. Yes. The non-constant DCF model, which Dr. Habr described in his direct
12 testimony (OCA St. No. 2, pp. 12-13), is not widely used in regulatory
13 proceedings, and with good reason, because it rests on a set of flawed
14 assumptions. Specifically, the non-constant DCF model requires assumptions
15 in order to extrapolate cash flows too far into the future to support a
16 reasonable and reliable result. Cash flows become less precise as the
17 estimates are extended ever further into the future. That is to say, the
18 traditional way of applying the multi-stage DCF involves forecasts of specific
19 amounts of future cash flows. Based on those specific cash flow estimates,
20 the non-constant DCF model's formula must be solved, by iteration, to derive
21 the present value of those estimated future amounts. Additionally, the process
22 of discounting specific future cash flows is sensitive to the accuracy of
23 forecasts of specific yearly dividends and the accuracy of the forecasted

1 terminal stock value (i.e., the stock price at the end of the forecast period). It
2 is difficult enough to forecast a stock price next week, next month or next
3 year, let alone forecast a stock price ten, fifteen or twenty years from now.

4 **34. Q. Are there objective measures that demonstrate why it is inappropriate to**
5 **use a multi-stage DCF like the model Dr. Habr proposes?**

6 A. Yes, those objective measures consist of: (i) an analysis of dividend payout
7 ratios; (ii) an assessment of electric utilities relative to other industries; and
8 (iii) a determination of whether analysts' forecasts depart so far from
9 reasonable measures of growth that they are not sustainable. First, I have
10 found that recent dividend payout ratios of electric utilities in the 60.0% to
11 76.6% range are typical for regulated public utilities, which indicates that the
12 results of the single-stage, constant-growth DCF model are acceptable for
13 electric utilities. Therefore, the multi-stage approach is not necessary.
14 Second, the multi-stage DCF approach used by Dr. Habr does not fit the
15 pattern of growth I described on pages 28 and 29 of PECO Energy Statement
16 No. 5. It is not reasonable to assume (as Dr. Habr has assumed) that all
17 electric utilities' returns will abruptly change from first-stage levels of growth
18 to second-stage levels of growth in Year 21. This is further evidence that the
19 multi-stage DCF is not appropriate for use in this case. Third, analysts'
20 earnings growth estimates average 5.75% for my Electric Group, which is
21 sustainable given the level of returns the industry is able to achieve. Thus,
22 based on the application of these objective criteria, the use of a multi-stage

1 growth rate in the DCF model for the Electric Group in this case is
2 unsupported and should be rejected.

3 **35. Q. Please explain how Dr. Habr applied his Multi-Stage DCF model in this**
4 **case.**

5 A. Dr. Habr purports to use a multi-stage approach employed by the FERC,
6 which assigns a 2/3 weighting to analysts' forecasts of earnings growth rates
7 and 1/3 weighting to a forecasted GDP growth rate. Dr. Habr's obtained his
8 estimate of GDP growth from the Annual Report from the Social Security
9 Trustees. There is reason to believe that the GDP growth rates he selected are
10 too low because they fail to account for the positive economic impact the
11 TCJA will provide. Dr. Habr's DCF approach, employing a 2/3 weighting of
12 analysts' forecasts and a 1/3 weighting of projected GDP growth, produces an
13 equity return rate of 9.17%.

14 **36. Q. Do you agree with Dr. Habr's use of the GDP growth rate in his "multi-**
15 **stage" DCF analysis of the proxy companies?**

16 A. No, I do not. The U.S. GDP growth rate has little or no connection to the
17 growth rates investors expect for these companies. GDP growth is an average
18 for all activities in the economy. At any given point in time – and over
19 periods relevant for equity cost analyses – some companies or industries grow
20 faster than the economy, while other companies or industries are declining.
21 Thus, it is not unusual for some companies or industries to exceed the average
22 GDP growth rate for significant periods of time. Companies grow at different

1 rates from each other for a variety of reasons related to the economy in their
2 regions, their financing practices, diversification opportunities, and other
3 factors. Consequently, there is no reason to expect that a growth rate based on
4 estimates of future GDP growth is as reliable an estimate based on analysts'
5 forecasts for the specific companies being analyzed.

6 Moreover, the cost of equity estimates that Dr. Habr calculates using projected
7 GDP growth rates are far below returns allowed for electric utilities in recent
8 years. This is further evidence that DCF results reflecting analysts' growth
9 rate estimates are far more reasonable for use in establishing utility base rates
10 for a typical rate application period than DCF results reflecting estimates of
11 GDP growth.

12
13 **37. Q. Have other regulatory commissions relied on the weightings that Dr.
14 Habr has used in his multi-stage DCF analysis?**

15 A. Yes, the FERC has used a methodology that employs a 2/3 forecast and 1/3
16 GDP weighting. The FERC's rationale for using this model, as expressed in
17 its Opinion No. 531, was that the electric transmission industry has reached a
18 mature state of growth that justifies using a 2/3rd – 1/3rd weighted average of
19 analysts' estimates and projected GDP growth, respectively. However, Dr.
20 Habr has not presented any valid factual basis for applying FERC's rationale
21 to the electric distribution industry in Pennsylvania. Moreover, in recent
22 cases, the FERC has also recognized that the results of its application of the

1 DCF model have been distorted by anomalous market conditions. Thus, in
2 Opinion No. 531, issued on June 19, 2014, the FERC noted:

3 There is ‘model risk’ associated with the excessive
4 reliance on mechanical application of a model *when*
5 *the surrounding conditions are outside of the normal*
6 *range*. ‘Model risk’ is the risk that a theoretical model
7 that is used to value real world transactions fails to
8 predict or represent the real phenomenon that is being
9 modeled.⁸

10
11 In Opinion No. 531, the FERC explained that the low interest rates and low
12 bond yields persisting throughout the period it analyzed, which the FERC
13 found to be anomalous,⁹ necessitated granting return rates above the median
14 midpoint of the range of the DCF model’s results. Therefore, in that case, the
15 FERC relied on the CAPM and other risk premium methodologies to inform
16 its judgment about the return rate it should select within the range of DCF
17 results. The FERC chose the 75th percentile (i.e., near the top of the range) to
18 address the effect of anomalous market conditions on the DCF model that it
19 employed.

20 In Opinion No. 551, issued in September 2016, the FERC recognized that
21 anomalous market conditions continued and, once again, concluded that it
22 needed to consider methods of estimating equity return rates other than the
23 DCF model to set the appropriate return on equity:

24 Although the Commission noted certain economic
25 conditions in Opinion No. 531, the principal argument

⁸ FERC Docket No. EL11-66-001, Opinion No. 531, footnote 286 (emphasis added).

⁹ Although Opinion No. 531 was appealed to the U.S. Court of Appeals for the D.C. Circuit and that Court remanded the case to the FERC for further consideration, the Court’s decision did not disturb the FERC’s finding that capital market conditions were anomalous.

1 was based on low interest rates and bond yields,
2 conditions that persisted throughout the study period.
3 Consequently, we find that capital market conditions
4 are still anomalous as described above ...

5 Because the evidence in this proceeding indicates that
6 capital markets continue to reflect the type of unusual
7 conditions that the Commission identified in Opinion
8 No. 531, we remain concerned that a mechanical
9 application of the DCF methodology would result in a
10 return inconsistent with *Hope* and *Bluefield*.

11 As the Commission found in Opinion No. 531, under
12 these circumstances, we have less confidence that the
13 midpoint of the zone of reasonableness in this
14 proceeding accurately reflects the equity returns
15 necessary to meet the Hope and Bluefield capital
16 attraction standards. We therefore find it necessary and
17 reasonable to consider additional record evidence,
18 including evidence of alternative methodologies ...¹⁰

19
20 **38. Q. If the FERC procedure were to be employed, what results would be**
21 **obtained based on Dr. Habr's calculations?**

22 A. The FERC has looked at the level of interest rates and bond yields, among
23 other factors, to determine whether market conditions are anomalous.
24 Anomalous market conditions presently exist because, while interest rates are
25 on the rise, interest rates and bond yields are still low relative to historical
26 measures as a consequence of actions by the FOMC. Indeed, the Federal
27 Reserve has continued to maintain a large balance sheet through its holding of
28 Treasury securities and mortgage-backed securities. While the Federal
29 Reserve has stopped adding to its holdings, its balance sheet currently
30 contains \$4.364 (\$2.546 + \$1.818) trillion of these securities. As I previously

¹⁰ FERC Docket No. EL14-12-002, Opinion No. 551, at para 121.

1 noted, the FERC has found that these factors have created anomalous market
2 conditions and has responded by adjusting upward the point at which it sets a
3 return on equity within the range of returns produced by the “two-stage” DCF
4 model.

5 In summary, the FERC has repeatedly expressed concern that a mechanical
6 application of the DCF methodology will produce anomalous results. For that
7 reason, the FERC stated in Opinion No. 531 that it would consider the results
8 of other models. Opinion No. 531 also indicates that the results of other
9 models help guide the FERC toward selecting a return from the range
10 indicated by the two-stage DCF model (see Opinion No. 531 at P 146). Thus,
11 when the foregoing conditions exist, the FERC moves to the 75th percentile,
12 which is the mid-point of the median and the top of the range of DCF results.
13 Here, the same approach produces a DCF return rate of 10.26% ($8.74\% +$
14 $11.77\% = 20.51\% \div 2$) using the data submitted by Dr. Habr. In addition, the
15 FERC considers, as it must, the requirements set forth in the *Bluefield* and
16 *Hope* decisions.

17

18 **VIII. COST OF COMMON EQUITY - CAPITAL ASSET PRICING MODEL**

19 **39. Q. Do you have concerns with Mr. Spadaccio’s application of the CAPM?**

20 A. Yes. Mr. Spadaccio’s CAPM analysis understates the cost of equity for a
21 number of reasons: (i) he used the yield on 10-year Treasury notes; (ii) he
22 used historical geometric means to calculate total market return; (iii) he used

1 out-of-date measures of the total market return; (iv) he failed to use leverage-
2 adjusted betas; and (v) he failed to make a size adjustment.

3 **40. Q. How does the use of the yield on 10-year Treasury notes compare with**
4 **yields on longer-term Treasury bonds?**

5 A. The Blue Chip reports show this comparison. For the fourth quarter of 2018,
6 the gap is projected to be 0.2% (3.4% - 3.2%) between the yields on 30-year
7 and 10-year Treasury obligations. For the period 2020-2024, that gap is
8 projected to become 0.4% (4.2% - 3.8%). By substituting the yield on 10-year
9 Treasury obligations for the yield on 30-year Treasury obligations, Mr.
10 Spadaccio introduced a systemic understatement of CAPM returns. This
11 understatement can be traced to extraordinary monetary policy actions taken
12 by the FOMC to deal with the persistent sluggishness in the economy. Part of
13 the Fed's strategy in dealing with this issue is a much lower Fed Funds rate
14 that has resulted in lower shorter-term interest rates. While the FOMC has
15 reduced short-term rates to restore investor confidence in the credit markets,
16 long-term interest rates have remained relatively higher. Even though the
17 FOMC has implemented seven increases in the Fed Funds rate since 2015,
18 and additional increases are expected, the current Fed Funds rate (i.e., target
19 range of 1.75% to 2.00%) remains relatively low. That is to say, short-term
20 rates respond more to the policy initiatives of monetary officials, while long-
21 term rates are more a reflection of investor sentiment of their required returns.
22 For this reason, long-term rates, such as those revealed by 30-year Treasury
23 bonds, should be used to measure the risk-free rate of return. Use of shorter

1 term rates, such as Mr. Spadaccio's 10-year Treasury notes yields, are more
2 susceptible to Fed policy actions.

3 **41. Q. How has Mr. Spadaccio understated the risk-free rate of return?**

4 A. The support for his risk-free rate of return is shown on his Schedule 10 of I&E
5 Exhibit No. 2. There, he incorrectly gives the same weight to the yield on 10-
6 year Treasury notes for the fourth quarter of 2018 as he does for the entire
7 five-year period 2019 through 2023. This approach leads to a seriously
8 understated risk-free rate of return. There are several problems with his
9 approach. First, even if 10-year rates are used, it is necessary to correct the
10 weights assigned to the forecast data presented by Mr. Spadaccio. I have
11 revised his forecast below, based upon the Blue Chip report issued June 1,
12 2018. Moreover, Blue Chip provides higher yields on Treasury obligations as
13 the forecasts are extended into the future:

	<u>Year</u>	<u>10-Year Treasury Yield</u>	<u>30-Year Treasury Yield</u>
14			
15	2019	3.40%	3.70%
16	2020	3.80%	4.10%
17	2021	3.80%	4.20%
	2022	3.80%	4.20%
	2023	3.80%	4.20%
18	2024	<u>3.80%</u>	<u>4.20%</u>
19	Average	<u>3.73%</u>	<u>4.10%</u>
20			

21 The resulting risk-free rate of return is 3.73% using the yield on 10-year
22 Treasury notes, as compared to Mr. Spadaccio's 3.38%, and 4.10% using the
23 yield on 30-year Treasury bonds.

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42. Q. What are your observations regarding Mr. Spadaccio’s use of the geometric mean?

A. Mr. Spadaccio has incorrectly used the geometric mean in his historic analysis of the total market returns (see page 26 of I&E St. No. 2). The theoretical foundation of the CAPM requires that the arithmetic mean be used because it conforms to the single-period specification of the model, provides a representation of all probable outcomes, and has a measurable variance. It has been established that the arithmetic mean best describes expected future returns, which is the objective of the CAPM. In contrast, use of the geometric mean, which Mr. Spadaccio advocates, consists merely of a rate of return taken from two data points which would have no measurable variance (i.e., the dispersion of the returns cannot be calculated with a geometric mean). Therefore, while a geometric mean will capture the growth from an initial to a terminal value, it cannot provide a reasonable representation of the market premium in the context of the CAPM because the model requires a representation of investors’ expectations for a single-period return. In contrast, the arithmetic mean provides an unbiased estimate, provides the correct representation of all probable outcomes, and has a measurable variance. This point was underscored by Ibbotson:

Arithmetic Versus Geometric Differences
For use as the expected equity risk premium in the CAPM, the arithmetic or simple difference of the arithmetic means of stock market returns and riskless rates is the relevant number. This is because the CAPM is an additive model where the cost of capital

1 is the sum of its parts. Therefore, the CAPM expected
2 equity risk premium must be derived by arithmetic,
3 not geometric, subtraction.

4 *Arithmetic Versus Geometric Means*

5 The expected equity risk premium should always be
6 calculated using the arithmetic mean. The arithmetic
7 mean is the rate of return which, when compounded
8 over multiple periods, gives the mean of the
9 probability distribution of ending wealth
10 values....This makes the arithmetic mean return
11 appropriate for computing the cost of capital. The
12 discount rate that equates expected (mean) future
13 values with the present value of an investment is that
14 investment's cost of capital. The logic of using the
15 discount rate as the cost of capital is reinforced by
16 noting that investors will discount their (mean) ending
17 wealth values from an investment back to the present
18 using the arithmetic mean, for the reason given above.
19 They will therefore require such an expected (mean)
20 return prospectively (that is, in the present looking
21 toward the future) in order to commit their capital to
22 the investment.

23 *Stocks, Bonds, Bills and Inflation - 1996 Yearbook*, pages 153-154

24 For all the foregoing reasons, the geometric mean should not be used in the
25 CAPM. Using the arithmetic mean, the market risk premium is 6.36%
26 (12.21% - 5.85%), not the value of 5.59% that Mr. Spadaccio derived.

27
28 **43. Q. What do later editions of the Ibbotson Yearbook say about use of**
29 **arithmetic means.**

30 A. Later editions of the Ibbotson Yearbook continue to support using arithmetic
31 data in the CAPM. Thus, in the 2014 Yearbook (*see* page 83), Ibbotson states
32 that "... the arithmetic mean better represents a typical performance over
33 single periods." The CAPM is a single-period model, i.e., it provides an
34 annual return, and, therefore, it requires the use of the arithmetic mean to

1 conform to the specifications of the model. Moreover, when applying the
 2 CAPM (see page 152), Ibbotson specifically states: “The equity risk premium
 3 is calculated by subtracting the arithmetic mean of the government bond
 4 income return from the arithmetic mean of the stock market total return.”

5 **44. Q. What are your observations concerning Mr. Spadaccio’s calculation of**
 6 **the total market return?**

7 A. His forecasted future returns (see Schedule 11 of I&E Exhibit No. 2) using the
 8 Value Line forecasts are out of date. According to the July 13, 2018 issue, the
 9 current Value Line return is 11.83%, consisting of a 9.73% growth rate and a
 10 2.1% dividend yield. Therefore, the correct return on the market is 12.96%
 11 (14.08% + 11.83% = 25.91% ÷ 2) rather than the 10.33% return Mr.
 12 Spadaccio shows on Schedule 11 of I&E Exhibit No. 2.

13 **45. Q. How should these results be used in the CAPM?**

14 A. To calculate the market premium ($R_m - R_f$) with both the forecasted return
 15 rate of 12.96% and historical return rate of 12.21% that I provided above, the
 16 market return would be 12.59% (12.96% + 12.21% = 25.17% ÷ 2). I have
 17 corrected Mr. Spadaccio’s CAPM, as shown below using those inputs, the
 18 yield on 30-year Treasury bonds and the leverage adjusted betas. As shown,
 19 the CAPM result is 10.89%:

	R_f	+	β	(R_m	-	R_f)	=	K
Electric Group	4.10%	+	0.80	(12.59%	-	4.10%)	=	10.89%

1 **46. Q. Do you have any concerns regarding Dr. Habr's CAPM?**

2 A. Yes. There are two principal problems with Dr. Habr's CAPM approach,
3 which preclude its use in this case, namely, the betas he employed and his
4 source of market risk component.

5 **47. Q. What did Dr. Habr get wrong about the betas he employed?**

6 A. He does not use betas that are available to investors, but instead uses betas he
7 calculated. This factor alone invalidates his CAPM results. Dr. Habr's
8 calculation of betas does not conform to, nor could it in any way influence, the
9 returns investors could expect from using the CAPM. In contrast, investors
10 have available, and use, Value Line betas. The CAPM should be applied by
11 using the same kinds of inputs that are available to, and used by investors, and
12 it is well known that investors use the Value Line data. Moreover, the
13 Commission itself relies on Value Line betas, as evidenced by the data and
14 analyses in its Quarterly Earnings Report. Likewise, Mr. Spadaccio and I
15 have also used the Value Line betas. There is no evidence that investors rely
16 on betas that are calculated in the manner Dr. Habr has done. As such, the
17 Value Line betas should be used in the cost of capital computation.

18 **48. Q. What problem have you detected in Dr. Habr's development of the**
19 **market risk premium component of the CAPM?**

20 A. Dr. Habr has used the Duff & Phelps risk premium of 5.69%, which is clearly
21 an outlier given the higher risk premiums of 6.57%, obtained from historical

1 data, and 8.04%, obtained from the S&P 500. It is quite clear that the Duff &
2 Phelps risk premium is much too low to be a reliable measure of market risk
3 premium for use in the CAPM.

4 **49. Q. Does Dr. Habr's CAPM analysis produce reasonable results?**

5 A. No, it does not. Dr. Habr's CAPM results are between 5.71% and 9.42%. For
6 reasons explained previously, these returns are far too low.

7 **IX. COST OF COMMON EQUITY - RISK PREMIUM ANALYSIS**

8 **50. Q. Do you believe the Risk Premium method provides significant evidence of**
9 **the cost of equity?**

10 A. Yes. In my opinion, the Risk Premium results should be given serious
11 consideration. The Risk Premium method is straight-forward, understandable,
12 and has intuitive appeal because it is based on a company's own borrowing
13 rate. The utility's borrowing rate provides the foundation for its cost of equity,
14 which must be higher than the cost of debt to recognize the greater risk borne
15 by equity investors (see PECO Energy St. No. 5 pages 30-33. Despite the
16 fact that Mr. Spadaccio and Dr. Habr decline to consider the Risk Premium
17 approach, it is a well-accepted tool for measuring a utility's risk and return
18 because it considers company-specific factors that are not reflected in the
19 betas used in the CAPM, which only a measure systematic risk. The Risk
20 Premium method is particularly useful when investors expect changes in the
21 cost of debt prospectively, which is currently the expectation of investors, as I
22 have explained in PECO Energy St. No. 5, pages 31-32. Indeed, the Risk

1 Premium approach directly reflects prospective interest rates and, therefore,
2 should be given weight in determining the equity cost rate in this case.

3 **51. Q. Dr. Habr argues that your risk premium model is inappropriate for**
4 **public utilities. Please respond.**

5 A. Returns on public utilities are a component of the data that I used to measure
6 the equity risk premium. Those data were obtained from the returns on all the
7 stocks in the NYSE/AMEX/NASDAQ, of which public utilities are an
8 important part. Hence, my data set is entirely appropriate for PECO Energy in
9 this case because the returns I used were influenced by public utilities.

10 **52. Q. What does Mr. Spadaccio say about your Risk Premium analysis?**

11 A. Mr. Spadaccio makes the unfounded assertion that the Risk Premium and
12 CAPM methods should only be used as a comparison to the results of the DCF
13 method because they do not carry over from the investment decision-making
14 process to the utility rate-setting process. In fact, it is precisely because
15 investors consider the results of methods other than the DCF – the CAPM and
16 Risk Premium, in particular – that those methods should be used in addition to
17 the DCF to develop the cost of equity in this proceeding.

18 Mr. Spadaccio’s assertion that the Risk Premium method does not measure the
19 current cost of equity as “directly” as the DCF is similarly without foundation.
20 As I explained in my direct testimony and earlier in my rebuttal testimony, we
21 are facing the prospect of increasing interest rates for the future. Finally, as I

1 have shown in my direct testimony, the risk premium, contrary to Mr.
2 Spadaccio's contention, is not constant. Therefore, my Risk Premium cost
3 rate is fully responsive to changing market fundamentals. I properly
4 incorporated the trend toward higher interest rates when I developed my Risk
5 Premium cost of equity of 11.25% (4.75% interest rate on A-rated public
6 utility bonds + 6.50% equity risk premium).

7
8 **X. ADJUSTMENT TO PECO ENERGY'S COST OF EQUITY**

9 **53. Q. Does Dr. Habr accept the Company's capital structure for the fully**
10 **projected future test year?**

11 A. Yes. All rate of return witnesses accept the Company's proposed capital
12 structure because it complies with Commission policy, i.e., it contains ratios
13 that fall within the range of the proxy group. Therefore, there should be no
14 claim in this case that the Company's rate of return must be adjusted to match
15 a hypothetical capital structure.

16 **54. Q. Dr. Habr nevertheless imposes a 0.24% penalty on the Company's equity**
17 **return because he believes that the common equity ratio of PECO Energy**
18 **is too high to justify the equity return he devised from his proxy group.**
19 **Do you agree?**

20 A. No. I disagree with his reduction in the cost of equity for both theoretical and
21 technical reasons. On a theoretical level, his reduction is a round-about means
22 of imposing a hypothetical capital structure on the Company. I say this
23 because he measures PECO's capital structure against the median values of

1 the proxy group's capital structures to develop his adjustment. Presumably, if
2 PECO Energy's capital structure were identical to the average of the proxy
3 group, then his adjustment would be zero (0.00%). His adjustment is nothing
4 more than the imposition of a hypothetical capital structure, without calling it
5 that and without providing the necessary justification to support its use.
6 Under Commission policy, a hypothetical capital structure is only appropriate
7 where a utility's capital structure is atypical in comparison to the proxy group.
8 PECO's proposed capital structure is 53.39% common equity and 46.61%
9 debt, which falls within the capital structure ranges of the proxy group,
10 including Dr. Habr's own adjusted proxy group shown on OCA Exhibit DSH-
11 19, p. 1.

12 **55. Q. You said that there are technical problems with Dr. Habr's adjustment.**
13 **Please explain.**

14 A. There are several problems with Dr. Habr's calculations. First, his
15 calculations were not performed on a pre-tax basis as they should have been.
16 Each utility's revenue requirements are determined by using interest
17 synchronization obtained from the weighted average cost of capital, and so,
18 even if I agreed that Dr. Habr's calculations were theoretically correct, they
19 would still have to be done on a pre-tax basis in order to be accurate. Second,
20 Dr. Habr is incorrect to assume the cost of debt would be the same regardless
21 of the debt ratio. Mr. Spadaccio has shown that the cost of debt for the
22 barometer group is 5.01% (see Schedule 3 of I&E Exhibit No. 2), which is
23 much higher than the 4.17% that Dr. Habr has assumed. So, for both

1 theoretical and technical reasons, Dr. Habr's 0.24% downward adjustment is
2 flawed and must be rejected.

3 **XI. COST OF COMMON EQUITY – COMPARABLE**
4 **EARNINGS APPROACH**

5 **56. Q. Have any of the witnesses criticized your cost of equity analysis utilizing**
6 **the Comparable Earnings approach?**

7 A. Yes. Dr. Habr claims that my Comparable Earnings analysis provides no
8 substantive information about the proper cost of equity, and Mr. Spadaccio
9 disagrees with a Comparable Earnings approach because it considered
10 companies that are not utilities.

11 **57. Q. Please respond to the witnesses' criticisms of the Comparable Earnings**
12 **approach.**

13 A. The underlying premise of the Comparable Earnings method is that regulation
14 should emulate results obtained by firms operating in competitive markets and
15 that a utility must be given an opportunity cost of capital equal to that which
16 could be earned if one invested in firms of comparable risk. For non-
17 regulated firms, the cost of capital concept is used to determine whether the
18 expected marginal returns on new projects will be greater than the cost of
19 capital, i.e., the cost of capital provides the hurdle rate at which new projects
20 can be justified, and therefore undertaken. Further, given the 10-year time
21 frame (i.e., five years historical and five years projected) considered by my

1 study, it is unlikely that the earned returns of non-regulated firms would
2 diverge significantly from their cost of capital.

3 The Comparable Earnings approach satisfies the comparability standard
4 established in the *Hope* case. In addition, the financial community has
5 expressed the view that the regulatory process must consider the returns that
6 are being achieved in the non-regulated sector to ensure that regulated
7 companies can compete effectively in the capital markets. Moreover, in a
8 1994 study that addressed the issue of return on equity, John Olson (then with
9 Merrill Lynch) established that equity return rates from non-regulated
10 companies are a better assessment of investor requirements than those
11 available for regulated utilities.¹¹

12
13 **XII. COST OF COMMON EQUITY - PECO ENERGY**
14 **RELATIVE RISK TRAITS**

15 **58. Q. Has Mr. Spadaccio recognized the higher risk of PECO Energy insofar as**
16 **the impacts of the TCJA on the risk and cost of equity?**

17 A. No, he has not. Although Mr. Spadaccio agrees with me that the TCJA's
18 elimination of deferred taxes and bonus depreciation reduces the percentage of
19 internally generated funds for construction, Mr. Spadaccio seems to argue that
20 this is not a concern because, historically, the Company's percentage of
21 internally generated funds to capital expenditures was comparable to that of

¹¹ "Natural Gas: The Case for ROE Reform," John E. Olson First Vice President, Merrill Lynch & Co., October 11, 1994.

1 other companies in the proxy group. However, Mr. Spadaccio's argument is
2 based on a historical judgment about funding prior to the TCJA, and, as I
3 explained in my testimony (and as Mr. Spadaccio separately agrees), these
4 percentages will decline due to the TCJA, so they do not support Mr.
5 Spadaccio's argument regarding the TCJA impacts on funding of capital
6 expenditures.

7 Mr. Spadaccio also asserts that the tax law changes will not prevent PECO
8 from being creditworthy and will likely not impact the Company's ability to
9 access capital at fair rates. I disagree. The risks to the ability of the Company
10 to maintain its credit ratings in light of the changes from the TCJA are clear.
11 Moody's recently reduced the rating outlook for 24 regulated utilities from
12 stable to negative. According to Moody's, the changes were made to those
13 utilities that have a limited cushion against deterioration in financial
14 performance within their ratings category. While customers enjoy the benefits
15 of reduced bills as the TCJA flows through to them, those benefits should not
16 bring with them the credit quality deterioration that can be avoided through
17 offsetting regulatory actions.

18 **59. Q. Have any of the witnesses questioned your recommended adjustment for**
19 **the Company's management performance?**

20 A. Yes. Although Dr. Habr and Mr. Spadaccio do not contradict the evidence of
21 the quality of the Company's management performance, both witnesses
22 nevertheless object to a management performance adjustment on theoretical

1 grounds. Dr. Habr and Mr. Spadaccio contend that the Company should not
2 receive an adjustment for its exemplary performance because, they assert, a
3 utility should not be rewarded for doing what it is supposed to do and,
4 furthermore, that the performance is not quantifiable and any savings achieved
5 from exemplary management performance should flow through to customers.
6 However, their argument really is a philosophical disagreement with the
7 concept of awarding an adjustment at all to a utility for its management
8 performance, which I believe is not an issue for debate in this case. As I
9 understand it, the Pennsylvania legislature has already made a policy
10 judgment that such adjustments should be made in appropriate circumstances,
11 as determined by the Commission. Accordingly, as I explained in my
12 testimony, the Commission has awarded management performance
13 adjustments in prior cases.

14 **60. Q. How should the Commission recognize the performance of the**
15 **Company's management when setting its return in this case?**

16 A. Mr. John McDonald, who adopted Mr. Innocenzo's direct testimony (PECO
17 Statement No. 1) given Mr. McDonald's succession to Mr. Innocenzo's
18 position as Chief Operating Officer of PECO, is addressing the Company's
19 noteworthy efforts in his testimony (see PECO Statement No. 1 and PECO
20 Statement No. 1-R). The Commission should adopt a return on equity above
21 the midpoint of the range of reasonable returns to recognize the exemplary
22 performance of the Company's management. This process has been used in
23 other cases. Thus, the Commission added 25 basis points to the return in the

1 case of West Penn Power Company, 22 basis points to the return in the case of
2 Aqua Pennsylvania, and 12 basis points to the return in the case of PPL
3 Electric Utilities. Certainly, in this case, based on the testimony of other
4 Company witnesses, PECO Energy is deserving of similar treatment for a 20
5 basis points increment ($0.25\% + 0.22\% + 0.12\% = 0.59\% \div 3 = 0.20\%$) that
6 represents an average of the performance recognition previously granted by
7 the Commission in the past. I believe PECO Energy should receive at least
8 this level as well.

9 XIII. SUMMARY

10 **61. Q. Please summarize your rebuttal testimony.**

11 A. It is my opinion that the equity allowances proposed by Mr. Spadaccio and
12 Dr. Habr significantly understate the cost of common equity for PECO
13 Energy. In an environment of prospectively higher interest rates and
14 company-specific risk factors including PECO Energy's operating risk and its
15 small size, an opportunity to earn a cost of equity of 10.95% is reasonable for
16 PECO Energy. In so doing, the Commission should be guided by the
17 exemplary performance of the Company's management and select a point at
18 the upper end of the range of reasonable returns I have recommended – an
19 increment that should be at least 20 basis points in the event the Commission
20 selects a starting value below the mid-point of my recommended range.

21 **62. Q. Does this complete your rebuttal testimony?**

22 A. Yes, it does.